

LIFE SCIENCE ACROSS THE ØRESUND

– a survey of transregional commuters, actors, research and investments



900 border commuters in
Medicon Valley

At least 20 Danish CEOs
at companies in Skåne

13 Danish companies listed
in Sweden since 2014



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– a survey of transregional commuters, actors, research and investments

This analysis has been prepared by Øresundsinstituttet as part of the Interreg-project Greater Copenhagen Life Science Analysis Initiative and was written by Jenny Andersson, Kristoffer Dahl Sørensen, Sofi Eriksson and Johan Wessman.

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Cover photo: News Øresund

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GREATER COPENHAGEN LIFE SCIENCE ANALYSIS INITIATIVE is an EU-project aimed at increasing knowledge about the region's life science cluster. The focus is on the demand for labourers, future expertise needs, and more. The project has received funding through the EU-programme Interreg Öresund-Kattegat-Skagerrak and will continue until 30 June 2022. The project's lead partner is Medicon Valley Alliance, and the partner is Øresundsinstituttet. Region Skåne and Region Zealand are co-funding the project.



MEDICON VALLEY is the bi-national life science cluster spanning eastern Denmark and the Skåne region of southern Sweden. Today, the Danish-Swedish region is marketed internationally with the name 'Greater Copenhagen', and its increasing population has reached more than four million residents. In Sweden, the same geographical area is often called the 'Øresund Region'.

PREFACE

The Danish-Swedish life science cluster that spans over the Øresund, Medicon Valley, is linked together by all of the engaged individuals who work at the universities, hospitals, research centres and all of the companies in the region. As part of the Interreg-project Greater Copenhagen Life Science Analysis Initiative, Øresundsinstituttet has surveyed networks, collaborations, investments, ownership and personal contacts in Medicon Valley.

More than 900 people employed at companies in the life science cluster commute across the Øresund Strait, most of them from Skåne to Danish companies such as Novo Nordisk, Ferring, LEO Pharma, Lundbeck and Genmab. The growing group of companies from Skåne – frequently small and listed in Sweden – is also helping itself to the generous offering of skilled business leaders schooled in the large life science companies across the strait in Denmark. Today, more than 20 life science companies in Skåne are headed by a Danish CEO. Ultimately, in and around Copenhagen is where Medicon Valley's largest life science companies are. The Danish system of large, foundation-owned companies means that power over the company remains in Denmark, even if it is publicly traded, and it also means that part of the company's profits return to research and new startups via the foundations that own them. In Sweden, the focus is more on going public; since 2014, thirteen Danish life science companies have acted on the attraction to listing in Stockholm, and twelve of them are still listed today. More than 25 companies are active on both sides of the Øresund – and this is no novel phenomenon. Already back in 1914, the then-Danish Løvens Kemiske Fabrik set up a Swedish subsidiary in Helsingborg: Leo Läkemedel. The company has changed hands many times since then, and today it's known as McNeil, and its manufacturing and development units are still in Helsingborg.

There is nothing new about national rules and regulations making work across the strait more difficult despite the proximity over the Øresund with the bridge connecting Copenhagen and Malmö and ferries shuttling between Helsingborg and Helsingør. University grants are generally not allowed to cross borders, for example, although a good collaboration means bilateral flow. Over the past six years, crossing the Øresund has become even more difficult for us humans. The migration crisis, crime and now the coronavirus pandemic have led to national decrees on border control and at times even partially closed the borders. At the same time, the border region is receiving support from Brussels via the EU-programme Interreg Öresund-Kattegat-Skagerrak. Since 2015, Interreg has granted nearly €47mn for joint border regional development projects in the life sciences. This analysis is part of one such project.

After more than 50 interviews with players from Medicon Valley, we can draw several conclusions:

- Personal contacts are of great consequence for the border regional development between Sweden and Denmark.
- The national systems still have difficulty managing a border region.
- The trans-Øresund exchange is extensive. Medicon Valley's Danish and Swedish parts are tightly interwoven by their people, capital, projects, research and affairs.
- There remains great potential to increase contacts across the Øresund. The Øresund is where Denmark's and Sweden's national life science strategies meet. Two neighbouring countries, both successful in the life sciences, each an important trade partner for the other. The interviews in this report show that the actors who see great opportunities in expanding collaborations are very many.

Copenhagen and Malmö, 22 June 2021

Johan Wessman
CEO
Øresundsinstituttet



BioInnovation Institute

PHOTO: LEO PHARMA



LEO Pharma Open Innovation.

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ABOUT ZEALAND AND SKÅNE

When we refer to Zealand and Skåne in this report, we are generally referring to the following geographic classification: the Danish island Zealand, and the southern Swedish province Skåne. There are also public and administrative geographies. On the Danish side, the Capital Region of Denmark includes the capital city Copenhagen and the surrounding municipalities, up to northeast Zealand and including the island Bornholm. Region Zealand comprises the remaining parts of Zealand and islands such as Møn, Lolland and Falster. On the Swedish side of the Øresund, the province of Skåne is geographically equivalent to Region Skåne. Together, the three Danish and Swedish regions comprise the Øresund Region, whose population was 4.1 million at the end of 2020, with two-thirds living on the Danish side. The Medicon Valley cluster shares the geography of the Øresund Region. The term Greater Copenhagen is used as an international place brand for the Danish-Swedish region, and it also designates a political collaboration that encompasses the three abovementioned regions as well as Region Halland. The Greater Copenhagen region has a population of 4.4 million.

10 HIGHLIGHTS FROM THE REPORT

MORE THAN 900 BORDER COMMUTERS

The life science sector's labour force moves back and forth across the Øresund Region. A total of over 900 border commuters were identified in the region. At least 800 people commute from Skåne to work at life science companies in Zealand. At least 100 commuters from Zealand were identified as working in the life science sector in Skåne. These figures are the result of extensive contact between ØresundsInstitutet and the companies between 2020-2021. One often hears about highly educated workers who are active across the Øresund. Novo Nordisk is the Medicon Valley company with the largest number of border commuters. 200 people travel from Sweden across the Øresund to work at the company in Denmark.

Read more about border commuting and the labour market in the sector on page 12-25



PHOTO: NEWS ØRESUND

Examples of life science companies in Zealand with border commuters from Sweden	Number of border commuters from Sweden
Novo Nordisk A/S	206
Ferring Pharmaceuticals A/S	110
LEO Pharma A/S	66
H. Lundbeck A/S	40-45

MORE FOREIGN CEOs IN ZEALAND

Around three-fourths of the life science companies that are listed in Sweden and have headquarters or manufacturing facilities in Skåne are headed by Swedish CEOs. In Denmark however, around two-thirds the life science companies with headquarters and listings in Denmark are headed by Danish CEOs. The share of foreign CEOs in the segment is thus larger in Denmark than in Skåne. Larger, listed Danish companies such as Novozymes, H. Lundbeck, Zealand Pharma, Orphazyme and Ambu for example have recruited chief executives from abroad in the past five years. According to recruitment experts, the differences in internationalisation between Denmark and Skåne are related to the companies' size, development stage, capital needs and more. Read more on page 26-40.



PHOTO: NEWS ØRESUND

CORONAVIRUS PANDEMIC GIVES BORDER COMMUTERS TAX HEADACHES.

Working more from home due to the pandemic is making it difficult for border commuters – in the life science and other sectors – to fulfil the requirement of working at least half of the time in their country of employment. This has created extra administration and additional costs for companies and could also mean that border commuters may be hit with back taxes. Read more on page 16.

PHOTO: NEWS ØRESUND



+20

At least 20 Danish CEOs/managing directors work in large, medium-sized and small life science companies in Skåne. The number of Danish directors has risen since 2017. Read more on page 27.



Søren Bregenholt, new CEO of Alligator Bioscience in Lund.



Simon Østergaard, new CEO of CellaVision in Lund.

PHOTO: NEWS ØRESUND & CELLAVISION

EXCELLENT RESEARCH IN THE REGION

Cancer, diabetes and reproduction are three research areas of excellence in Medicon Valley. World-class research is conducted in all three, and there are multiple links across the strait.

There are around 600 researchers in **CANCER RESEARCH** at the hospitals in Region Skåne, Region Hovedstaden and Region Sjælland, and there is also extensive research at the universities, in the industry and at the Danish Cancer Society's research institute in Copenhagen. Within cancer research, it is relatively common for researchers and research groups to collaborate across the strait, but researchers call for more structural collaboration.

DIABETES RESEARCH has strong historical links to the Øresund Region, as the predecessor to today's Novo Nordisk was founded in Copenhagen in 1923. Today, research centres on both sides of the Øresund bring together diabetes research, and many of the largest players have joined forces in the Interreg-collaboration DiaUnion.

REPRODUCTION RESEARCH has also traditionally been strong in the Øresund Region, and there has long been extensive exchange across the strait within the Interreg-project ReproUnion 2.0 and its earlier iterations. Today, a unique biobank is being constructed, the aim with which is to include 5 000 couples from Denmark and Sweden and get to the bottom of involuntary childlessness. Read more pages 46-89.



PHOTO: NEWS ØRESUND

POTENTIAL FOR MORE RESEARCH COLLABORATION ACROSS THE ØRESUND.

"Working together is incredibly easy; it's great when Danish and Swedish doctors and researchers get together for a project and share data and work together – that has never been a problem, it's always been a lot of fun. The obstacles to collaboration are much more structural."

Mef Nilbert, head of research at the Danish Cancer Society in Copenhagen. Read more on page 80-81.



PHOTO: NEWS ØRESUND

€47mn

Between 2015-2022, the EU-programme Interreg Øresund-Kattegat-Skagerrak granted just under €47mn to joint Danish-Swedish development projects in the life sciences. 18 life science projects have received funding during that time, and ten of the projects are still currently active – e.g. DiaUnion. Read more on page 91.

THE WORD ON ØRESUND COLLABORATION

"We have historical collaborations in the Øresund Region, and we will definitely continue to have them. The collaborations are both on the commercial and on the academia fronts. I think we should open a mutual invitation and say: the things that we can do better together working across the Øresund are things we should pursue", says **Kim Kjøller**, chairperson of the cluster organisation Danish Life Science Cluster, which was founded in 2020 and represents around 500 actors from the sector. Read more on page 106.



PHOTO: NEWS ØRESUND

€35mn

The Novo Nordisk Foundation granted €35mn for the super-microscope MicroMAX in Lund, which will be ready for use in 2022. The grant is the foundation's largest in southern Sweden today. Read more on page 107.



PHOTO: NEWS ØRESUND

INVESTMENT CLIMATE IN PROGRESS

The investment climate in Medicon Valley is moving forward, according to a number of Danish and Swedish investment companies. Funding rounds are growing larger, especially on the Danish side of the Øresund, and the participation of venture firms from abroad is increasingly more frequent. Many of the life science companies in Medicon Valley with Danish-Swedish ownership interviewed agree that the access to risk capital is generally good. Actors from the sector point out that Novo Nordisk Foundation's establishment of the BioInnovation Institute in Copenhagen in 2017 was an important event for seed-funding in the region, and it has also benefitted Swedish life science companies. Companies in Skåne also highlight the need for better access to venture capital, and companies on Danish shores would like to see the Danish stock market become more lucrative, like its Swedish counterpart. The result is different capital structures on either side of the Øresund:

- 71 life science companies have headquarters in Skåne and are listed in Stockholm
- 20 life science companies have headquarters in Zealand and are listed in Copenhagen
- 13 Danish life science companies have gone public in Stockholm since 2014; 12 of them are still listed. Together, the companies' IPOs raised 665mn SEK, or €65mn.



PHOTO: NEWS ØRESUND

DENMARK'S AND SWEDEN'S LIFE SCIENCE STRENGTHS CONSOLIDATE AROUND THE ØRESUND

The Øresund Region's Medicon Valley cluster is Scandinavia's largest life science cluster. The region's common research strengths are in diabetes, cancer, fertility and more, and globally leading companies and universities are active in those fields. Denmark and Sweden work across the Øresund to build highly advanced research facilities, and Danish and Sweden investment companies join together to fund new ideas. Innovation and new startups take shape at universities and science parks in Medicon Valley, and more than 900 border commuters cross the Øresund for their work, bringing together Danish and Swedish expertise.

Danish and Swedish companies, organisations, labour forces, capital and research merge in the Øresund Region's life science sector. This is apparent when research starts at Lund University and is developed further in Copenhagen, for example. Danish and Swedish trade organisations work together on conferences and marketing strategies. Biotech companies recruit expertise from Skåne. Danish companies list in Sweden with the help of Swedish financial players. Life science companies from Skåne recruit experienced business managers who have been schooled in Denmark's global enterprises. And research groups work across the Øresund to reach joint goals of finding new treatments.

The life science sector that spans across the Øresund is thus linked in many ways in the Danish-Swedish Medicon Valley cluster, which employs around 50 000 people. The five chapters of the report in hand aim to identify strengths, links and structural similarities and differences in the life science sector in Medicon Valley, which is Scandinavia's largest life science cluster.

One of Medicon Valley's shared Danish-Swedish strengths is that Zealand and Skåne both conduct globally leading research in diabetes, fertility and cancer. Research is carried out commercially via beacon companies such as Novo Nordisk, Ferring Pharmaceuticals and Genmab, as well as at universities, where the researchers further boost the region's scientific strong points. We received data for this analysis from hospitals and universities (The only data from the University of Copenhagen concerns the Center for Basic Metabolic Research (CBMR) and Biotech Research & Innovation Centre (BRIC), and reservation is made for the possibility that some researchers work at hospitals as well as universities regarding:

- **Approx. 1 700 cancer researchers**
- **Approx. 1 000 diabetes researchers**
- **Approx. 150 reproductive researchers**

Sector links within the cluster are apparent in that e.g. there are employees in the sector who work on the opposite side of the Øresund. All the while, researchers at Danish universities develop instruments and software that are already in use and will

MEDICON VALLEY EMPLOYS 50 000

The companies in the Danish-Swedish Medicon Valley cluster employ more than 50 000 people in the Øresund Region.



MEDICON VALLEY is the bi-national life science cluster spanning eastern Denmark (Region Zealand and the Capital Region of Denmark) and the Skåne region of southern Sweden. Today, the Danish-Swedish region is marketed internationally with the name 'Greater Copenhagen', and its increasing population has reached four million residents. In Sweden, the same geographical area is often called the Øresund Region'.

be used at research facilities in Skåne in the future. Danish companies also receive advice from Swedish players on going public in Sweden to raise capital for further development.

- There are at least **900 border commuters** employed in the companies in Medicon Valley, 800 of whom live in Skåne and work in Zealand.
- There are at least **20 Danish CEOs** in the life science cluster in Skåne.
- **13 Danish life science companies** have listed in Sweden since 2014, 12 of them are still listed today.
- Denmark makes financial contributions to **European Spallation Source, ESS**, and **MAX IV** in Lund. Denmark and Sweden are host countries for ESS, whose research facilities are being built in Lund and the data centre for which is at Copenhagen Bio Science Park (COBIS) in Copenhagen.

Border commuting is important for both Sweden and Denmark

One of the main results of this report is that there are more than 900 border commuters at companies in the region. Many in the sector thus live in one country and work in the other.

Trans-Øresund exchange is important, as it broadens the recruitment base across the Øresund. Danish life science companies are currently finding themselves with a labour force shortage. If border commuting from Skåne were to decrease, the need for labourers in the sector in Denmark would be intensified further.

Life science companies in Skåne also benefit from an open and flexible labour market, however. The expertise that people who reside in Sweden can acquire working at larger life science companies in Zealand is unique, as there are multiple large global companies in the industry in Zealand. They function as an anchor of sorts for startups and other businesses in the region. In many cases, people from the sector from Skåne later bring their expertise back and thus benefit other companies in e.g. Malmö and Lund.

Increasing awareness among Danes in the sector of the career opportunities that exist on the Swedish side of the Øresund is a transregional challenge. Danish-dwellers in the sector may also have higher expectations when it comes to e.g. salary that may be difficult to honour.

With its 25% rate, the so-called SINK-tax has traditionally prompted Danes to accept positions in Skåne despite the Danish crown being stronger than its Swedish counterpart. The taxation advantage for border commuters has become a tax trouble during the coronavirus pandemic, however. Official restrictions have made it difficult for many people to fulfil the requirement of being physically present in one's country of employment 50% of the time. This has meant additional administration and costs for companies and employees in the life sciences and in other sectors, and there have been calls for the tax rules for border commuters to be adjusted to accommodate for working from home in the future.

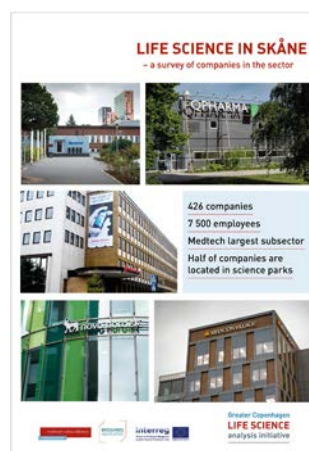
In spite of the abovementioned challenges, approximately 100 commuters live in Denmark and work at life science companies in Skåne, more than 20 of them in executive positions.

UPCOMING ANALYSIS: SURVEY OF THE DANISH LIFE SCIENCE SECTOR

The focus of this report is movement over the Øresund and transregional commuters, actors, research and investments in the life science sector. Upcoming analyses in the Interreg-project Greater Copenhagen Life Science Analysis Initiative will include a detailed survey of the life science cluster on the Danish side of Medicon Valley and more.

An analysis of the clusters on the Swedish side by the name of "Life science in Skåne – A survey of companies in the sector" was published in the autumn of 2020. The report shows among other things that more than 7 500 people work in the life science sector in Skåne; this in an increase of 1 500 employees since 2015. A total of 426 life science companies were identified in Skåne.

The analytic work is carried out by Øresundsinstitutet, and the Interreg-project's leading partner is Medicon Valley Alliance.



Report on life science in Skåne from November 2020.

EXAMPLES OF PEOPLE WHO WORK IN MEDICON VALLEY

COMMUTERS AND EXECUTIVES ACROSS THE ØRESUND



PHOTO: NOVO NORDISK

Kasper Bødker Mejlvang, Country Manager Novo Nordisk. See p. 14.



PHOTO: NEWS ØRESUND

Britt Meelby Jensen, CEO Atos Medical. See p. 22.



PHOTO: PRIVATE

Sara Harboe, Vice President ArjoHuntleigh. See p. 25.



PHOTO: LEO PHARMA

Niclas Nilsson, Head of Innovation Lab at LEO Pharma. See p. 41.



PHOTO: SCANDINAVIAN ONCOLOGY

Maj Hedtjärn, COO & Head of R&D Operations at Scandion Oncology. See p. 34.

RESEARCH AND EDUCATION



PHOTO: IKENNET RUONA - LUND U.

Erik Renström, Vice-chancellor of Lund University. See p. 54.



PHOTO: NEWS ØRESUND

Elise Witthof, Coordinator iCope. See p. 74.



PHOTO: KENNETH RUONA

Kristian Pietras, Professor and Coordinator LUCC. See p. 76.



PHOTO: DIRECTORS CORNER

Carl Borrebaeck, Professor and serial entrepreneur. See p. 78.



PHOTO: LUND UNIVERSITY

Aleksander Giwercman, Project Manager ReproUnion 2.0. See p. 87.

TRANSBORDER ACTORS AND OPERATIONS



PHOTO: NEWS ØRESUND

Petter Hartman, CEO Medicon Valley Alliance. See p. 108.



PHOTO: BIOINNOVATION INSTITUTE

Jens Nielsen, CEO BII Foundation. See p. 103.



PHOTO: NEWS ØRESUND

Tue David Bak, Managing Director Greater Copenhagen Committee. See p. 97.



PHOTO: INVEST IN SKÅNE

Ulrika Ringdahl, Managing Director Invest in Skåne. See p. 97.

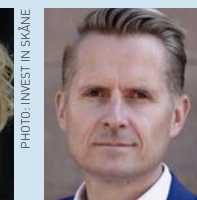


PHOTO: COPENHAGEN CAPACITY

Asbjørn Overgaard Christiansen, CEO Copenhagen Capacity. See p. 97.

INVESTMENT AND LISTINGS



PHOTO: NEWS ØRESUND

Carsten Barring, Head of Listing & Cap. Markets Nasdaq Copenhagen. See p. 118.



PHOTO: NEWS ØRESUND

Fredrik Rahl, Director Sedermera Fondkommission. See p. 120.



PHOTO: NOVO SEEDS

Søren Møller, Managing Partner Novo Seeds. See p. 126.



PHOTO: NEWS ØRESUND

Peter Benson, Chairperson & co-founder Sunstone. See p. 128.



PHOTO: PILA PHARMA-JENNY LEJMAN

Dorte X Gram, CEO PILA PHARMA. See p. 44 & 133.

Over 900 Danish-Swedish border commuters in Medicon Valley

Border commuters are important for the life science sector in Medicon Valley, as many of those active in the sector gain their professional experience across the Øresund. There are over 900 border commuters in the sector, many of them in positions that require a high level of expertise. At least 800 people from Sweden work in the sector on the Danish side. Over 100 border commuters from Denmark commute to jobs in the sector in Skåne; commuting for work from Skåne to Zealand is thus more common than in the opposite direction. These figures come from a survey in which Øresundsinstitutet interviewed the majority of Skåne's life science businesses, as well as 50 of the larger Danish life science companies in Zealand, regarding the number of their employees who commute across the Øresund. For example, just over 200 of Novo Nordisk's employees commute from Skåne to the pharma company's office- and research facilities in Zealand. The coronavirus-pandemic has created immediate challenges related to taxation, attracting employees and more, but also new, flexible working conditions for border commuters.

More than 900 life science employees commute over the Øresund. At least 800 life science employees from Sweden work in some of Denmark's largest life science companies. Around 100 border commuters from Denmark were identified as commuting to Skåne for work in the sector.

These results are based on contact for this report between Øresundsinstitutet and the region's businesses in 2020 and 2021. This involved asking the majority of Skåne's life science companies questions regarding the number of their employees who commute across the Øresund, and 50 larger-scale Danish life science companies were also selected and interviewed about the same. Over 30 Danish life science companies supplied figures regarding the number of their employees who commute from Sweden, and in total, around 800 people cross the border from Sweden to work in the Danish life science sector. They are frequently people with a high level of expertise.

Thus, people who live in Sweden commute to e.g. the pharmaceutical companies H. Lundbeck, LEO Pharma and Novo Nordisk, the hearing aid manufacturer GN Hearing, the ingredients solution company Chr. Hansen, the biotech companies Genmab and Zealand Pharma and the medtech company Ambu.

It may be assumed that the number of border commuters from Sweden to Denmark would be higher if board members and consultants were included in the figures; in addition, commuter figures were not supplied by all of the life science companies asked. Examples (page 14) show that labourers from Skåne find their way to Copenhagen

and the surrounding areas to make a difference in the Danish life science sector, and that the same is true in the other direction, toward Skåne.

Many border commuters at Novo Nordisk and Ferring

One pharmaceutical company in Denmark with many employees from Sweden is Ferring Pharmaceuticals A/S, which was founded in Malmö in

900

More than 900 Danish-Swedish border commuters were identified in Medicon Valley in Øresundsinstitutet's survey between 2020-2021.

800 BORDER COMMUTERS FROM SWEDEN

At least 800 border commuters from Sweden were identified as working in life science companies in Zealand; for example, ca. 200 commuters from Sweden work at Novo Nordisk on the Danish side of the Øresund.

100 BORDER COMMUTERS FROM DENMARK

At least 100 border commuters from Denmark were identified as working in life science companies in Skåne. Most of the sector's commuters travel from Sweden to Denmark.

COMMUTERS AND THE LABOUR MARKET

OVER 900 DANISH-SWEDISH BORDER COMMUTERS IN MEDICON VALLEY

Many life science companies in the Danish-Swedish Medicon Valley cluster recruit employees from across the Øresund. At least 800 people from Sweden work in the sector on the Danish side. Over 100 border commuters from Denmark commute to jobs in the sector in Skåne for a total of at least 900 border commuters in the life science sector in the Øresund Region. Most commute from Sweden to Denmark for work in the sector.

Examples of life science companies in Zealand with border commuters from Sweden	Subsector	Number of employees in Zealand	Number of border commuters from Sweden
Novo Nordisk A/S	Pharma	16 800	206
Ferring Pharmaceuticals A/S	Pharma	580	110
LEO Pharma A/S	Biotech	2 100	66
H. Lundbeck A/S	Pharma	1 700	40-45
Coloplast A/S	Medtech	1 300	31
Chr. Hansen A/S	Biotech	1 800	29
Demant A/S	Medtech	1 800	25
AGC Biologics A/S	CDMO	670	22
Genmab A/S	Biotech	210	20
GN Hearing A/S	Medtech	630	15
Xellia Pharmaceuticals A/S	Biotech	690	15
WS Audiology A/S	Medtech	1 000	13
Radiometer Medical A/S	Medtech	1 200	13
Zealand Pharma A/S	Biotech	230	13

Example of companies in Zealand with 1-9 border commuters from Sweden: Ambu A/S, Bavarian Nordic A/S, Symphogen A/S, AstraZeneca A/S, Orphazyme A/S and Ferrosan Medical Devices A/S.

Example of life science companies in Skåne with border commuters from Denmark	Subsector	Number of employees in Skåne	Number of border commuters from Denmark
Arjo Sverige AB	Medtech	200	14
PolyPeptide Laboratories AB	CDMO	280	14
Atos Medical AB	Medtech	200	10
LEO Pharma AB	Pharma	25	10

Example of companies in Skåne with 1-9 border commuters from Denmark: Novo Nordisk Scandinavia AB, Boston Scientific Nordic AB, Camurus AB, SVAR Life Science AB, Probi AB and Ascelia Pharma AB.

Source: Information from the companies and annual reports. Commuter numbers refer to 2018/2019/2020/2021. The numbers apply to border commuters from Sweden and Denmark, which does not necessarily imply that they are Swedes or Danes. Please note that these figures may have changed since they were reported. Read more about the method on page 135.

1950. In 2002, the company was among the first to consolidate in the then-new neighbourhood Ørestad, near Copenhagen Airport, and in 2006 it opened a new global headquarters in Switzerland. Today, Ferring Pharmaceuticals' International PharmaService Center and R&D are in Ørestad and employ around 600 people, 150 of whom are border commuters from Skåne. Between May and September of 2021, Ferring Pharmaceuticals will be moving to Soundport, near Copenhagen Airport. Soundport will be the new Danish headquarters and Ferring Group's largest R&D centre. It will be even closer to Malmö, where the company continues to have sales- and marketing activity.

Another Danish life science company with a commuting labour force from both Sweden and Denmark is Novo Nordisk. The largest pharmaceuticals company in Denmark and Scandinavia, Novo Nordisk has 206 employees in Denmark who receive their mail in Sweden and are thus border commuters between Zealand and Skåne. Of these 206, 138 are Swedish. Moreover, the company has around five Danish commuters at its facilities in Malmö, where around 75 people are employed.

– It is absolutely crucial for us as a company to be able to attract and retain competent employees where we are. This is also true for our Danish subsidiary, and luckily we can bring in sharp minds from Sweden. Similarly, our subsidiary in Malmö can be an attractive workplace for people who commute in the other direction over the Øresund, says Kasper Bødker Mejlvang, country manager for Novo Nordisk in Denmark. He himself works at Novo Nordisk's Ørestad office, which employs just under 100 people. He adds:

– Our position in Ørestad, close to the Øresund Bridge, makes commuting between work and home in Sweden both easy and fast. Under normal circumstances, without Covid-19, it actually takes less time to commute to and from Malmö or elsewhere in Skåne than it would from say Copenhagen to our facility in Hillerød, he says.

Another of Denmark's largest pharma-

FERRING'S NEW RESIDENCE CAN BOOST BORDER COMMUTING OVER THE ØRESUND ONCE AGAIN

More border commuters in Medicon Valley may become a reality in the years to come. One major reason is that Ferring Pharmaceuticals (International Pharma Science Center) is consolidating at a new address in the Copenhagen area, this time even closer to the southern Sweden.

In the summer of 2021, the pharmaceutical company will move from its Danish headquarters in the Ørestad district to Kastrup, adjacent to Copenhagen Airport.

Ferring Pharmaceuticals' new Danish headquarters, which goes by the name Soundport, is located right on the coast of the Øresund Strait, with a clear view of Malmö, the city in which the company has its historical roots. With its 37 500m2, Soundport will be the largest R&D centre for the Ferring Group, whose global headquarters are located in Saint-Prex, Switzerland.

Ferring Pharmaceuticals expects to recruit around 150 new employees as part of the move, says Marianne Kock, CEO of Ferring Pharmaceuticals in Denmark.

– We expect to employ more staff when we move to our new residence in Kastrup. The new building can accommodate up to around 750 employees; we are just under 600 in our current building. The new staff members might be from Denmark, Sweden or other countries. What is important to us is finding the right employees with the right competences, she says.

Marianne Kock emphasises that the broadest possible recruitment sphere will be vital for the many new vacancies at the new Danish headquarters, and employees who commute over the border will make all the difference, she says.

Historically, the company has made use of border-commuting employees. Today, more than one hundred of those employed at the International Pharma-Science Center and R&D in Ørestad, Copenhagen are border commuters from Sweden. Back in 2002, Ferring Pharmaceuticals consolidated in Denmark and in doing so scaled back its operations in Malmö, although the company still has sales and marketing activities there. Over the years, being established on both sides of the Øresund has meant that many border commuters from Denmark and Sweden have worked for the company, and the



Ferring's new Danish headquarters near Copenhagen Airport, in Kastrup.

chief executive at the company's headquarters in Switzerland today is the Swede Per Falk.

The company's choice to situate the new Danish headquarters Soundport near Copenhagen Airport and just one stop from Malmö's Hyllie district is justified by both practicality and logistics. The view of and proximity to Malmö are also a nod to the company's history, however: it was there that the company was founded by Dr Frederik Paulsen in 1950, under the name Nordiska Hormonlaboratoriet. The research lab and factory were built in the Limhamn district. Today, the founder's son Frederik Paulsen Jr is chairman of the board at Ferring Pharmaceuticals, and he is also the owner – via a foundation – of the Malmö-based life science companies PolyPeptide, QPharma, Nordic Drugs and Svar Life Science, which together employ more than 650 people in Malmö.



Ferring AB was founded in Malmö.

WORKING FROM HOME DURING THE CORONAVIRUS PANDEMIC HAS LED TO TAX ISSUES FOR THOUSANDS OF BORDER COMMUTERS

Partially closed borders in Denmark and Sweden, recommendations by authorities and employers to work from home and negative Covid tests at the border have made it complicated to commute for work in the Øresund Region. According to Skånetrafiken and the Øresundsbron Konsortiet, commutes by train and car over the Øresund Bridge have decreased as a result. Increased working from home during the coronavirus pandemic in 2020 and 2021 has meant tax trouble for some border commuters in the Øresund Region.

The Øresund Agreement requires that tax is paid in the country of employment

As per the Øresund agreement, border commuters must pay tax in the country in which they perform their work duties. For Øresund commuters to be taxed in their country of employment, at least 50% of their work duties must be performed in that country over a three-month period; otherwise, they should pay tax in their country of residence.

For border commuters who have elected or felt obligated to work from home during the pandemic, that has meant – and may continue to mean – filing taxes for certain periods in their country of residence and for other periods in their country of employment and thus submitting tax declarations in both Denmark and Sweden. According to the Øresund Agreement however, tax shall not be paid in both countries for the same period, and another Nordic agreement, the Trekk agreement, makes it possible for authorities to transfer tax revenue that has been paid between the Nordic countries. For Øresund commuters who live in Denmark and work in Sweden, changes in tax liability can lead to unpleasant fiscal surprises, as many usually pay a special income tax, called SINK-tax, on their work

in Sweden. The tax rate is 25%, but tax deductions are prohibited. The Danish tax rate is markedly higher.

For the ca 14 000 border commuters who usually travel from Sweden to Denmark according to the most recent available statistics from 2015, working from home may be an advantage, as the taxes in Sweden are lower than in Denmark. For the 1000-2000 border commuters who travel from Denmark to Sweden for work however, it may become more expensive.

Actors in the border region criticise regulation

Whilst some border commuters – both in the life sciences and in other sectors – have worked with the restrictions and continued to commute throughout the pandemic, others have worked from home. In March 2021, the information service Øressund-direkt told News Øresund that they receive around 200 e-mails regarding the taxation issue every week. The Facebook forum “I klemme mellem 2 lande” – stuck between two countries – has more than 4000 members. Among those to highlight the bureaucratic challenges that surround border commuting and tax issues during the pandemic has been the network organisation Medicon Valley Alliance, which works to promote Denmark and Sweden’s shared interests in the life science sector.

The Freedom of Movement Council, which works on behalf of the Nordic governments, and the organisation for Danish-Swedish political collaboration Greater Copenhagen Committee have also repeatedly brought these problems to the attention of the tax ministries in Denmark and Sweden in order to establish a fiscal exception for Øresund commuters – to date, to no avail.



PHOTO: NEWS ØRESUND

ceutical companies, H. Lundbeck, which has facilities in the Copenhagen area and in Malmö, also recruits from both sides of the Øresund. Around 40-45 employees in Skåne commute to Denmark, where around 1500-1600 people work at the company’s headquarters in Valby, Copenhagen.

– At Lundbeck we work to develop treatments for neurological disorders by researching and developing medicine for migraines, Alzheimer’s, and depression, for example. That requires highly specialised employees with neurological expertise. For that reason, we have an international workplace, with some of the top experts from around the globe, and thus naturally we’re also happy that we can recruit employees to our offices from both Denmark and Sweden, says Matias De Place, senior director of HR at H. Lundbeck.

“Our position in Ørestad, close to the Øresund Bridge, makes commuting between work and home in Sweden both easy and fast.”

AstraZeneca’s closure sent more Swedes to Denmark

One of the many Swedes in the Danish life science sector is Niclas Nilsson, head of Open Innovation for Danish LEO Pharma. He has noticed more Swedes taking on employment in Denmark in the years since he started working for LEO Pharma in Denmark in 2005.

– There are definitely a lot of Swedes in Danish life science, he says. As he sees it, many have come to Denmark in the past 5-10 years, and they contribute with additional competences and expertise.

The combination of Danish and Swedish colleagues in the sector has become much more widespread, accepted – even completely normal, says Niclas Nilsson. He notes that there was a particular surge in Swedish employees in the life sciences in Zealand when the Swedish-British pharmaceutical company AstraZeneca dismantled their R&D activities in Lund ten years ago as part of a larger, global R&D-restructuring, and 900 positions disappeared. Niclas Nilsson talks about his work in the life science sector in Denmark in more detail in the interview on page 41-43.

Many of those competences then became accessible for Danish life science companies on the other side of the Øresund, for example, says Niclas Nilsson. At the same time, he has the impression

that fewer Danes are commuting to jobs in the life sciences in Skåne. Other actors in the sector with whom Øresundsinstitutet has been in contact have confirmed this. It could be related to the lower salaries in Sweden, even when the special 25% tax rate with the SINK model is taken into account, according to Dorte X Gram, the Danish CEO of PILA PHARMA in Malmö. She talks about her company and more in the interview on page 44-45.

– Since large enterprises in Denmark offer such good salaries, Danes are often too expensive – relative to what I’m prepared to pay at any rate, she says.

Expertise creates value as it moves between Denmark and Sweden

The report Life Science in Skåne from 2020 is part of the Greater Copenhagen Life Science Analysis Initiative, and it identified around 100 Danes with full-time positions at around 30 life science companies in Skåne. The Danish labour force finds its way to some of the Swedish subsidiaries of larger Danish pharmaceutical companies such as LEO Pharma, Novo Nordisk and H. Lundbeck – see table on page 14.

Larger companies in Skåne, as well as the medtech manufacturers Arjo and Atos Medical and the

CDMO-company PolyPeptide Laboratories – all of whose global headquarters are in Malmö – also take advantage of the Danish labour force, they report.

Remarkably, McNeil AB in Helsingborg, which is Skåne’s largest life science company with around 655 employees and has historical roots in the Danish company LEO Pharma, has no border commuting employees from Denmark in its staff, whilst medium-sized and particularly small companies – for example at Medicon Village and Ideon in Lund – make use of the labour force from Denmark.

In addition, there are 20 life science companies with Danish CEOs in Skåne – read more on page 31. If board members and consultants are included in the count, the number of border commuters from Denmark linked to the life science sector in Skåne is even higher. The Danish-Swedish biotech company PILA PHARMA in Malmö for example



Kasper Bødker Mejlvang, Country Manager for Novo Nordisk in Denmark.

PHOTO: NOVO NORDISK

has put together an organisation that comprises both Danish and Swedish consultants, as CEO Dorte X Gram recounts; read more on page 44-45.

Danish life science companies anchor startups in Skåne

Another aspect of border commuting in Medicon Valley is that Swedes who have spent several years working in the life science sector in Denmark return to Skåne in new positions – see page 36-40 for some examples. Large Danish life science companies thus function as so-called anchor companies for life science companies in Skåne as well, which can recruit experienced personnel from larger global companies.

Among those who have benefitted from that

is the biotech company Ascelia Pharma which is headed by the Danish CEO Magnus Corfitzen. The company expected to double its staff in 2020 and in the years to follow. Today, it employs 15 people full-time in Hyllie, south of Malmö, where it moved last year from its previous location at Medeon Science Park.

– More than half of the Swedish employees at Ascelia Pharma today worked in Denmark for years; that means that they have been in a global pharma headquarters and gained experience in late-stage drug development and commercialisation that they would not have had the opportunity to gain in southern Sweden, he says.

Employees in Zealand and in Skåne can differ somewhat, Magnus Corfitzen observes, because

AROUND 1 300 PEOPLE WHO RESIDE ABROAD WORK IN THE LIFE SCIENCE SECTOR IN DENMARK...

The number of people who reside abroad and are employed in the life science sector in Denmark rose 12% between 2008-2018. The majority are employed in the capital area. Foreign employment in Denmark's life science sector comprises ca 2.5% of all employees.

Denmark		The number of people who reside in Denmark and are employed in the life science sector in Denmark		The number of people who reside outside Denmark and are employed in the life science sector in Denmark	
Area	2008	2018	2008	2018	
Capital Region of Denmark	29 032	38 028	1 028	1 209	
Region Zealand	7 044	6 858	107	69	
Elsewhere in Denmark	9 764	9 887	78	78	
Total	45 840	54 773	1 213	1 356	

Source: Statistics Denmark. The figures do not indicate how many Swedes work in the life science sector in Denmark. It is plausible that the majority of those who reside abroad are Swedes, as the majority of the commuting is to life science companies in the capital region in Zealand (Denmark). The figures refer to seven sector codes that are used to define the life science sector: 26.60.10, 26.60.90, 32.50.00, 46.46.10, 72.11.00, 72.19.00 and CF Pharmaceutical Industry.

... AND THEY PAY CA 265 MN DKK IN INCOME TAX

Income tax from people who reside abroad and are employed in the life science sector in Denmark rose 82% between 2008-2018. During that same period, people in the life science sector who reside abroad paid a total of ca. 2.6bn DKK in income tax in Denmark.

Denmark	2008	2018
The total income tax from people who reside in Denmark and are employed in the life science sector in Denmark	6.4 mn DKK	10.3 mn DKK
The total income tax from people who reside outside Denmark and are employed in the life science sector in Denmark	145 mn DKK	265 mn DKK

Source: Statistics Denmark. The figures refer to seven sector codes that are used to define the life science sector: 26.60.10, 26.60.90, 32.50.00, 46.46.10, 72.11.00, 72.19.00 and CF Pharmaceutical Industry.

COMMUTER STATISTICS AFTER 2015 IN UNDERSUPPLY

2015 is the most recent year for which official statistics on border commuting over the over Øresund Strait are available, as data exchange between Statistics Denmark (DST) and Statistics Sweden (SCB) has been temporarily suspended. The reason for this is that Sweden's rules regarding public access are considered more extensive than their Danish counterparts.

According to the most recent statistics from Ørestat / the Øresund Databank, the number of commuters and other gainfully employed individuals who commute over the Øresund rose by 297% in the period from 2000-2015.

In the year 2000, there were 3291 border commuters over the Øresund, and in 2015, that number had risen to 15 182 people, 14 045 of whom commuted from Skåne to eastern Denmark, and 1137 of whom moved in the other direction.

2008 was a record year: 25 689 people had an income on the other side of the Øresund. The number then dropped, and in 2015 the number of commuters was nearly one-third lower.

The majority (91%) commute from the Swedish to the Danish part of the region, but the number of commuters in the other direction has grown.

After 2015, travel and commuting over the Øresund has been negatively impacted by three events: In response to the migration crisis, Sweden introduced temporary border checks of incoming travel from Denmark. In November 2019, Denmark introduced a temporary internal border inspection of those coming from Sweden to prevent criminal activity across the border. In March 2020, Denmark partially closed the border to Sweden to limit the spread of the coronavirus SARS-Cov-2. Sweden partially closed its borders with Denmark for the same reason in December 2020. At the time of writing in the spring of 2021, Denmark and Sweden have both begun to loosen travel restrictions over the Øresund.

Efforts are currently underway to revive statistics on Øresund commuting. In the spring of 2021, Region Skåne and Statistics Denmark have explored the possibility of using Danish data from e.g. Denmark's income register to identify the number of trans-Øresund commuters.

In 2019, the Nordic Council of Ministers and the Nordic ministers of state set the goal of making Scandinavia the world's most sustainable and integrated region by 2030.

companies' composition varies according to size; that is both unique and positive and should be used to benefit everyone involved, he says.

– Being able to work freely in every direction is incredibly important so that the right competences can be recruited – for both Danish and Swedish companies, he says.

Pandemic creates tax issues for border commuters

The coronavirus pandemic has complicated border commutes for work between Sweden and Denmark. As a result, train- and car commutes over the Øresund Bridge have dropped: -43% and -27%, respectively, since 2019, according to Skånetrafiken and the Øresundsbron Konsortiet.

The pandemic has thus led to problems related to how employees working from home should be taxed. The regulations are part of the Øresund Agreement, a taxation agreement between Sweden and Denmark. According to the agreement, border commuters must work on site in their country of employment at least 50% of the time over a three-month period in order to be taxed in their

country of employment rather than in their country of residence. Working from home during the pandemic has made it difficult to fulfil the physical presence requirement of 50% in the country of employment.

As per the rules, tax must then be paid in both countries – albeit not at the same time, but for different periods throughout the year. Not declaring this might result in tax trouble costing thousands of crowns. This has meant extra administration and expenses for many, including the Malmö-based Ascelia Pharma, says the company's CEO Magnus Corfitzen. As he sees it, the situation has been suboptimal, although he understands border regions will probably never be completely frictionless.

To date, national authorities in Sweden and Denmark have not offered exemptions related to



Matias De Place, Senior Director i HR i H. Lundbeck

PHOTO: H. LUNDBECK

taxation issues for border commuters during the pandemic, despite calls for them by the Nordic Freedom of Movement Council, the collaborative Danish-Swedish organisation Greater Copenhagen Committee and others.

– Politicians say that there is no double taxation, but in effect there is, as commuters have difficulties getting refunds of the excess tax they have paid; each of the tax authorities believes that they have done what they have to and that the other tax authority is responsible for the reimbursement, says Magnus Corfitzen. He adds:

– Without border commuting, we dramatically reduce recruitment potential in both Denmark and Sweden, and the competitiveness of the region as a whole decreases. The question then is whether companies should recruit from elsewhere in Europe or from other parts of the world – if people can't be in the same place anyway, and we have to take transfer pricing etc into account anyway, even for employees whose workplace is just on the other side of the bridge. Our region has so much to offer on both the Danish and Swedish sides. We've built up so much and we need to reinforce that further so it will continue to become stronger in the future, says Magnus Corfitzen. He believes that smoother commutes, less administration and authorities' acceptance that working from home during this or any other pandemic has no effect on tax affairs are essential and necessary for the long-term growth of the life sciences in the region. Among other things, this is because promising biotech companies in Skåne are sometimes dependent on life science expertise from the Danish side of the region in order to grow into a commercial company – as is the case with Ascelia Pharma, he says – whilst competence in Skåne is, as mentioned earlier, broadly beneficial for the life science industry in Denmark.

Higher priority for border region challenges

Like Ascelia Pharma, the Danish-Swedish network organisation Medicon Valley Alliance is also critical of the border commuting conditions

during the coronavirus pandemic. According to CEO Petter Hartman, a consequence will be that companies will have more difficulty recruiting and retaining employees from the opposite shores of the Øresund, and the efforts being made to attract investments and talent to the region are also suffering damage.

– We have to handle crisis situations better. Border regions get shabby treatment on a national level, and if border regions are to be motors for growth, that has to change, he says. Read more in the interview on page 108-109.

Britt Meelby Jensen, CEO of the medical equipment manufacturer Atos Medical in Malmö, agrees. The company moved its headquarters from Hörby, Skåne to Malmö in 2016. Among other reasons, they wanted to facilitate access to the Danish labour market, which they did. Although she and her colleagues have been able to commute across the Øresund during the pandemic, the difficulties of border commuting have nonetheless

hit the Øresund Region as a whole, she says.

– I find that there has been very little focus on making it easier – neither on the part of Sweden nor Denmark, she says, pointing out that the Danish and Swedish rules have been unclear. As she sees it, it is essential that potential candidates don't get the impression that crossing the Øresund Bridge can be a nuisance.

– If the Øresund Region and transborder commuting are something we really want, then it's also important that commuting is made easier – even during a coronavirus pandemic, she says. More details in the interview on page 22-23.

Novo Nordisk's country manager in Denmark Kasper Bødker Mejlvang is positive at the moment when it comes to the opportunities for the labour market and recruitment that the coronavirus pandemic have made visible since March of 2020.

– The lockdowns showed us that it's very possible to work from home, and in the future that will also make working elsewhere in the region both easier and more attractive. But it's obviously important that there is proper and flexible framework in place for employees who commute, he says.

"Without border commuting, we dramatically reduce recruitment potential in both Denmark and Sweden, and the competitiveness of the region as a whole decreases."



Magnus Corfitzen, CEO
Ascelia Pharma.

PHOTO: NEWS ØRESUND

Examples of life science companies with facilities in both Skåne and Zealand

PHARMA/BIOTECH

- **Novo Nordisk.** Global headquarters near Copenhagen in Bagsværd, offices in e.g. Ørestad and Malmö.
- **H. Lundbeck.** Global headquarters in Valby, Copenhagen, sales and marketing division in Malmö.
- **LEO Pharma.** Global headquarters near Copenhagen in Ballerup, sales and marketing division in Malmö.
- **Ferring Pharmaceuticals.** Global headquarters in Switzerland, branches in e.g. Ørestad/Copenhagen and Malmö.
- **RhoVac.** Headquarters at Medicon Village in Lund, branch near Copenhagen in Hørsholm.
- **Astellas Pharma.** Global headquarters in Japan, Nordic headquarters in Kastrup and a branch in Malmö.
- **Lohmann & Rauscher.** Global headquarters in Germany and Austria, branches in Vedbæk and Lund.
- **Swedish Labex.** Headquarters in Helsingborg and branches in e.g. Valby, Copenhagen.
- **BD (Becton, Dickinson and co).** Global headquarters in the USA, branches in e.g. Helsingborg and Lyngby.
- **Medidyne.** Headquarters near Copenhagen in Nærum and branches in e.g. Ängelholm, Skåne.
- **European Institute of Science.** Headquarters at Ideon Science Park in Lund, branch in Kastrup near Copenhagen.
- **Acarix.** Headquarters in Malmö, branch in e.g. Hellerup in the Copenhagen area.

CRO/CMO/CDMO

- **Visiopharm.** Global headquarters near Copenhagen in Hørsholm and a branch in e.g. Lund.
- **Red Glead Discovery.** Headquarters at Medicon Village in Lund, office at COBIS in Copenhagen.
- **Larix.** Headquarters in Herlev, branch at Medicon Village in Lund.
- **KLIFO.** Headquarters in Glostrup in the Copenhagen area, branches in e.g. Medicon Village in Lund.
- **Bioneer.** Headquarters near Copenhagen in Hørsholm, branch at Medicon Village in Lund.

OTHER

- **Arjo.** Global headquarters in Malmö, branch near Copenhagen in Lyngby.
- **Atos Medical.** Global headquarters in Malmö and e.g. manufacturing and R&D in Hörby, Skåne and a branch in Roskilde.
- **Gefinge.** Global headquarters in Gothenburg, branches in Malmö and e.g. Ballerup, near Copenhagen.
- **Mediplast.** Global headquarters in Malmö, branch near Copenhagen in Herlev.
- **BoneSupport.** Headquarters at Ideon Science Park in Lund, branch in e.g. Lyngby near Copenhagen.
- **Rubin Medical.** Headquarters in Malmö and a branch in the Copenhagen area in Hvidovre.
- **Chas. Hude.** Headquarters in Copenhagen, branch at e.g. Medicon Village in Lund.
- **Højberg.** Headquarters in Copenhagen, branches at e.g. Medicon Village in Lund and MINC in Malmö.

“THE SKILLED LABOUR POOL IS MUCH LARGER IF WE CAN LOOK BEYOND SWEDEN TO DENMARK AS WELL”

Medical equipment manufacturer Atos Medical employs around 185 people in Malmö and Hörby and according to the company's Danish CEO Britt Meelby Jensen, it is important to take advantage of the possibility to recruit employees from both sides of the Øresund. She still finds it important to raise awareness – especially for people in the sector in Denmark – about the career opportunities in the life sciences in Skåne.

When Britt Meelby Jensen started in her position as CEO of Atos Medical in Malmö in March 2019, she was living north of Copenhagen in northern Zealand, and she had few reservations about heading the medical equipment company from the other side of the Øresund.

– The fact that the company was in Skåne and not in Denmark didn't influence my decision much, and that's because I see the Øresund Region as one single area, says Britt Meelby Jensen.

Her perception of the region is based on experiences and employment earlier in her career; she held top management positions at Novo Nordisk for 11 years, until 2013, and was thus based in Malmö for a brief period, and she also collaborated with Swedish colleagues in her position as CEO of the biotech company Zealand Pharma in the Copenhagen metropolitan area from 2015-2019.

– I had a lot of Swedish colleagues at my former position at Zealand Pharma; my chairperson was Swedish, as was the financial director, says Britt Meelby Jensen, who is on Novo Holdings' Advisory Group, a member of the board of the Danish medical device company Ambu, and a member of the Danish Competitiveness Council (Kompetencevnerådet), which proposes initiatives for how Danish businesses can sharpen their competitive edge.

Britt Meelby Jensen was already familiar with working in a richly diverse international environment with Swedes, Danes and others, and she saw that aspect as a definite plus.

– That the position was in Sweden was neither a specific asset nor an issue, says Britt Meelby Jensen of deciding to continue her career in Skåne. The motivation was thus not really about “Danish” or “Swedish”, she says. Instead, she chose to work in

Skåne because she made the choice to work at the company Atos Medical.

The focus on a niche population was what attracted Britt Meelby Jensen: the company's assistive equipment has helped more than 100 000 patients around the globe who have had a cancer-related laryngectomy or tracheotomy. The company's main products include a valve between the trachea and esophagus that makes speaking possible again, as well as products

that facilitate breathing. She also saw that Atos Medical had enormous potential for global growth.

Headquarters in Malmö helped recruitment

Additional growth requires access to the right expertise, and Atos Medical must be able to bring in employees from Sweden, Denmark and abroad. Numerous Danish staff members cross the border to work there. Since the headquarters moved from the small town of Hörby in central Skåne to Malmö in 2016, it has become easier to recruit the right staff.

– It has definitely made it easier to attract workers from Denmark and from abroad. We are 40 minutes closer to Denmark than we were before, says Britt Meelby Jensen. She notes that the headquarters' location in Hyllie, just one station away from Copenhagen Airport, makes commuting easy for the headquarters' ten Danish employees, as well as for visitors from abroad.

The company's upper management comprises both Danes and Swedes, and Britt Meelby Jensen believes that the synergy between the two countries is important for the company, among other things when it comes to recruiting expertise. Atos Medical thus has “Øresund-access”; at the same time however, Atos Medical is without a doubt a Swedish company, says Britt Meelby Jensen.

– Our focus is on attracting the best of the best. Sometimes they are in Sweden, in Denmark, or

somewhere else completely, she says, and points out that there are employees from 16 different countries at Atos Medical's headquarters. She also adds that recruiting employees from Denmark is vital.

– The skilled labour pool is much larger if we can look beyond Sweden and attract talent from Denmark as well. Being able to cast our net as far as possible is essential, she says, pointing out that there are many qualified candidates in the medical devices industry in Denmark. Britt Meelby Jensen thus sees it as mutually beneficial for both countries that Danish and Swedish life science companies can recruit expertise from across the border.

Knowledge of the sector in Skåne could be improved

While the Danish labour force does find its way to the Malmö headquarters, Britt Meelby Jensen maintains that a lot can still be done to make the career opportunities in the life science sector in Skåne more visible – especially in Denmark.

– When I talk to colleagues in the sector who are on the lookout for a new job, most have very limited knowledge when it comes to what's on the other side of the Øresund. I think it's a shame, and I still think there is a duty to see the region as one single whole and increase awareness about the exciting opportunities in both countries, says Britt Meelby Jensen. She believes that more news coverage of the sector in the region can increase that knowledge and awareness.

Thanks to the Øresund Bridge, connectedness in the region is vastly improved today compared to 20 years ago, she says. According to the most recent available statistics from 2015, 14 045 people commute from Skåne to eastern Denmark, and 1 137 commute from eastern Denmark to Skåne, and as Britt Meelby Jensen sees it, that bears witness to improvements in how well people find their bearings across the border, also when it comes to work.

– We've made a lot of progress in the past 20 years, but we can go so much further, and the conditions are excellent for that becoming a reality, she says.

The coronavirus pandemic has temporarily reduced commuters' freedom of movement in the Øresund Region. Britt Meelby Jensen does not feel that the crisis situation has been a barrier for commuting, and that it has shown the potential for greater flexibility through working from home. She does however feel that the region has been hit hard on the whole by the unclarity and confusion related to the differences in the countries' restrictions.

– I find that neither Sweden nor Denmark has put much focus on making commuting easier. If



PHOTO: NEWS ØRESUND

the Øresund Region and transborder commuting are something we really want, then it's also important that commuting is made easier – even during a coronavirus pandemic, says Britt Meelby Jensen, who has been commuting between Malmö and Copenhagen throughout the pandemic.

Mutual benefits from more exchange

It is essential that potential candidates don't get the impression that crossing the Øresund Bridge can be a nuisance, Britt Meelby Jensen points out. As she sees it, increased exchange in the life sciences between Denmark and Sweden would be beneficial since the



PHOTO: NEWS ØRESUND

ATOS MEDICAL AB

- **Founded:** 1986
- **Branches in life sciences:** Medtech
- **Focus area:** Laryngectomy care
- **Ownership:** Private
- **CEO:** Britt Meelby Jensen
- **Turnover 2019:** 1.7bn SEK
- **Total number of employees globally:** 809
- **Total number of employees in Malmö and Hörby:** 185
- **Total number of Øresund commuter employees from Denmark:** 10

countries are compatible in terms of their strong research- and innovation environments, and they also complement each other as Denmark's larger companies develop talents and make the sector's leading position visible whilst growth drivers in Sweden are linked more closely to incubation, startups and greater access to risk capital due to e.g. lower taxes on stock, says, Britt Meelby Jensen.

– We are two relatively small countries, but together we're stronger, and it's important to remember that so we don't always consider ourselves either one or the other. The Øresund Region is a good opportunity to put Sweden in focus, and in the future perhaps there can be more collaboration with other areas such as Gothenburg or Stockholm, she says.

Interview with a commuter – Håkan Bladh

Senior alliance manager at LEO Pharma A/S, whose headquarters are in Ballerup outside Copenhagen. Håkan Bladh commutes from Sweden and has worked in Denmark since 2010.

Why did you choose to work in Denmark?

– I had been considering changing my job for a while and the opportunities in southern Sweden were pretty limited in 2010 (Ed. note: AstraZeneca closed its R&D facilities in Lund in 2011, which resulted in 900 people being made redundant). Since my employer at the time was planning to restructure, it was natural to look for opportunities on the other side of the Øresund Strait. I got a good offer for a very inspiring position and I grabbed it.

How do you find commuting? Both now, with Covid-19, and under normal circumstances?

– Before started working in Denmark I found the idea of commuting to Denmark terrifying. But commuting by car works really well. There is a large group of commuters living in Lund, and we have a very effective carpooling system. I've commuted quite a bit by train, and it doesn't always work very well. In Denmark employers have been more receptive to employees working from home a few days a week for a long time; that helps a lot. Working from home has obviously increased because of the pandemic.

What are the biggest differences between working in the life science sector in Denmark compared to Sweden?

– As a Swede, the thing one reacts to when being employed in Denmark for the first time is that there are no collective agreements. It's important to look at the details of the agreement, especially when it comes to pension; there can be significant variations from company to



PHOTO: PRIVATE

company. As for the cultural aspect, I don't find that the differences are so great. Communication is more direct in Denmark. One big difference is that there is an enormous and dynamic labour market in the life sciences, especially in Copenhagen. That means great opportunities for people in the sector.

What have you learnt about the Danish life science sector that you didn't know before?

– I have learnt that Denmark is very advanced in the life science sector, more than what I had thought before I started. There are a huge number of good startups.

Would you say that people who work in the life science sector in Skåne are aware of the career opportunities in the life sciences in Denmark?

– I think that most people are; a lot of people are probably hesitant to start commuting. I was.

Would you recommend working in the life science sector in Denmark? Please explain.

– Absolutely, it's a great opportunity to get a chance to work abroad without moving! There are a lot of exciting companies with many development opportunities, and Swedes fit in well in Danish corporate culture.

Do you know of anyone who lives in Denmark and works in the life sciences in Sweden?

– Yes, I know of a few people, but it's definitely more common for Swedes to work in Denmark than the other way around.

Interview with a commuter – Sara Harboe

Vice president, Corporate Quality Management System & Product Compliance at ArjoHuntleigh AB, part of Arjo Group with headquarters in Malmö. Sara Harboe commutes from Denmark and has worked in Skåne since 2013.



PHOTO: PRIVATE

Why did you choose to work in Skåne?

– I've always liked working in international environments, and I've also found the idea of working abroad attractive. When I was offered a position at ArjoHuntleigh AB as Quality & Environmental Management Systems Director in 2013, I thought it could be interesting to work in Sweden for a few years. As it turned out it was more than that.

– The salary level in Sweden is generally lower than in Denmark, but by choosing the tax model called "special income tax for non-residents" – normally abbreviated "SINK-tax", it's comparable. The model means no deductions are allowed, but only 25% tax is paid on the Swedish income, on the condition that one is physically present in Sweden 50% of the time.

How do you find commuting? Both now, with Covid-19, and under normal circumstances?

– Commuting has worked well for me. I have a company car and a position that allows me to adapt my working hours, so I don't need to cross the bridge at rush hour. I got into the habit of keeping my passport on hand from the very beginning.

– During Covid-19, everyone has been called on to work from home, and travelling to Sweden and unnecessarily putting myself and others at risk of infection has obviously been inappropriate. The combination of easy access to Covid tests in Denmark and the rules of conduct for reducing transmission that we've introduced at my workplace in Sweden have made it acceptable, however.

What is the biggest difference between working the life science sector in Skåne compared to Denmark?

– I actually don't find that the differences are so great. Maybe because the Danish and the Swedish companies I've worked for have been parts of international businesses, with international organisation

and management. It has also meant that communication in English has been the norm.

What have you learnt or realised about the life science sector in Skåne that you didn't know before?

– That there so many businesses in the life sciences in Skåne – in biotech, medtech and pharma. That creates opportunities for collaborations and networks between companies, but also for career development.

Would you say that other Danes in the sector in Zealand are aware of the career opportunities in the life sciences in Skåne?

– I don't know, actually. I think that many people consider it a hassle to cross the border and learn new rules for taxes, national insurance, pension, banking, etc. When we recruit people to my department, I rarely see applications from Danes, unless we've used a recruitment agency. That's probably in part because it's relatively easy to find work in my field, and because people try to avoid long travel times.

Would you recommend working in the life science sector in Skåne? Please explain.

– Yes; I've had good experiences of working in Sweden. I live in mid-Zealand, in Lejre, and I would probably have gone to Copenhagen to find a comparable position; the journey time wouldn't have been any shorter than the commute to Malmö.

Do you know other people who live in Denmark and work in the life sciences in Skåne?

– Yes, there are several employees at Arjo who live in Denmark and work in fields such as business development, economics, product management, medical and regulatory affairs.

Degree of internationalisation varies in Medicon Valley – more top management recruited from abroad to Zealand than to Skåne

The majority of Skåne’s publicly traded life science companies are headed by a Swedish CEO. Internationalisation in upper management levels is more common in Zealand, where twice as many CEOs have been recruited from abroad to head listed Danish life science companies. According to Danish and Swedish recruitment experts, the reason for the intra-regional differences may be in the companies’ development strategies, subsidiary constructions and investor structures. Despite increased internationalisation in the sector, the cluster’s largest companies – Novo Nordisk, H. Lundbeck and LEO Pharma – are still majority-owned by Danish foundations.

The life science industry in Medicon Valley is international in many ways; this is apparent in that companies use English as their workplace lingua franca; in foreign ownership; in that they are traded on foreign markets and acquired by private equity companies from abroad; in that they have partnerships in other countries or conduct clinical studies abroad, or in that they have sales offices and subsidiaries in foreign lands, for example. The companies’ staff is also frequently comprised of people from many different countries, their board members often have global perspectives and international experience. In addition, the environment in Medicon Valley’s life science educational programmes has an international focus.

More internationalisation on the CEO-level in Zealand than in Skåne

Internationalisation of the life science sector is reflected not only among directors, but is also manifest in leading work groups, board configurations

and more. Due to the research scope, internationalisation of the sector has primarily been explored at the CEO-level in the publicly traded life science companies of Skåne and Zealand. It is apparent in that context that the life science sector is an international industry, in spite of there being more administrative directors recruited from abroad on Danish territory than in Skåne. Around 75% of the publicly traded life science companies in Skåne are headed by a Swedish director. When it comes to the ten largest companies in Skåne in terms of employees, both publicly traded and privately owned, five have a Swede at the helm. The has remained unchanged over the past five years.

The situation is different in the publicly traded companies in the Danish part of Medicon Valley, which are also the country’s largest companies. Since 2017 there has been larger-scale international recruitment of CEOs, and today almost half of the publicly traded life science companies in Zealand are headed by a CEO recruited from abroad. For




PHOTO: ALBRIGHT PARTNERS

Henrik Brabrand,
CEO, Albright Partners




PHOTO: PHARMARELATIONS

Kim Raabymagle,
Country Manager Denmark,
PharmaRelations




PHOTO: POOLIA

Anders Marcusson,
Recruitment manager, Poolia
Life Science & Engineering

56 of 74 listed companies with headquarters or larger-scale manufacturing in Skåne have a Swedish CEO. Internationalisation at the executive level is thus lower in Skåne than in Zealand, although the number of Danish and foreign CEOs there is higher than it was in 2017.

11 of 74 listed companies with headquarters or larger-scale manufacturing in Skåne have a Danish CEO. In total, there are at least 20 Danish CEOs at the listed and private life science companies in Skåne. The number of Danish CEOs has risen since 2017, e.g. at Hansa Biopharma, CellaVision and Alligator Bioscience.

10 of 23 listed life science companies in Denmark have a foreign CEO. That is double the number in 2017. Two companies have their headquarters outside of Denmark however. No Swedish CEOs were found at Danish listed life science companies or among the ten largest private companies in Denmark.

5 of 12 Danish life science companies that are listed in Sweden have a foreign or Swedish CEO. In 2017, all of the companies had a Danish CEO, with the exception of RhoVac. More Swedish and foreign CEOs have thus been recruited to this group of companies since 2017.

comparison, in 2017 around a quarter of companies were headed by a director from abroad. When it comes to the ten largest life science companies in Zealand in terms of the number of employees, both publicly traded and privately owned, five are currently headed by a Danish CEO. None have a Swedish CEO.

To date, the greater degree of internationalisation on the Danish side of Medicon Valley has not affected the fundamental ownership structures of the large Danish pharmaceutical companies Novo Nordisk, H. Lundbeck and LEO Pharma, all of which are still majority-owned by Danish foundations.

Another related aspect of internationalisation in Medicon Valley is that there are at least 20 life science companies with a Danish CEO in Skåne today. Among others, these are the large, privately owned life science companies QPharma, Atos Medical and PolyPeptide Laboratories in Malmö, which are headed by Jens Fricke, Britt Meelby Jensen and Kenneth Stokholm, respectively. In addition, Novo Nordisk's Swedish subsidiary in Malmö is led by the Dane Niels Abel Bonde, and publicly traded biotech companies such as Hansa Biopharma in Lund, Alligator Bioscience in Lund and Ascelia Pharma in Malmö are headed by Søren Tulstrup, Søren Bregenholt and Magnus Corfitzen, respectively.









Development stages, investors and company structure explain internationalisation

Differences in the degree of internationalisation between Copenhagen and its surrounding areas and Skåne may be related to a company's size and where it is development-wise, according to Henrik Brabrand, CEO of Albright Partners, a headhunting and recruitment agency with focus on the Nordic life sciences whose headquarters are in Copenhagen.






– There are a lot of small companies, for instance in Lund's science parks, while Copenhagen and the Stockholm region have come a bit further with late-stage biotech companies. That has meant that they have a larger funding platform, but also that they have typically gotten international financing; that has given those companies more brawn and more relevance when it comes to recruiting international CEOs. On top of that, there are also preferences that go via investor networks located outside Denmark that also invest in Danish biotech companies, says Henrik Brabrand.

One recent example of the internationalisation development is the recruitment of the French

THE 10 LARGEST PUBLICLY TRADED AND PRIVATE LIFE SCIENCE COMPANIES IN SKÅNE – EMPLOYEES AND NATIONALITY OF CEO
































Company	Municipality	Subsector	Employees in Skåne 2020/2021	Employees globally 2020-2021	CEO/Managing director	Nationality
McNeil AB* (Johnson & Johnson)	Helsingborg	Pharma	650	135 000	Jody Lodge	Other
Nolato AB**	Båstad + Lomma + Hörby	Medtech	400	1 900	Johan Iveberg	
Baxter (Gambro Lundia AB)	Lund	Medtech	300	50 000	Per-Ola Wictor	
QPharma AB	Malmö	CDMO	300	-	Kenneth Stokholm	
PolyPeptide Laboratories AB (PolyPeptide Group)	Malmö	CDMO	300	900	Jens Fricke	
HemoCue AB*	Ängelholm	Medtech	250	400	Christophe Duret	Other
TePe Munhygien-produkter AB	Malmö	Medtech	250	350	Hanna Hageberg Hammar	
Arjo Sverige AB	Malmö	Medtech	200	6 200	Joacim Lindoff	
Rechon Life Science AB	Malmö	CDMO	200	-	Roland Holmqvist	
Atos Medical AB	Malmö	Medtech	200	850	Britt Meelby Jensen	





































THE 10 LARGEST PUBLICLY TRADED AND PRIVATE LIFE SCIENCE COMPANIES ON ZEALAND – EMPLOYEES AND NATIONALITY OF CEO

Company	Municipality	Subsector	Employees at Zealand 2020/2021	Employees globally 2020/2021¹	CEO/Managing director	Nationality
Novo Nordisk A/S	Gladsaxe	Pharma	16 800	45 300	Lars Fruergaard-Jørgensen	
Novozymes A/S	Gladsaxe	Biotech	2 600	6 200	Ester Baiget	Other
LEO Pharma A/S	Ballerup	Pharma	2 100	6 000	Catherine Mazzacco	Other
Chr. Hansen Holding A/S	Rudersdal	Biotech	1 800	3 600	Mauricio Graber	Other
Oticon A/S (Demant)	Egedal	Medtech/hearing aids	1 800	16 200	Søren Nielsen	
H. Lundbeck A/S	København	Pharma	1 700	5 600	Deborah Dunsire	Other
Coloplast A/S	Fredensborg	Medtech	1 300	12 500	Kristian Villumsen	
Radiometer A/S*	København	Medtech	1 200	4 000	Henrik Schimmell	
WS Audiology A/S (Widex)	Allerød	Medtech/hearing aids	1 000	10 800	Eric Bernard	Other
ALK-Abelló A/S	Rudersdal	Pharma	900	2 500	Carsten Hellmann	

Source: Information was provided by the companies, their websites and their annual reports. The number of employees is rounded. Please note that these figures may have changed since they were reported. Contract development and manufacturing organisations (CDMOs) are companies that are commissioned to either develop and/or manufacture e.g. pharmaceuticals for other companies in the life sciences. 'Zealand' refers to the Capital Region of Denmark. *McNeil AB is part of Johnson & Johnson with 135 000 employees around the globe, and HemoCue AB and Radiometer A/S are part of the Danaher corporation with 69 000 employees internationally. **Figures and information refer to Nolato AB's Medical Solutions section. The company also has two other departments that are unrelated to the life sciences; these are Integrated Solutions and Industrial Solutions. Nolato AB employs ca. 6 750 people around the globe and is headed by Christer Wahlquist.

74 LISTED LIFE SCIENCE COMPANIES WITH HEADQUARTERS OR LARGER-SCALE FACILITIES IN SKÅNE

Company	CEO name 2021	Nationality
Abliva AB	Ellen Donnelly	Other
AcouSort AB	Torsten Freltoft	
Active Biotech AB	Helén Tuveßon	
AcuCort AB	Jonas Jönmark	
Aegirbio AB	Martin Linde	
Alligator Bioscience AB	Søren Bregenholt	
Alteco Medical AB	Fredrik Jonsson	
Amniotics AB ¹	Kåre Engkilde	
Aptahem AB	Mikael Lindstam	
Arjo Sverige AB**	Joacim Lindoff	
Ascelia Pharma AB	Magnus Corfitzen	
Axichem AB	Torsten Helsing	
Bibblnstruments AB	Fredrik Lindblad	
Bioextrax AB**	Edvard Hall	
BioGaia AB	Isabelle Ducellier	Other
BiolInvent International AB	Martin Welschof	Other
Bone Support AB	Emil Billbäck	
BrainCool AB	Martin Waleij	
Camurus AB	Fredrik Tiberg	
Cantargia AB	Göran Forsberg	
Carbiotix AB	Kristofer Cook	Other
CellaVision AB	Simon Østergaard	
Clinical Laserthermia Systems AB	Dan J. Mogren	
Coegin Pharma AB	Tore Duval	
Combogene AB	Jan Nilsson	
Cyxone AB	Tara Heitner	Other
Diagonal Bio AB ²	Jack E. Madsen	
Dignitana AB	William Cronin	Other
Doro AB	Carl-Johan Boudrie	
Duearity AB	Fredrik Westman	
Enorama Pharma AB	Mats Rönngard	
Enzymatica AB	Therese Filmersson	
Eql Pharma AB	Christer Fåhraeus	
European Institute Of Science AB	Dario Kriz	
Follicum AB	Kim Arvid Nielsen	
Genovis AB	Fredrik Olsson	
Glycorex Transplantation AB ³	Johan Nilsson	

Company	CEO name 2021	Nationality
GPX Medical AB	Hanna Sjöström	
Guard Therapeutics AB	Tobias Agervald	
Hamlet Pharma AB	Mats Persson	
Hansa Biopharma AB	Søren Tulstrup	
Iconovo AB	Johan Wäborg	
Idogen AB	Anders Karlsson	
Immunovia AB	Patrik Dahlen	
Invent Medic Sweden AB	Karin Bryder	
Lumito AB	Mattias Lundin	
Magle Chemoswed AB	Justin Pierce	Other
Medicpen AB	Jan Andersson	
Midsona AB	Peter Åsberg	
Nolato AB	Christer Wahlquist	
Optifreeze AB (Optcept Technologies AB)	Ulf Hagman	
Pharmalundensis AB	Staffan Skogvall	
Pharmiva AB	Christina Ö. Lloyd	
Phase Holographic Imaging Phi AB	Peter Egelberg	
PILA PHARMA AB ⁴	Dorte X. Gram	
PolarCool AB	Erik Andersson	
Polypeptide Laboratories AB (Polypeptide Group)	Jens Fricke	
Prebona Healthcare AB	Patrik Bernstein	
Probi AB	Tom Rönnlund	
Prostalund AB ⁵	Johan Wennerholm	
Respiratorius AB	Johan Drott	
Scandinavian Chemotech AB	Mohan Frick	
Selectimmune Pharma AB	Ann Gidner	
Sensodetect AB	Jonas Hagberg	
SenzaGen AB	Axel Sjöblad	
Spago Nanomedical AB	Mats Hansen	
Spectracure AB	Johan Folkunger	
Spermosense AB	John Lempert	
Swedencare AB	Håkan Lagerberg	
Vibrosense Dynamics AB	Hans Wallin	
WNTresearch AB	Anders Rabbe	
Xintela AB	Evy Lundgren-Åkertund	
Xvivo Perfusion Lund AB	Dag Andersson	
Ziccum AB**	Göran Conradson	

23 DANISH LIFE SCIENCE COMPANIES LISTED IN DENMARK

Company	CEO name 2021	Nationality
ALK Abelló A/S	Carsten Hellmann	
Ambu A/S	Juan Jose Gonzalez	Other
Audientes A/S	Steen Thygesen	
Bavarian Nordic A/S	Paul Chaplin	Other
Bioporto A/S ⁴	Peter Mørch Eriksen	
Cessatech A/S	Jes Trygved	
ChemoMetec A/S	Steen Søndergaard	
Chr. Hansen Holding A/S	Mauricio Graber	Other
Coloplast A/S	Kristian Villumsen	
Curasight A/S	Ulrich Krasilnikoff	
Demant A/S	Søren Nielsen	
Genmab A/S	Jan van de Winkel	Other
GN Hearing A/S	Gitte Aabo	
H. Lundbeck A/S	Deborah Dunsire	Other
Monsenso A/S	Thomas Lethenborg	
Novo Nordisk A/S	Lars Fuergaard-Jørgensen	
Novozymes A/S	Ester Baiget	Other
Onxeo DK*	Judith Greciet	Other
Orphazyme A/S	Christophe Bourdon	Other
Stenocare A/S**	Thomas Skovlund Schnegelsberg	
ViroGates A/S	Jakob Knudsen	
Zealand Pharma A/S	Emmanuel Dulac	Other
Össur hf.*	Jon Sigurdsson	Other

Christophe Bourdon, the new CEO of the Danish biotech company Orphazyme, who was most recently at the American, international biotech company Amgen.

Henrik Brabrand adds that top management candidates from other countries might also come into play more because competence can be greater abroad when it comes to raising capital.

– We see that CEOs need to understand raising capital, particularly when it comes to biotech. That brings us back to a challenge in Denmark, where neither stockmarket- nor investor culture is especially strong. Public equity offers are often in Stock-

12 DANISH LIFE SCIENCE COMPANIES LISTED IN SWEDEN

Company	CEO name 2021	Nationality
2cureX AB	Fernando Andreu	Other
Acarix AB	Per Persson	
Allarity Therapeutics A/S (formerly Oncology Venture A/S) ⁷	Steve Carchedi	Other
DanCann Pharma A/S	Jeppe Krog Rasmussen	
Expres2ion Biotech AB/ApS	Bent U. Frandsen	
FluoGuide A/S	Morten Albrechtsen	
Initiator Pharma A/S	Claus Elsborg Olesen	
Neuvolution AB	Sold to Amgen in 2019	
Qlife Holding AB	Thomas Warthoe	
RhoVac AB/ApS	Anders Månsson	
Saniona A/S	Rami Levin	Other
Scandion Oncology A/S**	Bo Rode Hansen	
SynAct Pharma AB/ApS	Jeppe Øvlesen	

Source: Stock exchanges' company lists. CEOs' nationalities were determined via direct contact with the companies. Information on websites, in annual reports and press releases and on LinkedIn, as well as audiovisual interviews and presentations were also used to discern national affiliations. 1 January 2017 was the cut-off date for the comparison of CEOs' nationalities, unless otherwise stated.

*Companies with headquarters outside Denmark ** CEO installed later in 2017. ¹Amniotics AB plans to list on Nasdaq Stockholm on 6 July 2021. ²Diagonal BIO AB plans to list on Nasdaq Stockholm on 6 July 2021. ³Glycorex Transplantation AB: Johan Nilsson is acting CEO. ⁴PILA PHARMA plans to list on Nasdaq Stockholm on 12 July 2021. ⁵Prostalund AB: Johan Wennerholm is acting CEO. ⁶BioPorto A/S: Peter Mørch Eriksen resigned from the position, effective 5 May 2021, until a successor has been found. ⁷Allarity Therapeutics A/S: the company is aiming to list at the latest by 30. August on Nasdaq in the USA. Note that the listed companies Biotage AB and Getinge AB have smaller-scale activities in Skåne. Note that Danish life science companies, e.g. Novo Nordisk, Zealand Pharma, Genmab, Gallecto Biotech and Orphazyme, are also listed in the USA with e.g. Danish Y-mAbs Therapeutics and Evaxion Biotech.

holm or the USA. We see a general challenge when it comes to experience raising capital, and we thus also sometimes see some experienced CEOs coming from abroad who have robust experience navigating capital markets, says Henrik Brabrand.

Another reason for the greater degree of internationalisation among CEOs in Denmark compared to Skåne is the larger concentration of subsidiaries to international pharmaceutical companies there, according to Kim Raabymagale, country manager of the consultant company PharmaRelations, which recruits employees in the life science industry. He has noted the increase in

internationalisation and explains that top management personnel from abroad at international pharmaceutical companies move around, gathering experience in smaller countries such as Denmark, for example, before moving on to a larger country. Although attracting talent from abroad is positive, internationalisation can also limit the career opportunities of employees who must accept being on a lower rung than general managers, says Kim Raabymagle.

He finds that the situation in Skåne is somewhat different. Whilst there are certainly subsidiaries to international life science companies, for example McNeil AB in Helsingborg, Rechon Life Science AB in Malmö and PRA International Sweden AB, many smaller companies have also been started in the region, for example as spin-offs from Lund University. These spin-offs have a local context and thus, rather than a director from abroad, their CEOs are frequently Swedish and have been involved in the company's development process, says Kim Raabymagle.

A third explanation might be that the internationalisation of the life science sector started earlier in Denmark, says Anders Marcusson, manager of the Swedish recruitment agency Poolia Life Science & Engineering AB. He works specifically

with consultants' need for skills and the recruitment of directors and specialists in life science and engineering.

– We believe that Denmark is advanced in that respect; there has long since been openness to international recruitments. When Sweden's pharmaceutical industry lost ground several years ago, its Danish counterpart continued to find success globally. Swedish life science has since developed significantly in e.g. contract manufacturing and contract research, with small and medium-sized companies and a lot of domestically-sourced skills, he says. He continues:

– There has also been a clear strategy in place for attracting international competence for a long time in Denmark. We're now seeing Swedish efforts to do the same, and we expect to see a successive increase in the draw for international competence, from researchers to top management. There are certainly many influential factors, but one of them might also be e.g. that Sweden's rules and regulations for expert tax are less competitive than Denmark's, although improvements are being made. We believe that the region's labour market is strongly affected by the fact that the Danish and Swedish labour markets don't really play by the same rules, says Anders Marcusson.

Bottleneck in the sector with regulatory affairs and quality assurance

Despite structural differences relating to internationalisation at the top management level, there is a general need to recruit more expertise in quality assurance and regulatory affairs to Medicon Valley on both sides of the Øresund. One reason is that legal requirements in the life science sector, e.g. by the EU, have become more stringent, say recruitment experts in Sweden and Denmark. Digital expertise to support the development of pharmaceuticals and medical equipment is also in shortage, which can mean a greater need to attract expertise to Medicon Valley from abroad.

Besides the tendency toward internationalisation at the top management level, representatives from Albright Partners, PharmaRelations and Poolia point out that there is a definite tendency when it comes to recruiting expertise in the life science sector in Denmark and Sweden in general: there is an increasing need for more expertise in regulatory affairs, where life science companies' employees ensure that medical equipment and pharmaceuticals fulfil the safety and

efficacy requirements set out by authorities.

– The entire sector, from medtech to biotech to pharma, is getting heavier and heavier in a purely legislative sense, says Kim Raabymagle. This is apparent from e.g. the EU's new MDR regulations, which has tightened the requirements for medical equipment since May 2021.

– New, expanded requirements from areas like regulatory affairs (RA), quality assurance (QA),



PharmacoVigilance (PV) and clinical development are being introduced all of the time. That means that these areas are growing in terms of personnel, and there needs to be a pipeline of people entering the sector. And it's harder to find [expertise] in these areas now than it was just five years ago because there is a need for more people [and] there are also more companies, says Kim Raabymagle.

He does not see it as directly related to an inadequacy in the educational programmes on offer. Kim Raabymagle adds that even if companies need to restructure, acquire and merge, which may lead to dismissals in R&D and sales, personnel in regulatory affairs (RA), quality assurance (QA) and performance qualification (PQ) are indispensable, since they need to have the legislation related to their products under control. He also sees an employment increase in areas such as market access, reimbursement and pricing and a negative trend in sales, branding and market profiles in Denmark.

Henrik Brabrand also points out that there is now a bottleneck when it comes to expertise in QA and RA).

– Quite simply, it's because the regulatory requirements from companies are on the rise – regardless of whether we're talking about medtech, pharma, or biotech – and it's driving up the demand, he says.

Anders Marcusson agrees.

– We are seeing a shortage of expertise in QA and regulatory affairs in general. This is not specific to Skåne; it's being seen in the sector as a whole. There are also challenges being faced in areas in which the borders are blurred between the life sciences and IT, as they often demand more senior expertise with complex, cross functional knowledge that has not yet matured, as many of the functions are relatively new, he says. He notes that the sector has continued

to grow in spite of Covid-19 and there is a need for more workers, and a recent survey by SwedenBIO confirmed this, reporting that eight out of ten small- and medium-sized companies in Sweden expect to recruit more employees in the coming year.

– We have seen hesitation in certain companies over the past year, what with the uncertainty about how the pandemic would affect operations, but very few have experienced anything more than short-term negative effects, and many are now announcing expansion – more than before the pandemic. With that has come a major shortage of candidates, and companies that are open to recruiting e.g. R&D expertise from abroad will have an upper hand, he says.

Shortage of digital expertise increased need for candidates from abroad

The demand for expertise in the life sciences is growing in the digital realm as well, says Henrik Brabrand. Covid-19 made that clear, with pharmaceutical companies like the Danish LEO Pharma increasing their focus on conducting decentralised clinical studies, so patients can participate digitally rather than physically reporting to a hospital. Furthermore, the pharmaceutical industries in both Denmark and Sweden want improved access to health data.

– Digitalisation is happening on all platforms, all over the value chain and in development processes, and a lot of that experience is outside Denmark's national borders. There is a huge shift toward digitalisation. We still have a way to go in Denmark, he says.

According to Albright Partners' own studies, around 90 Danish life science directors in the pharmaceutical-, biotech- and medtech sectors admit that their sector lacks the necessary digital knowledge, says Henrik Brabrand. He believes that this might factor into the internationalisation of the life science sector in Medicon Valley, as there is a demand for digital expertise from abroad.

In the future, the life science sector in Medicon Valley might become more internationalised still when the construction of the Fehmarn Belt Fixed Link, which began in January 2021, is completed in 2029.

– We hope to be able to link northern Germany with Denmark and in extension Skåne, which will make it even easier to commute and travel in and out of the region, and the labour market will become even larger, and new possibilities will be created for companies to recruit the right people, says Anders Marcusson.

PHOTO: CELLAVISION



CELLAVISION IN LUND RECRUITS NEW CEO FROM DENMARK

The medical technology company CellaVision has ca 200 employees around the globe and international headquarters in Lund, and in March 2021 it appointed a new CEO. The new chief executive is the Dane Simon Østergaard. He most recently held an executive position at the American diagnostics company Agilent Technologies; until his recent change of employment, he was, among other things, country general manager in Denmark. Experience with business development, research & development, quality assurance, operations and sales and marketing made him the right person to head CellaVision, states the company.

DANISH BIOTECH COMPANY THAT COLLABORATES WITH BIOTECH COMPANIES IN LUND BRINGS IN SWEDISH CEO

In March 2021, Maj Hedtjärn was recruited as the new chief operating officer and head of R&D operations at the Copenhagen-based biotech company Scandion Oncology, which is listed on Nasdaq First North Growth Market in Sweden. Maj Hedtjärn has over 15 years of experience in the life science sector and was most recently employed by the Swiss pharmaceutical company Roche Innovation Centre in Copenhagen. Scandion Oncology was founded in 2017 by among others Professor Emeritus Nils Brünner, who continues to be a scientific advisor for the company and is part of the board of Lund University's Faculty of Medicine. Scandion Oncology also has an active research collaboration with the Lund-based Swedish biotech company Alligator Bioscience.

+20

At least 20 Danish CEOs/managing directors were found to head listed and privately owned life science companies in Skåne – for example QPharma, PolyPeptide Laboratories, Hansa Biopharma and H. Lundbeck in Malmö. Companies with Danish managers include large, medium-sized, small and micro-companies in Skåne, and they are active in various subsectors in pharma, biotech, medtech and CDMOs.

LUND-BASED COMPANY FOCUSED ON HAIR GROWTH AND DIABETES THAT RECEIVED FUNDING FROM THE NOVO NORDISK FOUNDATION IN 2017 RECRUITS DANISH CEO

Kim Arvid Nielsen, with experience from life science companies such as Cytovac, Scandion Oncology and Bayer, is the new CEO of Follicum in Lund. Follicum develops peptide-based drugs to combat diabetes as well as unwanted hair loss. Kim Arvid Nielsen's new appointment started in April of 2021, and he was recruited based on his experience in business development, investor relations and pharmaceutical development, the company states.

– I see great medical and commercial potential in Follicum's unique tissue repair peptides, and I will do my utmost to contribute to the continuing value creation for the company, using my previous experience in business and pharmaceutical development, said Kim Arvid Nielsen in a commentary.

Follicum's research in diabetes led to the company

receiving a 400 000 DKK grant from the Novo Nordisk Foundation in 2017 for pre-clinical studies with Follicum's peptides. The grant was specifically for Jan Nilsson's research group at the Clinical Research Centre at Lund University.

Follicum was founded by the researchers from Lund Anna Hultgårdh and Pontus Dunér in 2011. The company was listed on Spotlight in Stockholm in 2014.



PHOTO: FOLLICUM

SWEDISH ALLIGATOR BIOSCIENCE APPOINTS DANISH CEO

Søren Bregenholt has a background from e.g. Novo Nordisk and Symphogen, and he is chairperson of the Danish-Swedish network organisation Medicon Valley Alliance. Starting on 1 June, he will also be CEO of the Swedish biotech company Alligator Bioscience. He says that he is aware of the differences in the workplace cultures of the two countries, and they do not worry him.

Søren Bregenholt's most recent position was as CEO and member of the board at Macrophage Pharma in the UK. Prior to that, he was corporate vice president at Novo Nordisk, and he was also COO at Symphogen. He is looking forward to his new position as CEO of the Swedish life science company Alligator Bioscience, whose headquarters are in Lund.

– I'm really looking forward to it; it's an exciting opportunity. Alligator Bioscience has existed for several years. It has strong technology and an interesting immuno-oncology pipeline. I'm eager to work closely with the Alligator team to maximise the value of the pipeline for patients, investors and others. It aligns well with my career to date, both at Symphogen and Novo Nordisk, he says. He continues:

– For the past 20 years, I have worked in company management with Danish and international pharma and biotech and done business on most continents. I've been involved in early- and late project phases and my previous roles have given me an inside view of the entire value chain when it comes to pharma. I believe that those years of experience have been good preparation for my position at Alligator, both in terms of subject matter and in a managerial respect.

Alligator Bioscience is a publicly-traded Swedish biotech company that develops tumour-directed immunotherapies for cancer. Among the company's largest shareholders are the Danish Sunstone Life Science Venture Fund; the Swedish co-founder Peter Benson, who is chairperson of the board at Alligator Bioscience; the professor from Lund Carl Borrebaek, whose research contributed to the company's founding; and Johnson & Johnson, with whom Alligator Bioscience entered an agreement worth billions in 2015.

Søren Bregenholt says that he is aware that there are differences in the workplace culture of Sweden and Denmark, but he doesn't consider them an obstacle as he prepares to start working on the opposite side of the strait.

– I am aware that there are certain differences



PHOTO: NEWS ØRESUND

between Danish and Swedish workplace culture, and I believe awareness is the most important thing. In Sweden the focus is perhaps more on consensus management than it is in Danish management culture. I'm confident that when I've gotten to know the team at Alligator Bioscience and they've gotten to know me, we'll be able to combine the best of Swedish, Danish and international workplace culture and create an excellent concept. I'm not worried about it, but I am aware that differences exist, he says.

As chairperson of the Danish-Swedish network organisation Medicon Valley Alliance, he would like to see more trans-Øresund collaboration within the life sciences, and he is pleased that so many people work on the opposite shore despite the challenges the region has faced in recent years because of border checks and travel restrictions.

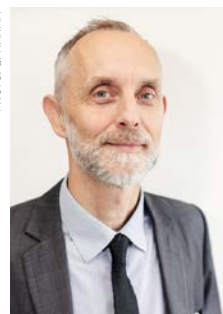
– We are a border region, and the more we work together to increase capacity, infrastructure and labour force, the stronger the region will stand in international competition. We are four million people in the region, around 50 000 of whom are employed in the life science sector – that's about as many as in a medium-sized American city. We believe that we're the best in the world, and when it comes to some things we are, but there are many synergies to be created if we start working together even more. Collaboration increases our chances and opportunities to become a leading international region, he says.

HIGHLY EDUCATED LABOURERS IN THE LIFE SCIENCE SECTOR WORK ON BOTH SIDES OF THE ØRESUND

Many Danes and Swedes work in the life science sector across the Øresund – as executives, employees, researchers and chairpeople. Experience and expertise from e.g. large pharmaceutical companies such as Novo Nordisk, H Lundbeck and Ferring often cross the border between Denmark and Sweden and attest to a dynamic and interlinked labour market.

EXAMPLES OF DANISH CEOS/MANAGING DIRECTORS IN THE LIFE SCIENCE SECTOR IN SKÅNE

PHOTO: QPHARMA



KENNETH STOKHOLM

CEO of QPharma AB in Malmö since 2009. Group CEO of QPharma since 2019. Previously employed by e.g. Xellia Pharmaceuticals in China and Copenhagen.

JENS FRICKE

General director of PolyPeptide Laboratories AB in Malmö since 2013. Previously employed at e.g. LEO Pharma, ALK Abelló and Novo Nordisk in Denmark.



PHOTO: POLYPEPTIDE GROUP

- **Jeppe Øvlesen.** CEO of the Lund-based SynAct Pharma AB since 2014. Previously employed at e.g. Action Pharma.
- **Kåre Engkilde.** CEO of Amniotics AB in Lund since 2019. Previously employed at e.g. Novo Nordisk, LEO Pharma and Bioneer in Denmark and Rigshospitalet in Copenhagen.

- **Lone Bruhn Madsen.** CEO of the Lund-based Timeline Bioresearch AB since 2019. Associated with the company since 2016.
- **Magnus Corfitzen.** CEO of Ascelia Pharma AB in Malmö since 2014. Previously employed at e.g. Sunstone Capital A/S, the Danish Growth Fund and Danske Capital in Copenhagen.
- **Michael Akoh.** Managing director and member of the board at Wieslab Laboratory Services (part of SVAR Life Science AB) in Malmö since 2020. Previously employed at e.g. SVAR Life Science, Dako and Oticon.
- **Niels Abel Bonde.** General manager of Novo Nordisk Scandinavia AB in Malmö since 2017. Employed at Novo Nordisk for over ten years. Previously held various positions at GlaxoSmithKline. Board member of the trade organisation Lif in Sweden.
- **Søren Tulstrup.** CEO of Hansa Biopharma AB in Lund since 2018. Previously CEO of Vifor Pharma AG in Switzerland, and prior to that employed at e.g. Merck, Novartis and Shire Pharmaceuticals.
- **Tore Duvold.** CEO of Lund-based Coegin Pharma AB and Edvince AB since 2020. Previously executive vice president of Innovation Fund Denmark and leading positions at LEO Pharma in Denmark.
- **Torsten Freltoft.** CEO of AcouSort in Lund since 2014. Previously CEO of Sophion Bioscience A/S, Chemometech and PlastiSens in Copenhagen and member of DTU Physics' Advisory Board.

EXAMPLES OF DANES WHO WORK OR HAVE WORKED IN THE LIFE SCIENCE SECTOR IN SKÅNE

PHOTO: ASCELIA PHARMA



JULIE WARAS BROGREN

Chief commercial officer of Ascelia Pharma AB in Malmö since January 2020. Previously employed at e.g. Novo Nordisk in Denmark and Brazil.

LARS BUKHAVE RASMUSSEN

Chief operating officer of PILA PHARMA AB in Malmö since May 2021. Employee since September 2020. Previously employed by e.g. LEO Pharma in both the USA and Denmark.



PHOTO: NEWS ØRESUND

- **Christina Reimer.** Chief medical officer of Alligator Bioscience AB in Lund since February 2021. Previously employed at e.g. Ferring Pharmaceuticals in Copenhagen.
- **Christian Stentoft.** Chief strategy officer at Arjo AB in Malmö since 2019. Employed in Arjo since 2017. Previously employed at e.g. Getinge.
- **Claus Egstrand.** Chief operations officer & senior director growth at Enzymatica in Lund. Associated with the company since 2017. Previously employed at e.g. Stryker and MSD.
- **Dennis Henriksen.** Chief technology officer of the Lund-based Idogen since 2014. Previously director of e.g. BioNebraska Inc. in the USA.

- **Hanne Risager Romedahl.** Chief scientific officer of Idogen in Lund until June 2020. Employed since then at Ferring Pharmaceuticals in Copenhagen. Previously employed at e.g. Novo Nordisk in Denmark.
- **Kristine Koppelhus.** Scientific affairs manager at BioGaia AB in Lund. Employed at the company since 2014.
- **Peter Dybdahl Hede.** Vice president R&D at Probi AB in Lund since 2020. Previously employed at e.g. Novozymes, Lundbeck and BASF Health and Nutrition.
- **Steffen Wad Jørgensen.** Chief development officer of RhoVac in Lund/Hørsholm since January 2020. Previously employed by e.g. Lundbeck and LEO Pharma.

EXAMPLES OF SWEDES WHO WORK OR HAVE WORKED IN THE LIFE SCIENCE SECTOR IN DENMARK

PHOTO: H. LUNDBECK



JOHAN LUTHMAN

CEO of R&D at H. Lundbeck A/S since February 2019. Previously employed by e.g. Merck & Co. in the USA and AstraZeneca in Sweden.

MARTIN RIDDERSTRÅLE

Head of patient care at the Novo Nordisk Foundation since February 2021. Previously employed by e.g. Novo Nordisk A/S. Formerly adjunct professor of endocrinology at Lund University.

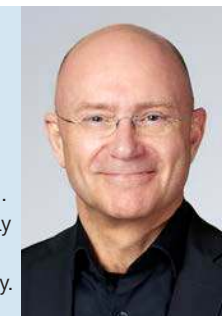


PHOTO: NOVO NORDISK FOUNDATION

- **Anders Månsson.** Employed at Ferring in Copenhagen from 2007-2011. Leading positions at LEO Pharma in Denmark from 2011-2017. From 2019, CEO of RhoVac in Lund.
- **Annika Isaksson.** CEO of Flow Robotics A/S in Copenhagen since early 2021. Previously CEO of e.g. Amminex Emissions Technology A/S in Denmark.
- **Johan Mastrell.** Vice president Nordic/country manager Denmark for Coloplast A/S since 2016/2017. Previously employed by e.g. Ferring Pharmaceuticals in Denmark.
- **Malin Carlsson.** Head of translational medicine at Ferring Pharmaceuticals A/S in Copenhagen until January 2020. Former chief medical officer at Takeda Pharmaceuticals in Roskilde. Employed at Alligator Bioscience AB in Lund since January 2020.
- **Mats Blom.** Chief financial officer of Zealand Pharma near Copenhagen from 2010-2019. Employed at NorthSea Therapeutics in Holland since. Board member at Hansa Biopharma in Lund since 2019.
- **Mats Persson.** Worked in R&D Partnerships Management at LEO Pharma in Denmark from 2011-2016. Previously employed at AstraZeneca. CEO of Hamlet Pharma AB in Lund since 2016.
- **Mia Sandberg Lundblad.** Pharmacokineticist at Ferring Pharmaceuticals A/S until February 2021. Previously employed at e.g. Novo Nordisk in Denmark. Clinical director at Respiratorius AB in Lund since February 2021.
- **Per Olof Ericsson**
Senior project director of Zealand Pharma in the Copenhagen area since 2014. Previously employed at AstraZeneca and SPAGO Imaging in Lund.
- **Tomas Landh.** Vice president of Innovation Sourcing at Novo Nordisk in Copenhagen since 2014. Employed by the company since 2003. Previously head of R&D and chief scientist at Camurus AB in Lund.
- **Åsa Schiött.** Senior project manager at Novo Nordisk in Denmark from 2013-2015; since then employed by e.g. Hansa Biopharma in Lund. Chief scientific officer at Idogen since 2020.

EXAMPLES OF SWEDES WHO ARE OR HAVE BEEN BOARD MEMBERS IN THE LIFE SCIENCE SECTOR IN DENMARK

PHOTO: LUND UNIVERSITET GUNNAR MENANDER



BO AHRÉN

Board member and former vice-chairperson at the BioInnovation Institute in Copenhagen. Pro vice-chancellor of Lund University. Board member of the Novo Nordisk Foundation from 2005-2017.

ANDERS EKBLOM

Vice-chairperson of LEO Pharma in Copenhagen since 2018. Board member of Lund-based Alligator Bioscience since 2017. Managerial positions at AstraZeneca between 2006-2013.



PHOTO: LEO PHARMA

- **Camilla Huse Bondesson.** Board member at 2cureX AB since 2019. Consultant for the life science company Conlega since 2004. Chairman of the board at Gradientech AB, Immuneed AB and TdB Labs AB.
- **Göran Ando.** Chairperson of the board at Novo Nordisk in Denmark from 2013-2018. Prior to that board member since 2005. Chairperson of the board at e.g. Symphogen in Copenhagen from 2011-2018.
- **Magnus Persson.** Chairperson of the board at Galeto Biotech AB in Copenhagen until May 2020. Continues to advise the biotech company. Founder of the Scandinavian venture fund Eir Ventures.
- **Martin Nicklasson.** Chairperson Zealand Pharma A/S in Denmark since 2015. Previously chairperson of e.g. Orexo AB and BioInvent International AB.

- **Mathias Uhlén.** Board member at Novozymes since 2007. Professor of microbiology at the Royal Institute of Technology (KTH) in Stockholm. Visiting professor at Karolinska Institute.
- **Per Falk.** President and head of research at Ferring Pharmaceuticals since 2019. Employed by the company since 2015. Previously held leading positions at AstraZeneca and Novo Nordisk in Denmark, Japan and the USA from 2002-2014. Board member of the Copenhagen-based Snipr Biome.
- **Peter Benson.** Chairperson of Sunstone Life Science Ventures in Copenhagen since 2019. Co-founder of the foundation and managing partner from 2007-2019. Chairperson of e.g. Alligator Bioscience AB in Lund and Ascelia Pharma AB in Malmö.
- **Ulf J. Johansson.** Board member at the Novo Nordisk Foundation from 2005-2013. Founded Europolitan Holdings AB in 1990. Previously held positions on boards at e.g. Novo Nordisk, Novo A/S, Ericsson and the Royal Institute of Technology in Stockholm.
- **Åke Lernmark.** Board member at Diaunion. Head of research at Hagedorn Forskningslaboratorium i Gentofte from 1979-1987. Professor at Lund University's Clinical Research Center in Malmö since 2009.

EXAMPLES OF DANES WHO ARE OR HAVE BEEN BOARD MEMBERS IN THE LIFE SCIENCE SECTOR IN SKÅNE

PHOTO: CELLAVISION



MIKAEL WORNING

Board member at CellaVision since 2021. Board member at Ambu and former CEO of Demant's American division.

ALEJANDRA MØRK

CEO of KLIFO A/S in the Copenhagen area since 2008. Board member at Follicum AB in Lund since 2018. Board member of the industry organisation Dansk Biotek since 2012.



PHOTO: KLIFO

- **Kirsten Drejer.** Board member at Alligator Bioscience AB in Lund from 2019-2021. Co-founder of Symphogen, where she was CEO for 16 years. Board member of Zealand Pharma and others.
- **Michael Shalmi.** Board member at Active Biotech AB since 2019. Previously managing director and head of principal investments at Novo Holdings A/S in Copenhagen.
- **Peter Høngaard Andersen.** Board member at Immunovia AB in Lund since 2020. Previously employed at Novo Nordisk and Lundbeck, formerly managing director of the Innovation Fund in Denmark.
- **Peter Wulff.** Board member at Spago Nanomedical AB in Lund since 2015. CEO of Bavarian Nordic from 1994-2007. Co-founder of NeuroSearch.

65 %

of the 23 listed life science companies in Denmark have a Danish chairperson of the board. Many companies' boards feature foreign members.

82 %

of the 74 listed life science companies in Skåne have a Swedish board chairperson. Many companies' boards feature foreign members.

EXAMPLES OF SWEDES WHO WORK IN LIFE SCIENCE-ORIENTED RESEARCH ENVIRONMENTS IN COPENHAGEN

PHOTO: PRIVATE



MARTIN MALMSTEN

Professor of biopharmaceuticals, biophysics, and drug delivery at the University of Copenhagen since 2016. Director of LEO Foundation Center for Cutaneous Drug Delivery in Copenhagen. Guest professor at Lund University.

EXAMPLES OF DANES WHO WORK IN THE LIFE SCIENCE SECTOR IN STOCKHOLM

NIKOLAJ SØRENSEN

CEO of the Stockholm-based Orexo since 2013. Previously held leading positions at Pfizer and Boston Consulting Group. Board member at Bioservo Technologies.



PHOTO: OREXO

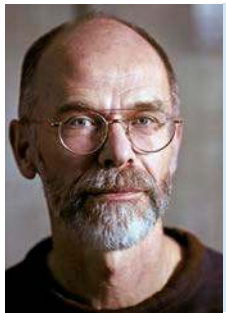
NIKOLAI BRUN

Chief medical officer of the Stockholm-based Affibody. Previously employed as head of medical evaluation and biostatistics at the Danish Medicines Agency. Previously employed at e.g. Novo Nordisk and Genmab.



PHOTO: LÆGEMIDDELSTYRELSEN

PHOTO: DANSTEM - ESSEN ZÖLLNER OLESEN



HENRIK SEMB

Professor and executive Director and group leader at Novo Nordisk Foundation Center for Stem Cell Biology (DanStem) in Copenhagen since 2011.

- **Gert Fredrik Bäckhed.** Professor at the Novo Nordisk Foundation Center for Basic Metabolic Research at the University of Copenhagen. Associate of the University of Gothenburg, among others.
- **Mef Nilbert.** Head of research at the Danish Cancer Society in Copenhagen since 2017. Also associated to e.g. Lund University as a professor of oncology, as well as Amager and Hvidovre Hospitals.

- **Christoffer Lorenzen.** CEO of the Stockholm-based Karo Pharma since 2019. Previously held leading positions at e.g. Hansen from 2008-2019.
- **Peter Nordkild.** CEO of the Stockholm-based Asarina Pharma since 2016. Previously CEO of Egalet and formerly employed at Novo Nordisk and Ferring Pharmaceuticals.



PHOTO: LEO PHARMA

DANISH AND SWEDISH BIOTECH COMPANIES IN THE ØRESUND REGION GAVE LEO PHARMA INPUT FOR OPEN INNOVATION PLATFORM

Swedish Niclas Nilsson helped build Danish LEO Pharma's open innovation model five years ago, drawing on input from Danish biotech companies and small-scale biotech companies from Medicin Village in Lund. The model has been a breeding ground for more life science collaboration in the Øresund Region and around the world. The platform is used by biotech- and pharma companies across the globe, as well as by universities and students from DTU and Lund University. Niclas Nilsson finds that open innovation leads to more sustainable network relationships, and that Danish and Swedish management culture have grown more similar in recent years.

Niclas Nilsson was first employed as a scientist at LEO Pharma back in 2004. His transdisciplinary background in biology and technology made the Swede an attractive candidate, and in the years since then he has noted more and more Swedes bringing their skills to the life science sector in Denmark, just as he did. That was especially true after AstraZeneca closed in Lund around a decade ago: a lot of the expertise from southern Sweden became relevant for companies on the Danish side of the Øresund.

Today, Niclas Nilsson is heading Denmark's oldest pharmaceutical company's open innovation work, and he also helped build up the platform that LEO Pharma

has used for external collaborations since 2015.

Generally, open innovation is about companies openly sharing knowledge and resources with far less restrictive legal contracts, using external partnerships to find solutions to complex challenges in the understanding that not all required competences are on hand internally in the organisation.

Over the years, open innovation has become more widespread in knowledge-heavy sectors like the biotech- and pharmaceutical industries, and it is also used in e.g. Ideon Science Park in Lund and Novozymes via the Hello Science platform.

– Most companies want to collaborate more with external partners than they do today, but only

few implement what is necessary in order to work together more. Open innovation is a very good example of how that can be made to happen, says Niclas Nilsson, who believes that their model has been a good way to start up collaborations in practice.

When LEO Pharma started working on an open innovation platform, they turned to a number of

biotech companies in Denmark and at Medicon Village in Lund, among others. The objective was to learn more about how a collaborative platform with a larger-scale pharmaceutical company could be attractive from the perspective of a small biotech company. One decisive piece of input for instance was to develop practical processes by sending and testing others' materials, as well as legal key points to minimise the risks for biotech companies when it comes to using open innovation.

Shared cultural understanding is a good precondition for collaboration

Turning to actors in the sector on both shores of the Øresund – LEO Pharma already had offices in Malmö – was a reminder that the mutual understanding and the trust-based way of working in both Sweden and Denmark is a cultural asset of the Øresund Region.

It is precisely that cultural closeness that makes the conditions for increasing collaborations in the region so favourable, says Niclas Nilsson, because it can be easier to establish relationships with one's neighbours, where there are similar cultural and collaborative notions. In addition, he feels that the differences between Danish and Swedish management have grown less pronounced over the past 15 years in which he has been working in the Danish life science industry; furthermore, as he sees it, it has become more common and accepted to have colleagues from across the strait.

– Swedish management has developed in terms of entrepreneurship and business focus from being a bit more academic in the past, and Danish management has become much more international and global, both in its mindset and its actions, he says.

New partnerships in Sweden and Denmark

From the beginning, LEO Pharma wanted to achieve three things with the platform: To start

more concrete, external collaborations; to make collaboration processes faster; and to find sparring partners with whom to discuss new knowledge in dermatology and inflammatory skin diseases.

To date, the initiative has led to collaborations between LEO Pharma and more than 150 partners in over 27 countries on every continent, and more

than 3000 molecules sent by external actors have been tested for free in LEO Pharma's laboratories.

Around five of the 150 partnerships have been from Sweden, and at least 20 have been from Denmark. LEO Pharma has followed additional business opportunities with around 10% of the partners who have made use of LEO Pharma's open testing opportunity. As an example,

one commercial agreement on the development of two new drug candidates was entered last year with the contract research Ubiquigent in Scotland.

The open innovation model has delivered, says Niclas Nilsson, because it is not just a question of the number of business contracts; it's also about learning to think differently, gathering input for other drug targets, and making new contacts without necessarily fuelling the pipeline from Day 1.

That's why e.g. master-level chemistry students from Lund University and DTU have also used the testing infrastructure to shorten the distance between academia and the industry. Universities from the USA and Canada are also involved.

– People who have chemical molecules can test them in our laboratory, entirely free from business and legal constraints, says Niclas Nilsson, adding that the results are given to the actors themselves.

The data thus does not belong to LEO Pharma – and that model is unique, according to Niclas Nilsson, who has noted that other large pharmaceutical companies have similar platforms that he does not necessarily consider completely open; there might be reservations related to disclosure, first rights negotiation or other business terms and conditions to continue the collaboration.

– We've taken away all of that, says Niclas Nilsson.

Open innovation creates relationship parity

Niclas Nilsson emphasises that open innovation can help mitigate asymmetrical relationships between

big pharma and smaller biotech companies, where the former has been able to dictate the conditions to a greater extent. A more modest, win-win stance is more beneficial if real work is to be done with open innovation, says Niclas Nilsson.

– In the long run, it's much better to have symmetrical relationships where everyone is taking the same risk and making the same obligations. It leads to a network with a more long-term perspective and makes people come back and find a match between assets and needs more easily, he says, pointing out that the open innovation model has been good branding, helping to strengthen the network and increase knowledge about the company and sending the message that LEO Pharma dares to do things differently.

When it comes to open innovation, the most important thing he has learned in the past five years is that one needs to think about collaboration from the partner's perspective, because it clarifies the value creation.

– Instead of saying: We want your help, the question should be: How can we help you?

Be open about challenges and needs

One way to improve transregional collaboration in the life sciences would be that companies dare to be more transparent when it comes to problems and needs that can lead to new partnerships, according to Niclas Nilsson. He illustrates this with an example: LEO Pharma recently announced that they are particularly interested in partnerships in protein-protein interactions (PPI) and a few specific drug targets – this information is traditionally confidential, says Niclas Nilsson, but if one opens up, the opportunities to find new partnerships increase.

For that reason, it would be an advantage if the Øresund Region became a "playground" for that access, says Niclas Nilsson, and he suggests that the newly established open research collaboration network ODIN (Open Discovery Innovation Network) between Aarhus University and other Danish and international pharma companies – including LEO Pharma – might inspire a regional model. The ODIN project has received 54.5mn crowns worth of funding from the Novo Nordisk Foundation, and its ambition is for researchers and companies to collectively and voluntarily exchange knowledge, collaborate, and make data and results available for the outside world in order to create drugs in a new and open way; in Oxford, England, this has proven to have great potential.

– That model could perhaps be used more bro-



Niclas Nilsson.

PHOTO: LEO PHARMA

adly in the Øresund Region, so we have a platform that facilitates scientific dialogue. What I think we need in the Øresund Region are conversation starters that open up communication about science and needs, and more business is sure to follow, says Niclas Nilsson.



PHOTO: LEO PHARMA

LEO PHARMA OPEN INNOVATION

- **Founded:** 2015
- **Branches in the life sciences:** Pharma
- **Focus area:** Dermatology and skin inflammation diseases
- **Ownership:** Private
- **R&D Lead:** Niclas Nilsson
- **Total number of molecules tested:** 3 000
- **Total number of partners that have used the platform:** 150
- **Moreover:** PPI-molecules are a new focus area. Based on recent success with their own PPI, LEO Pharma is looking to expand these activities and look for new partners as part of the Open Innovation platform.

MALMÖ'S INCUBATOR ENVIRONMENT AND ENTREPRENEURIAL SPIRIT ATTRACTED THE DANISH-SWEDISH PILA PHARMA

The smoothly operating incubator setting in Malmö was what made Dane Dorte X Gram choose Skåne as a home base when she started up the pharmaceuticals company PILA PHARMA after ten years at Novo Nordisk in Denmark. Today, the company has both Danish and Swedish consultant-associates, a Danish operational director with a background from LEO Pharma has been recruited, and there's an IPO around the corner.

Dorte X Gram started the company PILA PHARMA seven years ago. She had been working more than ten years at Novo Nordisk in Bagsværd, where she did her PhD studies, when the opportunity arose in 2008 to acquire her research results from Novo Nordisk and create her own company where she could develop a new diabetes treatment.

Although most of her professional network was in Denmark, she chose to develop PILA PHARMA in Malmö, where she had relocated with her family. – I set up PILA PHARMA in Sweden because the conditions there were more conducive to making progress when we were in the start-up phase, says Dorte X Gram.

She knew researchers at Lund University in Skåne through her work at Novo Nordisk, but other than that, her network in Skåne – particularly the commercial side of it – and her knowledge of the area were minimal.

That all changed, however. Encouraged by her Swedish partner, she went to a seminar at Medeon Science Park in Malmö and found that people there actively encouraged her to become a part of Medeon's incubator environment, where diabetes projects were a special focus.

She discovered that people were generous with their expertise, for example via the 'entrepreneur programme', where Medeon's partners offered a free entrepreneurs programme. Several of them later became collaborative partners – a good "win-win situation", says Dorte X Gram.

She notes that she was raised to value intelligence – her father was a professor of clinical pharmacology – but selling was considered uncouth and the commercial aspect wasn't promoted, neither growing up at home nor at school. At Medeon, however, she was given the tools to discover and explore that, among other things,

Environment influences business mentality

Today, PILA PHARMA has raised 45mn SEK (€4,5mn) in capital. The first to back PILA PHARMA was the state-owned Swedish foundation Almi Invest, which invests in tech, industry, cleantech and life science, with 1mn SEK. Private Swedish – and recently also Danish – investors followed suit, putting millions of crowns into the clinical develop-

ment of the pharmaceutical candidate XEN-D0501, which Dorte X Gram believes can be useful some of the global market with around 465 million patients.

The company is planning a public offering in July 2021 on Nasdaq First North Growth Market in Stockholm to raise more capital for the clinical development, which is now in phase 2. To date, the scientific work has been conducted across the Øresund Strait and with collaborative partners in e.g. England.

According to the company's Danish-born director, Denmark's seed funding environment was difficult around five to ten years ago; it was dominated by large investment actors, and companies that didn't fit the investment portfolio in one way or another had a hard time.

The investment environment in Sweden was – and still is – more diverse, encouraged by e.g. lower taxes on income from stocks in Sweden than in Denmark.

As a result, more Swedes invest in companies privately, creating a cultural difference in the mentality surrounding entrepreneurs and wage-earners, says Dorte X Gram.

– When I left Denmark and moved to Sweden, it definitely felt like putting the good, steady job at risk, she says; in her experience, there was a strong wage-earner mentality. That's changing in Denmark now, she notes, but there are still cultural differences, and in

Skåne – and even more so in Stockholm – the mindset is almost American.

– Swedes love it when people take chances and try to come out on top, says Dorte X Gram.

She likes that mentality. She has also found that Swedes, like Danes, expect people who come from abroad to learn the local language and make an effort to integrate, so she has learned herself to speak and write Swedish competently, so that others understand that she wants to be part of society.

Danish and Swedish consultant competences complement each other

Another difference between Denmark and Sweden that Dorte X Gram has noted is salary.

– Since large enterprises in Denmark offer such good salaries, Danes are often too expensive – relative to what I'm ready to pay at any rate, she says.

According to Dorte X Gram, the lower salaries in Sweden, which can be weighted against the advantages of the 25% SINK-tax for Danes, prevent more Danes from working in the life science sector on the other side of the Øresund. Nonetheless, she has been able to build a stable internal project organisation with around 10 Danes and Swedes in the Øresund Region, all of whom are employed as consultants based on their expertise.

Structurally, running PILA PHARMA virtually has worked well, she points out; in part this is because the looser formation of consultants is flexible, and expenses can be adjusted easily according to whether or not funding is available. As a result, the company has come very far on a relatively tight budget, she says, and the collaboration can continue for many years to come. There is also a good recruitment pool for consultants in the Øresund Region; large-scale staff cutbacks at regular intervals by the larger pharmaceutical companies – AstraZeneca in Skåne around a decade ago, and more recently LEO Pharma and Lundbeck in the autumn of 2020 – have freed up expertise that can be of service to smaller companies in the region.

– There is a sea of consultants. Among other things I've found that there are good consultants in Skåne for drug delivery. A lot of the diabetes- and big pharma expertise I'm looking for is in Denmark, says Dorte X Gram.

Bridge tolls limit commutes

In 2019, PILA PHARMA left the incubator at Medeon, and since then the company has had its offices in central Malmö. In September 2020, Dorte X Gram recruited Lars Bukhave Rasmussen; he has 15 years of experience in various leadership positions



Dorte X Gram.

at LEO Pharma in Denmark under his belt.

Any new recruits in the near future will likely be Swedish due to the coronavirus pandemic, which has made border commutes difficult and strained Danish-Swedish collaboration, says Dorte X Gram.

– But we have plans for a physical office in Copenhagen, which will make it easier for us to adapt by attracting relevant Danish expertise, says Dorte X Gram. She leaves us with a clear message about how collaboration can be increased.

– If politicians really want open collaboration across the Øresund Strait, conditions for border commutes during the pandemic need to be clear and realistic, and in addition, the bridge toll needs to be reduced – because at the moment, it's really a showstopper for border commutes, especially from Denmark, she says.



PILA PHARMA AB

- **Founded:** 2014
- **Branches in life sciences:** Pharma
- **Focus area:** Diabetes
- **Ownership:** Private
- **CEO:** Dorte X. Gram
- **Turnover 2019/2020:** 0
- **Gross year-end result 2019/2020:** -9 mn SEK/-6 mn SEK
- **Total number of employees in Malmö:** 3

Strong research environments and potential for more transborder collaboration

There are many strong research structures for diabetes, oncology, reproduction and more in Medicon Valley. There are also many research collaborations across the strait, primarily between individual researchers or research groups. As far as structural collaborations are concerned, many of the people interviewed for this report assert that they should be able to broaden and become more plentiful. National focus when it comes to research funding and different taxation and health insurance systems are two example of obstacles that were pointed out.

The life science sector has been made a priority in Denmark as well as Sweden. Both countries have formulated life science strategies with initiatives to strengthen the sector, and prioritisations have also been made on the regional scale regarding how research environments in the life sciences can be developed. A European comparison of research environments conducted the Dutch research institute CWTS shows that biochemistry and molecular biology, endocrinology and metabolism and oncology are the three areas of research that generated the greatest number of scientific publications in the life sciences in Medicon Valley between 2006-2016.

Life science research on the agenda in both countries

Denmark's latest life science strategy, from April 2021, asserts that "the life sciences are a Danish strength". "Sweden should be a leading life science nation" is the opening line of the Swedish national life science strategy, presented in December 2019. Investments in research are one tool for achieving the goals set in the respective countries. Initiatives in Denmark include extending the increased tax

deductions that companies are allowed to make for R&D costs and a multidisciplinary working group to improve the framework for clinical research. Sweden's goals include strong trans-sector research in the life sciences and broader exploitation of research infrastructure. The two countries' strategies meet on the shores of the Øresund and in the cluster called Medicon Valley.

In 2018, the Capital Region of Denmark adopted a research strategy for health research that will continue until 2022. The report shows that the three largest research areas in terms of scientific publications in 2015 were oncology, coronary heart disease, endocrinology and metabolism. In May 2019, Region Zealand's regional council adopted the strategy "Forskning på forkant" (Research at the forefront) for health research; it will also continue until 2022. According to the Danish-Swedish organisation for political collaboration the Greater Copenhagen Committee, "the life sciences are an industrial and research-related strength in Greater Copenhagen". The life sciences are one of the five key prioritised areas that lay the framework for growth and welfare in the future.

RESEARCHERS AT UNIVERSITIES AND HOSPITALS IN THE ØRESUND REGION *

1 000

Approx. number of diabetes researchers

150

Approx. number of reproduction researchers

1 700

Approx. number of cancer researchers

* Data based on information reported for this analysis. Note that researchers can be employed by hospitals and universities simultaneously; there is thus a risk that they have been counted twice. The University of Copenhagen did not report the number of researchers per field, with the exception of the Novo Nordisk Foundation Center for Basic Metabolic Research (CBMR) and and Biotech Research & Innovation Centre (BRIC); commercial research is not included here.

RESEARCH AND EDUCATION

According to Region Skåne's marketing agency Invest in Skåne, which works among other things with the life sciences in Skåne, the region is "at the forefront of research within diabetes, neuroscience, oncology and inflammation". Skåne's 2020 innovation strategy for sustainable growth, developed by the Research and Innovation Council of Skåne, FIRS, states that "Health and medicine are at the very foreground at learning institutions in Skåne, and dental health is an area of research with high impact". One of their priorities is working to develop research and innovation environments as well as to increase commercialisation of research and to promote internationalisation of the sector.

Biochemistry and molecular biology largest fields of research

The three research areas that generated the largest number of scientific publications in the life sciences in Medicon Valley between 2006-2016 are biochemistry and molecular biology, endocrinology and

metabolism, and oncology. This was shown in a European comparison with nine other prominent European life science clusters conducted by the research institute CWTS on behalf of Medicon Valley Alliance.

The ten largest areas in terms of the number of scientific publications between 2006-2016 are:

1. Biochemistry & molecular biology
2. Endocrinology & metabolism
3. Oncology
4. Neurosciences
5. Medicine, general & internal
6. Public, environmental & occupational health
7. Pharmacology & pharmacy
8. Cardiac & cardiovascular systems
9. Immunology
10. Surgery

Together, the 20 largest research fields are responsible for more than 50% of the total number of scientific publications in the life sciences in Medicon Valley during the period investigated.

When it comes to the scientific publications

by researchers from Medicon Valley cited most frequently between 2006-2017 in relation to the international average in each respective field, the five largest subject areas are: Medicine, general & internal; Cell biology; Genetics & heredity; Plant sciences and Sport sciences.

In this analysis, we note that among other things, there are three strong research structures across the Øresund: in diabetes, oncology and reproduction.

Potential for more research collaboration across the Øresund

Life science research in Medicon Valley takes place on many levels, including within companies, at hospitals and on behalf of the regions, at universities and in cooperative projects. This chapter offers many examples of such collaborations and interventions with the actors involved.

According to Erik Renström, the new Vice-chancellor of Lund University, there is solid bottom-up engagement and a great deal of collaboration between Lund University and the University of Copenhagen in the life sciences. The collaborations are primarily for research between individual researchers and research groups; collaborations on a structural level are fewer, he says. He mentions border issues in relation to the challenge of procuring research funds that can be used across the Øresund.

– I'm sorry to say that we have many structural obstacles impeding collaboration. There are many challenges. Interreg-projects are extremely valuable however, as we have a great deal of national projects in which we'd like to have Danish partners, he says.

He plans to work to establish a structural collaboration with the University of Copenhagen in the life sciences. Read more in an interview on page 54-55.

Swede Mef Nilbert has professor titles from both the University of Copenhagen and Lund University and works as head of research at Denmark's national cancer foundation, the Danish Cancer Society, in Copenhagen. She sees structural obstacles caused by the differing systems for taxation and health insurance as impeding research collaboration across the Øresund from expanding. This is apparent for example when researchers want to divide their time between e.g. a university and a hospital on different sides of the strait.

– The fact that the health insurance and tax systems aren't synced up to make working part-time in both countries possible is the single greatest obstacle to research collaboration in the region, I would say.



PHOTO: NEWS ØRESUND

HIGHEST RANKING UNIVERSITY

Three of the four highest ranking Nordic universities in QS' annual ranking are in the Øresund Region. The University of Copenhagen ranks highest at number 79, followed by Lund University at number 87, the Royal Institute of Technology in Stockholm at number 89, and the Technical University of Denmark at number 99.

It gets so incredibly complicated if the systems aren't synchronised; for many people, working on both sides of the Øresund would be so natural. Being associated with another university or company – in the same country this is no problem – but if one works for a university and a private company in the other country, it gets extremely messy and systematically speaking almost impossible, she says.

Read more in an interview on page 80-81.

Professor of immunology at Lund University and serial entrepreneur Carl Borrebaeck also sees great unexploited potential in trans-Øresund collaboration. He maintains that many collaborations are driven by personal contacts and engagement.

– As a researcher, one's demands are often extremely specific, and you choose the collaborations that give you the most. It doesn't necessarily need to be in Denmark; it could be anywhere. But proximity is always important, and that led me to work a lot with the Danish Cancer Society in Copenhagen and the Danish professor Nils Brünner, he says.

Read more in an interview on page 78-79.

MICROBIOME RESEARCH GROWING AS A SCIENTIFIC AREA OF STRENGTH IN THE ØRESUND REGIONS

Research in human's microbiome started around the year 2000. Now, some 20 years later, the Øresund Region stands out as a growing European centre for microbiome research, as the initial, partial results from an overview published in the autumn of 2020 show. The business- and network organisations Copenhagen Capacity, Invest in Skåne as Medicon Valley Alliance are the motor behind the survey in a transregional project funded by Interreg.

Research is becoming increasingly more conclusive that the body's microorganisms can improve treatments for e.g. cancer, diabetes and fertility. The survey also describes how the region's actors in microbiomes have conducted around 140 clinical studies in the field of microbiomes over the past 20 years; 80 of the studies were done since 2015.

In addition, around 900 research papers on microbiomes were published between 2014-2019. The main authors of 71% of the papers were from the Greater Copenhagen Region, giving the region a leading position in the field.

Around 80 Danish and Swedish businesses, organisations and academic institutions in the Øresund Region work with microbiome research. Of them, over 40 life science businesses in the region work with microbiome treatment R&D. Among these are the pharmaceutical company Ferring Pharmaceuticals, whose roots are Swedish, and the Danish ingredient manufacturer Chr. Hansen. Swedish biotech companies such as BioGaia, Probi and Gedea Biotech and the Danish Snipr Biom and Novozymes were also identified as part of the microbiome cluster. The latter acquired the American company Microbiome Labs for ca 126mn USD in 2020.

According to the actors driving the project, insight into the research will attract more expertise, more companies and more capital to the Øresund Region. In April 2021, more than 1 000 people from over 60 countries participated in a digital conference on microbiome research in the Øresund Region.

The survey of the Øresund Region's microbiome cluster will continue into 2022.

DENMARK HELPS FUND RESEARCH INFRASTRUCTURE IN LUND

Danish universities and the Novo Nordisk Foundation are helping build up an advanced research infrastructure in Lund at European Spallation Source (ESS) and MAX IV Laboratory.

Bifrost and Heimdal – Danish contributions to ESS in Lund

When the neutron spallation facility European Spallation Source (ESS) is ready for use in 2023 and, according to plan, fully operational in 2026, contributions from e.g. the Technical University of Denmark in Zealand will have helped it get there.

In recent years, the university has been involved in the development of an instrument called Bifrost. Bifrost consists of over 8000 different components, and the instrument itself is one of a total of 15 highly advanced instruments at the ESS facility currently under construction. Many of the instruments are relevant for the life science sector, whilst others – including the Danish Bifrost instrument – will be utilised more for basic research in magnetism, energy research, chemistry of materials and engineering and geo-sciences.

The Technical University of Denmark is responsible for the overall development of 'Bifrost' in cooperation with the University of Copenhagen and other research institution in Switzerland, France and Norway.

Staff from the Technical University of Denmark have also developed software for use at ESS, and Aarhus University has been involved in the development of the Heimdal instrument, another of the 15 large instruments at ESS.

The collaboration between Denmark and Sweden goes further than Bifrost, however. Both countries are hosts for the ESS facility in Lund, and are covering nearly half of the construction costs, which are around €1.84bn in total. Eleven other European countries are contributing to ESS' construction, making it a pan-European research infrastructure that will welcome up to 3000 international researchers annually. ESS' data centre is located at Copenhagen Bio Science Park (COBIS) in Copenhagen, where researchers can transform experimental data into scientific results – read more about ESS on page 99.

DanMAX and MicroMAX – Danish contributions to MAX IV in Lund

Another example of research collaboration between Sweden and Denmark is also located in Lund. Not far from the ESS facility is Sweden's national MAX IV Laboratory, which is an X-ray facility. The labora-

tory opened in 2016 and is part of Lund University.

A number of Danish public organisations joined together to construct a beamline at the MAX IV facility, called DanMAX. The instrument has been operational since 2020 and benefits e.g. research in materials- and nanotechnology and molecular and chemical processes, which can benefit life science companies and -students in the Øresund Region.

Funding for DanMAX in Lund was made available by the Danish Ministry of Higher Education and Science, which granted 35mn DKK – ca €4.7mn – to the project in 2014. Other Danish public organisations such as the Capital Region of Denmark, the University of Copenhagen and the Technical University of Denmark also contributed funds for DanMAX, as did MAX IV Laboratory.

At MAX IV Laboratory in Lund, the Novo Nordisk Foundation in Denmark also funded the construction and ten years of operational costs of a super-microscope by the name of MicroMAX. The equipment will enable more highly detailed study of proteins, which will create the foundation for developing new drugs and more. The Novo Nordisk Foundation has granted 225mn crowns, ca €35mn for the microscope; that is the foundation's largest grant to southern Sweden to date.

The Novo Nordisk Foundation's involvement in the MAX IV lab in Lund is part of a broader strategic initiative that the Novo Nordisk Foundation calls "Copenhagen Bioscience Cluster". The goal is to create a cluster of world class research centres and infrastructure in biomedicine and biotech in the Capital Region of Denmark and in Skåne in southern Sweden. Read more on page 107.



ILLUSTRATION: ESS



PHOTO: NEWS ØRESUND

Highest ranking universities in the Øresund Region – with around 27 000 students in the life sciences

Universities in the Øresund Region are standing strong against international competition, and around 27 000 students are in some way linked to the life sciences at the region's universities. Three of the four Nordic universities included on QS' annual ranking list of the world's top-100 universities on are located in the Øresund Region: the University of Copenhagen, Lund University and the Technical University of Denmark.

When it comes to the number of students in the life sciences, the Øresund Region's most prominent university is the University of Copenhagen: there are 7 900 students at the Faculty of Health and Medical Science and 5 800 in life science-related training programmes the Faculty of Science. Doctors, dentists, veterinarians and pharmacists of the future are educated at the Faculty of Health and Medical Science, and the Faculty of Science offers educational programmes in biochemistry, biology and molecular biomedicine.

There are approx. 4 500 students in the life sciences in various faculties at Lund University: the Faculty of Medicine (3 000), the Faculty of Science (700), and the LTH Faculty of Engineering (800). Lund's Faculty of Medicine offers undergraduate education in medicine, physical therapy, speech therapy and nursing, as well as higher level education such as further training in biomedicine and nursing

specialisation. LTH Faculty of Engineering offers life science-related education such as civil engineering training in medicine and technology, biotechnology, and chemical engineering. Advanced education includes master training in pharmaceutical technology.

LTH is part of Lund University, whilst the Technical University of Denmark (DTU) is an independent university. With 4 300 students in life science-related training programmes, DTU and LU have nearly the same number of life science students. Educational programmes at DTU include biotechnology, quantitative biology and disease modelling, and medicine and technology.

Multiple smaller universities and colleges in the Øresund Region also offer education in the life sciences; for example, Malmö University and Kristianstad University educate dentists and nurses, and Roskilde University offers training in molecular biology and mathematical bioscience.

STUDENTS IN BRIEF

26 800

Students studying in programmes completely or partially in the life sciences

7 900

Students at the Faculty of Health and Medical Sciences at the University of Copenhagen

3 000

Students at the Faculty of Medicine at Lund University

Footnote: The figure for KU is from 2019 and for LU from 2020.

DANISH STUDENT ORGANISATION FOR LIFE SCIENCE STUDENTS EXTENDED TO LUND IN 2020

Synapse – Life Science Connect is a student-led, non-profit organisation for life science students in Medicon Valley. The organisation works to build bridges between the life science industry and students and recent graduates of the life sciences by e.g. arranging networking events, company visits, workshops and summer schools. The organisation was established at the University of Copenhagen in 2014, and in 2020 it started up a division in Lund. Since 2018, the organisation received a grant of in total 992 000 DKK from the Novo Nordisk Foundation to continue their activities. Synapse also receives support from the Tuborg Foundation and Otto Mønsted Foundation in Denmark.

AROUND 26 800 STUDENTS IN THE ØRESUND REGION IN EDUCATIONAL PROGRAMMES IN OR RELATED TO THE LIFE SCIENCES

The following data shows the number of students in selected educational programmes or at departments at the region’s universities that are completely or partially related to the field of life science. Data was provided by the universities themselves and is from the years 2019-2020.

University	Number of students in the life sciences	Examples of life science programmes
University of Copenhagen	13 650	Faculty of Health and Medical Science and selected programmes the Faculty of Science
Lund University	4 500	Selected programmes at LTH, the Faculty of Medicine and the Faculty of Science
DTU	4 300	e.g. biotechnology, quantitative biology and disease modelling
Malmö University	2 000	e.g. dentistry, specialist nursing and biomedical analysis
Kristianstad University (HKR)	1 600	e.g. dental hygiene, nursing and health sciences
SLU Alnarp	600	e.g. the programme Outdoor environments for health and well-being
CBS	75	MSc Business Administration and Bioentrepreneurship & MSc Business Administration and Innovation in Health Care
Aalborg University in Copenhagen	60	Department of Sustainable Biotechnology
Total	26 800	

Footnote: See appendix for a complete list of educational programmes at the respective institutions.



University of Copenhagen



Lund University



Technical University of Denmark

THREE OF SCANDINAVIA'S FOUR HIGHEST RANKED UNIVERSITIES ARE IN THE ØRESUND REGION / MEDICON VALLEY

There are two Danish and two Swedish universities among the 100 top universities on QS’ annual ranking of around 1 300 higher learning institutions around the globe, according to the 2022 list released in June 2021. The best universities in Denmark and Sweden are in the Øresund Region. The University of Copenhagen ranks highest in Scandinavia at number 79, followed by Lund University at number 87, the Royal Institute of Technology in Stockholm at number 89 and the Technical University of Denmark at number 99. Lund University climbed ten places since the previous year, while the University of Copenhagen fell three.

Placement of universities in Skåne and the Copenhagen area (or with branches there) in QS’ ranking from 2022 (last year’s placement is in parentheses):

- University of Copenhagen: 79 (76)
- Lund University: 87 (97)
- Technical University of Denmark: 99 (103)
- University of Southern Denmark: 309 (353)
- Aalborg University: 326 (305)

NEW, REVISED TRAINING PROGRAMMES WITH LIFE SCIENCE-FOCUS AT CBS – FOR INDUSTRY WORKERS AND STUDENTS FROM MEDICON VALLEY AND ABROAD

With new continuing education programme on offer, Copenhagen Business School (CBS) is making it possible for Danish and Swedish life science employees and others Medi-con Valley to upgrade their skills. The educational institution in Copenhagen also offers students in e.g. Lund or Malmö master studies in Business Administration and Bioentrepreneurship and more. The training programme has been newly revised in collaboration with leading Danish biotech- and pharma companies and supported by the Novo Nordisk Foundation. To date however, only a small number of students in Sweden and Norway have taken advantage of the training opportunity in Copenhagen.

There are several new training programmes aimed at the life science sector on offer in Medicon Valley – at Copenhagen Business School, for one. Starting in September 2021, people who work in or head life science companies in Denmark, Sweden and abroad will be able to register for a new, flexible specialised training at a master level at CBS.

The Master of Business Development (MBD) programme, as it is called, is geared toward people who work in the pharma-, biotech- and medtech industries, and it offers an opportunity for experienced people from the sector from e.g. the Danish and Swedish sides to develop their networks and upgrade their knowledge of e.g. business development, pricing and open innovation processes.

People can choose to participate in the specialist training with others or individually. It consists of three courses, and each course costs between 10 000 and 20 000 DKK, or ca €1 400-2 700. The first course will start in September.

The training programme was designed through a sparring process with leading life science companies such as Novozymes, Chr. Hansen, H. Lundbeck and LEO Pharma, all of whom have border commuters on their staff (read more on page 14).

Together with the Technical University of Denmark (DTU), Novo Nordisk, and the University of Copenhagen, these same life science companies offered their input to another, two-year master programme at CBS so-called CBS-BIO, which is a MSc-programme in Business Administration and Bioentrepreneurship.

The programme is aimed at university students from around the globe; CBS has exchange programmes with schools such as e.g. Nanyang Technical University in Singapore.

Around 30 students were accepted to the newly revised, two-year programme MSc Business Administration and Bioentrepreneurship in 2020, according to figures from CBS. Approximately half of them were Danish – the remainder were from abroad, and only few were from Norway and Sweden. Another 45 students are expected to be accepted in 2024, as well as an additional three PhD students and postdocs.

In the master programme, life science companies involved, such as Novo Nordisk, offer teaching venues, and students will receive training and knowledge in bioentrepreneurship at BioInnovation Institute in Copenhagen.

The Novo Nordisk Foundation granted 6.5mn crowns, or approx. €875 000, to support the master programme in Business Administration and Bioentrepreneurship between 2021-2024.

CBS is also offering a MSc-programme in Business Administration and Innovation in Health Care. In 2020, around 50 students were admitted to the programme, according to CBS.



MANY OBSTACLES FOR LUND UNIVERSITY'S TRANS-ØRESUND COLLABORATION – BUT NEW VICE-CHANCELLOR WANTS STRUCTURAL LIFE SCIENCE SYNERGIES

Erik Renström was appointed Vice-chancellor of Lund University this January and wants to establish a structural collaboration in the life sciences that traverses the Øresund – but points out that unfortunately, the obstacles today are many; national research funding cannot be used across the Øresund, and educational training programmes are bound by national regulations. He sees solid bottom-up engagement in making collaboration between Lund University and the University of Copenhagen possible however, and there are a multitude of active exchanges today, particularly within research.

Today, Lund University has around 40 000 students, 8 000 employees and operations in Lund, Malmö and Helsingborg. Although Lund University is ranked as Sweden's most internationalised university and has the largest number of Danish students of all of the Swedish seats of learning, there remains unexploited potential for collaboration between the universities in the Øresund Region, according to Vice-chancellor of Lund University Erik Renström. He took his post as Vice-chancellor in January 2021. His biography includes a past as a doctor, a diabetes researcher at Novo Nordisk in Copenhagen and dean of Lund University's Faculty of Medicine.

Strong interest in working with the University of Copenhagen

Today, Lund University and the University of Copenhagen work together on many projects in the life sciences, particularly research collaborations.

– Based on the sum of my experience, there is solid bottom-up engagement. Many people from Lund University work with colleagues from the University of Copenhagen or other Danish universities and vice versa, says Erik Renström

The collaborations are primarily in research, and usually between individual researchers and research groups. There are fewer collaborations on a structural level, says Erik Renström.

– The whole border problem comes into play, and it does so recurrently. But it is important to emphasise that in contexts that allow for greater flexibility – which is often the case in research – there are many active collaborations, he says.

The border issues to which Erik Renström refers primarily concern the possibilities for transborder funding. In many EU contexts, he explains, collaboration between the University of Copenhagen and Lund University is basically impossible, since the funding is conditional on partners from different parts of Europe working together. Nor can national resources from Vinnova or the Wallenberg Foundations be used to involve collaborators from Denmark.

– I'm sorry to say that we have many structural obstacles impeding collaboration. There are many challenges. Interreg-projects are extremely valuable however, as we have a great deal of national projects in which we'd like to have Danish partners, he says. Examples of current Interreg-projects in life science research in which Lund University and the University of Copenhagen are both involved are ReproUnion and DiaUnion.

Wants to establish structural collaboration in the life sciences

In spite of the structural obstacles, Erik Renström hopes to be able to establish a structural life science collaboration with the University of Copenhagen.

– We need to identify topics that engage both the Swedish and the Danish sides, and in which we have good prerequisites to secure national funding, even if the project will be run as a joint endeavour, he says.

Several faculties of medicine in Scandinavia are currently working together in a collaboration on precision medicine. The hope is to join together in that field and to reach a critical mass, and thus be able to take advantage of the competitive

advantages in Scandinavia. Securing funding for each involved party is a recurrent challenge in this respect, however. For example, the Novo Nordisk Foundation is interested in contributing resources from Denmark.

– One needs to try and conjure up a shared unit with various funding typologies and structures in each of the respective countries – that entails more effort in addition to everything else, and the will to do it together needs to be very strong in order for it not to end in a lot of extra work, says Erik Renström, who hopes that the Wallenberg Foundations will contribute funds to this particular project.

Joint online learning might become reality in 2022

Collaborating on higher education programmes across the Øresund is complicated, says Erik Renström.

– One is bound by national regulations and by the universities' own regulations, particularly when it comes to training for professions such as medical doctors and nurses. While the conditions would probably be in place for something inspiring if we had new tools, it depends, once again, on what one really wants to get done despite all the obstacles. That is really the starting point, he says.

There is however one type of instruction between multiple countries that Erik Renström would like to see more of – so-called "collaborative international online learning", where students and teachers from



Erik Renström,
Vice-chancellor of
Lund University.

one country hold a course or parts of a course with students and teachers from another country, and the formal aspects of the course – such as exams – are managed by the respective home institutions.

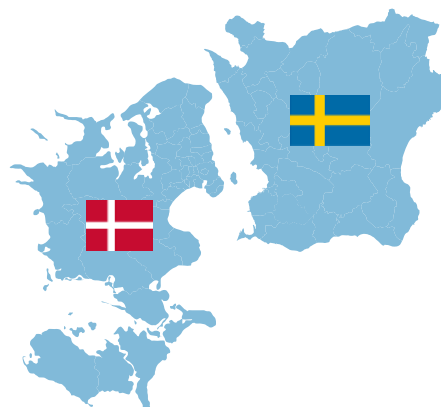
– When it comes to Danish universities specifically, we're especially fortunate, as we can combine online learning with real study visits – all of the conditions are in place for it to be a very attractive proposition, says Erik Renström, adding that this is already done today on a small scale at Lund University. If everything goes as planned, he believes it could be a reality between Lund University and the University of Copenhagen by autumn, 2022.



Lund University's
main building.

Focus: Diabetes research

The Øresund Region is a globally leading centre for diabetes research. There are strong research teams at hospitals, universities, research centres and companies on the Danish as well as the Swedish side of the strait. Novo Nordisk in Zealand goes back to 1923 and is a pioneer when it comes to insulin production as well as a global company that now manufactures 50% of the insulin produced worldwide and develops new and modern drugs for treating diabetes.



100 YEARS OF INSULIN

A team of Canadian researchers discovered the molecule insulin in 1921. Two years later, they were awarded a Nobel Prize. The discovery revolutionised healthcare for diabetics. In 1922 the team also received a visit from the Danish researcher couple Professor **August Krogh** (Nobel Prize winner for physiology/medicine in 1920) and **Marie Krogh**. August Krogh acquired the rights to produce insulin in Scandinavia, laying the foundation for the listed company known today as Novo Nordisk and its major owner, the Novo Nordisk Foundation.

NOVO NORDISK

Today, half of the world's insulin is manufactured by Scandinavia's largest pharmaceutical company, Danish **Novo Nordisk**. Novo Nordisk employs 45 000 people, 17 300 of whom work in Denmark. Novo Nordisk is a merger between the two Danish companies **Nordisk Insulinlaboratorium**, founded in 1923, and **Novo Teraeutisk Laboratorium** (the name was later changed to Novo Industri), founded the following year by two former employees of Nordisk Insulinlaboratorium.

NOVO NORDISK FOUNDATION

Via its subsidiary **Novo Holdings**, the Novo Nordisk Foundation is the major shareholder of the publicly traded company **Novo Nordisk** and **Novozymes** as well as a shareholder in a number of other companies. The Novo Nordisk Foundation was founded in 1989 when the two foundations **Novo's Fond** and **Nordisk Insulinfond** merged. The merger also meant that the two competing Danish companies Novo Industri and Nordisk Insulinlaboratorium united to become Novo Nordisk. Every year the foundation distributes billions in grants, primarily to support research, and invests in new companies via Novo Holdings.



CITIES CHANGING DIABETES

The initiative **Cities Changing Diabetes** was started by Steno Diabetes Center Copenhagen, Novo Nordisk and University College London in 2014. Its aim is to lower the incidence of Type-2 diabetes in cities. Today more than 30 cities have joined the project, including Malmö and Copenhagen.

STENO DIABETES CENTER COPENHAGEN

Steno Diabetes Center Copenhagen brings together around 220 diabetes researchers in clinical and health promotion research and offers treatment and training in the field of diabetes. Steno Diabetes Center is a collaboration between the Danish regions and the Novo Nordisk Foundation.

PHOTO: NEWS ØRESUND



Faculty of Health and Medical Sciences at University of Copenhagen.

THE UNIVERSITY OF COPENHAGEN

The majority of KU's research in the life sciences is conducted at the Faculty of Health and Medical Sciences. 3 000 researchers and 1 700 PhD students are linked to the faculty. Diabetes research is primarily conducted at research centre established with the help of donations from the Novo Nordisk Foundation.

• Novo Nordisk Foundation Center for Basic Metabolic Research (CBMR)

Founded in 2010 with donations from the Novo Nordisk Foundation. Focuses on diabetes, obesity and more. More than 210 researchers are linked to the centre.

• Novo Nordisk Foundation Center for Protein Research (CPR)

Founded in 2007 with a 600mn DKK donation from the Novo Nordisk Foundation and contributions from KU.

• Novo Nordisk Foundation Center for Stem Cell Biology (DanStem)

International research centre for basic stem cell and developmental biology founded in 2011 with a donation from the Novo Nordisk Foundation. Today the research aims to answer fundamental questions regarding stem cells' developmental biology in order to contribute new types of treatment for cancer and chronic diseases, including diabetes.

THE REGIONS

• Capital Region of Denmark

A total of 493 researchers work at Steno Diabetes Center Copenhagen (219), Rigshospitalet (106), Herlev & Gentofte (106), Nordsjælland (31), Amager & Hvidovre (19) and Bispebjerg & Frederiksberg (12)

• Region Zealand

Around 40 diabetes researchers are linked to Region Zealand.

• Region Skåne

Around 25-30 diabetes researchers are linked to Region Skåne.

MEDEON SCIENCE PARK & INCUBATOR

• Science park focused on diabetes

Diabetes is the primary focus of the science park in Malmö. Among other things, the Medeon stipend of 50 000 SEK is awarded annually as part of the World Diabetes Day arrangements in Malmö.

• Diabetes Alliance Sweden

A national network that brings together actors from different parts of the diabetes field. Founded in 2015, it now has 360 members from 120 organisations.

DIAUNION 1.0

The Interreg project **DiaUnion** brings together actors from Sweden (Region Skåne and Lund University) and Denmark (Steno Diabetes Center, Capital Region of Denmark and Novo Nordisk Foundation) as well as the Danish-Swedish project- and network organisation Medicon Valley Alliance in order to promote research of Type-1 diabetes.

LUND UNIVERSITY DIABETES CENTRE)

Founded 15 years ago, **Lund University Diabetes Centre (LUDC)** now brings together 219 diabetes researchers. Together with diabetes research from Uppsala University, LUDC's research has been designated as a national strategic research area in the initiative Excellence of Diabetes Research in Sweden (Exodiab). The research is conducted in both Malmö and Lund.

PHOTO: NEWS ØRESUND



Parts of Lund University Diabetes Centre are located at Medicon Village in Lund.

A long tradition of collaboration in diabetes research in the Øresund Region – complementary research focuses create synergetic effects

Over a long time, the Øresund Region has grown to become a globally leading centre of diabetes research. Insulin was discovered in Canada in 1921, and just two years later, the predecessor to Novo Nordisk had been founded with the rights to manufacture and sell insulin in Scandinavia. Today, Novo Nordisk is the world's largest insulin-manufacturing company and it has multiple research- and manufacturing facilities, as well as headquarters in Zealand and offices in Malmö. In addition, world-class diabetes research is carried out at Lund University, the University of Copenhagen and the research centre Steno Diabetes Center Copenhagen. The research park Medeon in Malmö is responsible for the national network Diabetes Samverkan Sweden (Diabetes Alliance Sweden). There is a historical precedent for working together on diabetes research across the Øresund, spurred on in part by the fact that Denmark and Sweden have had very different focus areas in research, which has created good synergetic effects. In early 2020, the collaboration was formalised in the Interreg-project DiaUnion, where the region's various strengths are combined to develop a public screening programme for Type-1 diabetes. The aim is to eventually be able to cure the autoimmune disease.

There are multiple centres that bring together research and treatment in the field of diabetes in the Øresund Region, for example Steno Diabetes Center Copenhagen and Lund University Diabetes Centre at Lund University. On the commercial front, the insulin manufacturer and largest pharmaceutical company Scandinavia Novo Nordisk has its global headquarters near Copenhagen in Bagsværd, Swedish headquarters in Malmö and four research facilities on the Danish side of Medicon Valley. Diabetes research is also carried out at hospitals in Region Skåne, the Capital Region of Denmark and Region Zealand – the Danish regions count more than 500 diabetes researchers. Via interviews for this report, it becomes clear that there is a long tradition of collaboration on diabetes across the Øresund. Nonetheless, it wasn't until early 2020 that the collaboration was formalised in a joint project with the Interreg-project DiaUnion.

Europe's first insulin was produced in Denmark in 1923 – and it was the start of Novo Nordisk

The history of diabetes in the Øresund Region goes back to Copenhagen in 1923, when a doctor called Hans Christian Hagedorn, the Nobel Prize winner August Krogh and the manufacturer August Kongsted started Europe's first insulin production. Called Nordisk Insulin Laboratorium, it would later become Nordisk Genstofte A/S. Following disputes within the company, two former employees from

Nordisk Insulin Laboratorium – the two brothers Harald and Thorvald Pedersen – started Novo Teapeutisk Laboratorium, which later became Novo Industri A/S. In 1989, the two companies found their way back together and merged to become Novo Nordisk A/S, thus becoming the world's largest manufacturer of insulin.

A long tradition of collaboration

As diabetes research is a major focus on both the Swedish and Danish sides of the Øresund Region, collaborating over the Øresund has also become natural, as interviews for this report showed. Collaboration has primarily been between individual clinics and researchers.

– There used to be collaborations where people did a project together, but there has never been anything overarching, that brings everyone together under one roof with a decision that it's something we want to do. There have been individual projects, but otherwise people have stayed in their own institutes or clinics, says Finn Kristiansen, project leader of the Interreg-project DiaUnion, which brings together multiple actors from the field of diabetes in a collaborative research project focused on Type-1 diabetes.

Flemming Pociot is head of research at Steno Diabetes Center Copenhagen and a DiaUnion partner, and he also talks about a long tradition of research collaboration. He was also an adjunct professor at Lund University and has had many research projects



across the strait.

– I actually do believe that diabetes as a field stands out when it comes to collaboration, and there's a solid tradition for that. Together, Copenhagen and Malmö are an epicentrum for diabetes research, and a lot of people work across the strait.

Geographic proximity and research areas that complement each other

Geographic proximity is highlighted as one factor that encourages collaboration across the Øresund. Shared resources are another; for example, there is a lot of clinical research on both sides of the Øresund at the Clinical Research Center in Malmö, which is part of the Institute of Clinical Studies at Lund University.

– In Sweden there is a good combination of clinical research and basic research in one place with the Clinical Research Centre in Malmö; in Denmark it's more separated. Our research at Steno Diabetes Center is primarily close to the clinical; otherwise basic research is mostly carried out at universities in cooperation with us, says Flemming Pociot from Steno Diabetes Center.

But what has made collaboration across the Øresund so fruitful is that there have traditionally been different focus areas in diabetes research in Denmark and Sweden, which creates good synergetic effects in collaborations.

– There is a long tradition of diabetes research on both sides of the strait, and I would say that on the

Danish side, we've concentrated on the insulin-producing cell for many years and tried to understand why the immune system destroys it and whether we can alter that somehow. Sweden's strength is that they have been faster when it comes to researching in a clinical setting and getting involved in international projects where the focus is on longer periods prior to the disease emerging, says Flemming Pociot.

DiaUnion brings together actors against Type-1 diabetes

The complementary research areas were also one of the reasons why the Interreg-project DiaUnion started up in early 2020.

– Our expertise in the Øresund Region overlaps to a certain extent – but for the most part each side complements the other extremely well. People can do something in Denmark that they can't do in Sweden and vice versa, and that's something that's been in focus for many years, but until DiaUnion there was never any more formal collaboration set up between the two research groups on either side of the Øresund, says project leader Finn Kristiansen.

The three-year project brings together Steno Diabetes Center, the Capital Region of Denmark, Medicon Valley Alliance, Region Skåne and Lund University, and it is funded by Interreg and the Novo Nordisk Foundation. The project focuses on Type-1 diabetes, which is an autoimmune disease; that means that the cells that produce insulin are destroyed by the body's immune system.



Novo Nordisk's headquarters in Bagsværd near Copenhagen.

– We have no explanation for why people develop Type-1 diabetes, and that is what we want to learn more about. People are working on it on both sides of the Øresund: in Denmark there is a strong focus on genetics, and in Sweden there is a great deal of experience with screening; these are two things that we're seeking to align. We want to try to collaborate on other autoimmune diseases in order to make some progress, says Finn Kristiansen.

The other two autoimmune disorders being investigated are celiac disease (gluten intolerance) and thyroiditis (inflammation of the thyroid gland). A pre-study is being done right now to see whether it's possible to screen children for all three diseases simultaneously. The hope is that the pre-study will become a public screening programme for determining who is at risk of developing the diseases and in which bracket of time that will happen. Read more about DiaUnion on pages 64-65.

Pharmaceutical giant Novo Nordisk has headquarters and four research centres in the region

With 16 800 employees at the company's headquarters as well as manufacturing- and research facilities in Zealand and 75 employees at the company's Swedish offices in Malmö, Novo Nordisk is Scandinavia's largest pharmaceutical company. Of the 16 800 employees in Zealand, 206 commute from the Swedish side of the Øresund. Four of Novo Nordisk's total of 12 research facilities are in Zealand. The

largest of them is located in Måløv, 18km northwest of Copenhagen. The three other facilities are near the headquarters in Bagsværd, in Søborg and in Hillerød. There are e.g. early drug discovery laboratories and facilities for production upscaling in Måløv, and drug candidates are developed, formulated and manufactured for pre-clinical and clinical testing in Bagsværd. The focus at the research centre in Søborg is on late-stage development across all therapy areas, and the centre in Hillerød is an innovation hub and the company's key location for pioneering new medical devices and delivery technologies.

Over the past two years, Novo Nordisk has made additional investments in Måløv and Kalundborg. Two years ago, the company invested two billion crowns in its insulin factory in Kalundborg, where half of the world's insulin is manufactured. In early 2021, Novo Nordisk also announced its plan to invest 500mn DKK in its production facility in Måløv in order to meet the future demand for the diabetes pill Rybelsus, which has been approved by pharmaceutical authorities in the USA, Europe and Canada in the past two years.

Malmö-based science park Medeon focuses on diabetes – but would like more commercial collaboration across the strait

Back in 1985, Medeon Science Park & Incubator in Malmö were Sweden's first science park focused on the life sciences. Today, diabetes is one of its main areas of focus. Medeon helped put Malmö on the map when it comes to diabetes, for example by starting up the national network Diabetes Samverkan Sweden, or DSS. Today, DSS has around 360 members from more than 120 organisations in the industry, academia, the healthcare sector and patient organisations in order to strengthen innovation potential, develop startups in the field, generate new collaborations and more. Medeon is also part of the programme Cities Changing Diabetes and works with the Lund University Diabetes Center (LUDC), for example in the annual joint arrangement World Diabetes Day, at which Medeon also awards its annual 50 000 SEK stipend to a diabetes researcher.

As far as Medeon's collaborations across the Øresund are concerned, commercial co-operations are currently rather limited; reasons for this include that there are not as many small companies in diabetes on the Danish side as in Sweden, which is also a question of resources, according to Medeon's CEO Ulf G. Andersson.

Diabetes research at the University of Copenhagen

Numerous centres at the Faculty of Health and Medical Sciences conduct research in diabetes and other fields. Many of them have been established with the help of donations from the Novo Nordisk Foundation. Read more about four selected research centres below.

Novo Nordisk Foundation Center for Protein Research (CPR)

Novo Nordisk Foundation Center for Protein Research (CPR) was established in 2007 thanks to a 600mn DKK donation from the Novo Nordisk Foundation and contributions from the University of Copenhagen (KU). The centre is a part of the Faculty of Health and Medical Sciences at KU. In 2015, the centre received another 180mn DKK donation from the Novo Nordisk Foundation, which granted an additional 700mn DKK in 2019 to finance the five following years. There are research groups in the fields of diabetes and cancer at the centre. Most of the cancer research conducted at the centre is basic level, but there is also translational research. CPR has 235 employees; 160 of them are researchers, 50 are research assistants, and 15 work in administration.

Novo Nordisk Foundation Center for Stem Cell Biology (DanStem)

DanStem is an international research centre for basic stem cell and developmental biology instituted in 2011 at the Faculty of Health and Medical Sciences at KU via a donation from the Novo Nordisk Foundation. Today, it aims to answer fundamental questions regarding stem cells and developmental biology in order to contribute new types of treatment for cancer and chronic diseases, including diabetes. The centre is currently running two larger scale strategic translational research programmes in diabetes and haematological cancers. Basic and translational research are also conducted in the field of reproduction. The centre has 241 employees, 194 of whom are researchers/research students.

Novo Nordisk Foundation Center for Basic Metabolic Research (CBMR)

Started in 2010 at the Faculty of Health and Medical Sciences at KU with the help of a donation from the Novo Nordisk Foundation in the amount of 885mn DKK. The centre received another donation in the amount of 700mn DKK in 2018. The centre's vision is: "To strengthen interdisciplinary research that transforms the basic understanding of

the mechanisms involved in metabolic health and disease, and to accelerate this knowledge toward new prevention and treatment strategies". The centre focuses on basic metabolic research, including obesity and diabetes. There are 210 researchers linked to the centre today.

Biotech Research and Innovation Center (BRIC)

A research centre at the Faculty of Health and Medical Sciences at KU. BRIC was founded by the Danish Ministry of Science, Technology and Innovation in 2003 with the aim of creating an elite research centre. There are 250 researchers and a number of research students at BRIC. While BRIC's primary research focus is on cancer, followed by neurological disorders, a number of projects also deal with metabolic diseases – one of which is diabetes.

BRIC is involved in multiple collaborations across the Øresund, and most of the collaborations are within specific research projects. As a centre for example, BRIC works with a Swedish professor by the name of Sara Ek, who is a member of their advisory board and on the selection committee for a H2020 Marie Curie project. BRIC is also working with Medicin Valley Alliance (MVA) on another Marie Curie-project, and MVA is helping spread knowledge about the project and its results.



Steno Diabetes Center Copenhagen

Steno Diabetes Center Copenhagen brings together around 220 diabetes researchers in clinical- and health promotion research and offers treatment and training in the field of diabetes. The centre has a long history that goes back to the founding of Novo Nordisk. Research at the centre has long since had links across the Øresund, and its involvement in the Interreg-funded project DiaUnion has made the collaboration more concrete and brought research across the strait to a new level, says Flemming Pociot, who is head of research at Steno Diabetes Center Copenhagen and a professor at the University of Copenhagen.

Steno Diabetes Center Copenhagen goes back to 1932, when Nordisk Insulin Laboratorium (NIL) – known today as Novo Nordisk – founded Niels Steensens Hospital in Copenhagen. Niels Steensens Hospital admitted patients from all over Scandinavia, although most were Danes with Type-1 diabetes. Treatments were permeated with a holistic view of patients' lifestyles, and diet and exercise played an important role. The hospital also started a collaboration with the public healthcare system, which was unique at the time, and through donations from the Nordisk Insulin Foundation – today the Novo Nordisk Foundation – many of the patients received treatment free of charge.

The merger that made Novo Nordisk set Steno Diabetes Center in motion

About ten years earlier, in 1923, Europe's first insulin production had been started by a doctor called Hans Christian Hagedorn, the Nobel Prize winner August Krogh, and the manufacturer August Kongsted. It was called Nordisk Insulin Laboratorium, and would later become Nordisk Gentofte A/S. Following disputes within the company, two former employees from Nordisk Insulin Laboratorium – the two brothers Harald and Thorvald Pedersen – started Novo Terapeutisk

Laboratorium, which later became Novo Industri A/S. In 1989, the two companies reunited and merged to become Novo Nordisk A/S, thus becoming the world's largest manufacturer of insulin. Two years after the merger, Niels Steensens Hospital merged with Hvidovre Hospital, which was owned by Novo Industri A/S at the time. The merger meant that more research labs and clinics were added to Niels Steensens Hospital, whose name was changed to Steno Diabetes Center.

Steno Diabetes Center is now in all Danish regions thanks to donations from the Novo Nordisk Foundation

The centre continued to develop; in 1991 for example, an educational unit was created to allow research results to be transferred to training of health personnel, and in 2010, the humanistic-oriented research unit Sundhedsfremme (Health promotion) was founded. Sundhedsfremme works for diabetes prevention.

The collaboration between Steno Diabetes Center and publicly-funded healthcare has continued until today, and there is now a Steno Diabetes Center in every region in Denmark – an initiative made possible by donations from the Novo Nordisk Foundation. Steno Diabetes Center thus became Steno Diabetes Center Copenhagen in early 2017, and the regional diabetes centres throughout the country were founded between 2018-2019.

Clinical and health-promoting research brings together 220 researchers

Steno Diabetes Center Copenhagen currently has two primary research focuses: clinical research and research on promoting health. A total of 219 researchers are linked to the centre, according to the Capital Region of Denmark. Research is conducted in close collaboration with the University of Copenhagen, where a large part of the basic research is carried out.



PHOTO: THE NOVO NORDISK FOUNDATION



PHOTO: NEWS ØRESUND

Lund University Diabetes Center

Lund University Diabetes Centre (LUDC) was founded 15 years ago, and there are 219 diabetes researchers there today. Together with diabetes research from Uppsala University, LUDC's research has been designated as a national strategic research area in the initiative Excellence of Diabetes Research in Sweden (Exodiab). The research is conducted in Malmö and Lund.

In 2006, diabetes researchers at Lund University received a ten-year 'Linné Grant' from the Swedish Research Council. That was the start of the Lund University Diabetes Center (LUDC), but diabetes research has long since been recognised as one of Lund University's strong areas of research. Already back in 1997, a research group was granted the status "Centre of Excellence" by the Wallenberg and Juvenile Diabetes Research Foundation for a larger scale research project that continued until 2003. The distinction laid the foundation for a number of other important research contributions. Many other initiatives in diabetes research have since taken place at LU; for example, the academic network the Diabetes Programme at Lund University (DPLU) was established in 2003 to augment research and generate research collaborations, primarily between young researchers; this eventually led to LUDC receiving the Linné Grant in 2006.

Designated national strategic research area in 2009

In 2009, the government designated LUDC's diabetes research in collaboration with Uppsala University as a strategic research area under the name Exodiab. A total of ca 430 people are employed in Exodiab (310 in Lund and 120 in Uppsala). The initiative is financed with 30mn crowns annually, and its aim is to develop new treatments and drugs that can prevent or cure diabetes. Researchers in Exodiab

have access to e.g. globally leading biobanks for diabetes research as well as the Human Tissue Lab, where insulin-producing cells from humans, liver- and muscle tissue and fat can be studied.

Research in Lund and Malmö

Research at LUDC is conducted in both Lund and Malmö. At the Clinical Research Center (CRC) in Malmö, basic research is combined with clinical research. A robot by the name of Hamilton is a recent addition to the centre. One of three of its kind in the world, it can simultaneously analyse multiple different antibodies remarkably faster than previously. Among other things, the new robot will be used in the screening for diabetes, celiac disease and thyroiditis planned within Øresund collaboration and the Interreg-project DiaUnion. The two other robots that use the same technology are located at a lab in California.

Close collaboration with the industry

Diabetes research at LUDC is also conducted in close collaboration with the industry in the collaborative project LUDC-IRC. Other partners are Region Skåne, Follicum AB, Probi AB, Pfizer, Johnson & Johnson Innovation and Novo Nordisk. The goal of the project is to develop tailored treatments for Type-2 diabetes by using the biobanks and tissue samples available in LUDC. The project has received 100mn crowns from the Swedish Foundation for Strategic Research.

HIS SON'S DIABETES MADE HIM WANT TO PUSH RESEARCH FORWARD – AND IT WAS THE BEGINNING OF THE DIAUNION PROJECT

Started in 2019, the Interreg project DiaUnion 1.0 has brought together many actors in the Øresund Region to improve understanding of why Type-1 diabetes occurs, as well as to establish a joint screening program to identify those at risk of developing the disease. The goal is to be able to offer preventative treatment as early as possible and, in the future, to contribute to preventing the disease entirely. Research expertise on both sides of the Øresund complements each other well, and collaboration has worked perfectly to date, says Finn Kristensen, who initiated DiaUnion 1.0 and now manages the project.

When Finn Kristensen's son was diagnosed with Type-1 diabetes, he felt he needed to do everything in his power to help research move forward. He put his career as a civil engineer on hold and instead started working with the international non-profit organisation Juvenile Diabetes Research Foundation (JDRF), which he started up in Denmark and headed until 2017. Via the organisation, he became aware of the research expertise on both sides of the Øresund Region, and the idea to gather the region's actors in a joint project was born.

– I initiated a more formal collaboration. There have been individual collaborations in diabetes between Sweden and Denmark in the past, but no one had formed a group and formulated a common objective previously, says Finn Kristensen, who is now DiaUnion's project manager.

After a year of collaboration between the actors, his conclusion is that the collaboration has worked well.

– I can say quite simply that the collaboration has worked absolutely perfectly. There has been a great positive drive to pool our strengths from the very beginning, and I find that everyone's contributions have been incredible, and everyone has been willing to share their knowledge and follow up. It could not have been better; I see it as a huge success, says Finn Kristensen.

ReproUnion inspired the Interreg project

In order to realise his idea, Finn Kristensen turned first to the Novo Nordisk Foundation, which tipped him off on a project with similar ambitions in the field of reproduction called ReproUnion. After that,

Medicon Valley Alliance – which has a coordinating role in ReproUnion – became involved in the plans, and they decided to seek funding via Interreg. They also turned to the regions, to get them on board the project.

– We found that interest was strong and there were great opportunities to work on the project. We started out informally, looking at what we could do to develop a project together that we believed had good chances of receiving funding from Interreg and the regions.

We knew that the regions' interest was strong when it came to promoting development projects on diabetes, he says.

An uncommon path to funding

To begin with, the DiaUnion project had a total budget of one million euros, half of which was from Interreg. The initial ambition had been to bring in two million euros, but the Interreg funds for innovation projects had been exhausted.

– We revised the original plan as a one million euro-project that we could start in January 2020. Our attention was then drawn to the fact that funding was still available for other types of projects in the Interreg-programme – funds that risked not being distributed because the demand was too low. Following productive discussions with Interreg and other central actors regarding the possibility to transfer funds between the various priorities, we were able to apply for a supplementary grant that we were lucky enough to receive, says Finn Kristensen.

The foundational project was coordinated by Medicon Valley Alliance. Besides Interreg, it was funded by Region Skåne, the Capital Region of Den-

mark, Lund University, and Steno Diabetes Center Copenhagen. In addition to the supplementary grant, the Novo Nordisk Foundation also became a financier, contributing €250 000. As of now, the project is set to continue until September 2022, and discussions are already underway about how the collaboration may be developed in the future; the working name is DiaUnion 2.0.

The drive to improve understanding of the disease's origin

Expertise in diabetes research on both sides of the Øresund complements each other well, and the research in DiaUnion is based on that expertise, says Finn Kristensen.

– Type-1 diabetes is an autoimmune disease, and lifestyle has absolutely nothing to do with whether or not one develops it. We have no explanation for why people get Type-1 diabetes, and we want to learn more about it. People are working on it on both sides of the Øresund: in Denmark there is a strong focus on genetics, and in Sweden there is a great deal of experience with screening; these are two things that we're seeking to unite, says Finn Kristensen.

Concretely speaking, this is being done through collaborations on two other autoimmune diseases: coeliac disease (gluten intolerance), and thyroiditis (inflammation of the thyroid gland). These three diseases share risk genes, meaning that there are shared mechanisms in the body that lead to their



Finn Kristensen,
project manager
DiaUnion

emergence. In spite of that, they manifest in very different ways; for that reason, doctors and researchers have not shared information and experiences to a broader extent previously.

– Another advantage of looking at all three diseases simultaneously is that we can screen for all three at the same time. That means that we can streamline the work of tracing who is at risk of being affected by these diseases and prevent or delay their emergence. The primary goal is to be able to determine who is in the risk group, follow them and prevent the disease from developing – or at the very least delay its development, he says.

FACTS: DIAUNION 1.0

The Interreg project DiaUnion brings together actors from Sweden (Region Skåne and Lund University) and Denmark (Steno Diabetes Center, Capital Region of Denmark and Novo Nordisk Foundation) as well as the Danish-Swedish project- and network organisation Medicon Valley Alliance in order to promote research of Type-1 diabetes. DiaUnion 1.0 will be ongoing from January 2020 to September 2022. The hope and aim is to discover more about why the autoimmune disease develops and to establish a screening programme on both sides of the Øresund to identify special risk genes that reveal who is at risk of developing Type-1 diabetes in the future and providing treatment as early as possible.

Research in the project focuses in part on increasing knowledge about the biomarkers that are linked to an increased risk of developing Type-1

diabetes and adding other biomarkers to improve filters and thus better predict who runs a high risk of developing the disease and when it might be expected to emerge. The next stage is to use the research on biomarkers in a screening in which children will have an opportunity to be screened for Type-1 diabetes, coeliac disease and thyroiditis in a pre-study for the upcoming project DiaUnion 2.0. The goal of the upcoming DiaUnion 2.0, expected to start in 2022, is to screen newborns for the three autoimmune diseases and follow them for an extended period in order to see which of them develop diseases and to be able to implement preventative treatments in an early stage. Two PhD students have been employed for the project, and the entire research group meets on a weekly basis to report and discuss results.

“BRINGING IN PARTNERS TO BOOST RESEARCH VIA COLLABORATION HAS BEEN AN ENORMOUS SUCCESS”

Daniel Agardh researches autoimmune diseases at Lund University and is a practising paediatrician at Skåne University Hospital. Part of the research he conducts is within the project DiaUnion, where he is responsible for research on Swedish turf.

– This project makes me feel there is great hope for the future. I have found that bringing in external partners to boost research to new levels through collaboration has been an enormous success so far, he says.

– I see huge benefits to be had by using strengths on both sides of the Øresund to carry out the project. Together, Malmö and Copenhagen are a very large region with great opportunities to join together and do excellent research, says Daniel Agardh.

He finds that the collaboration between the parties in DiaUnion works very well. In practice, this means that e.g. the PhD student Sara Juul has been employed at Steno Diabetes Center Copenhagen to investigate biomarkers for Type 1 diabetes and their development, and postdoc Alexander Lind has been given a position at Lund University where he studies how these biomarkers can be used more for a future screening. They then discuss their results with the senior researchers. In addition to Daniel Agardh, these include Flemming Pociot from Steno Diabetes Center Copenhagen and Åke Lernmark from Lund University Diabetes Centre (LUDC). Although the coronavirus pandemic has made it more difficult to meet in person, the collaboration has continued smoothly, and the physical meetings have been replaced by video conference calls, says Daniel Agardh.

He also points out that the design of the collaboration has been a success factor for the project, and he emphasises how important the roles of project coordinator Finn Kristiansen and Medicon Valley Alliance's CEO Petter Hartman have been.

– The collaboration is very good, and Finn Kristiansen is behind that – he's a phenomenal organiser who keeps everything together when the rest of us are busy doing other things. He makes sure that we stay in touch and arranges meetings with everyone from Novo Nordisk to patient associations. He has been able to bring in external parties, and then we bring our expertise, says Daniel Agardh. He emphasises that conducting a good study goes far beyond

just research.

– There are so many other puzzle pieces that need to be in place, for example contact with politicians. In that respect I'd like to mention Petter Hartmann (MVA's CEO), who is fantastic at bringing contacts together via his network; as researchers, we wouldn't be able to do it, because we simply don't have those contacts.

In addition to the exchange of experiences, expertise and strengths, trans-Øresund collaboration also provides a greater base for research, which in turn means that research moves forward at a faster pace, says Daniel Agardh. While the collaboration between Danish and Swedish researchers has worked well within the DiaUnion project, certain differences in the countries' legislation have become more apparent.

– What I'm seeing are small differences in legislation regarding whether or not certain research can be conducted. I see it as a challenge rather than a weakness, and there are opportunities to use the difference to actually make changes where things didn't work before. Some things are very challenging however, such as conducting a screening on both sides of the Øresund; since it isn't as common in Denmark, getting ethical approval can be difficult, says Daniel Agardh.



PHOTO: JOHAN PERSSON

“NOW THAT WE'RE IN DIAUNION, WE HAVE BOTH FUNDING AND TIME – IT USED TO BE SOMETHING WE HAD TO FIND TIME FOR ON THE SIDE”

Flemming Pociot is a professor at the University of Copenhagen and head of research at the Steno Diabetes Center Copenhagen. As he sees it, research collaboration has become more concrete and moved up on the agenda since the establishment of DiaUnion. Copenhagen and Malmö have developed into an epicentre for diabetes research, and there is a great deal of activity across the Øresund, which can largely be explained by the complementary expertise found on either side of the strait, he says.

– Both sides have a long tradition of diabetes research; our strengths on the Danish side are that we've focused on insulin-producing cells for many years and sought to understand why they are destroyed by the immune system and whether we can change that somehow. The strength on the Swedish side is that they are faster when it comes to conducting clinical research and getting involved in international projects that focus on longer periods before people have the disease, says Flemming Pociot, who is a professor at the University of Copenhagen and head of research for the research group Translational Type 1 Diabetes Research in clinical research at the Steno Diabetes Center Copenhagen.

He adds that the model for diabetes research on the Swedish side of the Øresund, where both basic and clinical research are gathered at the Clinical Research Center (CRC) in Malmö, is a more favourable research model than the one used on the Danish side; there, clinical research is located at the Steno Diabetes Center Copenhagen, and a large part of the basic research conducted is done at the University of Copenhagen.

As a former adjunct professor at Lund University, Flemming Pociot has a broad network and good familiarity with diabetes research on the Swedish shores of the Øresund. He has been researching the emergence of Type-1 diabetes, which is one of DiaUnion's focus areas, for the past 25 years, and he has had a series of collaboration in research, but it wasn't until the Interreg-funded project DiaUnion that the Øresund collaboration became more concrete and more highly prioritised.

– When the opportunity arose to formalise the collaboration – because it has never been done before, with joint funding and a shared structure, although it has existed for years – it was a fantastic prospect. It also helped that we know the Swedish partners, we know what they represent and how we can best help each other and in doing so get as much as possible out of the collaboration, he says. He continues:

– Before we became part of DiaUnion, the collaboration depended more on whether we made the right agreement with the right people, and because it hadn't been formalised, the priorities were different. Now that we're part of the project, we have both funding and time – and we can do the things we want to get done. It used to be that we had to find time for them on the side.

As he sees it, the Øresund collaboration works well, but he would like to see it be easier for PhD students to split their research training between the two countries.

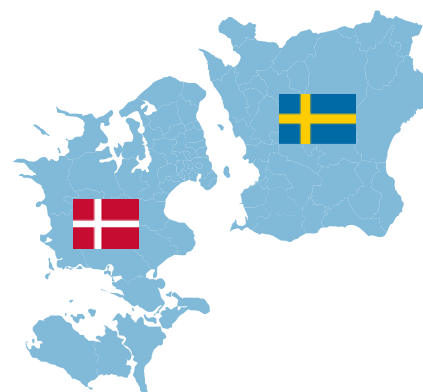
– It would make a lot of sense in a lot of research projects, he says.



PHOTO: LIZETTE KABRÉ

Focus: Cancer research

Cancer research is carried out in many universities, hospitals and research centres in the Øresund Region. There are frequently collaborations between individual researchers and research groups across the Øresund strait. A selection of cancer research environments are presented below.



TECHNICAL UNIVERSITY OF DENMARK (DTU)

Cancer research at DTU is conducted at e.g. DTU Health Tech. The department recently received a 37.7mn DKK grant from the Novo Nordisk Foundation to establish an interdisciplinary research centre where they will transform CAR T-cell therapy for treating solid cancer tumours.

DANISH NATIONAL RESEARCH CENTRES

There are 11 research centres for cancer in Denmark. They were founded in 2016 in collaboration with the Danish Cancer Society, Danish Comprehensive Cancer Center (DCCC) and the regions themselves. Many of the centres are based in Zealand.

- **COMPAS – Danish Research Center for Equity in Cancer**
Steered from Zealand University Hospital in Næstved; research is based at research institutions and hospitals all over Denmark.
- **Danish Research Center for Precision Medicine in Blood Cancer**
Based at the Biotech Research & Innovation Centre (BRIC) at the University of Copenhagen (KU); research is conducted in collaboration with all five Danish regions.
- **DCCC Danish Center for Targeted treatment of Primary Brain Tumors**
Founded in 2020 at the Department of Oncology at Rigshospitalet in collaboration with researchers from e.g. BRIC at KU.
- **National Center for Cancer Immune Therapy (CCIT-DK)**
CCIT-DK is located at Herlev Hospital and is a centre for experimental, translational, and clinical collaborations in the field of cancer immunology and cancer immunotherapy.
- **CASTLE – Cancer Survivorship and General Late Effects**
The centre is located at Rigshospitalet and focuses on late effects such as anxiety and depression in cancer patients.

THE DANISH CANCER SOCIETY

Denmark's national cancer foundation the Danish Cancer Society is located in Copenhagen. It has its own research institute in Copenhagen with 250 researchers and research students from 46 different countries.

UNIVERSITY OF COPENHAGEN

The majority of KU's research in the life sciences is conducted at the Faculty of Health and Medical Sciences. 3 000 researchers and 1 700 PhD students are linked to the faculty. Cancer research is for example carried out at these two research centres:

- **Biotech Research & Innovation Centre (BRIC)**
BRIC's focuses are biomedical basic research in cancer and neurological and metabolic diseases and disorders. 250 researchers who primarily, though not exclusively, work with cancer are linked to the centre.
- **Novo Nordisk Foundation Center for Stem Cell Biology (DanStem)**
International research centre for basic stem cell and developmental biology, founded in 2011 with a donation from the Novo Nordisk Foundation. Today the research aims to answer fundamental questions regarding stem cells developmental biology in order to contribute new types of treatment for cancer and chronic diseases, including diabetes.

ROSkilde UNIVERSITY

Here, researchers at the Department of Science and Environment have for example collaborated with Zealand University Hospital to develop models for more effective and more individual treatments for cancer of the blood.

KRISTIANSTAD UNIVERSITY

Three researchers work in oncological research. They are at the departments of biomedicine, physical therapy and nursing, respectively.

THE REGIONS

The Capital Region of Denmark, Region Zealand and Region Skåne count a total of 600 cancer researchers. Note that some of these researchers are also linked to the universities.

- **The Capital Region of Denmark**
438 researchers at Rigshospitalet (321), Herlev & Gentofte (74), Bispebjerg & Frederiksberg (27) and Amager & Hvidovre (5), Nordsjælland Hospital (11)
- **Region Zealand**
Around 50 cancer researchers.
- **Region Skåne (Skåne University Hospital; SUS)**
95-100 cancer researchers.

MALMÖ UNIVERSITY

- **Department of Biomedical Science at the Faculty of Health and Society**
Experimental and clinical cancer research is conducted by around ten employees. These include PhD students, post-docs, lecturers and professors. In addition, students are also involved in research projects.

SWEDEN CANCEROME ANALYSIS NETWORK - BREAST

- **Sweden Cancerome Analysis Network – Breast (SCAN-B)**
The Øresund Region's largest breast cancer research project. The collaboration started in 2010. Since then, tissue samples have been collected from 17 000 people and analysed at SCAN-B-labbet in Lund. In addition to Lund University and SUS, a number of other hospitals in southern Sweden are also involved.

LUND UNIVERSITY

- **Lund University Cancer Center (LUCC)**
LUCC is at the core of Lund University's cancer research. More than 600 researchers are linked to the centre. Read more about LUCC on page 76-77.
- **CREATE Health**
A strategical research centre for translational cancer research at LTH School of Engineering in Lund, and also part of LUCC. The centre is unique in that researchers from four different faculties at Lund University are at home here (LTH, the Faculty of Medicine, the Faculty of Social Sciences and the Faculty of Science.)
- **The European Cancer Moonshot hot Lund Centre**
The international collaborative project Cancer Moonshot was initiated by the National Cancer Institute in the USA, and the project's European centre is in Lund. Research there focuses on identifying proteins in melanoma tissue, and it is conducted at the Biomedical Centre (BMC).

TWO PRIVATE CLINICS AT MEDICON VILLAGE IN LUND

- **Peritus Clinic**
A private specialist clinic at Lund's Medicon Village focused on cancer treatment and research, primarily in urology. Opened in 2020. One of Sweden's first private cancer clinics.
- **A new clinic for treating cancer that affects** will be founded at the science park Medicon Village in Lund. The clinic is being financed with private funds from Hans and Julie Rausing, who are donating £20mn, or approximately a quarter of a billion SEK.



PHOTO: NEWS ØRESUND

Broad unexploited potential in the Øresund Region's oncological research

There are strong cancer research environments on both sides of the Øresund. Nonetheless, few formalised collaborations in cancer research exist across the Øresund; collaborations are instead largely driven by individual initiatives and personal networks. Structural obstacles, national research funds that may not be utilised for transborder projects, a lack of time and of knowledge about what is available on the other side of the Øresund have all been highlighted as reasons why the collaborations are not more firmly established. One exception is the Interreg-funded collaborative project iCope, where researchers from both sides of the Øresund work together in the field of childhood cancer with the aim to establish a permanent centre in the region.

There are multiple oncological research centres in the Øresund Region. For instance, Lund University (LU) brings together around 600 researchers at Lund University Cancer Center (LUCC), and the strategic centre for translational cancer research Create Health is at LTH School of Engineering, also in Lund. In addition, the research group Cancer Moonshot Lund conducts research within the international project Cancer Moonshot. On top of that, research is undertaken at Skåne University Hospital in Lund and Malmö, often with universities.

On the other side of the bridge, cancer research is conducted at the University of Copenhagen (KU), especially at the Faculty of Health and Medical Sciences. One research centre there is the Biotech Research & Innovation Centre (BRIC) where 250 researchers focus primarily on studying cancer. The university also works with hospitals in the Capital Region of Denmark, at which 438 people work in cancer research – most of them at the Center for Cancer- and Organ Diseases at Rigshospitalet, and with Region Zealand, where around 50 people conduct cancer research. Denmark's national cancer foundation, the Danish Cancer Society is located in Copenhagen. Unlike its Swedish counterpart the Swedish Cancer Society, the Danish Cancer Society has its own research institute. The research institute aims to conduct globally leading cancer research, and 250 researchers from 26 different countries work there. Cancer research cancer is also conducted at Malmö University, the Technical University of Denmark (DTU), Roskilde University and Kristianstad University, albeit on a smaller scale.

Research collaboration is largely driven by individuals and personal networks

Collaborations in cancer research in the Øresund Region are mainly smaller scale undertakings brought about by individual initiatives and personal networks, resulting in collaborations between individual researchers, research groups or clinics.

The cancer researchers interviewed for this report have or have had collaborations across the Øresund, but these have been via their research groups and individual collaborations. Kristian Pietras is a professor at Lund University and former coordinator of the Lund University Cancer Center and he works with e.g. research groups from BRIC at the University of Copenhagen, and his own research group also includes Danish employees. Head of research at the Danish Cancer Society Mef Nilbert has professor titles from both sides of the Øresund: she is a professor at KU and a visiting professor at LU. Carl Borrebaeck is a professor at LU and a serial entrepreneur and has multiple collaborations established on the Danish side of the strait. The majority of the other research institutes also report that they collaborate across the Øresund, but on a smaller scale – between individual researchers and research groups or as part of larger Nordic projects.

The right collaboration is more important than geographic proximity

Various reasons why collaborations haven't been established more broadly emerged in the interviews with researchers. It is repeatedly mentioned that research collaboration is facilitated – though not dependent on – geographic proximity. Finding

the right research group for collaboration is more important than geographic proximity, and in today's international research environment that might well mean looking to the USA or China.

– As a researcher, one's demands are often extremely specific, and you choose the collaborations that give you the most. It doesn't necessarily need to be in Denmark; it could be anywhere. But proximity is always important, and that led me to work with the Danish Cancer Society in Copenhagen and numerous Danish cancer researchers early on, says Carl Borrebaeck.

Head of research at the Danish Cancer Society Mef Nilbert sees it similarly.

– Our research centre truly wishes to be at the forefront of research centres, and our collaborations are also globally leading collaborations. So, a research collaboration might be with Karolinska, but it might also be with New York or Glasgow. In that respect we think somewhat more internationally than simply the Øresund Region, she says.

She emphasises however that working together to share resources such as core facilities and specialised analyses is big in the Øresund Region.

More collaboration requires time and knowledge

There is broad unexploited potential and room for improvement in cancer research collaboration across the Øresund, as many of the interviewees for this

report point out. However, expanding joint efforts requires both time – which is not always available in the hectic day-to-day life of a researcher – as well as knowledge, and a network in the other country. When a network is already in place, asking around for potential collaborators is often easy. If one lacks a network however, getting a general view of researchers and research environments can be difficult, according to the interviewees.

– I consider the fact that there is no systematic collaboration across the Øresund as a failure personally, but the task has been too great; so much has been happening internally in the organisation. I see enormous potential, and I myself work a lot with research groups in Copenhagen – so personally, I have a lot of interaction across the strait, but I'd like to bring that to the institutional level. Building a network is often the first step to collaboration, says Kristian Pietras, professor at LU and former coordinator of LUCC.

Mef Nilbert points out that collaboration can be obstructed by a lack of knowledge about the research environments that exist in the region.

– Now, I know both sides well, but it's hard for people in Copenhagen to read the menu of research environments on offer in Lund – and vice versa, I'm sure. Universities could play a bigger role by opening up and approving courses, as well as making some kind of menu and showing that these excellent research environments are in Copenhagen, and these are in Lund, she says.



Danish Nils Brünner, professor at the University of Copenhagen, and Carl Borrebaeck, professor at Lund University, have many years of collaborative cancer research behind them. Among other things, they founded the company Scandion Oncology together; Nils Brünner still acts as scientific advisor.

National research funds make transborder research more difficult

An addition factor making research collaborations across the Øresund more difficult is that research funds are often earmarked for national research.

Carl Borrebaeck, who tried to start an Interreg-programme in the field of cancer a number of years ago, believes this to also be one of several reasons why cancer research has not been built up more across the Øresund.

– It's obviously a real limitation. I hear people say, "money isn't always the most important thing", and no, I agree that it isn't, but it is an important catalyst that makes it possible for us to build up collaborations on a somewhat larger scale, he says, and goes on:

– If Innovation Fund Denmark and Vinnova were to make a joint programme, collaborations would take off quickly. It's an unexploited potential, and it could work better.

Part-time positions are common in the world of research, which also means that structural obstacles emerge between the

countries – for example if one researches at a university in one country and has a part-time position at a private company in the other country.

– The fact that the health insurance and tax systems aren't synced up to make working part-time in both countries possible is the single greatest obstacle to research collaboration in the region, I would say. It gets so incredibly complicated if the systems aren't synchronised; for many people, working on both sides of the Øresund would be so natural, says Mef Nilbert, head of research at the Danish Cancer Society, a professor at the University of Copenhagen and a visiting professor at Lund University.

Interreg-project on childhood cancer grew from an individual collaboration between clinics

One collaboration between two separate clinics that was formalised by an Interreg-project is iCope

(Interregional Childhood Oncology Precision Medicine Exploration). As the name indicates, the project focuses on researching childhood cancer. It is run by the Capital Region of Copenhagen (Rigshospitalet), the Technical University of Denmark (DTU), Lund University and Region Skåne (SUS). The three-year project started in April 2019 and will continue until March 2022. The project started with a close, long-term collaboration between the departments for childhood oncology at Skåne University Hospital in Lund and Rigshospitalet in Copenhagen.

In 2014, the clinical collaboration received the Oresund Award for its work, and that prompted them

to start investigating how to establish their joint efforts more firmly – which resulted in iCope. The collaboration has multiple focus areas; among other things, researchers work with the industry to develop a robot that will help children maintain a presence at school during periods when they're receiving treatments, and research is also conducted on late effects for the afflicted children. Working together on a relatively narrow diagnosis like childhood cancer makes

it possible to form a broader research base, and children can receive care and treatment on both sides of the Øresund.

Read more about the project on page 74-75.

New Interreg-project on cancer being investigated

In addition to the abovementioned iCope, there are also larger Interreg-projects in diabetes- and reproduction research today – these are DiaUnion and ReproUnion 2.0, both coordinated by the Danish-Swedish cluster organisation Medicin Valley Alliance. Possibilities to start similar collaborations in oncology and a collaboration focused on drug delivery are currently being investigated, says MVA's CEO Petter Hartman.

– These are topics with strong links to the border region, and there are interested actors from research environments as well as the industry, he says.



PHOTO: TOMAS BERTELSEN

"The fact that the health insurance and tax systems aren't synced up to make working part-time in both countries possible is the single greatest obstacle to research collaboration in the region, I would say."

SKÅNE SETS IT SIGHTS ON BECOMING A COMPREHENSIVE CANCER CENTRE

In April 2020, Karolinska Institute and Karolinska University Hospital were accredited as Sweden's first Comprehensive Cancer Centre by the Organisation of European Cancer Institutes (OECI). There are a total of around 20 such centres in Europe today. To receive accreditation, an institute must demonstrate the highest level of quality in everything from a kind reception, prevention, diagnosis, treatment and rehabilitation to research, teaching and training. Skåne University Hospital is currently seeking to receive accreditation; this is done via a project in which Skåne University Hospital is working together with LUCC.

– We are one part of the process, and we are managing the research aspect for Region Skåne, says Kristian Pietras, professor and former coordinator of LUCC. He explains that the aim with the accreditation is to put a quality assurance

seal on the centres that offer well thought out and well-structured cancer care integrated with research.

Mef Nilbert is head of research at the Danish Cancer Society in Copenhagen and a member of the European accreditation group. When asked if she believes it would be possible to receive accreditation for cancer research in the Øresund Region as a whole, she replies:

– Yes, it could be done, and it would really baffle those big Europeans; they think a country and a city can be a cancer centre. I'm part of the accreditation group – and if Lund University was accredited and the University of Copenhagen got quality assurance, then they could create a joint network across the two countries; it would be incredibly exciting and it could even include other hospitals.

ELEVEN NATIONAL CANCER CENTRES IN DENMARK

Denmark has created a national network by the name of Denmark Comprehensive Cancer Center (DCCC) that functions as a research network with focus on translational and clinical cancer research. It is not accredited according to the European quality assurance, however. In 2016, DCCC and the Danish Cancer Society and the Danish regions established eleven national cancer centres in Denmark. Four of these are based in Zealand, but all of them aim to include healthcare and research throughout the country. The national centres are intended to strengthen cancer research and compile new research experiences. The centres also have a coordinating function; they are responsible for ensuring that all larger Danish research environments within their research areas are involved in the centre and for making sure that new research in the respective areas are implemented in hospitals throughout Denmark. Read more about the national cancer centres on page 68-69.



PHOTO: MOELVEN DENMARK

Copenhagen Centre for Cancer and Health.

ICOPE STRIVES FOR GLOBALLY LEADING RESEARCH IN CHILDHOOD CANCER IN THE ØRESUND REGION

A long and fruitful collaboration between the departments for childhood cancer at Copenhagen's Rigshospital and Skåne's University Hospital (SUS) in Lund grew into the Interreg-funded project iCope (Interregional Childhood Oncology Precision medicine Exploration). Among other things, the project is a collaboration on diagnostics and treatment, as well as the development of robots and tablets that aim to help make the everyday easier for children with cancer and their families. The lead partner is the Capital Region of Denmark (Rigshospitalet), and other partners include the Technical University of Denmark (DTU), Lund University and Region Skåne (Skåne University Hospital).

iCope is a three-year project that took off in April 2019. It is the result of a long clinical collaboration between the departments for paediatric cancer at Rigshospitalet and Skåne University Hospital in Lund. As cancer in children is a relatively infrequent diagnosis and the number of patients is small, collaboration across the Øresund has been very valuable for creating a larger base and allowing experience to be shared. In 2014, the 30-year collaboration between SUS and Rigshospitalet received the Øresund Award. The collaboration has since developed further, ultimately leading to the Interreg-funded joint project iCope, whose vision is to create a globally leading centre for childhood cancer research in the Øresund Region.

Developing digital tools and robots

The project works broadly in the field of childhood cancer and includes everything from research on molecular- and DNA level to treatment and diagnosis to the development of digital tools and robots. It also conducts research for improved cure rates and better quality of life in the long term for childhood cancer patients related to late effects in the project ALL-Star, and bio-ethics are an overarching focus.

– When it comes to e-health, health sciences are exploring the development of a tablet to make life easier for patients and their families in the everyday, with frequent check-ups and questions – it will allow them to contact their clinic directly and get answers to questions, as well as to see test results and the like, says iCope's coordinator Elise Witthoff.

This is being done in collaboration with LTH

"The Øresund Region has what it takes to become a globally leading centre for research and treatment of childhood cancer."

School of Engineering. On the Danish side of the Øresund, a robot is being developed in collaboration with Shape Robotics A/S.

– Children with cancer miss out on a lot of time at school and in their social contexts – the robots are meant to represent the child at school, so children can be part of lessons even if they are under isolation during the treatment, says Elise Witthoff. In addition, iCope works with the company Qlucore, which develops software to facilitate analysis of complex genetic data for

individual patients and that can easily be used clinically.

The aim is to increase the number of childhood cancer researchers

One of the project's objectives (see the fact box for others) is to increase the number of researchers in the region who study childhood cancer. By creating a joint PhD-programme between Lund University and the Technical University of Denmark, the hope is that the number of researchers will increase, as well as the exchange of research over the Øresund.

– The hope is that the PhD-qualification will weigh heavier, particularly when one is looking for work or a research position in Denmark or Sweden, says Elise Witthoff.

Due to the coronavirus pandemic, research candidates have been unable to conduct teaching and research at DTU and Lund University, meaning that to date, the work has focused heavily on recruiting students and coordinating the PhD-agreement between the universities. The goal is for the joint PhD-programme to remain in place even after

the conclusion of the iCope project; the programme is thus already being managed by the universities' postgraduate research studies.

Another of iCope's focuses is to increase the number of female research leaders; this is being pursued in collaboration with the company Indea. Together, they have devised a one-year leadership programme for female researchers and heads of research.

– We have been able to hold the training online in spite of the coronavirus pandemic, and the first participants received their diplomas this May. It has been very successful, says Elise Witthoff.

The pandemic means new conditions for collaboration

The coronavirus pandemic has not only meant that iCope's joint PhD-programme hasn't been able to go according to plan; many nurses and doctors who research within the project have had to cut back on their research hours and work with covid-related tasks instead. Absences due to illness have increased and created additional pressure on wards; as a result, researchers who are clinically active have had less time to dedicate to the project, says Elise Witthoff. Nonetheless, research in the project has progressed.

– Research that started before the pandemic has been easier to continue and produce results with, for example e-health and tumour biology. Now, as spring draws to an end, we also see great progress in the areas that have required some new structures to be built up, for example bioinformatics.

Striving for a world-leading research centre

The Øresund Region has what it takes to become a globally leading centre for research and treatment of childhood cancer, says Elise Witthoff. She explains that the Paediatric Oncology Research Laboratory at Copenhagen's Rigshospital is the largest Nordic centre for phase I and II research in paediatric oncology, that Lund University and Skåne University Hospital were among the first in Scandinavia to research late effects and that one of Europe's foremost institutions for bioinformatics and healthtech is located at DTU.

The hope is that when the project comes to an end in September 2022, the collaboration will continue and become permanent, despite the lack of Interreg funding.

– The vision is to become a stable organisation/network/centre that can be active between Lund and Copenhagen, and our goal is to become globally-leading in genetic childhood cancer research



PHOTO: NEWS ØRESUND

Elise Witthoff is the Swedish coordinator of iCope, and Cornelis Jan Pronk, senior consultant at SUS and associate professor at Lund University, is responsible for research on the Swedish side.

and e-health. The steering committee is discussing what can be done organisationally and what it might look like in the future, says Elise Witthoff. The steering committee is comprised of SUS' head of research Ingemar Petersson, Rigshospitalet's vice director Per E. Jørgensen, Thomas Lars Andresen, professor and head of department at DTU, and the dean of the Faculty of Medicine at Lund University Kristina Åkesson.

OVERARCHING GOALS

- Equal access to personalized medicine for children with cancer
- Improved quality of life in the long-term for those who have been treated for childhood cancer
- Identify genetic biomarkers for children with cancer
- Maintain continuity at school and facilitate social contact and family life for children during cancer treatment
- Create a stable infrastructure for sharing of data across the Øresund whilst maintaining patient integrity
- Increase the number of paediatric oncology researchers
- Increase the number of female researchers in leading positions
- Strengthen collaboration with the industry

NATIONAL COOPERATION IN PLACE – BUT COLLABORATION ACROSS THE ØRESUND IS FUELLED MOST BY INDIVIDUALS AND SPONTANEOUS MEETINGS

Lund University Cancer Centre (LUCC) brings together over 600 cancer researchers in more than 100 research groups. While collaboration with similar organisations at other Swedish institutions is strong, there is a great unexploited potential when it comes to international collaboration and contacts on the other side of the Øresund. "We have a lot of very strong research here, but people stay on their own turf", says Kristian Pietras, professor at Lund University and the coordinator of LUCC. His own research does however involve exchanges with multiple research groups in Copenhagen.

In Lund, cancer research is focused at Lund University Cancer Centre (LUCC). LUCC was established in 2019 as an extension of an earlier cluster collaboration for Lund University's research on cancer. LUCC is described as an umbrella organisation, facilitating research through its overview and insight of the landscape. Another of LUCC's important roles is to function as management support, preparing questions related to cancer research for the management of different departments at Lund University, within the university as a whole, and for Region Skåne. Today, funding for the centre comes from subventions from Lund University's Faculty of Medicine, Region Skåne (ALF-funds, which are Swedish Research Council funds for clinical research in medicine) and a number of external foundations.

600 cancer researchers associated with LUCC

Today, 600 researchers in more than 100 research groups are linked to the centre.

– We generated the list of our researchers by reviewed who has research grants related to cancer research. Some have their primary activities in a different branch of basic research relevant to cancer research, but it is perhaps less obvious that they

are cancer researchers, says Kristian Pietras, who is a professor and Lund University and LUCC's coordinator.

Kristian Pietras explains that a large number of the researchers at LUCC are also linked to Region Skåne and research at Skåne University Hospital – but that LUCC is responsible for the majority of the research.

"...many people get their PhD at Lund University and then continue with their research here. So, the international perspective is lacking somewhat in Lund, and on top of that perhaps the Danes don't see the point of trans-Øresund collaboration."

Unexploited potential in international collaboration

Region Skåne is LUCC's main collaborative partner. There is also ample and fruitful collaboration in cancer research with similar organisations at larger higher learning institutions in Sweden, says Pietras. When it comes to international collaboration and collaboration across the Øresund Strait however, there is more to be desired.

– We have a lot of very strong research here, but people stay on their own turf, so more internationalisation is high on the agenda right now, he says.

Why might that be so?

– I'm not sure. It's difficult to pinpoint, but studies have shown that many people get their PhD at Lund University and then continue with their research here. So, the international perspective is lacking somewhat in Lund, and on top of that perhaps the Danes don't see the point of trans-Øresund collaboration, he says.

Strategic collaboration across the strait is lacking – but the University of Copenhagen is the most frequent collaborative partner for research publications

There are no systematic collaborations for cancer research that span over the Øresund today.

– I have requested them and tried to initiate them. When I moved here from Karolinska Institute, I initiated a number of collaboration projects, but none of them survived. But although there is no systematic trans-Øresund exchange in place, researchers from the University of Copenhagen are the most frequent collaborative partner for research publications by cancer researchers in Lund.

– I think that the cooperation between Lund and Copenhagen today is fuelled mainly by individuals and spontaneous collaborations, says Kristian Pietras, although he mentions the Interreg project iCope as an exception.

Personally, Kristian Pietras sees the lack of an established, systematic trans-Øresund collaboration for cancer research as a failure; he says that it is difficult to find the time to establish something like that when there is so much internal work in the organisation. In his own research however, he has a great deal of exchanges with research groups from Copenhagen, and a number of the researchers on his team commute from Denmark. Kristian Pietras works with e.g. research groups at Biotech Research & Innovation Centre in Copenhagen, and he is also a member of the scientific board at the Danish Cancer Society.

Breast cancer, genomics and tumour micro-environments are areas of strength

Singling out LUCC's areas of strength in cancer research is complex; in practice, it is a question of around 200 different diseases, says Kristian Pietras. He does however point out three areas in which LUCC excels.

– Breast cancer research has traditionally been strong in Lund. The volume and quality are both high across the board, from basic research to translational research and clinical research, where we are at the leading edge.

– Genomics, if we're talking about bioinformatics and technology. We are good at analysing patient samples using large-scale methods.

– Within biology, we are strong when it comes to tumour microenvironments – that is, the interaction between tumour cells and other cells in the vicinity of the tumour, says Kristian Pietras.



PHOTO: NEWS ØRESUND



Kristian Pietras.

PHOTO: KENNETH RUONA

“WE COULD BEAT SILICON VALLEY OR ANY OTHER “VALLEY” FOR THAT MATTER – WHAT HOLDS US BACK IS THAT THERE ARE NO TRANSBORDER RESEARCH FUNDS”

Carl Borrebaeck is a professor of immunology at Lund University, and his research has led to the formation of six companies. In his capacity as a researcher and an entrepreneur, he has put the vicinity of the Øresund to good use, but he believes that there remains a great deal of unexploited collaboration potential. To improve collaboration, he would like to see more transborder research funds and a shared platform that highlights the differences in Swedish and Danish company rules.

Carl Borrebaeck is a professor and the serial entrepreneur behind the companies Alligator Bioscience, Immunovia, Scandion Oncology, SenzaGen, BioInvent International and PainDrainer. His research and his business ventures take him over the Øresund extensively; an example is Scandion Oncology, a Danish company recently

offered on First North in Stockholm that Carl Borrebaeck founded with the Danish professor and entrepreneur Nils Brünner. The two have conducted a great deal of research together and are both behind the Øresund network the Oncology Network, which is now run by Medicon Valley Alliance. Carl Borrebaeck also initiated the strategic centre for cancer research Create Health at LTH School of Engineering, which works to extend translational cancer research and the cooperation between academia and health care.

The Øresund collaboration is fuelled by personal engagement and geographic proximity

Carl Borrebaeck is active in research and entrepreneurship on both sides of the Øresund. He has worked for many years with the Danish professor Nils Brünner, with whom he founded the Danish company Scandion Oncology, to which he is now scientific advisor. He has also published numerous articles with the Danish researcher Julia Johansen from Hvidovre Hospital and been active in various Danish boards of directors.

Carl Borrebaeck explains that his collaboration with Danish actors has largely been fuelled by his

own initiative and his personal contacts, and the short distance between the two countries has also played an important role.

“Geographic proximity plays an important role in collaboration, but people also need to know each other.”

– As a researcher, one’s demands are often extremely specific, and you choose the collaborations that give you the most. It doesn’t necessarily need to be in Denmark; it could be anywhere. But proximity is always important, and

that led me to work with the Danish Cancer Society in Copenhagen and numerous Danish cancer researchers early on, he says.

He travelled to China and found what he was looking for in Hvidovre

Carl Borrebaeck talks about the time he travelled across the world to find a suitable biobank for collaboration. He came into contact with an interesting potential collaborative partner in China, but later discovered that there was a more suitable biobank at Hvidovre Hospital, which led to a long collaboration and many joint research publications with the professor Julia Johansen.

– A more structured programme between Sweden and Denmark would have made it much easier. We would have saved hundreds of thousands of crowns by now. Geographic proximity plays an important role in collaboration, but people also need to know each other. If I don’t know exactly what is available on the other side of the Øresund, I can call Danish colleagues and ask, but those without that option miss out on a lot of “benefits” and good advice that doesn’t need to cost a lot, says Carl Borrebaeck.

Great potential in more collaboration – but funding is an obstacle

Carl Borrebaeck believes that the Øresund Region brings together a large and unique variety of cancer researchers, e.g. at Lund University Cancer Center, BRIC at the University of Copenhagen, and the Danish Cancer Society in Copenhagen. The fact that there isn’t more trans-Øresund collaboration than there is means that the resource is underexploited, he says.

– We’ve been talking about generating more collaboration between Skåne and Copenhagen for 20 years now, and the million-dollar question is: how can it be done? he says.

One important reason why collaboration in cancer research isn’t more extensive in the Øresund Region is the type of funding for research, Carl Borrebaeck says.

– In terms of the basic conditions, there are good researchers in both Skåne and Denmark. We could easily beat Silicon Valley or any other “valley” for that matter. What holds us back is that Denmark gives funding to Danish researchers and Sweden gives money to Swedish researchers, he says.

Carl Borrebaeck is convinced that there would be more collaborations if e.g. Innovation Fund Denmark and Vinnova joined together for a common funding programme.

– We have unique biobanks, expertise, equipment, we have a 7-tesla machine in Lund that is co-owned by Danish researchers but that isn’t being taken advantage of the way it could because of the limitations in how research funds may be used. Collaboration works in spite of those limitations – but it could work very, very, very much better, he says.

Wanted: shared trans-Øresund platform

When it comes to commercial collaborations across the Øresund, differences in the countri-



Carl Borrebaeck.

es’ legislation are what pose the greatest risk of throwing a spanner in the works, says Carl Borrebaeck. He mentions disparities in internal company regulations and election committees as examples, and he would like to see a shared platform that pools together the differences in the legislation of both countries.

Sweden’s stock market opens up for smaller companies than Denmark’s, making it fairly common for Danish companies to list on the Swedish market. There is even a need to re-examine the legislation in Sweden and Denmark in that respect, says Carl Borrebaeck – who has listed numerous Danish companies in Sweden himself.

– Which legislation should be followed if a Danish company wants to be listed in Sweden? One must follow Swedish market rules but remains a Danish company. That means that many listings are delayed and unnecessarily complicated, he says.



PHOTO: NEWS ØRESUND

"CROSSING THE ØRESUND MAY BE EASY, BUT COLLABORATING IS VERY COMPLICATED"

Mef Nilbert is head of research at Denmark's national cancer foundation, the Danish Cancer Society in Copenhagen. As a Swede with professor titles from the University of Copenhagen and Lund University, she is an Øresunder from head to toe. She sees structural differences between the two countries that put limits on what is otherwise simple research collaboration – and believes that the region needs to be better at presenting the research environments that exist. At the moment, Øresund collaboration primarily means jointly exploiting resources and performing specialised analyses at both sides of the Øresund Strait.

Mef Nilbert is a professor at the University of Copenhagen and a visiting professor in Lund. After splitting her time between Sweden and Denmark for many years, she decided to work exclusively in Denmark in 2017 when she became head of research at the Danish Cancer Society in Copenhagen, which is the country's national cancer foundation with a research institution of its own and the vision to conduct cancer research at the global forefront.

There are 250 researchers and students at the research centre, and they are also closely linked to Danish hospitals and universities. Six of them commute from Sweden – there are thus more Italian researchers than Swedish at the Danish Cancer Society's research institution.

– We are extremely international, and we'd like our institution to be the same. We always want to recruit the best of the best, and it makes no difference if they come from Mexico, Sweden or the Philippines, says Mef Nilbert.

Collaboration for resources and specialised analyses

The Danish Cancer Society strives to be an international research institution, and there is a great deal of exchange across the Øresund.

– When it comes to jointly exploiting resources for example – such as core facilities and performing specialised analyses – we really think 'Copenhagen and Lund'. The same is true when it comes to technological platforms, clinical trials and developing early startups; one wants to stay close to one's own

environment, Mef Nilbert says.

But when it comes to strong research collaborations where joint analysis or innovation are necessary, collaboration across the Øresund is more limited.

– Our research centre always strives to collaborate with other leading researchers around the world. So, a research collaboration might be with

Karolinska, but it might also be with New York or Glasgow, she says.

Structural obstacles limit part-time work across the Øresund Strait

According to Mef Nilbert, there is great potential for more research collaboration

across the Øresund, and the collaboration itself is often simple and works well. What obstructs that are structural obstacles created in part by the countries' different taxation- and health insurance systems.

– Working together is incredibly easy; it's great when Danish and Swedish doctors and researchers get together for a project and share data and work together – that has never been a problem, it's always been a lot of fun. The obstacles to collaboration are much more structural. Crossing the Øresund may be easy, but substituting data or including patients from different countries in a clinical study is extremely complicated.

The fact that the tax- and healthcare systems differ and haven't been synchronised better is blatantly apparent when a researcher wants to divide her time between e.g. a university and a hospital on opposite sides of the Øresund, she says.

– The fact that the health insurance and tax



Mef Nilbert, Head of research at Denmark's national cancer foundation.

systems aren't synced up to make working part-time in both countries possible is the single greatest obstacle to research collaboration in the region, I would say. It gets so incredibly complicated if the systems aren't synchronised; for many people, working on both sides of the Øresund would be so natural. Being associated with another university or company – in the same country this is no problem – but if one works for a university and a private company in the other country, it gets extremely messy and systematically speaking almost impossible, she says.

Universities can play a greater role in creating collaborations that cross borders

Postgraduate studies are very different at e.g. the University of Copenhagen and Lund University, and that is yet another obstacle for generating more research collaboration, Mef Nilbert points out.

– It isn't possible to take courses on one side of the Øresund and receive credits for them in the other country. The universities' proximity to one another entails great potential for exploiting the course offering on the other side of the Øresund. But I know that both the University of Copenhagen and Lund University have taken the initiative to explore how this issue could be solved, and I consider that positive.

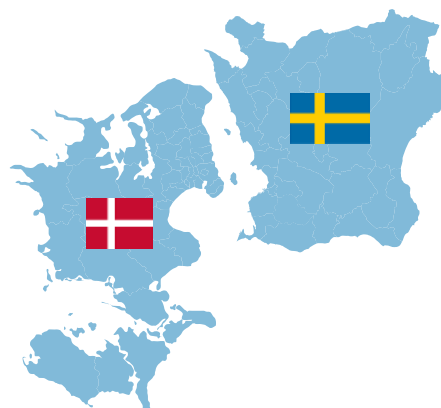
She also believes that the region's universities should be better at showing which research environments exist to facilitate collaborations in the region.

– Now, I know both sides well, but it's hard for people in Copenhagen to read the menu of research environments on offer in Lund – and vice versa, I'm sure. Universities could play a bigger role by opening up and approving courses, as well as making some kind of menu and showing that these excellent research environments are in Copenhagen, and these are in Lund, she says.



Focus: Reproduction and fertility

Reproductive research is conducted at the Öresund Region's universities, hospitals and commercial enterprises; the pharmaceutical company Ferring Pharmaceutical's largest research facility is in Copenhagen. Many of the research environments throughout the region are part of the collaborative project ReproUnion 2.0, which has been active in various iterations for more than ten years. The following is a presentation of some research environments in the field.



CAPITAL REGION OF DENMARK

There are a total of 140 researchers at:

- **Rigshospitalet (80)**

The Department of Growth and Reproduction is located here, as well as the Fertility Department, and some research is carried out at the Laboratory of Reproductive Biology (LRB).

- **Nordsjællands Hospital (23)**

Research is conducted here at the Department of Gynaecology and Obstetrics. Among the focus areas are gestational diabetes and labour stimulation. During the coronavirus pandemic, research has also investigated the effects of Covid-19 on pregnancy.

- **Herlev & Gentofte Hospital (10)**

Research is conducted here at the Fertility Clinic at the Department of Obstetrics and Gynaecology.

- **Amager & Hvidovre (27)**

Denmark's largest gynaecology and obstetrics department is located at Hvidovre Hospital. There are two research focus areas: – Optimising patient treatment while lowering risks, and – Patient-centred care/personalised medicine.

- **Bispebjerg/Frederiksberg Hospital***

Reproductive health is an area of focus for research at the Department of Occupational and Environmental Medicine.

* Although the hospital is part of ReproUnion, the Capital Region of Denmark did not report the number of researchers in the unit.

UNIVERSITY OF COPENHAGEN

The majority of the University of Copenhagen's research in the life sciences is conducted at the Faculty of Health and Medical Sciences, and there are 3 000 researchers and 1 700 PhD students linked to the faculty. Reproductive research takes place at e.g.:

- **Department of Cellular and Molecular Medicine**
- **Department of Public Health**

FERRING PHARMACEUTICALS

- **Research facility in Ørestad**

The company's largest research facility will be part of Ferring's new offices in Kastrup. Today, 600 people work at Ferring in Copenhagen; this number is expected to increase to 750 with the move. There are just under 20 employees in Malmö.

REGION ZEALAND

There are a total of around 10 reproductive researchers at:

- **The fertility clinic at Zealand University Hospital in Køge**, which is currently conducting three different PhD-studies in fertility. The clinic has an extensive exchange with the Capital Region of Denmark.
- **Zealand University Hospital in Roskilde** conducts fertility research at the Clinical Biochemical Department.
- **ReproHealth Research Consortium Zealand University Hospital** is a consortium whose aim is to conduct international reproductive research. The aforementioned Clinical Biochemical Department is a main partner together with the Department of Gynaecology/Obstetrics, the Pathology Department and the Paediatric Department of Zealand University Hospital.
- **The Centre for Immune Regulation and Reproductive Immunology (CIRRI)** is a collaboration between the Clinical Biochemical Department in Roskilde and the Department of Clinical Medicine at the University of Copenhagen. The focus is on modelling the immune system and its function during pregnancy and with certain gestational complications.

PHOTO: NEWS ØRESUND



MALMÖ UNIVERSITY

- **Centre for Sexology and Sexuality Studies**

The Centre for Sexology and Sexuality Studies at Malmö University is involved in research projects dealing with fertility and cancer. The centre is part of ReproUnion's challenge 5 – "Improving fertility awareness".

REGION SKÅNE

- **Reproduction Medicine Centre (RMC)** conducts a great deal of the reproductive medicine research in Region Skåne. Today, RMC is located on the hospital premises in Malmö, but in late 2021 it will move to a new location in Malmö's Western Harbour district to make room for a maternity ward hotel in Malmö. Around 5-6 reproductive researchers are linked to Region Skåne, according to the region.

REPROUNION 2.0

A collaborative project between Region Skåne, the Capital Region of Denmark, Lund University, the University of Copenhagen, Ferring Pharmaceuticals and Medicon Valley Alliance. ReproUnion is the fourth consecutive collaborative project on reproduction, and five primary research topics are in focus. The project started in 2019 and is scheduled to end in September 2022. Read more about ReproUnion 2.0 on page 86.

PHOTO: REGION SJÆLLAND



PHOTO: NEWS ØRESUND ØRESUND



World class reproduction research in the Øresund Region

Reproduction and fertility are strong research areas in the Øresund Region. There are numerous excellent research environments on both sides of the Øresund, most of which are involved in the EU-funded collaborative project ReproUnion 2.0, which has been active in various forms for the past ten years. Researchers in the project are currently building up a unique biobank by the name of RUBIC. The only one of its kind in the world, it will comprise 5 000 couples from Region Skåne and the Capital Region of Denmark. Ferring Pharmaceuticals is a globally leading company in the field of fertility. In the summer of 2021, it will move to its new Danish headquarters in Kastrup, and the research facility there – which is already the company's largest – will welcome 150 new employees.

Research on reproduction in the Øresund Region is conducted at a high international level at hospitals, universities and in the industry. Ferring Pharmaceuticals' largest research facility is located in Copenhagen. Many of the region's major actors in reproduction research collaborate across the Øresund via the Interreg-funded project ReproUnion 2.0, which was preceded by three other collaborative projects. ReproUnion brings together the healthcare sector, academia and Ferring Pharmaceuticals in a unique "private-public partnership" that is coordinated by Medicon Valley Alliance. In recent years, the project has also started research collaborations with universities from the international forefront, such as Stanford University in the USA. Read more about ReproUnion on page 86-87.

Unique biobank of infertile couples being constructed in ReproUnion 2.0

As part of ReproUnion 2.0, researchers are currently building up a one-of-a-kind biobank and register that will contain 5 000 couples from the Danish and Swedish sides of the Øresund Region. The biobank is called ReproUnion Biobank and Infertility Cohort (RUBIC). RUBIC is expected to be an important part of the Øresund Region's research infrastructure in the future. The hope is that research will be able to discover what causes involuntary childlessness.

– No comparable studies with this many participants have ever been conducted before, and the eyes of the research community are on us, said Margareta Kitlinski, specialist at Skåne University Hospital and one of Sweden's leading experts on involuntary childlessness in a press release when RUBIC was presented in the spring of 2021.

The hope is that the model used to jointly explore the biobank – which will effectively comprise two

separate national biobanks – will be utilisable in other research areas as well.

A patient mobility agreement across the Øresund has been developed through the ReproUnion collaboration; it entails that residents of the Øresund Region affected by reproductive challenges or other disorders related to reproduction can receive treatment and healthcare in Region Skåne as well as in the Capital Region of Denmark. Patients can thus be offered more and improved treatment options. The patient agreement on fertility was the first of its kind in the Øresund Region when it came into operation in 2017. Since then, residents of Skåne have been able to receive specialised treatment for certain reproductive disorders and hospitals in the Capital Region of Denmark in Copenhagen and vice versa.

Ferring Pharmaceuticals largest research facility is in Copenhagen

The pharmaceuticals giant Ferring Pharmaceuticals has 600 employees in Copenhagen and 17 in Malmö. One of its two R&D facilities is in Copenhagen; the other is in San Diego, USA. When the company – whose headquarters are in Switzerland – moves its Danish headquarters from Ørestad to Kastrup, the number of employees there will increase by 150, says Marianne Kock, CEO of Ferring in Denmark, in an interview for this report. The new headquarters is called Soundport, and the inauguration is planned for the summer of 2021. With its 37 000m², it will be Ferring's largest R&D facility. Ferring conducts research in five main areas:

- Reproductive medicine and maternal health
- Gastroenterology
- Urology & Uro-oncology
- Microbiome
- Early-stage development

During the coronavirus pandemic, Ferring has also funded research projects that investigate how pregnancy and fertility are affected by Covid-19.

More than 150 researchers in the regions

Region Skåne, the Capital Region of Denmark and Region Zealand are all investing in research in reproductive medicine, and according to data from the three regions, there are over 150 researchers in the field in the three regions.

In Region Skåne, the majority of the research is conducted at the Reproductive Medicine Center (RMC) and the Clinical Research Center (CRC) on the hospital premises in Malmö. In late 2021, RMC will move to a new location in Malmö's Western Harbour district to make room for a maternity ward hotel at its previous location in Malmö.

In the Capital Region of Denmark, research is conducted at the fertility clinics at Nordsjællands Hospital in Hillerød, Bispebjerg/Frederiksberg Hospital, Herlev and Gentofte Hospital, Hvidovre Hospital and at Rigshospitalet. The Department of Growth and Reproduction is also located at Rigshospitalet, and combines clinical activity and research. There is a special focus on male reproductive disorders and children with growth- or hormonal disorders. The department has a number of labs in which research is carried out, and it receives patients from all over Denmark. 80 people are employed there; around half of them are researchers.

In 2017, Region Zealand founded a consortium for reproductive research called ReproHealth Research Consortium Zealand University Hospital. The main partners in the consortium are Region Zealand's Clinical Biochemical Department (Zealand's University Hospital in Roskilde), the gynaecological/obstetric department, the pathology department and the paediatric department of Zealand's University Hospital. The region's fertility clinic is part of the gynaecological/obstetric department at Region Zealand's University Hospital in Køge. At the clinic, research is conducted as part of three different PhD study programmes, as well as in numerous studies and projects in collaboration with the Capital Region of Denmark and others.

Region Zealand was part of ReproUnion until 2019, but prior to ReproUnion 2.0, which is still active today, it chose to leave the collaboration in order to focus more on its own research projects. Anne Lis Englund heads the fertility clinic in Region Zealand and says that it is possible that the region will become an active party in the collaboration again in the future. The fertility clinic in Region



PHOTO: NEWS ØRESUND

Zealand will be part of the new university hospital currently being constructed in Køge. Completion is planned for 2025, and it will contain 800 beds in separate rooms.

Generous regulations for assisted reproduction attracted the involuntarily childless to Denmark

Denmark's rules for assisted reproduction have long since been more generous than in many other countries, including Sweden. There has been no shortage of donated sex cells in Denmark, and there are many private clinics that offer both egg and sperm donations to single women and childless couples. Swedish legislation related to assisted reproduction has grown more forgiving over the past five years, and in 2016 it became possible for single women in Sweden to receive reproductive assistance. As of 2019, private clinics in Sweden are allowed to carry out assisted reproduction with donated embryos, eggs or sperm. Since that same year, double donation is also permitted – that is, both egg and sperm may both be from donors.

ReproUnion 2.0: Øresund collaboration gives reproduction research an extra boost

For more than ten years, researchers from both sides of the Øresund have collaborated on reproductive medicine within the Interreg-funded projects ReproSound, ReproHigh and ReproUnion. Not only has this benefitted the research community; the patient mobility agreement put in place via the project has also helped involuntarily childless couples throughout the Øresund Region gain access to the best healthcare possible. The current project ReproUnion 2.0 will conclude in 2022 – but the researchers have no intention of letting their research collaboration end there, says project manager Aleksander Giwercman, who helped start the collaboration in 2010.

Since 2010, the research projects in the Repro-series have received 30mn crowns in grants; the funds have been distributed among four different projects. What began as an individual collaboration between Jens Sønksen at Herlev Hospital and Aleksander Giwercman at Skåne University Hospital has become a firmly established research collaboration, and also inspired the diabetes research collaboration DiaUnion.

Today, project manager and co-founder of the collaborative project Aleksander Giwercman is a professor at Lund University and a senior physician at the Reproductive Medicine Center in Malmö. Born in Poland, he moved to Denmark at fourteen and later studied to become a physician, specialising in andrology, the branch of medicine that deals with the study of male reproduction. He worked at Rigshospitalet for a number of years before moving to Skåne in 1999. In Skåne, he helped establish clinical reproduction- and andrological operations at what was then University Hospital MAS –known today as Skåne University Hospital. That led to a mixed reproductive medicine clinic for both women and men that opened in Malmö in 2007. Aleksander Giwercman headed the clinic until 2014. All the while he conducted research, predominantly on male reproduction, and in 2012 he became a professor at Lund University. When reorganisations merged the clinic with other departments in 2014, he chose to focus exclusively on research and teaching.

A patient cancellation gave the opportunity to google shared research funding

While working as a physician, he built up a collaboration with former colleagues on the Danish side of the Øresund, in particular with Jens Sønksen, who was a urologist and researcher at Herlev Hospital who occasionally came to Malmö to help Aleksan-

der Giwercman with various treatments.

– Every time we met, we said to each other that there really must be funding accessible for Øresund collaborations somewhere for the research projects we wanted to do together. But there was never time to develop it further. But then one time there was a patient cancellation, and we had one and a half hours; we started googling, and then we found Interreg. At the time Interreg had offices in Copenhagen, so we had a meeting with them, and they were very positive. Their approach was user-friendly and they helped us bring it forward, says Aleksander Giwercman.

One of the people in charge of the matter with whom they had contact is a well-known figure in the Øresund Region's life science sector today – namely Petter Hartman, now CEO of Medicon Valley Alliance.

– He was extremely enthusiastic, and we applied for and received €1mn from Interreg, to be distributed over three years, from 2010-2013, under the name ReproSound, says Aleksander Giwercman.

Complementary competences led to the idea for ReproHigh and the patient mobility agreement

As ReproSound progressed, ideas for the next project began to emerge as the researchers realised they had complementary competences on both sides of the Øresund. In Denmark for example, they had come a long way with research on extracting and freezing the ovaries of women who were to e.g. be treated for cancer. At the time however, there was a shortage of donated eggs in Denmark, since women who donated their eggs were not given any compensation; this happened to coincide with a campaign by Region Skåne to encourage more women to donate eggs.

– We contacted Region Skåne, which in turn

contacted the Capital Region of Denmark, because they realised that we needed an agreement so these patients could cross the bridge and receive the best possible treatment free of charge, says Aleksander Giwercman.

The patient mobility agreement came into action in 2017. In practice, it means that all residents of Skåne and the Capital Region of Denmark can receive healthcare for certain more advanced kinds of reproductive disorders on both sides of the strait, and thus expand and improve their treatment options. With the realisation of the highly complementary expertise in the Øresund Region, a new project began to emerge: the project ReproHigh was granted €2mn by Interreg between 2012-2014. The name ReproHigh is a nod of recognition to the high level of expertise on

"Every time we met, we said to each other that there really must be funding accessible for Øresund collaborations somewhere for the research projects we wanted to do together."



Aleksander Giwercman, professor at Lund University and a senior physician at the Reproductive Medicine Center in Malmö.

both sides of the Øresund. Aleksander Giwercman recounts how the patient mobility agreement and the collaborative research during that time benefitted from the great visions of a well-integrated Øresund Region.

– It was in the spirit of the times; there was a lot of talk about integration in the Øresund Region at that time. We had proposed our collaboration ourselves, and we were enthusiastic about it, so nobody needed convincing, he continues.

REPROUNION 2.0

Programperiod: 1 jan 2019-30 sep 2022

Partners:

Medicon Valley Alliance
Region Skåne
Region Hovedstaden
Lund University
Malmö University
University of Copenhagen
Ferring Pharmaceuticals

Five research areas in ReproUnion 2.0:

Improving male fertility: Increase the understanding of how lifestyle, environmental and genetic factors affect male fertility with the goal of developing specialized treatments and preventative measures.

Optimizing reproductive health outcomes:

Develop new, cheaper, and more efficient reproductive techniques to reduce societal costs and to minimize the strain women are exposed to during artificial reproductive treatment.

Securing female ovarian function: Reduce the negative impact diseases and treatments have on fertility by increasing the knowledge of the function of the ovary.

Preventing infertility-related morbidity: Investigate how infertility can function as an early marker for common major diseases.

Improving fertility awareness: Increase information to the society regarding the impact of lifestyle factors on reproduction and the possibilities of having a family; important information in relation to political decisions and the work of authorities to minimize negative societal consequences.

Increased funding created new opportunities – as well as challenges

When ReproHigh started up, it also involved Medicon Valley Alliance, of which Stig Jørgensen was CEO at the time. As the project progressed, the researchers saw, with MVA's help, that if the collaboration was to continue after ReproHigh, the perspective needed to be broader, and more funding was necessary. The project that was to be ReproUnion 1.0 was granted €15mn by Interreg, 50% of which would be funded by the parties themselves – this created new, greater opportunities, as well as challenges, says Aleksander Giwercman.

– Throughout the first two projects, our counter-financing was one and two million, respectively, and we could use our own working hours to finance the project. But when we reached that level that was impossible, so MVA said that we would have to approach the pharmaceutical industry and the regi-

"We are extremely talented when it comes to research here in the Øresund region. But if anything has to change, really change, we will have to ally with others as well."

ons to access co-funds. The regions were incredibly positive, and with Greater Copenhagen in mind it was natural for Region Zealand to be a part of it. Ferring also contributed and co-financed part of the project. More than 20 PhD students were associated with the project and conducted research in a broad field surrounding reproductive medicine.

Five research areas in ReproUnion 2.0

Prior to the project that is now ReproUnion 2.0, five clear areas of focus were selected, instead of the broader research that had been conducted in earlier projects. An additional

difference to earlier projects is that Region Zealand is no longer involved. ReproUnion 2.0 was granted just over €8mn, of which 50% from Interreg, and it will continue until September 2022.

– We realised that we can't research everything – we need to find several broad areas where we can really direct our efforts, and we decided that we wanted to make a programme with a longer-term



PHOTO: NEWS ØRESUND

24 MILLION FOR RESEARCH ON COVID-19 AND FERTILITY

In December of 2020, ReproUnion was granted an additional 24mn crowns to investigate the effects of Covid-19 on fertility, pregnancy and fetuses. The funding is from Region Skåne, the Capital Region of Denmark, the pharmaceutical company Ferring and the EU-programme Interreg.

scope. Research projects usually last three years, but we had a 10-12-year programme in mind where Interreg and the regions can contribute funding in the first years, and that will eventually have produced results that allow us to compete for major grants from the NIH and EU foundations, for example.

Before ReproUnion 2.0, they also looked beyond the boundaries of the Øresund Region to find collaborators at large universities in the USA and Britain; there is a lot of interest in working with biobanks and registers, as the access they have to these in their nations is not comparable. A collaboration has been established with e.g. Stanford University in the USA.

– We are extremely talented when it comes to research here in the Øresund Region – but if anything is to change, really change, we will have to ally with others as well, he says.



Margareta Kittlinski, senior physician at SUS.

Building a one-of-a-kind shared used biobank – RUBIC

In ReproUnion 2.0, researchers are working to build a biobank that can be used as a shared resource – although in practice, there will be one biobank in Denmark and another in Sweden, as Swedish material may not be stored in Denmark and vice versa. The name of the biobank is ReproUnion Biobank and Infertility Cohort (RUBIC), and the goal is to include 5 000 infertile couples.

The hope is that the biobank will become part of the research infrastructure in Region Skåne and the Capital Region of Denmark in the future.

– We're currently setting up a steering group



PHOTO: NEWS ØRESUND

with our Danish colleagues so both regions will have strong representation and can avoid the legislation involved in solving this issue. The regions are extremely interested; they understand that if we do some of the work and find a model that works, others will be able to use it in other fields as well. And at the same time, we enjoy being pioneers – in one way it's a bit of a nuisance, but in another it's fun, and

there is a goodwill of sorts from our surrounding environments because we're developing something of which everyone sees the potential, says Aleksander Giwercman.

The aim with the biobank is to find reasons for infertility and to develop new methods of treatment.

– The short-term goal is for more people to be able to have children after treatment. In the long term, we want to map out the reasons for infertility, develop new treatments methods and study the long-term consequences of infertility, says Margareta

Kitlinski in a press release. She is a senior physician at Skåne University Hospital, and together with Aleksander Giwercman, she is responsible for research on the Swedish side of the Øresund.

While the formal starting date for the establishment of the biobank was June 2020, couples who have sought help for fertility treatments at clinics in Region Skåne and the Capital Region of Denmark in recent years have been asked to participate in the study.

The Swedish examinations are conducted at the Reproductive Medicine Center in Malmö, and the Danish examinations are done in a collaboration between Rigshospitalet, Hvidovre Hospital, Herlev Hospital and Nordsjællands Hospital.



TRANSREGIONAL SECTOR ACTORS AND ACTIVITIES

Sector actors have their sights set on strengthening transregional activity in Medicon Valley

For many Danish and Swedish actors in the life science sector, working together across the Øresund Region simply makes sense. Perhaps they want to promote the region, establish business contacts, broaden research collaborations, fund startups, work to reach political goals, or something else entirely. Many actors and science parks have also expressed willingness to increase transregional collaboration.

Multiple actors work to connect the Danish-Swedish Medicon Valley cluster more closely. These actors work on a wide variety of levels – politically, financially, in investments, in marketing, academically, with innovation, as students, with events and as enterprises – to strengthen the life science sector across the Øresund.

ØresundsInstitutet has identified an array of organisations that coordinate, promote and benefit from the life science activities across Medicon Valley in different ways.

As an example, the Danish-Swedish cluster organisation Medicon Valley Alliance works to create networks and with workshops and research projects with Danish and Swedish actors from the sector.

In Copenhagen and Malmö respectively, Copenhagen Capacity and Invest in Skåne are dedicated to international branding of the region and attracting businesses and talent from abroad, and over the past 8-10 years, the Novo Nordisk Foundation has

granted more than 6.5bn DKK. (€875mn) to the strategic initiative "Copenhagen Bioscience Cluster", which aims to make the Capital Region of Denmark and Skåne in southern Sweden a leading cluster for biomedicine and biotech. To the same ends, the foundations has also contributed around €35mn to the new super-microscope MicroMAX in Lund, which will be operational in 2022.

These diverse efforts strengthen transregional activities, and according to Medicon Valley Alliance, there is a good basis for increased Danish-Swedish collaboration on e.g. health data and clinical studies.

There is also transregional collaboration between Medicon Valley's science parks and incubators, although these actors are not organised in their own network; instead, collaboration in the group has a project-to-project character, meaning that some collaborations often last a limited time. Generally speaking, the will to work across the Øresund is good at the region's science parks.

EU-PROGRAMME CONTRIBUTED ALMOST €47MN IN GRANTS TO DANISH-SWEDISH LIFE SCIENCE ØRESUND PROJECTS BETWEEN 2015-2022

Since 2015, the EU-programme Interreg Öresund-Kattegat-Skagerrak has granted almost €47mn to joint Danish-Swedish development projects in the life sciences; that corresponds to ca. 350mn DKK, or ca. 479mn SEK. Project funding thus makes the EU an important transregional life science actor in the Øresund Region.

In concrete terms, 18 projects in the life sciences received support between 2015-2022; ten of these are still active. The active development projects include e.g. DiaUnion and ReproUnion, which bring together such actors as Lund University, the University of Copenhagen, Region Skåne, the Capital Region of Denmark, Medicon Valley Alliance

and Steno Diabetes Center in Copenhagen. These projects are described in more detail in Chapter 3. Having received ca. €4.5mn, ReproUnion is one of the ten currently active projects that has been given the most funding from the EU-programme Interreg Öresund-Kattegat-Skagerrak. The nine life science-oriented innovation projects under the auspices of Interreg that will be active until 2022 were originally granted around €18mn.

Since 1990, the EU has provided financial support to partnerships across European borders via the Interreg initiative. There are approximately 70 Interreg-programmes in the EU. The secretariat of the Öresund-Kattegat-Skagerrak programme is located in Copenhagen, Malmö, Gothenburg and Sarpsborg.

JENNI NORDBORG: SWEDEN'S AND DENMARK'S LIFE SCIENCE STRATEGIES HAVE HEALTH DATA, CLINICAL STUDIES AND PREVENTATIVE HEALTH IN COMMON

Denmark and Sweden each have their own national life science offices in Copenhagen and Stockholm, and communication and exchange between the countries is continuous. A growth team for life science was instituted in Denmark in 2016, and the recommendations it presented became a political agreement in 2018. The Danish government launched an updated life science strategy in April 2021. Sweden's new life science strategy was released in 2019, and Jenni Nordborg is heading the task of implementing the strategy in Sweden. According to Jenni Nordborg, both strategies particularly emphasise for example health data, clinical studies and preventative health as important focus areas with potential for more collaboration.

– Collaboration across the Øresund is definitely crucial for Scandinavia becoming a leading life science hub, and that is an important objective of the Swedish life science strategy. Since we have so many trans-Øresund collaborations, our situation in the future could be improved by developing more sustainable structures for collaboration on clinical studies

and health data, for example. Prioritising Scandinavian collaboration – and thus collaboration across the Øresund – has become more important, she says.

According to Jenni Nordborg, the following research- and innovation structures in Sweden and Skåne may benefit increased life science collaboration across the Øresund:

- European Spallation Source (ESS) in Lund and data centre (DMSC) in Copenhagen
- MAX IV Laboratory in Lund
- SciLifeLab, with facilities in Lund and Stockholm
- Testa Center in Uppsala
- AstraZeneca Bioventure Hub in Gothenburg



PHOTO: NEWS ØRESUND

MUNICIPALITIES AND ACTORS FROM THE SECTOR IN THE ØRESUND REGION JOIN FORCES IN NEW MARKETING CONSORTIUM TO PROMOTE MEDICON VALLEY

Greater Copenhagen International Marketing Consortium (GCIMC) is the name of a new collaboration for international branding and marketing in the Danish-Swedish Greater Copenhagen Region.

The new collaboration is being driven by Danish and Swedish investment promotion organisations Invest in Skåne in Malmö and Copenhagen Capacity in Copenhagen, as well as the political, transregional collaborative organisation Greater Copenhagen Committee, which is presided over by Danish-Swedish leadership.

Four municipalities – Copenhagen, Malmö, Lund and Helsingborg – are contributing funds to the new marketing consortium.

The aim is to draw attention from abroad to the Greater Copenhagen Region, which comprises 85 municipalities and the four regions the Capital Region of Denmark, Region Zealand, Region Skåne and Region Halland. Attracting talent and investments

to the region are among the goals, and the consortium will also coordinate between actors.

The consortium will focus particularly on marketing the region based on three areas of strength: Life science, IT/Tech and cleantech/climate. The actors already work to promote these areas of strength.

In addition, Invest in Skåne, Copenhagen Capacity and Greater Copenhagen Committee are already involved in another marketing project related to the life sciences where the focus is on promoting the Øresund Region's growing microbiome cluster. The marketing enterprise has resulted in digital marketing campaigns, a website about the opportunities to work with microbiome research in the Øresund Region and a digital conference in April 2021, attended by more than 1 000 participants from 60 countries around the world. Read more about the microbiome project on page 48, and about the actors mentioned here on page 96.

PERSONAL CONTACTS AND ØRESUND PROXIMITY BRING TOGETHER LIFE SCIENCE COMPANIES IN SKÅNE AND BIG PHARMA IN ZEALAND

Many life science companies in Skåne have collaborations and clients in the sector in the Copenhagen area. At Medicon Village in Lund for example, which is a science park with around 170 life science companies, there are a series of contract research organisations, or CROs, that conduct research for clients on the Danish shores of the Øresund.

Among these CROs are Red Glead Discovery and Truly Labs. Another is ImaGene-IT AB, whose focus is on histology and molecular labelings combined with quantitative image analysis, among other things., respectively CEO and CSO of ImaGene-IT, have worked across the strait numerous times since founding the CRO in 2012, with Novo Nordisk in Denmark and others.

The large Danish diabetes concern contacted ImaGene-IT for laboratory research support. The contact was initiated through personal contacts; several previous colleagues from ImaGene-IT later began working for Novo Nordisk and could recommend the small, Lund-based company for consultancy work. Network and geographic proximity thus mean a lot in Medicon Valley, note the directors of the CROs.

– Being able to cross over and work so closely is clearly an advantage. All of our projects are close to our clients in general, so the Copenhagen area is absolutely perfect, Bo Holmqvist says.

The collaboration with Novo Nordisk lasted several years, until 2016. ImageGene-IT was happy to see that larger pharmaceutical companies in Medicon Valley, such as Novo Nordisk, invited external, previous collaborators to seminar- or network days, so the contact could remain active and needs and new innovations could be sketched out. Luckily enough, ImaGene-IT's product and method allow

for collaboration with a broad range of life science companies, Anders Brinte and Bo Holmqvist explain, and for a small company, being located in a science park is an advantage when it comes to contact with others.

– A lot of companies contact Medicon Village and enquire about specific expertise, and Medicon Village contacts us, its members, and puts us in contact with potential clients, says Anders Brinte.

Contacts with Lund University and Region Skåne have also been important in terms of new commissions, they explain. The two public actors use ImaGene-IT's solutions, and they had a previous collaboration with the Irish pharma company Shire, which was acquired by the Japanese Takeda in 2019. Via personal contacts at the university and Region Skåne, ImageGene-IT established a new collaboration with Takeda, which has a subsidiary in the Copenhagen area.

Takeda then brought in ImageGene-IT on a new project in which the pharmaceutical company was involved at the University of Copenhagen. Over the past two years, ImageGene-IT in Lund has thus had a fruitful collaboration on tissue analysis studies with Takeda and the Faculty of Health and Medical Sciences in Copenhagen, Bo Holmqvist says.



PHOTO: IMAGE-IT



PHOTO: IMAGE-IT



PHOTO: NEWS ØRESUND



GALECTO AND MINERVAX are examples of life science companies that were started at Lund University and are now established in Copenhagen.

26

Danish organisations are members of the new cluster organisation Danish Life Science Cluster, whose tasks include promoting transborder collaboration – albeit there are no specific requirements to focus on working together across the Øresund.



FERRING AND BII ESTABLISH COLLABORATION

In January 2021, the pharma company Ferring Pharmaceuticals started a collaboration with the life science incubator BioInnovation Institute (BII), which receives funding from the Novo Nordisk Foundation and became an independent foundation in 2020, after an initial three-year establishment phase. It is BII's first industry collaboration with a life science company outside the incubator. The two parties' collaboration focuses on access to industry expertise and identifying promising new businesses. Ferring has R&D centres in 12 countries around the globe, the largest of which is in Copenhagen's Ørestad district (International Pharma Science Centre) and employs around 600 people. Of them, 110 are border commuters from Sweden. Ferring also has facilities in Malmö, and it will be moving to its new Danish headquarters adjacent to Copenhagen Airport this summer.

500

employees will be linked to the new ESS facility in Lund in 2025. An additional 60-70 will work in ESS' data centre DMCS, located at COBIS in Copenhagen.

BIOTECH COMPANIES FROM COPENHAGEN AND LUND JOIN TOGETHER IN CANCER RESEARCH



Copenhagen-based Scandion Oncology and Lund-based Alligator Bioscience want to use their drugs to develop improved cancer treatments that will increase the value of both companies. In June 2020, the biotech companies entered a preclinical collaborative agreement, the goal

of which is improved treatments for cancer patients in the future. The first preliminary results are expected in the first half of 2021. The collaboration is expected to give increased access to expertise in immunology, which is a strong field in the Øresund Region's life science environment. Scandion Oncology and Alligator Bioscience are listed on the Spotlight and Nasdaq Stockholm exchanges, respectively. The Danish private equity company Sunstone Life Science Ventures Fund owns 8.1% of Alligator Bioscience's shares.

NOVO NORDISK FOUNDATION SUPPORTS ØRESUND COLLABORATION

Over the past two years, the Novo Nordisk Foundation has granted funding to a series of life science actors with a focus on transregional collaboration in the Øresund Region. The foundation's support has gone to e.g.:

€250 000 to the Danish-Swedish DiaUnion project, headed by Medicon Valley Alliance; partners include Lund University and the Capital Region of Denmark.

€98 500 to the student organisation Synapse, which has teams in Copenhagen and Lund.

€1.8mn to the mentorship programme NOME, which has benefitted many biotech startups in Lund's life science environments and others. Medicon Village in Lund, Accelerace Management in Copenhagen are two of the seven partner organisations that run NOME.

SEDERMERA FONDKOMMISSION IN MALMÖ INCREASES ITS PRESENCE IN COPENHAGEN

The financial advisor Sedermera Fondkommission is expanding with new offices and a Danish subsidiary in Copenhagen to strengthen its corporate finance activities in Denmark. The company's headquarters are in Malmö. Since 2014, Sedermera Fondkommission has advised 12 Danish life science companies on going public in Sweden and Denmark. The company is part of the Swedish Spotlight Group AB, which is behind the Swedish mini stock exchange Spotlight Stock Market. The group company Spotlight Group AB also set up Danish offices and a company list in Copenhagen in 2018. Read more about the two companies on page 120-121.



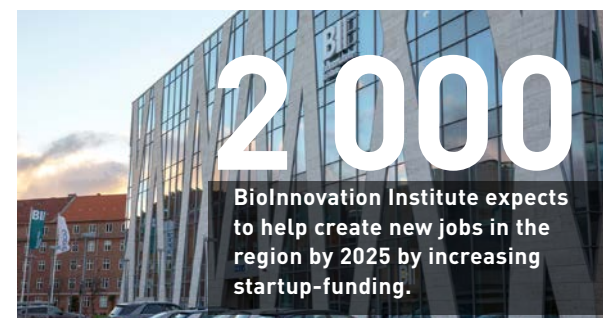
CPHLABS is a co-working lab space in Copenhagen meant to help biotech entrepreneurs. People from the industry on both sides of the Øresund can request space there.

SWEDISH FOUNDATION OPENS COPENHAGEN BRANCH

The Swedish private equity company Segulah Medical Acceleration is setting up a new investment company and offices in Copenhagen. The fund also has a base in Stockholm and is focused on investments in medtech companies, both in Medicon Valley and in Europe. The new fund has 1.2 bn SEK under management.

Danish and Swedish medtech create closer bonds to help companies enter the American market

The Danish-American alliance MedTech Bridge wants to collaborate with the Swedish trade organisation Swedish Medtech in the future and thereby help Danish and Swedish as well as Finnish medtech companies enter the US market. Medtech is Skåne's largest life science industry subsector; it employs ca 3100 people according to the report Life Science in Skåne, which was published by Øresundsinstitutet in November 2020.



2 000

BioInnovation Institute expects to help create new jobs in the region by 2025 by increasing startup-funding.

Øresund actors

Numerous actors on both the Swedish and Danish sides of the Øresund work full- or part-time to strengthen collaboration in the life science sector across the strait with networking meetings, political collaborations, transregional projects, events, investment promotion, investments, marketing, financial advice and grants to startups and partnerships. Many of these actors work and run joint projects together.

Medicon Valley Alliance (MVA)

Bi-national private network organisation with around 300 members from the Danish and Swedish life science sectors. Since its founding in 1997, MVA has worked to promote collaboration in Medicon Valley by acting as a platform for transregional projects and alliances between universities, hospitals, science parks, incubators and businesses. Among MVA's undertakings are the Interreg-projects DiaUnion and ReproUnion. The organisation also facilitates sector-specific, bi-national networks for knowledge exchange in e.g. microbiome research and oncology. Every November, MVA holds an annual meeting at which the industry report State of



MVA's annual meeting in 2017, on the organisation's 20-year jubilee.

PHOTO: NEWS ØRESUND

Medicon Valley is presented. The report is prepared by Øresundsinstitutet.

CEO: Petter Hartman
Chairperson: Søren Bregenholdt



Interreg seminar in 2019.

PHOTO: NEWS ØRESUND

Interreg Öresund-Kattegat-Skagerrak

EU's programme for transregional collaboration. Between 2014-2020, the programme Øresund-Kattegat-Skagerrak has had at its disposition €127.6mn with which to support a long list of different projects in four areas: innovation, employment, green economy and transportation. Interreg's secretariat has offices in Copenhagen, Malmö and Gothenburg. Funds for the Interreg-projects come from the EU's European Regional Development Fund, and half of the project's budget goes to financial support. Since 2015, the EU-programme Interreg Öresund-Kattegat-Skagerrak has granted around

€47mn to joint Danish-Swedish development projects in the life sciences. That corresponds to ca. 350mn DKK and ca. 479mn SEK. A total of 18 life science projects received funding between 2015-2022; ten of these are still active. Among the active development projects are e.g. DiaUnion and ReproUnion, which bring together Lund University, the University of Copenhagen, Region Skåne, the Capital Region of Denmark, Medicon Valley Alliance, Steno Diabetes Center in Copenhagen and others.

Programme director: Magnus Schöningg

Greater Copenhagen Committee

Political partnership organisation between 46 Danish and 39 Swedish municipalities and the Capital Region of Denmark, Region Zealand, Region Skåne and Region Halland. The collaborative organisation was founded in January 2016 and replaced the previous political collaboration of the then-Øresund Committee. The objective is to promote growth, attract more foreign investors and businesses, work to reinforce international infrastructure and promote a cohesive labour market. The committee has defined five areas of focus that are important for future growth and welfare: Green transition, labour market, infrastructure, digitalisation and the life sciences. The board consists of 18 members from selected municipalities and regions.

Managing director: Tue David Bak
Chairperson: Carl Johan Sonesson



Greater Copenhagen Committee holding a summit meeting at Copenhagen City Hall in 2019.

PHOTO: NEWS ØRESUND



PHOTO: NEWS ØRESUND

Invest in Skåne

The official trade- and investment promotion agency for the southernmost part of Sweden. Invest in Skåne is part of Business Region Skåne, owned by Region Skåne. Invest in Skåne works to promote and market Skåne and the Greater Copenhagen Region in order to attract foreign investments, help technological development and to encourage international businesses to set up in the region. Invest in Skåne also helps local businesses enter the international market. Invest in Skåne highlights the life sciences as a key industry in Skåne. Together with the business promotion organisation Copenhagen Capacity, Invest in Skåne runs a database of the region's life science businesses.

Managing Director: Ulrika Ringdahl
Chairperson: Ulrika Nilsson

Copenhagen Capacity

Organisation that works to strengthen Medicon Valley and the Greater Copenhagen region by offering advice free of charge to foreign businesses and investors on the opportunities, rules and conditions for setting up in the region. The life science industry is one of Copenhagen Capacity's sectors of choice, and they seek to strengthen it by attracting foreign investments and skilled labourers from abroad and by marketing the region internationally. Copenhagen Capacity is working with Medicon Valley Alliance, Invest in Skåne and others on an Interreg-project surveying the transregional microbiome research between 2019-2022.

CEO: Asbjørn Overgaard Christiansen
Chairperson: Marianne Philip

Øresund actors, cont.

Nordic Life Science Days, SwedenBIO

Scandinavia's largest life science partnering conference, held in Malmö between 2017-2019 with around 1 200 participants. The event was held digitally in April 2021 due to the corona-virus pandemic. An important aspect of the 2021 conference was that approx. one-fourth of the ca. 800 participants were investors, particularly from abroad. The last time Nordic Life Science Days was held in Malmö, in 2019, investors made up ca. 8% of the over 1 300 participants; investor representation at the show thus more than doubled. 28% – the largest portion – of the participants at Nordic Life Science in 2021 were from biopharma; 17% were from academia and 8% from medtech and digital health.

The partnering conference started in Stockholm in 2013 and is arranged by the trade organisation Sweden-



PHOTO: NEWS ØRESUND

BIO. Lasting four days, the conference offers workshops, business presentations, debates, and one-on-one meetings between companies, partners and investors. Co-arrangers include Invest in Skåne, the City of Malmö, Business Sweden, Healthcare Denmark, Copenhagen Capacity and others. Sponsors include Novo Holdings, Medeon, AstraZeneca, HealthCap, Industrifonden and others.

CEO: Helena Strigård

Chairperson: Lars Adlersson

The Future of Swedish Danish Life Science

Annual international partnering event held at Medicon Village in Lund. The conference is arranged by Life Science Sweden and Kemivärlden, a leading journal in Scandinavia with content such as R&D, pharma, biotech, labtech, chemistry and medtech. Medicon Village and Medicon Valley Alliance are co-arrangers. The conference combines presentations, access to partnering meetings and informal networking. The next conference will be held on 2 September 2021. The conference started in 2012 and brings together 400-500 decision-makers from around the globe. People who work in pharma, biotech and medtech are



PHOTO: SAMUEL LAGERCRANTZ

represented alongside interested parties from academia, the healthcare sector, policy, regulatory authorities and the finance sector. The topic of the 2021 conference is opportunities in finance, investments and precision medicine.

Managing Director: Maria Eriksson

Synapse – Life Science Connect

Student-led non-profit organisation created at the University of Copenhagen in 2014. The organisation works to bridge the life science industry, students and recent graduates by e.g. arranging networking meetings, company visits and summer schools. Synapse has divisions at the universities in Copenhagen and Aalborg and started a team in Lund in 2020. In 2018, they were awarded 732 000 DKK from the Novo Nordisk Foundation to continue their activities; they had received 260 000 from the foundation the preceding year. Synapse works with e.g. Novo Nordisk and SmiLe Incubator, and employees from AstraZeneca,



PHOTO: NEWS ØRESUND

Eir Ventures and Lundbeck Foundation and other have held presentations. Around 40 volunteers work at Synapse, seven of them in Lund.

Chairperson: Emilie Dalbram

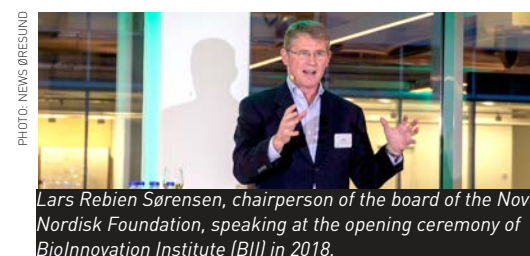


PHOTO: NEWS ØRESUND

BioInnovation Institute

Independent, international, commercial foundation with a non-profit purpose at COBIS in Copenhagen whose focus is on incubation of life science companies in therapeutics, bioindustrials and healthtech.

Since it was founded in 2018, the Novo Nordisk Foundation has contributed 465mn DKK to support the set-up and development of the incubator. 68 startups have received a total of €35mn since it began, among them Lund Stem Cell Center and Wallenberg Center for Molecular Medicine in Gothenburg. The incubator became an independent foundation in December 2020 and has since partnered with Ferring Pharmaceuticals, which has facilities in Malmö and Copenhagen, as well as with Danish universities and foreign investors.

CEO: Jens Nielsen

Chairperson: Sten Scheibye



PHOTO: PERRY NORDENG/ESS

European Spallation Source (ESS)

Multidisciplinary neutron facility currently under construction in Lund; expected completion in 2023. ESS' data centre, located at COBIS in Copenhagen, opened in 2019. The ESS facility will be the world's largest and most advanced neutron source. In the future, the ESS facility will furnish new knowledge in e.g. materials research and biotech, which can be used to develop new drugs, materials, fuels and more. Denmark and Sverige are host countries for the ESS facility and are covering almost half of the construction costs, a total of ca. €1.84bn. An additional 11 European countries are contributing funding for ESS' construction, and it is thus a pan-European research infrastructure. Not far from the ESS facility is Sweden's national MAX IV Laboratory, which is part of Lund University.

Director general: Helmut Schober

Council chairman: Beatrix Vierkorn-Rudolph

ØRESUND ACTORS IN THE INVESTMENT AND CAPITAL SECTORS

A range of actors in the investment and capital sectors in Medicon Valley focus partially or completely on the Øresund Region. Among these actors are the Copenhagen-based venture capital fund Sunstone Life Science Ventures, which invests in biotech companies in Zealand and in Skåne. Founded in 2020, the private equity company Eir Ventures is based in Copenhagen and Stockholm and also has investments in Medicon Valley. Other venture capital funds such as Danish Novo Seeds and Swedish HealthCap are also active in the region, as are financial actors like Nasdaq and Spotlight Group, which makes it possible for companies to be on different company lists and marketplaces in Copenhagen or Stockholm. The Malmö-based subsidiary Sedermera Fondkommission is a financial advisor linked to Spotlight Group. Since 2014, Sedermera Fondkommission has advised multiple

Danish life science companies on going public in Sweden or listing with Spotlight Stock Market's Danish division. In 2018, Spotlight Group opened offices and a mini stock exchange in Copenhagen, and Sedermera Fondkommission also expanded in 2021 with a new Copenhagen office; read more about all of these actors in Chapter 5.



PHOTO: NEWS ØRESUND

Multiple actors associated with the life science sector and Medicon Valley

TRADE AND NETWORKING ORGANISATIONS:

- **ASCRO** – Swedish association focused on clinical research and clinical trials
- **Cluster Excellence Denmark** – a support function for clusters and innovative networks in Denmark co-funded by the Danish Agency for Institutions and Educational Grants and the regions
- **CHI**, Copenhagen Health Innovation – Danish organisation focused on developing new educational and development activities within healthcare
- **Danish Life Science Cluster** – one of 14 new cluster organisations in Denmark that was highlighted by the Ministry of Science Innovation and Higher Education and received funding from the Danish Executive Board for Business and Growth in October.
- **Dansk Biotek** – Danish trade organisation for companies in biotechnology
- **EuropaBio**, the European Association for Bioindustries – European trade organisation for the biotechnology industry
- **EFPIA**, European Federation of Pharmaceuticals Industries and Associations – European trade association for the pharmaceutical industry in Europe
- **FOIN**, the Association of Innovative Settings in Denmark – Danish trade association for science parks and innovative settings, formerly Forskerparkforeningen/The Science Park Organisation
- **Healthcare Denmark** – Danish organisation with political mandate to market the Danish health care sector
- **IFPMA**, International Federation of Pharmaceutical Manufacturers & Associations – international trade association for pharmaceutical companies and associations
- **Kemi & Life Science** – Danish trade community and network for distributors and manufacturers of chemicals
- **Lif Danmark** – Trade association for the pharmaceutical industry
- **Lif Sverige** (researching pharmaceutical companies) – Trade association for manufacturers of pharmaceuticals
- **Life Science Law DK** – an independent society that aims to improve legal conditions for the Danish life science industry
- **Medicoindustrien** – Danish trade association for companies that produce, sell, or have an interest in medical equipment
- **Pharma Danmark** – trade union for academics employed in the Danish life science industry
- **Swecare** – Swedish member organisation that works for broad collaboration with the health and healthcare sectors
- **SwedenBIO** – Swedish trade association for the life science sector
- **Swedish Labtech** – Swedish trade association for com-

panies working in diagnostics, laboratory equipment, analysis and biotechnology

- **Swedish Medtech** – Swedish trade association for medical technology
- **SISP**, Swedish Incubators & Science Parks – Swedish trade association for incubators and science parks
- In addition, there are the broader trade organisations Dansk Industri (Confederation of Danish Industry) and Dansk Erhverv (Danish Chamber of Commerce) and Handelskammaren (Sweden's Chamber of Commerce) and Svenskt Näringsliv (Confederation of Swedish Enterprise).

PUBLIC ACTORS:

- **Erhvervsfremmebestyrelse** (The Danish Executive Board for Business Development and Growth) – a part of the Danish Business Authority that promotes and funds decentralized business approaches
- **Erhvervsstyrelsen** – Danish business authority that works to improve companies' competitive strength
- **Innovationsfonden** – Fund from the Danish Ministry of Higher Education and Science that invests in new knowledge initiatives
- **Läkemedelsverket/Medical Products Agency** – Swedish authority that tests and approves pharmaceuticals
- **Lægemiddelstyrelsen /Danish Medicines Agency** – Danish authority that tests and approves pharmaceuticals
- **Patent- och registreringsverket/Swedish Patent and Registration Office** – Swedish authority for intellectual property rights
- **Danish Patent and Trademark Office/Patent- og Varemærkestyrelsen** – Danish authority for intellectual property rights



Dansk Industri's office building near City Hall Square in Copenhagen, illuminated with a Swedish flag.

PHOTO: NEWS ØRESUND



The Danish government presenting a new life science strategy in April 2021. From left: Minister of Higher Education and Science Ane Halsboe-Jørgensen (S), Minister of Health Magnus Heunicke (S), Minister of Economic and Business Affairs Simon Kollerup (S) and Minister of Foreign Affairs Jeppe Kofod (S).

PHOTO: NEWS ØRESUND

- **Styrelsen for Forskning og Innovation** – Danish authority that works to strengthen research and innovation
- **The Government Offices of Sweden's coordinating Office for Life Science** – was established in 2018 and is working among other things with a new life science strategy.
- **The Life Science Office at Denmark's Ministry of Industry, Business and Financial Affairs** – the government office responsible for the implementation of the Danish national strategy for life science
- **Tillväxtverket/ Swedish Agency for Economic and Regional Growth** – Swedish authority to promote companies' competitive strength
- **Tillväxtanalys/Growth Analysis** – Swedish authority with tasks such as analysing and evaluating Swedish growth policies
- **Trial Nation** – Danish organisation that offers a single, national entry point for actors wishing to conduct clinical trials in Denmark
- **Vetenskapsrådet/Swedish Research Council** – Swedish authority that works to promote Swedish research
- **Vinnova** – Swedish authority that works to improve opportunities for innovation and research
- **Wonderful Copenhagen** – Danish organization working to attract e.g. life science conferences to the Medicon Valley region

MEDIA:

- **Altinget** – News site with a website and newsletter on research, health and more
- **Biostock** – News- and analysis service with a focus on companies in the life science sector and an editorial board in Lund's Medicon Village
- **Dagens Medicin** – Swedish journal about the health-

care sector

- **Dagens Medicin, Dagens Pharma, Kommunal Sundhed and Praktisk Medicin** – Danish journals about the healthcare sector
- **European Biotechnology News** – European journal about life science
- **Greater Copenhagen Life Science Magazine** – Scandinavian life science magazine published by the Danish marketing and advertising agency Nem Media
- **Kemivärlden Biotech** – Scandinavian journal for chemistry, chemical engineering and biotechnology
- **Labiotech.eu** – European news site on the biotechnology industry
- **Life Science Sweden** – Journal on the Swedish biotechnology, medical technology and pharmaceutical industries
- **MedWatch** – Danish news site on the medical and pharmaceutical industries
- **Nordic Life Science News** – journal and news site on the Nordic life science industry
- **Pharma Industry** – Swedish trade journal for the pharmaceutical industry



Debate at Altinget's summer meeting in 2020.

PHOTO: NEWS ØRESUND

Collaborations between science parks in the Øresund Region are project-based

Medicon Valley's science parks have no organised, formal collaboration in the life sciences; instead, collaborations across the Øresund have a project-based character and focus on e.g. matching skills and incubation growth. Most of the region's science parks are members of the Danish-Swedish network organisation Medicon Valley Alliance, which works to promote life science collaborations in the Øresund Region.

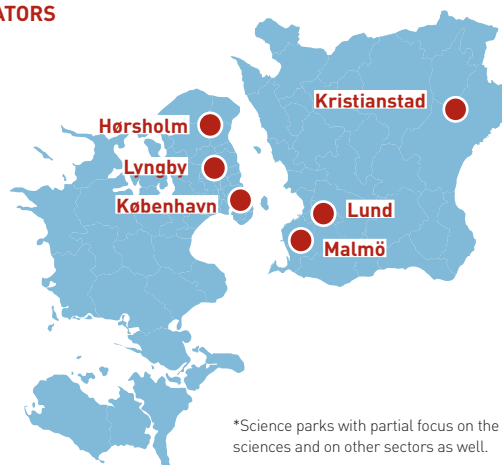
SCIENCE PARKER OG INCUBATORS INDEN OM LIFE SCIENCE

ON ZEALAND

DTU SCIENCE PARK*
(Lyngby and Hørsholm)

COBIS
(Copenhagen)

**BIOINNOVATION
INSTITUTE**
(Copenhagen)



*Science parks with partial focus on the life sciences and on other sectors as well.

IN SKÅNE:

IDEON SCIENCE PARK*
(Lund)

SMILE INCUBATOR
(Lund)

MEDICON VILLAGE
(Lund)

MEDEON SCIENCE PARK
(Malmö)

KRINOVA SCIENCE PARK*
(Kristianstad)



DTU SCIENCE PARK

Founded: 2004

Number of companies: 300

Number of people: 4 300

Location: Hørsholm and Lyngby

Focus: Deep tech, life science, biotech and med-tech comprise around 40% of the science park.

Øresund collaboration: DTU Science Park has had project-oriented collaborations with MINC in Malmö and Ideon in Lund. In 2020 it was part of an Interreg-project on Science City Lyngby with Lund Municipality, Ideon and others. At present, DTU Science Park has no active collaborations with any science parks in Skåne, but are in continuous dialogue with the various actors in the Skåne

startup ecosystem

Steen Donner, CEO:

– At DTU Science Park we are always open to collaborations across national borders, and we have established multiple alliances with strong collaborative partners in Europe and the USA, primarily to support our startups. We know that we have very good, talented colleagues on the other side of the strait with whom we can collaborate. If such collaborations – despite a number of attempts – have yet to be firmly established, it's simply due to circumstances. The timing needs to be right; the shared interests need to be right; and the project needs to be in an area on which both parties are focused at that particular point in time; the resources need to be in place for both parties to carry out the collaboration, and finally, the project's scope needs to be large enough so that it's interesting for both parties. Unfortunately, these conditions haven't all been met at the same time yet, but we have not abandoned our wish to strengthen collaboration across the Øresund.



COBIS BY SYMBION

Founded: 2009

Number of companies: Approx. 100

Number of people: Approx. 500

Location: Copenhagen

Focus: Life science

Øresund collaboration: COBIS has had numerous projects and joint experience exchanges with partners across Øresund, including Invest in Skåne and Medeon and MINC in Malmö. Some of the collaborations have been with Medicon Valley Alliance, others as part of the Scandinavian project Health-Tech Nordic; Invest in Skåne and SmiLe Incubator in Lund are also collaborators in this project.

Morten M. Jensen, CEO:

– Today, COBIS is one of seven locations in the

Symbion community with approx. 650 startups distributed throughout Copenhagen. With so many clients with diverse needs it is crucial that we continuously develop and strengthen our business offer. A central parameter in this is establishing international relations, because we know that the majority of our clients are active in a global arena and seek out clients, partners and/or funding all over the world. Over the years, COBIS and Symbion have supported that demand with a long list of collaborations with science parks, incubators, funding sources and other actors in the ecosystem for startups on the other side of the Øresund. Sweden is an interesting market for collaboration because the culture, labour market and business environment are very similar to those of their Danish counterparts. For many of our clients, Sweden is thus the first natural choice for an export market. Access to capital via the stock exchange in Sweden is also more active than in Denmark, and that has led several of our clients to seek funding in the Swedish ecosystem. And that's one of many areas where collaboration with Swedish actors plays a central role.



BIOINNOVATION INSTITUTE

Founded: 2017. BioInnovation Institute Foundation (BII) was established as a commercial foundation with a non-profit purpose in December 2020.

Number of companies: 68

Total number of employees at COBIS, where BII is located: Approx. 500

Location: COBIS, Copenhagen

Focus: Bioindustrials, therapeutics, healthtech

Øresund collaboration:

BII is a member of Medicon Valley Alliance and has continual dialogues with incubators, universities, science parks and other on the Danish and Swedish sides of the Øresund. BII has an indu-

ustrial collaboration with e.g. Ferring Pharmaceuticals, whose facilities are located in Copenhagen and Malmö. In 2020, BII funded research at the Wallenberg Centre for Molecular Medicine at Lund Stem Cell Center.

Jens Nielsen, CEO:

– Bringing research out of the universities and onto the market for the benefit of society is a long journey, and working together across national borders is a must. In the past, we visited a number of Nordic innovation initiatives in order to understand how they work and to create network relationships that can facilitate development in the area as a life science innovation hub. In the future, we want to work to secure the establishment of several solid companies that will continue to enrich science parks and incubators on both sides of the Øresund.





MEDICON VILLAGE

Founded: 2012

Number of companies: Approx. 170

Number of people: Approx. 2 600

Location: Lund

Focus: Pharmaceuticals, medtech, and biotech

Øresund collaboration: Medicon Village collaborates with Medicon Valley Alliance and the seed accelerator Accelerace in Copenhagen. COBIS also has a strategic partnership with Accelerace, which runs the mentorship programme NOME; Accelerace receives support from the Novo Nordisk Foundation, and Medicon Village is one of seven Nordic partnership organisations. Medicon Village thus has a collaboration with the Novo Nordisk Foundation via NOME.

* Kerstin Jakobsson was appointed CEO of Kongsberg Beam Technology AS, a medtech company in Oslo Cancer Cluster Norway, earlier this year. Kerstin Jakobsson has been part of the management team of Medicon Village and deputy CEO since the start in 2012 and CEO of Medicon Village Innovation AB since 2018

Kerstin Jakobsson, CEO*:

– It's important that all of the innovation-support organisations in Scandinavia work together to help entrepreneurs and development companies so that even more successful companies can be developed and make their mark on the international market. If we can cluster our successful companies in Scandinavia in different segments as an indication or a technological platform, we can be even better at attracting international capital and expertise to the region. With that said, collaboration in the Øresund Region is extremely important; we have the proximity to each other – there's just a bridge between us... although the distance over the bridge seems longer at this moment in time. We already need to prepare for the time after the pandemic now, when we can meet in person again; in the meantime, we need to make sure not to lose contact.



SMILE INCUBATOR

Founded: 2007

Number of companies: 25-30

Number of people: Approx. 350

Location: Lund

Focus: Biotech, pharma, medtech, and e-health

Øresund collaboration: SmiLe Incubator has had collaborative projects including events and boot camps with COBIS, DTU and CBS, and is also associated with Health Tech Hub and BioInnovation Institute in Copenhagen and with Erhvervs- og Själland (Business Hub Zealand) for support and development of startups. In addition, SmiLe Incubator has had companies that were accepted in the mentorship programme NOME, which is funded by the Novo Nordisk Foundation.

Ebba Fåhræus, CEO:

– Collaboration with other actors across the Øresund is extremely important. We like running transborder projects, and doing that requires good relationships. I believe that it pays off; we have different networks on both sides of the Øresund and can share each others' networks, and above all companies can establish contacts that they otherwise wouldn't have had the opportunity to.

We can complement one another in terms of different specialisation areas, and there might also be expertise on one side that's important for a company in the network on the other side. There are a large number of pharma companies in Denmark, and their specific therapeutic areas are based on expertise from the region, for example in Lund; tapping into that is pertinent for startups in Skåne. Lund is strong in immunoncology and cancer in general, so collaboration in those areas is relevant, and SmiLe also has advanced labs and equipment to which companies have access.



IDEON SCIENCE PARK

Founded: 1983

Number of companies: Approx. 400

Number of people: Approx. 10 000

Location: Lund

Focus: Healthtech/medtech and some biotech. 30% of the companies are active in the life sciences. Ideon also focuses on 'smart cities', 'transportation of the future', and 'smart materials'.

Øresund collaboration: Ideon collaborates with Danish medtech companies via the network Medtech Network, which is run by Medicon Valley Alliance. Ideon also collaborates with Copenhagen Capacity on student-matching activities for Ideon's

* Mia Rolf will take the post as the director of marketing and communications at Wihlborgs Fastigheter AB by 1 August 2021 at the latest. Wihlborgs is a property developer specialising in commercial properties in the Øresund Region. Mia Rolf has been CEO of Ideon Science Park in Lund since 2016.

companies. Furthermore, Ideon has a collaboration with the headquarters of the UN's global unit for project implementation UNOPS in Copenhagen; UNOPS' innovation centre is located on Ideon's premises. Ideon has a continuing dialogue with CBS, DTU and Bloxhub and wants to increase its collaborations.

Mia Rolf, CEO*:

– We aren't fully integrated yet, which is a shame. We may not be as cool as Copenhagen as a city, but our deep tech knowledge within various areas like medtech, foodtech, proptech, IoT, AI, clean energy, mobility and more combined with our entrepreneurial skills puts us and Sweden in the very top of the sustainable innovation league. And we are open to interregional partnerships. I think this combined region has a lot to offer both growth companies and international talents.



MEDeon SCIENCE PARK & INCUBATOR

Founded: 1985

Number of companies: Approx. 60

Number of people: Approx. 400-450

Location: Malmö

Focus: Pharma, medtech, biotech, and health care

Øresund collaboration: Medeon collaborates with Medicon Valley Alliance, and Medeon-com-

panies become members of MVA. Medeon has previously had collaborative projects with COBIS and Biopeople; these are not currently active.

Ulf. G. Andersson, CEO:

– Collaboration between science parks and incubators across the Øresund is important, and it will grow more even more important for strengthening Medicon Valley's international competitiveness as time goes on. It's vital that such cooperation is sustainable in the long-term, and that it is focused on the life science companies' needs rather than short-term, project-funded, top-down planning and events.



KRINOVA INCUBATOR & SCIENCE PARK
The science park Krinova is in Kristianstad, northwest Skåne, and focuses on food, environment, and health; because of sector overlap, these areas of focus are partially or entirely within the life science sector.

Krinova is owned by Kristianstad Municipality, its subsidiary Kristianstads Industribyggnads AB and Högskolan Kristianstad Holding AB. Krinova has collaborated across the Øresund with the Technical University of Denmark (DTU), University College Absalon, and others.

“The things we can do better together working across the Øresund are things we should pursue”

26 public and private organisations have joined forces to found the Danish Life Science Cluster with headquarters in Copenhagen. While the new cluster is prioritising more extensive collaboration and associations between life science actors in Denmark first and foremost, the chair of the board also welcomes trans-Øresund collaborations.

Danish Life Science Cluster is one of 14 new business clusters in Denmark highlighted by the Danish Executive Board for Business Development and Growth in 2020 in line with new legislation on business promotion from 2019. The objective is use business clusters to strengthen Danish innovation, green transition, and financial group cohesiveness.

The organisation wants to start by prioritising more developed collaborations between Danish life science actors, but external collaborations will also be on the agenda, says Kim Kjøller, chairman of the board at Danish Life Science Cluster.

At his day job, he is CEO of the Copenhagen-based biotech company Union Therapeutics. From 2015-2020 he was head of research and development at the pharmaceutical company LEO Pharma.

– We have historical collaborations in the Øresund Region, and we will definitely continue to have them. The collaborations are both on the commercial and on the academia fronts. I think we should open a mutual invitation and say: the things that we can do better together working across the Øresund are things we should pursue, says Kim Kjøller, noting that the strategic processes regarding external collaborations will start when Danish Life Science Cluster's new director, Diana Arsovic Nielsen, takes the helm on 1 July 2021.

She is leaving behind a position as director of the Centre for Regional Development at the Capital Region of Denmark, and she was previously head of innovation for the Municipality of Copenhagen, among other things.

In addition to being open to transregional collaboration, says Kim Kjøller, Danish Life Science Cluster will contribute positively to the Danish life science sector in various ways: among the cluster organisation's goals are more joint coordination and greater knowledge exchange and visibility between industry and the universities; this in turn will result in improved patient treatment, as well as more growth opportunities and more jobs in Denmark for life science companies.

Previously, the Danish life science innovation system comprised e.g. five small cluster organisations: Copenhagen Health Cluster, Life Science Innovation North Denmark, MedTech Innovation Consortium, Welfare Tech and BioPeople. These five regional cluster organisations have now ceased to be individually operating units and have merged into a single national organisation, Danish Life Science Cluster. According to Kim Kjøller, this will make it easier for life science actors to find with the right collaborator – both in Denmark and abroad.

– It's about improving the way we make use of each other and the joint institutions in the collaboration. We have fantastic expertise at the universities, and small and medium-sized companies aren't even necessarily aware of its existence, says Kim Kjøller.



PHOTO: DANISH LIFE SCIENCE CLUSTER

DANISH LIFE SCIENCE CLUSTER

- Represents ca 500 small and medium-sized companies in the sector.
- Received a total of 13mn DKK from the Danish Executive Board for Business and Growth and 21mn DKK from the Ministry of Higher Education and Science in 2020.
- Ca 30 people will work at Danish Life Science Cluster, which will have regional offices in Denmark's four largest cities and headquarters in Copenhagen.
- The University of Copenhagen, the Danish Chamber of Commerce, Confederation of Danish Industry, Dansk Biotek and Medicoindustrien are among the cluster's 26 partners.

Novo Nordisk Foundation funded a super microscope in Lund in 2018 – next year it will be ready for use

When the Novo Nordisk Foundation granted ca €35mn to set up “the world's most powerful protein microscope” in Lund four years ago, it was the foundation's largest investment in southern Sweden to date. The microscope will be operational in 2022, and the investment itself is part of the foundation's strategic initiative “Copenhagen Bioscience Cluster”.

The world's most powerful “protein microscope”, located at the Swedish, national research lab MAX IV in Lund, should be ready for use in late 2022. Funding for the microscope, called MicroMAX, came in 2018 from Denmark's – and one of the world's – wealthiest foundations, the Novo Nordisk Foundation.

The foundation granted 225mn DKK – equal to ca €35mn – for the microscope, which enables proteins to be studied in greater detail than ever before and thus also offers a new base for the development of new medicines and more.

Novo Nordisk Foundation's grant will extend over 14 years. It has preliminarily covered the costs of the four years of construction of MicroMAX, and will also cover ten years of operational costs for the microscope in Lund.

– The grant to MAX IV is the Novo Nordisk Foundation's largest grant to southern Sweden (the Medicon Valley region) to date, says Dagnia Looms, senior vice president of the Novo Nordisk Foundation.

The foundation's involvement in the MAX IV-lab in Lund is part of a broader strategic initiative that the Novo Nordisk Foundation calls “Copenhagen Bioscience Cluster”. The goal is to create a cluster of world-class research structures and infrastructure in the Capital Region of Denmark and in Skåne, in southern Sweden.

The initiative has been ongoing for the past 8-10 years, and in that time the Novo Nordisk Foundation has granted over 6,5 billion DKK (€875mn) to establish and expand the cluster on both sides of the Øresund.

When the microscope MicroMAX in Lund is operational next year, it will thus truly be part of the Copenhagen Bioscience Cluster. According to Dagnia Looms, the many investments and initiatives aim to increase the international visibility of the region's research and innovation, to attract international talents and star researchers

to the region, stimulate cross-pollination between university environments, hospitals and businesses, and to contribute to a knowledge-based community.

– The major focus of the foundation's strategic initiatives in the current strategic phase has been on Denmark, with increasing emphasis on international collaboration and collaborative projects with international partners. The largest allocations made have been to partners in the USA, Sweden and England, says Dagnia Looms.

Novo Nordisk Foundation Center for Stem Cell Biology, DanStem, in Copenhagen, with around 250 employees, is also part of the “Copenhagen Bioscience Cluster”. The centre is headed by the Swede Professor Henrik Semb.

The new director of the Novo Nordisk Foundation, Mads Krogsgaard, who was Novo Nordisk's research director for many years, announced this May that stem cell research will be a major area for the foundation in its new 2030-strategy. The Novo Nordisk Foundation plans to use the coming years to complete the strategic process whilst the MicroMAX-microscope in Lund reaches completion.



PHOTO: NOVO NORDISK FOUNDATION

NOVO NORDISK FOUNDATION

Foundation with corporate interests. Its capital is managed by its subsidiary Novo Holdings, which is the largest shareholder of the listed companies Novo Nordisk A/S and Novozymes A/S. The foundation employs more than 200 people.

MVA SEES THE GREATER COPENHAGEN REGION AS A TEST BED FOR DANISH-SWEDISH INNOVATION IN THE LIFE SCIENCES

The Greater Copenhagen Region should be a test bed for more innovative collaboration in the life sciences between Denmark and Sweden, says Petter Hartman, administrative director of Medicon Valley Alliance, who will become CEO of Medicon Village Innovation AB in Lund in November. To achieve that, there should be concrete pilot projects for the benefit of patients as well as the industry in both countries. For that to happen however, there's a need for increased resources and political determination.

How can the trans-Øresund life science sector be strengthened? According to Petter Hartman, CEO of the Danish-Swedish network organisation Medicon Valley Alliance (MVA), there are several answers to that question. The important thing is walking the walk and allocating financial resources to concrete projects across the Øresund.

– I believe that getting concrete collaborations on their feet is the best recipe for strengthening integration in the long-term. Opportunities to meet aren't enough, even if seeing each other at events and sharing experiences is a good start. When people work together – when we let our various competences cross-pollinate – we can take that extra step, he says.

MVA was founded almost 25 years ago. It was at the time when Ørestad was established, the Øresund Bridge was nearing completion, and a group of experts strategically pointed out the greater Copenhagen area as a centre of medical research and development.

In the past five years as MVA's CEO, Petter Hartman has prioritised concrete regional collaboration more highly. As a result, the organisation is now running five transregional projects with universities, hospitals, companies and political interest organisations in the Øresund Region. MVA's projects are funded in part by the EU's Interreg fund, as well as by the Novo Nordisk Foundation and others.

– Over the past five or six years, we've successfully transformed the organisation and become a platform for collaboration that facilitates collaborations on both sides of the strait and attracts funding for research and development, Petter Hartman says.

The region as a hub for experiments

This February, MVA's efforts led to the organisation being selected as the winner of the first Malmö Greater Copenhagen Business Award for its work promoting

collaboration across the Øresund. The award was developed by the city of Malmö and ØresundsInstitutet.

Petter Hartman adds that the transregional projects MVA runs, for example DiaUnion or ReproUnion, are not meant to only be relevant for MVA's 300 members. They should enrich the region's research capacity more broadly and benefit patients as actors from the Danish and Swedish sectors come together to develop joint biobanks, new treatments, transborder screening programmes, or run clinical studies on both sides of the Øresund.

According to Petter Hartman, in addition to strengthening relationships between researchers and the life science industry, transregional projects also demonstrate that the Øresund Region is a place where complex ideas and pilot studies can be tested and developed by actors in the sector.

– The single most important role that Medicon Valley and Greater Copenhagen have is to be a hub for experiments, a place to put solutions to the test and bring together the best of both countries, says Petter Hartman. He adds:

– Denmark is a tiny country. Sweden is a relatively tiny country. Our volume is greater together, and I believe it gives us a better chance of increasing our attractiveness internationally. In that context, the Øresund Region can be seen as the place to find and test solutions to shared issues or try out new models for collaboration between the public and private sectors. And if it succeeds in Medicon Valley, the lessons can be passed on and scaled up to a Nordic and perhaps even an international level. That's how I believe the Øresund Region should be used – as a frontrunner for transborder collaboration where it's pertinent.

As Petter Hartman sees it, the areas in which more transborder collaboration will be advantageous in the future are related to research commercialisation, coordination of clinical studies, international marketing of

the Øresund Region, and joint projects that deal with health data.

– I see good potential to create synergies across the border in those areas. As far as health data goes, the fact that our systems are so similar and contain such volumes of information means that if we can find ways to collaborate there, it will be extremely positive for both Swedish and Danish life science, says Petter Hartman.

Border obstacles hit the labour market on both sides of the Øresund

Unfortunately, the past year with the coronavirus-pandemic has also shown that joint coordination in Øresund Region is far from functional, and the open society has been facing yet another challenge, on top of previous years' closed border and the migrant crisis, according to Petter Hartman.

– When a crisis hits, the pressure is often felt in border regions, he says.

– We have to handle crisis situations better. Border regions get shabby treatment on a national level, and that has to change if border regions are to be motors for growth, he says. He emphasises that the consequences can be dire for Medicon Valley, as it will become more difficult to reap the advantages of the shared, transregional labour market and promote Greater Copenhagen as an integrated metropolis.

Border obstacles on the labour market are problematic for life science businesses in and around Copenhagen, where many Swedes are employed, as well as for biotech companies in Malmö and Lund, which are dependent on attracting key actors from e.g. larger scale Danish pharmaceutical companies, says Petter Hartman.

He has, however, been pleased to see the innovative force in Medicon Valley during the pandemic, where more than 200 research projects related to Covid-19 have been started, and he is happy that the life science sector as an industry is stable against the ups and downs of the market. That was clear from a survey conducted by ØresundsInstitutet in the spring of 2020 in which 125 life science businesses in Skåne were asked questions as part of the project Greater Copenhagen Life Science Analysis Initiative. 80% of the companies interviewed reported that it had not been necessary to dismiss employees at the beginning of the pandemic.

Petter Hartman hopes that in 2021, they and other transborder actors in the region can continue to take steps toward a stronger collaboration on academic education between Copenhagen and Skåne.

He welcomes the establishment of the new Danish



Petter Hartman.

Life Science Cluster and hopes that the organisation with its 26 actors will be able to simplify the innovation system with complementary activities.

In addition, MVA wants to advocate a model for how life science projects wishing to be active on both sides of the Øresund can access public funding and thus avoid being hindered by requirements that financial support be used exclusively in Sweden or Denmark.

– If we succeeded in getting national fund structures with public resources to support initiatives meant for both Sweden and Denmark, it would be very, very positive, says Petter Hartman.



MEDICON VALLEY ALLIANCE

- Non-profit membership organisation in the Danish-Swedish life science cluster Medicon Valley.
- Founded in 1997, the organisation works to promote the integration of Danish and Swedish life science in the Øresund Region.
- MVA's members include more than 300 actors from the sector, among them universities, hospitals, life science businesses, regional governments and service providers in the Øresund Region.
- The organisation facilitates network groups for oncology, medtech, R&D and more, and runs transregional projects in fertility and diabetes.

Differing capital structures in Medicon Valley mean differing funding conditions

Access to risk capital in Medicon Valley has improved in general in recent years, according to a number of investment companies and life science businesses with Danish-Swedish ownership. That has a positive effect on funding conditions in the region on the whole. A major difference across the Øresund remains that the stock market is more accessible in Sweden, while actors from the sector maintain that access to venture capital is better in Denmark. Although there are numerous listed companies in Skåne, the total market value of the listed companies is significantly higher in Zealand.

When it comes to capital structure, one of the greatest differences in the Danish-Swedish Medicon Valley cluster is that there are far more listed life science companies in Skåne compared to the number in Zealand. 71 companies were identified as having headquarters in Skåne and listings in Stockholm, and 20 life science companies were identified as having headquarters in Zealand and listings in Copenhagen. In addition, there are 12 Danish life science companies listed in Stockholm.

This bears witness to the generally more active stock market in Sweden; this is in part due to lower taxation on shares, which makes it more attractive for private individuals to invest.

As an example, five life science companies in Skåne have gone public in the spring and summer of 2021 to date; on the Danish side of the strait however, no company has gone public yet this year. Furthermore, a total of around 700 companies – in the life sciences and in other sectors – are listed on Nasdaq Stockholm, whilst around 170 companies in all sectors are listed on Nasdaq Copenhagen. When it comes to Spotlight Stock Market, a total of 158 companies in the life sciences and in other sectors are listed in Stockholm, whilst five companies in the sector across the Øresund are listed on Spotlight Stock Market's mini exchange in Copenhagen.

Although a number of Danish life science companies chose to list in Copenhagen in 2020, going via the stock exchange is more convenient for life science companies in Skåne. There is a particularly high concentration of biotech- and pharma companies in the Malmö-Lund area.

Many listings in Skåne are linked to fewer venture capital opportunities

Sweden's more active stock exchange has also been an advantage for Danish life science companies, which have sought capital via Nasdaq or Spotlight Stock Market in Stockholm since 2014. The Swedish investment company Sedermera Fondkommission has headquar-

ters in Malmö and has advised 12 Danish life science companies on going public in Sweden. Like its parent company Spotlight Group did in 2018, the company has now set up offices and a physical presence in Copenhagen as well. A result has been closer financial links in the Øresund Region – read more on page 120-121.

Sometimes however, the more lucrative stock market path in Sweden is a necessity for funding life science in Skåne, the reason being that unlike in Zealand, there are fewer options for continued funding by professional national and foreign investors, according to a number of life science companies and investment companies with a Danish-Swedish stance – read more on page 129-134.

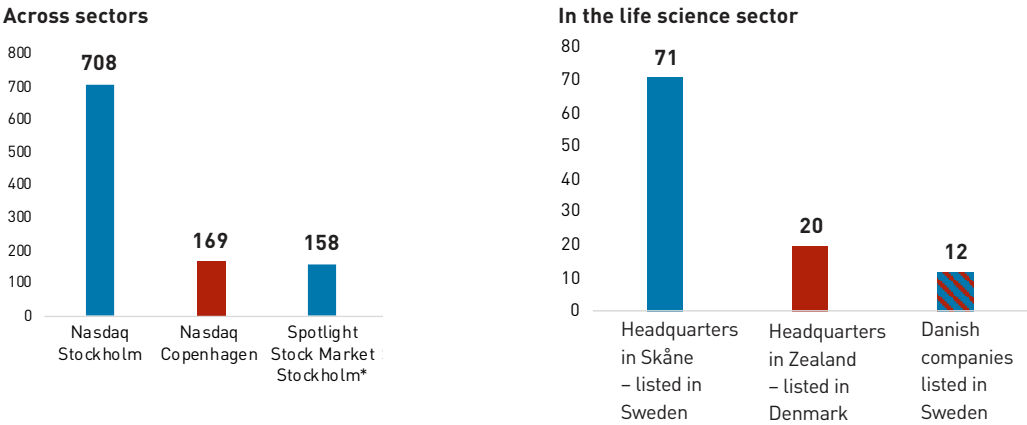
The same points were made in the report Life Science in Skåne from 2020, which was prepared by Øresundsinstittutet. 20 predominantly small biotech- and medtech companies in Skåne expressed in written and spoken interviews that access to risk capital is a must.

Despite there being more than three times as many listed life science companies in Skåne, the total market value of the group of listed life science companies in Zealand is significantly greater. This highlights another structural difference within the Danish-Swedish Medicon Valley cluster regarding company size, with beacon companies such as the listed Novo Nordisk and H. Lundbeck. These global companies contribute seed- and venture-funding to Danish life science via commercial foundations. There are no foundations of that calibre in Skåne, which leads to an imbalance.

However, Danish and Swedish companies in Medicon Valley benefit in general from international investors growing interest in the region as they look for new investment opportunities, say Danish and Swedish investment companies – read more on page 124-129. The Medicon Valley ecosystem has matured, and according to a number of companies with Danish-Swedish ownership in the region, that has largely improved the opportunities for start-up funding – read more on page 129-134.

INVESTMENTS, OWNERSHIP AND LISTINGS

NUMBER OF LISTED COMPANIES IN DENMARK AND SWEDEN



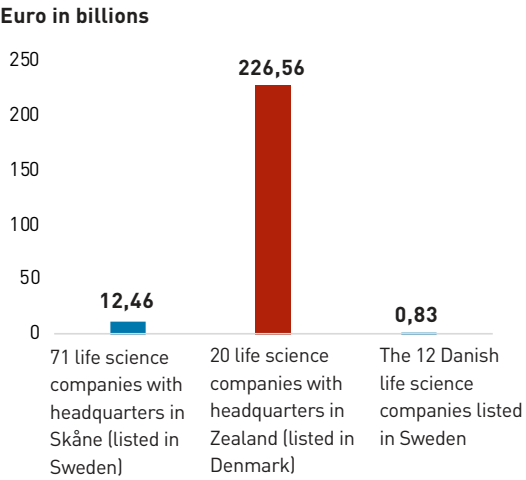
Source: Nasdaq and Spotlight Stock Market. *10 companies from Spotlight NEXT are added to Spotlight Stock Market in Stockholm. Spotlight Next is for companies that want greater internal control. Note that five companies are listed on Spotlight Stock Market in Copenhagen

20 LIFE SCIENCE COMPANIES WITH HEADQUARTERS IN ZEALAND – LISTED IN DENMARK

Company name	Subsector	Exchange/ marketplace	HQ site	Listing date	Market cap in €; 3 May 2020
Novo Nordisk B A/S ¹	Biotech/pharma	Nasdaq	Bagsværd	1974	110 460 611 994
Coloplast B A/S	Medtech	Nasdaq	Humblebæk	1983	27 079 187 850
Genmab A/S	Biotech/pharma	Nasdaq	Copenhagen	2000	19 897 956 846
Novozymes B A/S	Biotech/pharma	Nasdaq	Bagsværd	2000	13 570 409 969
GN Store Nord (GN Hearing)	Medtech	Nasdaq	Ballerup	1869	10 520 876 376
Chr. Hansen Holding A/S	Biotech/pharma	Nasdaq	Hørsholm	2010	10 358 560 322
Ambu A/S	Medtech	Nasdaq	Ballerup	1992	10 177 742 727
Demant A/S	Medtech	Nasdaq	Smørum	1996	10 000 764 506
H. Lundbeck A/S	Biotech/pharma	Nasdaq	Valby	1999	5 116 499 789
ALK Abelló B A/S	Biotech/pharma	Nasdaq	Hørsholm	2005	3 623 016 040
Bavarian Nordic A/S	Biotech/pharma	Nasdaq	Hellerup	1998	2 374 212 266
ChemoMetec A/S	Biotech/pharma	Nasdaq	Allerød	2006	1 553 920 114
Zealand Pharma A/S	Biotech/pharma	Nasdaq	Søborg	2010	1 204 831 618
Orphazyme A/S	Biotech/pharma	Nasdaq	Copenhagen	2017	274 026 828
Bioporto A/S	Biotech/pharma	Nasdaq	Hellerup	2004	165 812 002
ViroGates A/S	Biotech/pharma	Nasdaq	Birkørød	2018	95 828 249
Curasight A/S	Biotech/pharma	Spotlight Stock Market	Copenhagen	2020	45 591 669
Monsenso A/S	Healthtech	Nasdaq	Copenhagen	2020	18 189 275
Audientes A/S	Medtech	Nasdaq	Virum	2020	13 200 924
Cessatech A/S	Biotech/pharma	Spotlight Stock Market	København	2020	8 133 584

€226 559 372 949

MARKET CAP IN MEDICON VALLEY



665

Since 2014, 13 life science companies from Denmark have gone public in Sweden, 12 of which are still listed – on Nasdaq and Spotlight Stock Market in Stockholm, respectively. The companies initially raised ca 665mn SEK in capital, or ca €65mn. Share emissions following the IPO have increased the amount of capital raised by the company further. Sederme-ra Fondkommission in Malmö has helped multiple Danish life science companies list – read more on page 120-121.

13 DANISH COMPANIES HAVE LISTED IN SWEDEN SINCE 2014, 12 OF WHICH ARE STILL LISTED

Company name	Subsector	Exchange/ marketplace	HQ site	Listing date	Market cap in €; 3 May 2020	Capital app- rox. raised at IPO
SynAct Pharma AB ¹	Biotech/pharma	Spotlight Stock Market	Lund/Holte	2016	200 539 431	32mn SEK
Saniona AB*	Biotech/pharma	Nasdaq	Glostrup	2014	141 706 269	17 mn SEK
FluoGuide A/S*	Biotech/pharma	Nasdaq	Copenhagen	2019	114 961 520	22 mn SEK
Expres2ion Biotech Holding AB	Biotech/pharma	Nasdaq	Hørsholm	2016	108 721 462	18 mn SEK
Scandion Oncology A/S*	Biotech/pharma	Nasdaq	Copenhagen	2018	72 377 343	26 mn SEK
Qlife Holding AB	Healthtech	Nasdaq	Helsingborg/ Copenhghen	2020	53 852 187	55 mn SEK
RhoVac AB	Biotech/pharma	Spotlight Stock Market	Lund/ Hørsholm	2016	34 651 459	20 mn SEK
2curex AB	Biotech/pharma	Nasdaq	Copenhagen	2017	32 049 812	18 mn SEK
Acarix AB	Medtech	Nasdaq	Malmö Hellerup	2016	25 802 006	125 mn SEK
Allarity Therapeutics A/S (formerly Oncology Venture A/S)*	Biotech/pharma	Nasdaq	Hørsholm	2015	21 436 145	20 mn SEK
Initiator Pharma	Biotech/pharma	Spotlight Stock Market	Aarhus	2017	11 240 128	20 mn SEK
DanCann Pharma A/S	Biotech/pharma	Spotlight Stock Market	Ansager	2020	8 145 686	42 mn SEK
Neuvolution (delisting) ²	Biotech/pharma	Nasdaq		2015		
					€825 483 449	665 mn SEK

Source: Nasdaq, Spotlight Stock Market, Nordic Growth Market and information from the companies. Currency rates based on Denmark's National-bank. Note that market value indicates the respective share class for trade. Companies can offer multiple share classes, just as a company may have a number of unlisted shares. ¹Novo was listed in 1974 under the name Novo Industri A/S. Novo and Nordisk later merged in 1989 ²Neuvolution was sold to Amgen for 1.6bn SEK in 2019. Note that 'Zealand' refers to the Capital Region of Denmark. The figures in the above table for capital raised with an IPO are rounded off. Capital raised with later emissions is not included. Note that even if the companies are classified as Danish companies, some have partial headquarters in Skåne. Note that Össur, Onxeo and Stenocare are also listed on Nasdaq Copenhagen, but do not have headquarters in Zealand. *Saniona, FluoGuide, Scandion Oncology and Allarity Therapeutics were originally listed on Spotlight Stock Market but have moved to Nasdaq Stockholm.

71 LIFE SCIENCE COMPANIES WITH HEADQUARTERS IN SKÅNE – LISTED IN SWEDEN

Company name	Subsector	Exchange/ marketplace	HQ site	Listing date	Market cap in €; 3 May 2020
Arjo AB ser. B	Medtech	Nasdaq	Malmö	2017	2 043 447 600
Nolato AB	Medtech	Nasdaq	Torekov	1984	2 013 359 448
Camurus AB	Biotech/pharma	Nasdaq	Lund	2015	1 152 169 719
Swedencare AB	Biotech/pharma	Nasdaq	Malmö	2016	1 060 610 809
CellaVision AB	Medtech	Nasdaq	Lund	2007	848 255 177
Hansa Biopharma AB	Biotech/pharma	Nasdaq	Lund	2007	730 682 761
Probi AB	Biotech/pharma	Nasdaq	Lund	2004	545 124 067
Midsona AB	Foodtech	Nasdaq	Malmö	1999	496 671 272
Bone Support Holding AB	Medtech	Nasdaq	Lund	2017	427 770 760
Cantargia AB	Biotech/pharma	Nasdaq	Lund	2015	337 996 291
Genovis AB	Biotech/pharma	Nasdaq	Lund	2006	295 534 491
Biolnvent International AB	Biotech/pharma	Nasdaq	Lund	2001	270 859 283
Immunovia AB	Biotech/pharma	Nasdaq	Lund	2015	259 534 445
Enzymatica AB	Medtech	Nasdaq	Lund	2011	158 168 531
Doro AB	Healthtech	Nasdaq	Malmö	1993	142 833 528
Eql Pharma AB	Biotech/pharma	Spotlight Stock Market	Lund	2013	125 618 578
Ascelia Pharma AB	Biotech/pharma	Nasdaq	Malmö	2019	123 015 850
Aegirbio AB	Medtech	Nasdaq	Lund	2020	102 255 734
Glycorex Transplantation AB	Biotech/pharma	Nordic Growth Market (NGM)	Lund	1999	89 445 772
Spectracure AB	Medtech	Nasdaq	Lund	2018	86 693 943
Hamlet Pharma AB	Biotech/pharma	Spotlight Stock Market	Lund	2015	77 290 921
Optifreeze AB (Optcept Technologies AB)	Other	Nasdaq	Lund	2014	73 555 390
BrainCool AB	Medtech	Spotlight Stock Market	Lund	2014	65 558 052
Axichem AB	Biotech/pharma	Nasdaq	Malmö	2011	55 466 249
Alligator Bioscience AB	Biotech/pharma	Nasdaq	Lund	2016	47 603 670
Dignitana AB	Medtech	Nasdaq	Lund	2009	47 350 183
Iconovo AB	Biotech/pharma	Nasdaq	Lund	2018	46 345 808
Magle Chemoswed AB	CMO	Nasdaq	Malmö	2020	44 612 294
Phase Holographic Imaging Phi AB	Medtech	Spotlight Stock Market	Lund	2014	35 280 358
Guard Therapeutics International AB	Biotech/pharma	Nasdaq	Lund	2013	33 518 142
Follicum AB	Biotech/pharma	Spotlight Stock Market	Lund	2014	33 385 428
Active Biotech AB	Biotech/pharma	Nasdaq	Lund	1998	32 799 948
Respiratorius AB	Biotech/pharma	Spotlight Stock Market	Lund	2012	32 090 435
SenzaGen AB	Biotech/pharma	Nasdaq	Lund	2017	31 823 454
Bioextrax AB	Biotech/pharma	Spotlight Stock Market	Lund	2020	30 744 241
Spago Nanomedical AB	Biotech/pharma	Nasdaq	Lund	2021	29 567 523
Acousort AB	Biotech/pharma	Nasdaq	Lund	2020	26 878 255
Prostalund AB	Medtech	Nasdaq	Lund	2019	24 545 467

Company name	Subsector	Exchange/ marketplace	HQ site	Listing date	Market cap in €; 3 May 2020
Cyxone AB	Biotech/pharma	Nasdaq	Malmö	2016	24 504 957
Abliva AB	Biotech/pharma	Nasdaq	Lund	2008	24 069 965
Clinical Laserthermia Systems AB ser. B	Medtech	Nasdaq	Lund	2009	23 314 179
Xintela AB	Biotech/pharma	Nasdaq	Lund	2016	22 844 722
Selectimmune Pharma AB	Biotech/pharma	Spotlight Stock Market	Lund	2019	22 638 650
Lumito AB	Medtech	Nordic Growth Market (NGM)	Lund	2018	22 348 521
Ziccum AB	Biotech/pharma	Nasdaq	Lund	2020	21 730 060
Coegin Pharma AB	Biotech/pharma	Nordic Growth Market (NGM)	Lund	2018	18 895 308
Carbiotix AB	Biotech/pharma	Spotlight Stock Market	Lund	2019	16 233 986
Combigene AB	Biotech/pharma	Nasdaq	Lund	2018	16 183 519
Enorama Pharma AB	Biotech/pharma	Nasdaq	Malmö	2016	15 506 940
BibbInstruments AB	Medtech	Spotlight Stock Market	Lund	2017	15 120 946
Prebona Healthcare AB	Other	Spotlight Stock Market	Lund	2015	14 629 914
Medicpen AB	Medtech	Spotlight Stock Market	Lund	2006	14 139 299
Vibrosense Dynamics AB	Medtech	Spotlight Stock Market	Malmö	2015	11 986 647
Aptahem AB	Biotech/pharma	Spotlight Stock Market	Malmö	2015	10 087 101
Invent Medic Sweden AB	Medtech	Spotlight Stock Market	Lund	2016	9 931 765
AcuCort AB	Biotech/pharma	Spotlight Stock Market	Helsing-borg	2015	9 605 753
WNTresearch AB	Biotech/pharma	Spotlight Stock Market	Lund	2010	9 161 598
Pharmiva AB	Medtech	Nasdaq	Lund	2021	7 867 154
Spermosense AB ¹	Medtech	Spotlight Stock Market	Lund	2021	7 828 618
Sensodetect AB	Medtech	Spotlight Stock Market	Lund	2009	6 560 631
Duearity AB ²	Healthtech	Nasdaq	Malmö	2021	6 265 009
Scandinavian Chemotech AB B	Medtech	Nasdaq	Lund	2016	5 885 237
Idogen AB	Biotech/pharma	Nasdaq	Lund	2020	5 651 923
Alteco Medical AB	Biotech/pharma	Spotlight Stock Market	Lund	2014	5 499 666
GPX Medical AB	Medtech	Nasdaq	Lund	2020	4 213 059
PolarCool AB	Medtech	Spotlight Stock Market	Lund	2018	3 537 861
Pharmalundensis AB	Biotech/pharma	Spotlight Stock Market	Lund	2010	2 752 582
European Institute Of Science AB	Medtech	Spotlight Stock Market	Lund	2001	1 236 344
Amniotics AB	Biotech/pharma	Listing expected 6 July 2021	Lund	2021	
Diagonal Bio AB	Biotech/pharma	Listing expected 6 July 2021	Lund	2021	
PILA PHARMA AB	Biotech/pharma	Listing expected 12 July 2021	Malmö	2021	
€12 458 695 790					

Source: Nasdaq, Spotlight Stock Market, Nordic Growth Market and information from the companies. Currency rates based on Denmark's Nationalbank. Note that market value indicates the respective share class for trade. Companies can offer multiple share classes, just as a company may have a number of unlisted shares. ¹Spermosense was first listed on 5 May 2021; market value and currency exchange are calculated for that day rather than 3 May 2021 ²Duearity was first listed on 11 May 2021; market value and currency exchange are calculated for that day rather than 3 May 2021



HOW HAS THE OPENING OF A SPOTLIGHT'S COPENHAGEN OFFICE IN 2018 BENEFITTED MEDICON VALLEY'S LIFE SCIENCE SECTOR TO DATE?

– It is my experience that both Danish and Swedish life science companies and investors have profited from this and that we see an increased cross border flow. Six Danish healthcare companies – Curasight, Cessatech, FluoGuide, Stenocare, DanCann Pharma and Scandion Oncology – have listed since medio 2018 and raised growth capital – a total of approximately 370mn DKK, says Katrine Hoff, Head of Danish Market, Spotlight Stock Market.

** Stenocare has since moved from Spotlight Stock Market to Nasdaq in Denmark in 2020. FluoGuide and Scandion Oncology moved from Spotlight Stock Market to Nasdaq Sweden in 2021.*

New Swedish investment company wants to improve southern Sweden's access to seed capital with €19mn

SmiLe Inject Capital AB is a new Swedish investment company, created in the spring of 2021. Over the next two years, it aims to invest up to €19mn in 10-15 life science startups that have been growing in Lund's SmiLe Incubator. Behind SmiLe Inject Capital AB are the national Swedish investment company Saminvest, 11 Swedish investors and SmiLe Incubator.

€35

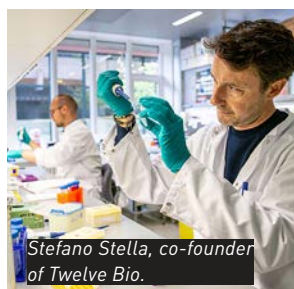
bn is how much the Novo Nordisk Foundation granted Lund University and MAX IV in 2018 to develop the world's strongest "protein microscope". It should be ready for use in 2022. The grant is the foundation's largest in southern Sweden to date.

€450

Bn – that's how much the investment company Nordic Capital has invested in Denmark's oldest pharma company LEO Pharma. Nordic Capital has offices in e.g. Stockholm and Copenhagen. After 35 years, the LEO Foundation is no longer the sole owner of LEO Pharma; Nordic Capital has an owner's share of max 25%. LEO Pharma's global headquarters are in Ballerup near Copenhagen, and it has facilities in Malmö.

BRITISH PRIVATE EQUITY COMPANY INVESTS IN BIOTECH STARTUP, BYPASSES REGIONAL INVESTORS

PHOTO: ANTON WILLEMANN
UNIVERSITY OF COPENHAGEN



Stefano Stella, co-founder of Twelve Bio.

The British venture capital fund Arix announced in March 2021 that it had invested ca. 20mn DKK in the Copenhagen-based biotech company Twelve Bio. The investment is notable, as a national or regional anchor investor in Medicon Valley is usually necessary before life science venture funds from abroad start to grow interested and confident enough to invest. Twelve Bio was founded in 2019 as a spin-out from Novo Nordisk Foundation's protein research centre at the University of Copenhagen. The company researches in crispr-technology and has offices at COBIS in Copenhagen.

PHOTO: NEWS ØRESUND



THE NOVO NORDISK FOUNDATION SUPPORTS RESEARCH ON BOTH SIDES OF THE ØRESUND

Each year, the Novo Nordisk Foundation's Research Leader Programme awards grants to researchers in the natural sciences. In addition to researchers at Danish universities, researchers at Malmö University, Lund University, Uppsala University, the University of Gothenburg and Karolinska Institute also received grants in 2020 and 2021. Professor Charlotte Ling from Lund University, who specialises in diabetes, for example, received a 10mn DKK grant in 2021.

MALMÖ'S LARGEST LIFE SCIENCE COMPANY CAN TRIPLE ITS PRODUCTION CAPACITY – AND IS NOW LISTED IN SWITZERLAND

Malmö's third-largest life science company, PolyPeptide Laboratories AB, has gotten the green light to triple its production capacity; up to 1000 kg of pharmaceutical substances can now be manufactured in Malmö annually. PolyPeptide expects that more employees will thus need to be recruited to Malmö, where the company already has around 300 associated employees. Its parent company, PolyPeptide Group, was listed in Switzerland in April 2021 to accelerate growth of the company, which employs over 900 people around the globe. The listing implied a market capitalisation of 2.12bn Swiss francs. PolyPeptide's historic roots reach back to Ferring Pharmaceuticals, which was founded in Malmö in 1950. PolyPeptide is still owned, via a foundation, by Frederik Paulsen Jr, son of Ferring's founded Frederik Paulsen.

LARGEST SERIES A INVESTMENT IN DANISH BIOTECH: DANISH AND SWEDISH VENTURE FUND RAISED

380mn DKK, equal to €51mn. The capital was invested in the Danish biotech company Adcendo by a consortium comprising five investment companies – among them Danish Novo Seeds and Swedish HealthCap – in May 2021. The investment has made history: it is the largest so-called series A investment ever in a Danish biotech company. A series A investment refers to a company's first significant round of venture capital financing from established capital funds following a startup-capital period. Adcendo was founded in 2017 as a spin-out from research at the University of Copenhagen and Rigshospitalet. Read more about the company on page 130.

BiolInnovation Institute becomes a foundation, and the Novo Nordisk Foundation pledges ten years of funding

For the next ten years, BiolInnovation Institute in Copenhagen has been pledged 350mn DKK annually from the Novo Nordisk Foundation. A prerequisite is that BiolInnovation Institute's positive development continues. Since 2017, more than 68 research projects and startups from Denmark and other Nordic countries – including Skåne – have received support via BII for the development of new life science innovations and solutions in pharma, bioindustry and healthtech.



PHOTO: NEWS ØRESUND

1.2

bn SEK is the start capital for the new, Swedish investment company Segulah Medical Acceleration, which aims to invest in medtech companies in Medicon Valley and in Europe.

PHOTO: NEWS ØRESUND

The head of Nasdaq sees private investors gearing up for life science investments, but the institutional investors are still holding back

Private investors' interest in the life science sector is on the rise, says Carsten Borring, head of Listings & Capital Markets at Nasdaq in Copenhagen. They are taking greater risks and investing more than they did five years ago. But the capital raising climate would be improved – especially in the Danish part of Medicon Valley – if institutional actors and pension funds were more involved in the small-cap market like they are in Sweden, he says.

The investment and capital raising climate in the life sciences is in a good phase right now, according to Carsten Borring, who heads Listings & Capital Markets at Nasdaq in Copenhagen.

– It's getting better and better every day, he says.

The positive tact of investments in the sector is a definite trend right now, which bankers and analysis agencies have also pointed out. According to Carsten Borring, this is in part because private and professional investors – in Denmark in particular, but also in Sweden – have taken greater risks than usual over the past five years and invested more in the sector.

The increasing investment tact thus represents a shift from 10 years ago, when raising capital for earlier life science companies was more difficult because they had a long way to the market and were thus associated with a higher risk.

Now however, private and strong professional investors alike have really gotten inspired and are a driving force for development, says Carsten Borring, who has been working with capital markets for 20 years and helped list the large Danish pharmaceutical company H. Lundbeck in 1999.

Interest in investing in the sector is due partially to the current situation, with interest rates at zero to negative, he notes. But the willingness to invest is related to the sector delivering stable yields to its shareholders, and the focus on fighting diseases and promoting health is fundamentally appealing in investor circles. This is something that the coronavirus pandemic has made clear.

– Many people actually want to make a difference; I see that when I speak with investors, says Carsten Borring.

Institutional investors need to get on board like private investors have

According to Carsten Borring, strong professional investors are gearing up in Denmark and Sweden, while Danish institutional investors continue to hold back more than their Swedish counterparts. However, the Danish pension fund ATP for example has announced a more venture-oriented investment strategy and recently invested millions in the Danish diagnostics company MedTrace, and ATP also owns shares in larger Danish life science businesses such as ALK-Abelló, Bavarian Nordic, Chr. Hansen, Novo Nordisk, Coloplast and Genmab.

Nonetheless, as Carsten Borring sees it, the lack of institutional investors has meant that when life science businesses find themselves seriously needing to raise capital, some of them have had to look abroad and e.g. list in the USA, as the biotech companies Galecto and Evaxion

did in 2020 and 2021, respectively. Among other things, events like those are a manifestation of the lack of actively investing institution investors in Denmark, says Carsten Borring.

– Institutional investors in Denmark are just not as willing to take risks as private investors. The situation is a bit better in Sweden, he says, pointing to the general AP pension funds, which invest pension capital in the stock market to a greater extent.

The difference may stem from a reform process

"Many people actually want to make a difference; I see that when I speak with investors."



Carsten Borring, head of Listings & Capital Markets at Nasdaq Copenhagen

PHOTO: NEWS ØRESUND



Ringling of the bells for Nasdaq Stockholm's opening at the conference The Future of Swedish & Danish Life Science in Lund 2018.

PHOTO: NEWS ØRESUND

that took place in Sweden in the 1980s and 1990s, when Swedish national pension funds became more oriented toward the small-cap market.

More life science listings in Sweden – Danish businesses contribute to the increase

For that reason, says Carsten Borring, Sweden is still ahead of Denmark when it comes to the number of listings in the life science sector. In Nasdaq's Danish healthcare group, for example, there are currently 21 listed companies. One of the most recent listings was the healthtech company Monsenso in 2020. Around 175 life science companies are traded publicly on the Nasdaq exchange in Sweden. Of these, one of the most recent to go public is the medtech company Pharmiva (Lund) in 2021.

Since 2014, 13 Danish companies have had IPOs in Sweden – nine of them are now on the Nasdaq exchange in Stockholm. This has contributed to an increase in dynamism, as well as differences between the stock exchanges in Denmark and Sweden.

And the number of public offerings is not insignificant, Carsten Borring points out, because listed companies survive longer, as it's easier for them to make changes in a shareholder structure, while the ownership structure of a privately owned company is more rigid.

That's why the life science sector in Medicon Valley could benefit from a greater number of small, high-risk companies, so it would be easier for investors – private, professional and institutional – to weight risks by investing in multiple businesses rather than just a few, says Carsten Borring.

But that would require political willingness in Denmark to change the structures and incentives related to the taxation of capital, so more types of inve-

stors will be motivated to get involved in companies at an earlier stage. Carsten Borring points out that Swedish politicians have been able to do just that.

– One shouldn't be fooled because it's going well in the life science sector, but now is the time for politicians to take initiatives that can move things ahead, because now is when there's momentum. The money is there now. And even if one might ask: Well, why bother with new incentives when everything is going so well? Well, because we know from history that as soon as stocks go red, venture capital for biotech and the life sciences disappears very quickly.



PHOTO: NEWS ØRESUND

NASDAQ COPENHAGEN

- **Founded:** 1625 (Copenhagen Stock Exchange), became part of Nasdaq Inc. in 2007
- **Branches in life sciences:** Finance and stock market
- **Focus areas:** Trade, clearing, technology, listing and services for listed companies
- **Ownership:** Public
- **CEO:** Nikolaj Kosakewitsch
- **Number of listed companies across all sectors in total on Nasdaq Copenhagen:** 169 – of which 21 are life science companies in Denmark
- **Number of listed companies across all sectors in total on Nasdaq Stockholm:** 708 – of which 69 are life science companies in Medicon Valley

“WE ARE IMPORTANT TO LIFE SCIENCE AND LIFE SCIENCE IS IMPORTANT TO US”

With its headquarters in Malmö, Swedish Spotlight Group AB has become a more important life science actor in Denmark and the rest of Scandinavia in recent years – a stock market where the focus is on smaller companies. Its sister company Sedermera Fondkommission has financially advised 18 Danish companies, most in the life sciences, about listing on Spotlight Stock Market and First North in Stockholm to date. They found their way to the Danish life science sector in 2014, when the Swedish corporate finance company helped the Danish biotech business Saniona go public in Sweden. Since 2018, Spotlight Group has set up both offices and a Danish stock market in Copenhagen. Around 30% of the ca. 160 companies listed with Spotlight Stock Market are active in healthcare, making the sector the largest subsector on the Danish-Swedish mini-stock exchange.

One of the financial companies active in both Denmark in Sweden – and in Medicon Valley in particular – is Spotlight Group with the marketplace Spotlight Stock Market, which is now in Stockholm as well as Copenhagen. Over the past eight years, the group has helped multiple Danish and Swedish life science companies raise capital on Swedish stock exchanges.

In 2018, Spotlight Group expanded its activities to include Denmark by setting up an office and a Danish version of Spotlight Stock Market – a Danish mini-stock exchange in Copenhagen. The company's headquarters are in Malmö and facilities are in Stockholm.

Prior to Spotlight Stock Market's entrance in Denmark, Danish companies had to set up a Swedish holding company and be traded in SEK. The establishment of the Spotlight exchange in Denmark now makes it possible for life science companies to be traded in DKK.

– We – our different businesses – have definitely played an important role in the life science segment in Sweden and Denmark in general, and particularly in the Malmö-Copenhagen area, where there are many interesting and growing life science companies. Our different businesses have been working actively with many life science companies from the region for many years. I think you can sum it up by saying that we are important to life science and life science is important to us, says Peter Gönczi, CEO of Spotlight Group.

Historically and at present, healthcare is the largest subsector on the Spotlight exchange. 30% of the ca. 160 listed companies on the Spotlight exchange are active in healthcare.

Spotlight Group comprises six different independent businesses; one of them is Spotlight Stock

Market, which was founded as a Swedish mini exchange under the name Aktietorget in 1997. The aim was to make it easier for startups to access capital.

Sedermera Fondkommission is one of the sister companies in the group, and since 2003 it has given financial advice to growth companies in various industries in Sweden and the rest of Scandinavia. Sedermera Fondkommission's advice has

helped for example Danish life science companies, which benefitted from a more active stock market in Sweden, where liquidity is easier to access.

Sedermera Fondkommission has helped 12 Danish life science companies go public

Since 2014, Sedermera Fondkommission has helped 18 Danish companies list in Sweden or on the Danish segment of the Swedish Spotlight exchange in Denmark. 12 of these can be classified as life science companies: Saniona, Oncology Ventures, ExpreS2ion Biotechnologies, SynAct Pharma, RhoVac, 2curex, Initiator Pharma, Scandion Oncology, Stenocare, FluoGuide, Curasight and Cessatech.

Like Spotlight Group, Sedermera Fondkommission has its headquarters in Malmö, and offices in Copenhagen, and they have thus had an advisory role in the majority of the Danish public equity offers in Sweden.

The 12 listings linked to Sedermera Fondkommission's advice have generated a total of 265mn SEK – corresponding to ca. 32mn USD – for life science companies since 2014. But that's not the whole story, says Fredrik Rahl, who is director of Sales & Capital Markets at Sedermera Fondkommission.

– After the IPOs, these companies – as listed companies – have additionally raised over 1.9 bn SEK, corresponding to ca. 225mn USD. This shows

how a listing provides long term access to growth capital. As I see it, that is one of the key reasons to go for an IPO, he says.

In total, the 12 Danish companies have raised ca. 2.2bn SEK in growth capital with their IPOs, which corresponds to ca. 260mn USD.

The first Danish life science company listed was, as mentioned earlier, the biotech company Saniona, which raised 17mn SEK with its IPO in Sweden in 2014. Sedermera Fondkommission was involved in the process.

– Back in 2014 we already had a high activity level in Sweden – both among growth companies with a need to raise capital and investors. The Saniona IPO was kind of a groundbreaking IPO for us, and it opened the door to Denmark. Since then we have continued to work with a lot of interesting growth companies from Denmark, says Fredrik Rahl.

Most recently, Sedermera Fondkommission has been involved in listing the Danish biotech company Cessatech, which initially raised ca. 16mn DKK in 2020 on the Spotlight exchange in Denmark.

The Danish market is mature

Back in 2017, when more Danish life science companies started seriously considering an IPO in Sweden, the biotech company Orphazyme listed itself of the Nasdaq exchange in Denmark. Orphazyme's listing was the first life science company listed in Denmark in seven years – since Zealand Pharma and Genmab were listed in 2000 – and it was considered a boosting event in Danish biotech circles. In Sweden, 36 companies from the pharmaceutical, biotech and medical equipment sectors were listed that same year – among them the Danish biotech companies 2cureX and Initiator Pharma.

The difference in the number of life science IPOs in Denmark and Sweden remains, but there is currently a trend toward improvement on the stock and capital markets on the Danish side of Medicon Valley, according to Fredrik Rahl.

– On the investor side, we have seen increasing interest from Danish investors – it is more popular to invest in growth companies today than what it was back in 2014.

His colleague Anders Eriksson, who is head of Spotlight Stock Market, agrees. He notes that over the past five years, larger transactions and IPOs in terms of raised capital have been a reality for Danish and Swedish life science companies in Medicon Valley.

– It is also interesting that Danish private individuals' shareholding, according to the statistics we have seen, increased significantly during 2016-2019. Although it is not possible to draw any concrete



PHOTO: NEWS ØRESUND

conclusions for the future, this is of course gratifying. Liquidity in a share is an important aspect for creating good opportunities for a listed company to raise further capital after the IPO, says Anders Eriksson.

In the years to come, Spotlight Group plans to continue working to strengthen the financial life science links between the Danish and Swedish markets.

– One important ambition within Spotlight Group is to continue our efforts to further link the Swedish and the Danish market. To give you two fresh examples, just look at Nordic Issuing [an issuing agent in Spotlight Group, ed.] which recently became a member of Danish VP Securities; in addition to that, Sedermera is opening an office in Denmark. These are two steps forward on the road to creating even better solutions for our Danish clients, says Peter Gönczi.



PHOTO: NEWS ØRESUND

SPOTLIGHT GROUP AB

- **Founded:** 1997
- **Branches in life sciences:** Finance and stock market.
- **Focus area:** Financial and legal advising
- **Ownership:** Publicly traded on Spotlight Stock Market since 2020
- **CEO:** Peter Gönczi
- **Turnover 2020:** 140,4mn. SEK
- **Gross year-end result 2020:** 11.4mn SEK
- **Number of employees in Malmö:** ca. 60
- **Number of employees in Stockholm:** ca. 25
- **Number of employees in Copenhagen:** 3

PROFESSIONAL INVESTORS FROM ABROAD LOOKING TOWARD MEDICON VALLEY WITH INCREASING INTEREST

Professional investors and private equity companies are looking increasingly to Medicon Valley and the rest of Scandinavia for company investments. The increasing investment interest from abroad is evident in conference participation, funding rounds, new ownership structures and more.

Danish and Swedish private equity companies and life science companies that are active in the Øresund Region agree: professional investors from abroad are becoming increasingly interested in investing in Medicon Valley.

– Professional investors from abroad are very interested in the funding rounds we're working on now, says Søren Møller, managing partner at Novo Seeds. He believes among other things that the Øresund Region's life science ecosystem has matured – read more on page 126.

The increase in foreign investors' interest was also expressed this April at the conference Nordic Life Science Days, which was held in Malmö from 2017-2019 and took place online in 2021. Around a quarter of the approximately 800 participants in 2021 were investors, particularly from abroad, reports the industry organisation SwedenBIO. The

last time Nordic Life Science Days was held in Malmö, in 2019, investors made up 8% of the over 1 300 participants. Investor participation in the conference has thus more than doubled.

– We've definitely seen a major increase in interest from foreign investors in Nordic life science, the administrative director of SwedenBIO Helena Strigård told the news service News Øresund.

The interest of foreign investors – particularly when it comes to the Danish side of Medicon Valley – is also apparent: as an example, the Dutch investment firm Van Herk Investments invested ca 83mn USD in the Danish biotech company Zealand Pharma in 2019. In May 2021, another Dutch capital market company, Gilde Healthcare, became a majority owner of the consultancy firm KLIFO, which works to develop drugs and medical equipment. And Fujifilm Diosynth Biotechnologies, a subsidiary of the FUJIFILM group with headquarters in Tokyo, will invest 928mn USD in their facility in Hillerød by 2023. According to the company, this will create around 300 new jobs.

In addition, American and European funds are becoming increasingly involved in the funding of life science startups in Medicon Valley, for example in IO Biotech in Copenhagen.

BII IN COPENHAGEN EXPECTS TO TAKE IN MORE STARTUPS FROM SCANDINAVIA AND EUROPE

BII runs a life science incubator and is increasing its focus on attracting life science startups from Scandinavia and abroad to Copenhagen, parallel to a strategic goal of increasing seed-funding for startups from 2021 onward.

BII in Copenhagen doesn't only support Danish life science startups in Medicon Valley. Last year, the then-PreSeed-programme made it possible for the Wallenberg Centre for Molecular Medicine at Lund Stem Cell Center to receive ca €470.000 from the BII Foundation for a development project, for example.

Currently, the Swedish biotech-startup BOOST Pharma – developed at Stockholm's Karolinska Institute – is part of the incubator programme, which was founded in 2017 and is funded by the Novo Nordisk Foundation. Since it was established, BII has funded 68 startups in various incubation-programmes with €35mn.

According to Jens Nielsen, CEO of BII and a profes-

sor at Chalmers University of Technology in Sweden, the focus on taking on startups from the Nordic countries and beyond at the incubator will increase in the years to come, as BII plans to significantly increase startup funding starting in 2021.

– Following the successful establishment of BII as an independent foundation (in December 2020, ed.), we want to reach further geographically and attract startups from all of Europe. Our increased focus in Scandinavia in particular is already evident from a significant increase in applicants from other countries than Denmark, and we expect the companies we take on to reflect that. At the moment, four non-Danish projects or startups have been part of our programmes, says Jens Nielsen.

Increased internationalisation at BII in Copenhagen should be seen in the context of the advisory group that the incubator formed with Danish Novo Holdings and seven private equity companies from abroad in 2020 to help highlight interesting company cases.

EXAMPLES OF DANISH FINANCIAL ACTORS WITH INVESTMENTS ON THE SWEDISH SIDE OF MEDICON VALLEY

Investor	Company	Subsector	Votes and capital	City
Formue Nord	Idogen AB	Biotech/ pharma	10,7% – largest shareholder	Lund
Seed Capital Denmark	Acarix AB	Medtech	3,4% – second largest shareholder	Malmö
Sunstone Life Science Ventures	Ascelia Pharma AB	Biotech/ pharma	16,4% – largest shareholder	Malmö
Sunstone Life Science Ventures	Alligator Bioscience AB	Biotech/ pharma	6,7 % – second largest shareholder	Lund
Sunstone Life Science Ventures	Cantargia AB	Biotech/ pharma	3,0% – ottende største shareholder	Lund
William Demant Invest	CellaVision AB	Medtech	13,6% – largest shareholder	Lund

EXAMPLE OF SWEDISH FINANCIAL ACTORS WITH INVESTMENTS ON THE DANISH SIDE OF MEDICON VALLEY

Investor	Company and location		Votes and capital	City
EQT	Ellab A/S	Medtech	Majority shareholder	Hillerød
EQT	WS Audiology A/S	Medtech	47% – second largest shareholder	Lynge
Impilo	Scantox A/S	CRO	Majority shareholder	Lille Skensved
Impilo	Ferrosan Medical Devices A/S	Medtech	Majority shareholder	Søborg
HealthCap	Hemab ApS	Biotech/ pharma	Minority shareholder	Copenhagen
HealthCap	Adcendo ApS	Biotech/ pharma	Minority shareholder	Copenhagen
Linc AB	FluoGuide A/S	Biotech/ pharma	7,7% – third largest shareholder	Copenhagen
Industrifonden	MinervaX A/S	Biotech/ pharma	Minority shareholder	Copenhagen

EXAMPLES OF FINANCIAL ACTORS FROM ABROAD WITH INVESTMENTS IN MEDICON VALLEY

Investor	Company	Subsector	Votes and capital	City
Arix Bioscience (UK)	Twelve Bio ApS	Biotech/ pharma	49% – second largest shareholder	Copenhagen
Eiffel Investment Group (France)	Qlucore AB	ICT	Major shareholder	Lund
Gilde Healthcare (The Netherlands)	KLIFO A/S	CRO	Majority shareholder	Glostrup
Pai Partners (France)	Atos Medical AB	Medtech	Majority shareholder	Malmö
Redmile Group (USA)	BioInvent International AB	Biotech/ pharma	16,8% – largest shareholder	Lund
Van Herk Investments (The Netherlands)	Zealand Pharma A/S	Biotech/ pharma	15,9% – largest shareholder	Søborg

Sources: Companies' annual reports, press releases, reports in the press, information on company websites and information from the companies themselves. Please note that these figures may have changed since they were reported.

Danish and Swedish private equity companies: Positive investment climate in Medicon Valley

Medicon Valley's investment climate is positive, say partners from Danish and Swedish private equity companies. The region is increasingly catching the eye of investors from abroad as an attractive life science hub, and funding rounds are growing larger as a result. Whilst there is more stock market action in Sweden, the conditions for venture- and seed-funding are considered more favourable on the Danish side of the Øresund. In Danish Medicon Valley in particular, there is a wish that pension funds would invest more in the life sciences.

The investment climate in Medicon Valley is advancing in general, according to Eir Ventures, Novo Seeds, Sunstone and HealthCap. Among other things, this is apparent in that life science companies – particularly on the Danish side of the Øresund – have seen large funding rounds in recent years. A result has been increased attention on the life science sector in Medicon Valley in general – also from private equity companies from abroad. An increase in international investment syndicates contributes to a more international network for companies and improved chances to recruit expertise from abroad. There is a structural difference between the countries on the stock market in particular. In Sweden, the majority of life science companies access risk capital through the stock market and marketplaces in Stockholm. In Denmark, going public is a less attractive option

for life science companies, although a number of Danish life science companies chose to list in Denmark between 2017–2020. As a result, other Danish companies list in the USA or in Sweden in order to access capital. A total of 13 Danish life science companies have listed in Sweden since 2014. Access to seed-funding, on the other hand, is deemed better in Denmark than in Sweden. This is related – among other things – to the foundation of the BioInnovation Institute in Copenhagen in 2017. In addition, Danish life science foundations, such as the Novo Nordisk Foundation, LEO Foundation and Lundbeck Foundation, create a structural economic distinction between the Danish and Swedish sides of Medicon Valley. There is also a wish in the sector for pension funds to invest more actively in the life science sector.

EIR VENTURES: THE REGION NEEDS MORE SPECIALIST INVESTORS

Co-founder and partner of Eir Ventures Stephan Christgau sees progress in the investment climate for life science startups but points out that the attractiveness of the stock exchange in Sweden comes with risks, and that the lack of specialist investors is problematic.

What are your thoughts on how the funding of life science startups in Medicon Valley is developing?

– There are quite a few differences between the two shores of the Øresund. The market in Stockholm is the most active market for biotech listings outside the USA, at least in Europe. There's significantly more access to non-specialist, or generalist, capital in Sweden than in Denmark in general. That means that many life science enterprises choose that path to get funding, but also that investors that are completely external to the sector are behind a lot of funding. In one sense this is a good thing, because

projects that perhaps wouldn't have been possible without those investors can be developed. But I do also wonder how rationally things are done when so much of the capital in the sector comes from investors with limited insight, because if there is one thing that is complex and demands experience, network and comprehension, it's life science. So, a lot of companies take the stock market path in Sweden or seek funding from investors who don't understand the sector very well. There are far fewer non-specialist investors in Denmark and in spite of great efforts by the Copenhagen stock exchange, Danish institutional

investors' interest in the life sciences and biotech is limited, so the listings have been very few. We are seeing that a lot of international investors are keeping an eye on the region, however, and there is increasing participation from European and American funds when it comes to funding local biotech companies. But there is a shortage of specialist investors in the region, so in that sense the Medicon Valley-ecosystem is a little fragile. Some companies will manage. But I also think that a lot of companies list too early, or would benefit more from being pressure-tested by specialist investors. Some companies will fail; what happens then? The atmosphere is very positive for life science listings in Sweden right now, but if there are two, three, four fiascos and studies that go awry, all that can change, and it can affect everyone – even good companies – and make it hard to access capital. Perhaps specialised investors are more used to that – that things go up and down – and they can be involved in reworking plans and aim for future value-creating activities. It can be more difficult for a listed company to get the market to understand that.

"The investment climate is progressing. We're seeing some very impressive rounds with international venture fund participation."

What are the trends affecting investment in Medicon Valley?

– I'm seeing more and more generalist investors with an eye on the sector in Sweden. In Denmark and Sweden, the life sciences and biotech sectors are basically actively omitted from the pension sector. As I see it, by not allocating to the sector, pension funds are neglecting their responsibility. The absence of investors of that kind is notable in the region; if you go to the USA or countries like Holland and France, you see there's a different focus on it. Just as an example, a Dutch pension fund allocated hundreds of millions of Euros to Inkef Capital. The lack of specialist capital in the region means that there are opportunities that could have grown to become something, but don't.

On the whole, would you say the investment climate in the life sciences in Medicon Valley is progressing, maintaining the status quo or regressing, and why?

– The investment climate is progressing. We're seeing some very impressive rounds with international venture fund participation. Adcendo, IO Biotech and

Galecto Biotech are just a few examples where you can see good syndicates with American investors in particular, who have caught sight of the region's potentials, and that is positive. So, syndicates where international investors are involved is one trend. I firmly believe that specialist investors mean unexploited potential; a syndicate with international capital typically requires a local anchor investor, and there are limits to how much funding can be given since there are so few local investors.

Another positive development is that the BioInnovation Institute has started with some really good tempos. I'm convinced that we'll see a marked strengthening of the ecosystem's possibilities to create viable and commercially interesting biotech companies in the years to come.



Stephan Christgau.

PHOTO: PRIVATE

EIR VENTURES

- **Headquarters:** Copenhagen and Stockholm
- **Eir Ventures was founded in 2020.** The investors Novo Holdings, the Danish Growth Fund, the Swedish state investment company Saminvest and European Investment Fund (EIF) have invested a total of €76mn in the fund. In the future, Eir Ventures aims to have 12–14 companies in its portfolio.
- **Number of life science companies in portfolio:** 4
- **Geographic distribution of investments between Denmark, Sweden and other countries:** Two-thirds of the investments are in Scandinavia, primarily Denmark and Sweden; the remainder are in Europe and the USA.
- **Most recent Eir Ventures-investments in Medicon Valley:** IO Biotech, Synklino and Galecto Biotech; all in Copenhagen. Eir Ventures has also invested in the Swedish Sortina Pharma in Gothenburg.

NOVO SEEDS: THERE HAVE BEEN 3-4 YEARS OF STEP CHANGE

As managing partner of Novo Seeds Søren Møller sees it, the life science ecosystem in Medicon Valley has matured, and foreign investors' interest is significant. International recruitment to Medicon Valley is thus important for the investment climate.

What are your thoughts on how the funding of life science startups in Medicon Valley is developing?

– We are very optimistic. I think there has been a step change over the past 3-4 years. While early companies with local investors have been typical for Scandinavia, we've put energy into syndicating investments in companies internationally. Companies like Galecto Biotech, IO Biotech and MinervaX have attracted strong international investors, and the attention on Scandinavia has increased. Professional investors from abroad are very interested in the funding rounds we're working on now. The reason is that we've gotten better. Our ecosystem has matured. Investors have built networks. The innovators know which inventions are high-quality enough to be the core of a company. Management has gained experience from an earlier company or two. And we've been able to internationalise our boards and management teams. We prefer it if a Danish biotech company is not made up of only Danes, but that it has the right people in a global sense, and we've built the networks to attract people.

What trends do you see affecting investment in Medicon Valley?

– The ecosystem has grown, it's bigger and there are more companies to choose from. Good companies raise a lot of funding, and the stock market in Sweden has been good for supporting companies that can develop on that path.

On the whole, would you say the investment climate in the life sciences in Medicon Valley is progressing, maintaining the status quo or regressing, and why?

– The investment climate is definitely progressing. But we need to prioritise international recruitment highly, and the framework conditions need to be such that the international community wants to come to Medicon Valley and work with us. It isn't certain that all of the experts on a particular disease are in Sweden and Denmark, and since the competition is global, you have to be able to access that from a global perspective.



PHOTO: NOVO SEEDS

"It isn't certain that all of the experts on a particular disease are in Sweden or Denmark, and since the competition is global, you have to be able to access that from a global perspective."

NOVO SEEDS

- **Headquarters:** Copenhagen
- **Novo Seeds was founded in 2007.** Novo Seeds is one of four main investment areas in Novo Holdings: Principal Investments (largest investments), Novo Ventures (venture companies), Novo Growth (companies between principal and ventures) and Novo Seeds (startups). Novo Holdings is a majority shareholder in Novo Nordisk and Novozymes and is wholly owned by the Novo Nordisk Foundation.
- **Number of life science companies in Novo Seeds' portfolio:** 25
- **Geographic distribution of investments between Denmark, Sweden and other companies:** Around half of the investments are in Denmark, and one-third of the portfolio companies are Swedish.
- **Most recent Novo Seeds investments in Medicon Valley:** Adcendo, Muna Therapeutics, Hemab and Chromologics, all in Copenhagen

HEALTHCAP: THE CLUSTER FACTOR IS IMPORTANT WHEN WE'RE TALKING LIFE SCIENCE INVESTMENTS

Björn Odlander, co-founder and partner of the Swedish company HealthCap, believes that what makes the investment climate in Medicon Valley strong is the cluster's combination of large- and small companies and its proximity to universities. Physical incubation locations and the Novo Nordisk Foundation are important players.

What are your thoughts on how the funding of life science startups in Medicon Valley is developing?

– Life science is a global sector, and like all clusters, Medicon Valley has to be competitively strong to attract international capital. An illustration of this is e.g. that Adcendo recently attracted investments from Spain, the USA, Sweden and Denmark; Adcendo and many other companies benefit from the Øresund Region being an interesting region at the forefront of life science research. And Medicon Valley is home to small- and large companies and academia, so it's a good platform for medical business activities. Right now, the investment market is strong in general, and the life science industry around the world is reaping the benefits of a strong investment climate. Attracting private venture investors is doable, and so is going to the stock exchange and listing your company, so the funding climate is good, and that's true for Medicon Valley as well. The cluster factor is incredibly important when we're talking life science investments. There needs to be a proximity to universities, large companies – then smaller companies can grow and thrive in that environment and recruit good people.

What trends do you see affecting investment in Medicon Valley?

– The trend is that the Medicon Valley-cluster has gotten stronger over the past decade in spite of

AstraZeneca's and Gambro's cutbacks, and there are two factors that play a role there: Novo Nordisk's fantastic progress and their approach and the willingness to invest via the Novo Nordisk Foundation. It's an important motor for the region. And another is Medicon Village's efforts in Lund and the BioInnovation Institute in Copenhagen; physical meeting places have been created where entrepreneurs can develop ideas and grow together. That makes it easier to make the next investment, and then the next one after that, so the access to strong expertise is increased.

On the whole, would you say the investment climate in the life sciences in Medicon Valley is progressing, maintaining the status quo or regressing, and why?

– There are very strong equity markets for the life sciences today, and they also benefit Medicon Valley. The corresponding ecosystem has developed, and there is a lot of capital; because of this, the investment climate is good right now, and there is every reason to believe that the cluster can continue its strong development.



PHOTO: HEALTHCAP - DAN COLEMAN

HEALTHCAP

- **Headquarters:** Stockholm
- **HealthCap was founded in 1996.** HealthCap has invested more than €1bn in more than 100 companies. More than 40 medical device products have reached the market with funding from HealthCap over the years, and over 20 pharmaceutical companies have achieved market approval with their products.
- **Geographic distribution of investments between Denmark, Sweden and other countries:** HealthCap

makes no division between Denmark and Sweden but treats Scandinavia as a single, integrated region. HealthCap invests between 35-40% of its capital in Scandinavia; the rest is divided evenly between Europe and the USA.

- **Number of life science companies in portfolio:** ca 25
- **Most recent HealthCap-investments in Medicon Valley:** Adcendo in Copenhagen

SUNSTONE: GENERAL ACCESS TO CAPITAL HAS IMPROVED, BUT DIFFERENCES IN FUNDING BETWEEN DENMARK AND SWEDEN HAVE GROWN

According to chairperson and co-founder of the Danish-Swedish Sunstone Life Science Ventures Peter Benson, the region's investment climate is improving; more capital is being raised, and interest from abroad has increased, especially in Denmark. A decrease in biotech's total market value on the Swedish exchange could mean economic challenges for Swedish startups, whilst Danish life science startups benefit from new initiatives and more foundations.

What are your thoughts on how the funding of life science startups in Medicon Valley is developing?

– There are certain differences between the Swedish and the Danish sides. Generally speaking, we have had better access to capital in the Øresund Region as a whole for the past few years. Historically, listing has been easier on the Swedish side, and that remains unchanged for the moment. That aspect is not nearly as good in Denmark, but access to venture capital in Denmark has improved in general over the past couple of years. That goes for everything from early startups, where initiatives like BioInnovation Institute and others have improved the opportunities for startups to get early-phase funding. In that respect there's a big difference between Denmark and Sweden – bigger than ever before, I would say. Getting venture capital for startups isn't as easy on the Swedish side, but a good option for businesses in Sweden has been seeking capital on the stock exchange. That isn't necessarily the situation now. I believe we're heading for a change in the near or intermediate future in terms of possibilities to locate capital for startups via the stock exchange. That will make it more difficult to list new companies in Sweden in the future. On the other hand it can create opportunities for investors to make new structures and merge companies into stronger entities.

What trends do you see affecting investment in Medicon Valley?

– Larger investment rounds are one trend, especially on the Danish side. International investors have been involved in more rounds, which means that more capital has been raised. The access to venture capital in Europe is greater and easier than previously; this is good news for people who are starting up and developing life science businesses. This isn't true to the same extent in Sweden, so there is still a tendency in Sweden to seek funding from the capital market; this is likely because there aren't as many alternatives – there are a larger number of life science investors in Denmark than in Sweden. One might ask oneself why foreign funds seek

out Denmark more than Sweden – but the historic access to syndication partners definitely plays a role.

On the whole, would you say the investment climate in the life sciences in Medicon Valley is progressing, maintaining the status quo or regressing, and why?

– The investment climate is improving. In general, there is more access to capital, and there is more competition for investments, especially in Denmark. I haven't seen investment rounds this large since 2001; there is more money in circulation in general in Eu-

SUNSTONE LIFE SCIENCE VENTURES

- **Headquarters:** Copenhagen
- **Sunstone was founded in 2007.** Since then, the venture capital fund has invested in more than 45 life science companies. Sunstone collaborates with the Danish investment company Novo Holdings, among others. In 2019, Sunstone established a new fund, Sunstone Life Science Ventures Fund IV, the goal of which is to invest more broadly in European biotech. The fund has around €500mn under management.
- **Geographic distribution of investments between Denmark, Sweden and other countries:** Sunstone does not have targets for how much of their investments should be placed in Denmark and Sweden, but expects it to be around half. Sunstone considers Sweden and Denmark its domestic market. The rest is distributed elsewhere in Scandinavia and Europe.
- **Number of life science companies in portfolio:** 16
- **Most recent Sunstone investments in Medicon Valley:** Sunstone has investments in e.g. Alligator Bioscience, Ascelia Pharma, Cantargia, IO Biotech and Minervax, and has re-financed several of the investments over the past 12 months.

rope. If we look at the stock market, we see very high valuations in Sweden. According to Dagens Industri, the Swedish stock market has never been valued higher relative to the GDP. In 2021 however, we've seen a decrease in the total market value for biotech companies, so there has been a correction in 2021 following 2020, which was more favourable and where a lot of businesses saw a major value increase. A large number of small companies go public in Sweden compared to other European countries, and that's in part because seeking capital has been easy and because there has been an increase in value. It is difficult to say whether the 2021 correction is temporary or permanent, but if the asset class re-allocation continues it will present

greater challenges for small companies trying to locate new capital. Many of them need refinancing, and I think finding new capital will be harder in the next 12-24 months.



PHOTO: NEWS ØRESUND

10 companies in Medicon Valley with an Øresund link: Good seed-funding opportunities

Øresundsinstituttet asked ten Medicon Valley life science companies with Danish-Swedish ownership to share their thoughts on the access to venture capital for new life science startups in Medicon Valley. The general consensus is that the funding opportunities are good, and some point out that there have been improvements in recent years. However, the conditions for accessing funds differ for life science companies depending on whether they are active on the Danish or Swedish side of the Øresund.

There are a number of life science companies in Medicon Valley with Danish-Swedish links in terms of their ownership structure, upper management and where they were founded; their research may have started in Denmark for example, and the ensuing Danish company then went public in Sweden. In other cases, research started in Lund and was developed further in Copenhagen, or a company in Skåne received venture capital from a private equity company in Copenhagen.

The ten companies interviewed by Øresundsinstituttet about the access to risk capital were chosen on the basis of their ownership structure, with both Danish and Swedish owners, and because they are currently or were formerly part of a science park- and incubation environment in Medicon Valley.

A consistent feature in all of the companies' responses is that the Swedish and Danish life science companies were largely positive regarding the funding opportunities and access to capital for life science startups in the region. A newly founded life science company with good, high quality projects will generally be able to secure funding for further development, they say. Many highlight the establishment of BioInnovation Institute in Copenhagen as

important for seed-funding in the region.

There may be provisional variations when it comes to where the first funds come from for a budding life science startup. The individual histories of the companies' selected is a testament to the fact that start capital can come from many different places: private equity companies, commercial foundations, institutional investors, public innovation actors, angel investors and the founders themselves.

Going public may be an option for early- or later-stage funding – particularly for Swedish companies, but also for some Danish companies; since 2014, a total of 13 have chosen to list in Sweden – read more on page 113. Going via the stock market is a more obvious path in Sweden due to historical differences in investment culture and lower share taxation on private investors, but also because there is more limited access to venture capital in Sweden, making listing in Stockholm on e.g. Nasdaq First North or Spotlight a more convenient, and necessary, way to access funding. In Denmark however, the chances of accessing venture capital are better because of foundations such as Novo Nordisk Foundation, Lundbeck Foundation and LEO Foundation.

Danish Novo Seeds and Swedish HealthCap part of the biggest series A investment in Danish biotech history

ADCENDO: VENTURE CAPITAL IS THERE FOR THE RIGHT PROJECT

The Danish biotech company was founded in 2017 as a spin-out from the University of Copenhagen and Rigshospitalet and is now based at COBIS in Copenhagen. The first investment was a pre-seed grant from the Novo Nordisk Foundation. In April 2021, the company raised the biggest series A investment ever seen in Danish biotech history: €51mn came from Novo Seeds, Spanish Ysios Capital, American RA Capital Management, Swedish HealthCap, Dutch Gilde Healthcare and Danish BioInnovation Institute. Together with the founders, the new investors now own all of the company's shares. A series A investment refers to a company's first significant round of venture capital financing from established capital funds following a startup-capital period.



PHOTO: ADCENDO

– Based on my own experience, venture capital is definitely there if you have the right project. A biotech company needs to have good scientific results in an area where there's a clear unmet medical need; if you have that and establish a case with a good research and clinical development plan that has a good chance of getting FDA/EMA approval and commercial success, investors will be ready to invest. So, the money is there. Competition for investors' favour is stiff, and of course there's a se-

lection process, so it's important to be well prepared and have a complete business case. In the past I secured venture capital funds for the company Santaris Pharma, which was sold to Roche in 2014. An alternate route for projects that are somewhat more developed may be to secure funding via Spotlight- or the First North-exchange. I've also done that with two other companies: SynAct and RhoVac, says **Henrik Stage**, CEO of Adcendo.

From startup at Malmö's Medeon Science Park to American expansion

ASCELIA PHARMA: OPPORTUNITIES TO RAISE CAPITAL HAVE IMPROVED SIGNIFICANTLY

Biotech company founded in 2000 with headquarters in Malmö and an office in New Jersey, USA. The company was previously based at Medeon Science Park in Malmö and was listed on Nasdaq Sweden in 2019. Ascelia Pharma has a number of Danish employees and a Danish CEO and focuses on orphan oncology treatments with two drug candidates. The company's first sources of investment were Øresund Healthcare Capital K/S and the investment company Malmöhus Invest AB. Copenhagen-based Sunstone Capital, Øresund Healthcare, Fourth Swedish National Pension Fund, Swedish Handelsbanken Funds and Swedish HealthInvest Partners are now the main investors in Ascelia Pharma.



PHOTO: ASCELIA PHARMA

– Opportunities for promising life science companies in Medicon Valley to raise capital have improved significantly in recent years, in my opinion. Venture capital investment firms have grown larger and more active, and non-Nordic funds have become more active in the region; together they are perhaps the most important source of funding for many life

science companies in the early startup phase. The stock exchange works very well, particularly on the Swedish side, and it supports continued growth and expansion for companies that are further along in their development, says **Magnus Corfitzen**, CEO of Ascelia Pharma.

WHAT ARE YOUR THOUGHTS ON THE ACCESS TO VENTURE CAPITAL FOR NEW LIFE SCIENCE STARTUPS IN MEDICON VALLEY?

Research from Lund funded by Danish private equity company for almost ten years

CANTARGIA: SHORTAGE OF PROFESSIONAL LIFE SCIENCE INVESTORS

Swedish biotech company, founded in 2009 to refine a research discovery made at Lund University. Cantargia is located in Lund, formerly at Medicon Village and specialises in the development of drugs against cancer diseases as well as lung cancer and autoimmune diseases. The company was listed on Nasdaq First North in Stockholm in 2015 and has since moved to the Mid Cap segment on the Nasdaq exchange. The first large investment in Cantargia was made by LU Bio (Lund University Bioscience AB), which was a consortium of investors who created a fund with Lund University's innovation system. LU Bio was the company's largest shareholder until 2018. Today, Cantargia's main investors include Swedbank and the Swedish pension funds First and Fourth National Pension Funds (AP1 & AP4), Swedish Alecta Pensionsförsäkring and Swiss Six Sis AG. The Copenhagen-based venture capital fund Sunstone Capital has also been a shareholder since 2013. Until 2020, Sunstone was Cantargia's largest investor.



PHOTO: CANTARGIA

– There is start capital to be had via the stock exchange, if that's the route one chooses, and there are certainly business angels who are prepared to invest. But what is really in shortage is smart money; that is, investors with competence in the life

sciences who can go in and maybe be a member of the board and help the company. It's a question of combining money and expertise, and there is more of that to be desired, says **Göran Forsberg**, CEO of Cantargia.

Danish and Swedish primary investors behind spin-out from Rigshospitalet and the University of Copenhagen

FLUOGUIDE: ACCESS TO CAPITAL IS FINE

Biotech company founded in 2018 after taking over a patent from Rigshospitalet and the University of Copenhagen. FluoGuide is based at COBIS in Copenhagen, where they work with intelligent surgical targeting by illuminating cancer cells intraoperatively. FluoGuide was listed on Spotlight Stock Market in Copenhagen in 2019, but in 2021 the company moved to Nasdaq's First North exchange in Sweden. The company's first investments sources were the foundations that are now FluoGuide's main investors. In addition, there were contributions from 9 500 shareholders, as well as Danish Arbejdernes Landsbank and Swedish Linc AB as institutional investors.



PHOTO: FLUOGUIDE

– Overall, the balance is good, and the access is fine. There is enough capital to realise good projects and take advantage of the potentially good projects. Too much capital can lead to too many projects, and then there's a risk of compromising

the quality of projects or companies. If there is too little capital, there is no funding for good projects. Nonetheless, there are still quite a few framework conditions that could use improvement, says **Morten Albrechtsen**, CEO of FluoGuide.

WHAT ARE YOUR THOUGHTS ON THE ACCESS TO VENTURE CAPITAL FOR NEW LIFE SCIENCE STARTUPS IN MEDICON VALLEY?

From research in Lund to headquarters in Copenhagen and an IPO in the USA

GALECTO BIOTECH: ACCESS TO CAPITAL IS GOOD IN GENERAL, BUT SUBSTANTIAL FINANCING IS DIFFICULT

Biotech company founded in 2011 based on research at Lund University. The company is located at COBIS in Copenhagen and was listed on Nasdaq in the USA in 2020, as one of few life science companies from Medicon Valley. Novo Seed (today Novo Holdings) was the first investment source. Novo Holdings is still among the major investors in Galecto Biotech, along with the American venture capital firm OrbiMed, Copenhagen based Sunstone Capital and the new Scandinavia venture firm Eir Ventures, which chose Galecto Biotech as the first company for its investment portfolio.



PHOTO: GALECTO - HENRIETTE DAN BONDE

– The access is good in general for very early companies, and Denmark also has a relatively higher number of active venture capital investors than most other European countries. Substantial financing remains difficult however, and listings in

particular, because of the unfavourable climate for investors. Compared to other countries around us, Denmark lacks a coordinated strategy for helping companies with active research, says **Hans Schambye**, CEO of Galecto Biotech.

Research in Lund funded by Danish foundations like Novo Holdings and Sunstone

MINERVAX: LARGE AMOUNTS OF CAPITAL RAISED IN THE REGION HAVE INCREASED INVESTORS' FOCUS

Biotech company founded in 2010 based on research at Lund University. Today, the company has offices at COBIS in Copenhagen and a research lab in Lund and is currently expanding its team in Lund so R&D will take place on both sides of the Øresund. Danish Seed Capital was the first source of investment for MinervaX, and today the largest investors in the privately owned MinervaX are Novo Holdings, Sunstone Capital, German Wellington Partners, French-American Sanofi Ventures, American Advent Capital and Swedish Industrifonden.



PHOTO: MINERVAX

– It has improved significantly in the past few years. Very large amounts of capital have been raised for some of the more firmly established biotech companies. While that doesn't cover startups, it does mean that Denmark has come into focus and more investors are looking this way. There is a lot of attention on Danish biotech. And then there has

been an important trend of companies listing in Sweden and raising capital that way. So, it looks like a window to the stock exchange has opened in both Sweden and the USA. That helps people believe in making early investments. BII has done a great service in that respect, says **Per Fischer**, CEO of MinervaX.

Swedish Almi Invest supported Danish CEO in Malmö

PILA PHARMA: SWEDISH ACTORS GIVE BETTER FUNDING OPPORTUNITIES IN THE STARTUP PHASE; DANISH ACTORS GIVE BETTER FUNDING OPPORTUNITIES IN THE SCALEUP PHASE

Biotech company founded in 2014 on the basis of Dorte X Gram's research at Novo Nordisk in Denmark. The Malmö-based company is developing an oral anti-diabetic agent for Type-2 diabetes. PILA PHARMA was previously part of Medeon Science Park, also in Malmö. In 2015, the Swedish national investment fund Almi Invest became the company's first investor. Today, PILA PHARMA'S largest investors include the founder, Almi Invest, Almi Invest Syd – which is a specific fund for Skåne – and Finnish Vimpu Intressenter. Private individuals such as Swede Sebastian Clausen and the Danish biotech profile and co-founder of Saniona and Symphogen Thomas Feldthus are also investors.



PHOTO: PILA PHARMA - JENNY LEYMAN

– During the startup phase, the resources in Sweden are better through Almi Invest and business angels. In the scaleup phase, the venture opportunities are better in Denmark, but the market climate is better and more active in Sweden.

One still needs to work hard for one's money, and nothing is free, although it does get easier farther along, when one is de-risked and known among investors, says **Dorte X Gram**, CEO of PILA PHARMA.

Danish spin-out from the University of Copenhagen continuing to develop in Lund

RHOVAC: THE COMBINATION OF KNOW-HOW AND ACCESS TO CAPITAL MAKES FERTILE SOIL FOR LIFE SCIENCE IN MEDICON VALLEY

Originally founded in 2007 as a private Danish company based on research from the University of Copenhagen, the biotech company RhoVac was become established as a Swedish company with offices at Medicon Village in Lund in 2015 and was listed on Spotlight Stock Market in Sweden in 2016. RhoVac is dedicated to immuno-oncology, and its founders, Anders Ljungqvist and Per Thor Straten, were the first source of investment. Other early investment sources included Ventac Partners and the European Innovation Council (EIC) through the Horizon 2020 programme. Today, Swedish M2 Asset Management, Swedish Nordic Cross, RQ Solutions, Ventac/UBS and the Swedish insurance company Avanza Pension are among the major investors.



PHOTO: RHOVAC

– Scandinavia has a very special 'culture' as regards the possibility to access the stock market in early phases and with modest capital raising, through Spotlight Stock Market and Nasdaq First North. Personally, I think this is a good solution. For the investor who can spread the risk over a portfolio of companies, it can still be lucrative in relation to the often digital outcome possibilities of early biotech companies, and the stock market allows for many

small stakes in a portfolio of companies, so that the risk/reward can be balanced. In addition, with its cluster encompassing both big and medium-sized pharma plus biotech, there is no shortage of know-how in the Medicon Valley region. The combination of access to capital and know-how makes for fertile soil for life science in this region, says **Anders Månsson**, CEO of RhoVac.

WHAT ARE YOUR THOUGHTS ON THE ACCESS TO VENTURE CAPITAL FOR NEW LIFE SCIENCE STARTUPS IN MEDICON VALLEY?

Listed company in Sweden developing new cancer treatment at Symbion in Copenhagen

SCANDION ONCOLOGY: GOOD SEED-FUNDING OPPORTUNITIES, BUT DENMARK NEEDS BETTER IPOs

Biotech company founded in 2017 on the basis of research in another Danish biotech company, Saniona. Both companies are listed on Nasdaq in Sweden, where Scandion Oncology went public in 2018. The company's offices are at Symbion in Copenhagen. Scandion Oncology is developing a cancer treatment that can better target chemotherapy resistance mechanisms. Saniona and the founders Jan Stenvang and Nils Brünner, the latter of whom is on the board of Lund University's Faculty of Medicine, were the first to invest in Scandion Oncology, along with other private investors. Along with Danish Formue Nord A/S and Dutch Nyenburger Capital, the founders are among the company's largest shareholders today.



PHOTO: SCANDIAN ONCOLOGY

– There are a number of good seed-funding opportunities, including strong evergreen funds and venture funds. More international presence is important for

attracting investors from abroad. There's also a need for better IPO opportunities in Denmark, says **Bo Rode Hansen**, CEO of Scandion Oncology.

Spin-out company from the University of Copenhagen receives funding from new Danish-Swedish venture fund

SYNKLINO: GOOD OPPORTUNITIES FOR RESOURCES FROM INNOVATION FUND AND THE DANISH GROWTH FUND

Biotech company founded in 2017 as a spin-out from research at the University of Copenhagen. Synklino has locations at COBIS in Copenhagen and elsewhere and is developing an antiviral drug for protect transplant patients with CMV infections. Privately-owned Synklino was part of BioInnovation Institute, which granted the company a convertible, 10mn DKK loan. Danish Innovation Fund and private investors were the first to invest in the company. The Danish Growth Fund and the Scandinavian venture fund Eir Ventures later invested. The primary owners remain the founders and the early private investor.



PHOTO: SYNKLINO

– I feel that the conditions are steadily improving. The possibilities for access to early capital are plentiful thanks to BII and others; BII has become a crucial player. As I see it, there are also good opportunities for resources from Innovation Fund and the Danish Growth Fund. In addition, there are funds such as e.g. Eir Ventures; we received funding from them the first time around. So, I believe that there are some excellent possibilities to get started.

We're getting ready for a funding round that will take us well into the development phase, which will change the discussion somewhat. The next move is difficult and it's a huge task, but it's still possible to tap into Eir Ventures, Sunstone, Lundbeck Emerge and Novo Seeds. But one can always look to other geographies than Medicon Valley to raise capital, says **Thomas Kledal**, CEO of Synklino.

ABOUT THIS REPORT AND THE METHODOLOGY

This is the second report for the EU-funded Greater Copenhagen Life Science Analysis Initiative project, led by Øresundsinstituttet and Medicon Valley Alliance from 2019-2022. The analysis has been prepared by Øresundsinstituttet.

The first report, Life Science in Skåne, provided a survey of the size of the life science sector in Skåne and its employment development, expertise needs and more. The report in hand focuses on identifying the strengths, links and structural similarities and differences in the life science sectors across the Øresund in the Danish-Swedish Medicon Valley cluster. The report was prepared between the winter of 2020 and the early summer of 2021.

The qualitative material in the report is comprehensive and comprises 53 interviews with Danish and Swedish interviewees from the sector who are engaged in the life sciences in the Øresund Region in a variety of ways. Øresundsinstituttet has focused on representing a broad range of people from the sector in the report, from companies, organisations, universities and financial actors, to capture as many sector links over the Øresund as possible. Interviews were conducted via telephone, e-mail and Microsoft Teams between January 2021 and June 2021.

The quantitative material in the report is based on statistics acquired from SCB/Statistics Sweden and DST/Statistics Denmark. Stock market data from Nasdaq and Spotlight Stock Market were also utilised, for example for Chapter 5. Quantitative data was also accessed via personal research and direct contact with the companies in question, both in Zealand and Skåne, for example for Chapters 1 and 2. To determine commuter numbers for Chapter 1, Øresundsinstituttet personally contacted the companies for data. Figures for the number of border commuters from Denmark and Skåne are based on comprehensive telephone- and email contact with the majority of Skåne's life science companies in 2020 that included enquiries into the number of border commuters on company staff. The data was utilised in the report Life Science in Skåne; as mentioned earlier, that was the first report for this project, and it was published in November 2020.

In order to survey the number of border commuters from Skåne/Sweden to Denmark, Øresundsinstituttet first selected 50 of the largest Danish life science companies in Zealand. The selection was made in part as a delineation and is in part based on industrial codes used by the Confederation of Danish Industry and Vinnova to determine the core segment of the life science sector – see below. Data from Statistics Denmark was then utilised and the number of employees was ranked in order to create a list of the 50 largest companies; Øresundsinstituttet contacted these companies between January and May 2021. Some smaller companies that could feasibly have numerous Swedish employees were also contacted. Approximately 30 companies in Zealand provided figures regarding border commuters.

- 2660 Manufacture of irradiation, electromedical and electrotherapeutical equipment (26.60.10 and 26.60.90)
- 3250 Manufacture of medical and dental instruments and supplies
- 2120 Manufacture of pharmaceutical preparations

- 2110 Manufacture of basic pharmaceutical products
- 4646 Wholesale trade of pharmaceutical goods (contains 46.46.10 and 46.46.20)
- 7211 Research and experimental development on biotechnology
- 7219 Other research and experimental development on natural sciences and engineering

Figures for the number of researchers and students have been provided by the universities themselves. All figures are headcounts and from 2019 unless otherwise noted.

University of Copenhagen. Number of doctoral students at departments and centres with life science activities.

Lund University. Figures from 2020. The numbers apply to the total number of researchers at the Faculty of Medicine, and a number of researchers at the Faculty of Science and the following departments at the Faculty of Engineering: Institutionen för immunteknologi, the Department of Biomedical Engineering and Chemical Engineering. There are also researchers in the life sciences at the Department of Computer Science, the Department of Transport & Roads and the Department of Technology and Society at Lund University's Faculty of Engineering.

Technical University of Denmark (DTU). The information is for the total number of researchers at the following departments: DTU Food, DTU Vet and Centre for Diagnostics, DTU Aqua, DTU Biosustain, DTU Bioinformatics, DTU Bioengineering, DTU Chemical Engineering, DTU Environment and DTU Nutech, and an equivalent selection of students for the academic year 2019/20. Research in the life sciences was also performed at DTU Chemistry, DTU Electrical Engineering, DTU Nanotech, DTU Mechanical Engineering, and DTU Compute.

The Swedish University of Agricultural Sciences in Alnarp. The number of students includes those from Horticultural Science, Landscape Engineering, Agronomics, Plant Biology for Sustainable Production, Agroecology, Lantmästare and Outdoor Environments for Health and Well-being for the academic year 2019/20.

Malmö University. Life science students: full-time equivalents. Includes students of Dentistry, Oral hygiene, Dental technician studies, Welfare work, Social work and related, Nursing – Care, Specialist nursing, Biomedical analysis and related, and independent courses.

Kristianstad University. Number of students for autumn 2019. This includes nursing and specialist nursing programmes, the Public Health and Education Programme, the Biomedical Analyst programme, the Gastronomy programme and Integrated Health Science

Aalborg University in Copenhagen. Figures from 2020. Data on professors includes associate- and assistant professors. All students study Sustainable Biotechnology

Copenhagen Business School. Figures from 2020. Includes students from MSc Business Administration and Bioentrepreneurship and MSc Business Administration and Innovation in Health Care.

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- Websites of science parks and incubators: ideon.se, mediconvillage.se, medeon.se, smileincubator.life.krinova.se, innovation.lu.se, bii.dk
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- In addition, we received data via email and telephone from companies, municipalities, trade organisations, regions, universities and other players

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- Morten Albrechtsen**, CEO, FluoGuide, telephone, 4. May 2021
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- Kim Kjølner**, Chairman, Danish Life Science Cluster, telephone, 6. May 2021
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- Stephan Christgau**, Co-founder and Partner, Eir Ventures, telephone, 10. May 2021
- Björn Odlander**, Founder and Managing Partner, HealthCap, digital meeting, 11. May 2021
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- Anne Lis Englund**, Head of the fertility clinic at Zealand University Hospital, telephone, 10. June 2021
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Greater Copenhagen LIFE SCIENCE analysis initiative

GREATER COPENHAGEN LIFE SCIENCE ANALYSIS INITIATIVE is an EU-project aimed at increasing knowledge about the region's life science cluster Medicon Valley. The focus is on the demand for labourers, future expertise needs, and more. The project has received funding through the EU-programme Interreg Øresund-Kattegat-Skagerrak and will continue until 30 June 2022. The project's lead partner is Medicon Valley Alliance, and the partner is Øresundsinstittet.

The primary objective of the GCLSA-project developed and managed jointly by the Danish-Swedish organizations Øresundsinstittet and Medicon Valley Alliance is to

- 1) analyze and increase knowledge about the need and demand for competencies and skills and
- 2) support the development of the integrated labor market in the Danish-Swedish life science cluster, Medicon Valley.

Furthermore, the project will establish a bi-national forum which can push this agenda on an ongoing basis thereby addressing an issue of crucial importance for growth and employment on both the Danish and the Swedish side of the Greater Copenhagen region.

Targeting national, regional and local Danish and Swedish policy makers and key opinion leaders from industry and academia, the analysis work and the deliberations of the established Competencies and Skills Forum aim to provide a more qualified point of departure for developing initiatives which

- increase awareness of the supply and demand of labor in the regional life science cluster and facilitate mobility on the bi-national regional life science labor market
- optimize relevant life science educations in Sweden and Denmark including a more coherent approach to the prioritization and distribution of resources for R&D and educational institutions specifically addressing the needs of the life science industry
- highlight the scientific, commercial and societal strongholds of the Medicon Valley region and market the general attractiveness of the region as a first-class destination for both talent and business.
- investigate which factors are decisive when life science companies in the region successfully develop and expand
- provide national and regional stakeholders working with labor market life science related issues a common statistic point of departure and methodology
- help to eliminate obstacles to the free movement of labor (commuting) between Sweden and Denmark

In sum, the analysis work provided, and the forum established will not only help Medicon Valley prosper and grow scientifically, but also help finetune and fuel the growth engine created by public and private stakeholders during the last 20 years, which has helped Medicon Valley to firmly establish itself as the leading and most dynamic and vibrant life science cluster of the Nordics.

ØRESUNDSINSTITUTTET

Øi is an independent Danish-Swedish centre for analytics and information that brings together more than 100 actors from the industry, the public sector and academic institutions with the aim of strengthening knowledge about societal developments on both sides of the Øresund Strait. As a member of Øresundsinstittet, you become part of our strong Danish-Swedish network – and gain access to network meetings, facts, analyses and news about developments in the Greater Copenhagen region.
www.oresundsinstittet.org

MEDICON VALLEY ALLIANCE

MVA is a Gold Label-certified, non-profit member organisation in the Danish-Swedish life science cluster Medicon Valley. Its 300 members include universities, hospitals, human life science businesses, regional governments and service providers that represent the Region's 'double triple-helix'. The activities in MVA focus on strengthening collaborations for a vibrant life science ecosystem in Medicon Valley through networking events and increased collaboration across borders and sectors.
www.mva.org

THE VISION

The vision is to be a well-known and respected member-driven contributor to the realisation and positioning of Medicon Valley as the most competitive and vital life science cluster in Northern Europe.

THE MISSION

MVA is committed to realising Medicon Valley's potential by facilitating networking, knowledge-sharing, and collaboration, analysing challenges and potentials, and mobilising support from key opinion leaders.

CALL TO ACTION

Read more about the Danish-Swedish life science cluster organisation Medicon Valley Alliance's events and activities on www.mva.org, where you can also find more information about how YOUR company can benefit from a membership.



