

State of Medicon Valley 2022 edition

Celebrating 25 years in
Medicon Valley

November 2022



Photo: News Oresund - Johan Wessman

Foreword

The idea of Medicon Valley was ignited in the early 1990's due to the concentration of universities, hospitals and life science industry in the Øresund region in Southern Sweden and Eastern Denmark. In 1995, The Öresund Committee started working on the creating the foundation for a non-for-profit organisation which should be an anchor of cross-border cooperation between the universities, hospitals and life science companies in the Danish-Swedish Medicon Valley.

In 1997, Medicon Valley Academy was established backed by the regions, universities and life science companies and was initially also co-financed by the European Regional Development Fund under the INTERREG program. In 2007, it was renamed Medicon Valley Alliance - signalling the strong collaboration not only with academia but also with the life science industry.

Today in 2022, Medicon Valley Alliance with its 300+ members and numerous stakeholders is still based on its pillars of Danish-Swedish collaboration between universities, hospitals and life science companies with a mission to present, promote and strengthen the life science eco-system in Medicon Valley regionally, nationally and internationally.

This report will show that the vision of the Öresund Committee of a Medicon Valley and creation of a supporting cluster organisation has and will continue to leave its footprint on what now is becoming the strongest life science region in the European Union.

Anette Steenberg

CEO, Medicon Valley Alliance
November 2022

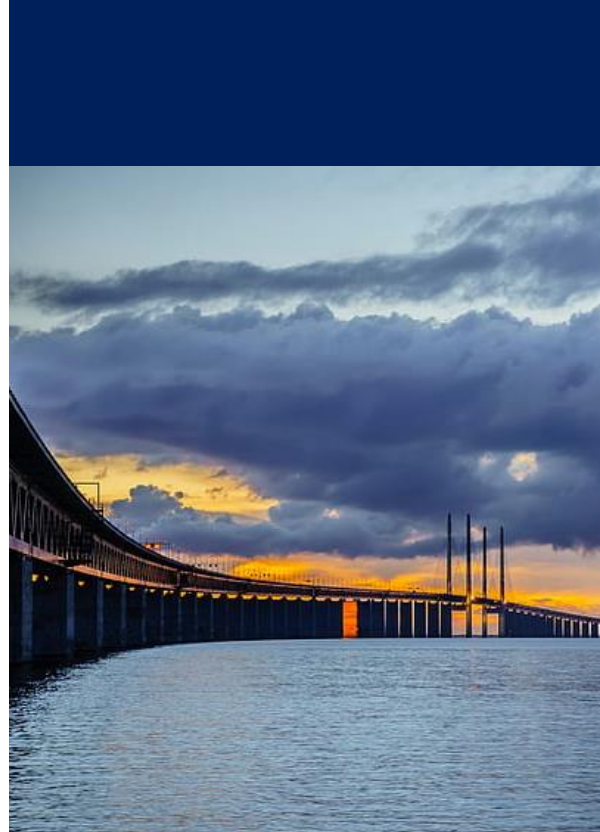


About the Report

This report is a special edition that focuses on the developments in Medicon Valley over the past 25 years. It also builds on the existing annual State of Medicon Valley series, and incorporates some new data for 2022.

The report was developed in collaboration with Öresundsinstitutet. Öresundsinstitutet was responsible for providing data and high-level analysis in the sections relating to exports and patents, as well as Medicon Valley beacons, science parks and life science employment. The information provided in the section on the Medicon Valley eco-system is based on a series of in-depth studies developed within the Greater Copenhagen Life Science Analysis project between 2019 and 2022. Medicon Valley Alliance conducted its own analysis for the section related to research activity and university performance in Medicon Valley.

Further details on the methodology can be found in the appendices.



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The Making of Medicon Valley Alliance

The Making of Medicon Valley Alliance

1997-2022

- Vision of the **Öresund Committee** in the early 1990's of a cross-border public-private life science cluster organisation nurturing the potential of creating a world-class life science eco-system in Eastern Denmark and Southern Sweden.
- **Medicon Valley Academy** – supported by **EU Interreg** 1997-1999
- Renamed **Medicon Valley Alliance** in 2007

Et Medicon Valley ved Øresund

af Heinz Andresen

Øresunds-regionen kan med sværget som danske Novo-Nordisk og Levens samt svenske Astra-Draco og Pharmacia blive et nyt "Medicon Valley".

Gennem et tæt samarbejde inden for medicinalindustrien og omkring uddannelse og forskning kan der

ter i Nordeuropa i konkurrence med bl.a. Hamburg, Berlin og Stockholm, fastslår Malmös borgmester Joakim Ollen i forbindelse med indvielsen af komiteens ny sekretariat i Holbergsgade i København. Bag Øresundskomiteen står de tre nordjyske amter og Københavns og Frederiksbergs kommune samt de skanske amter Malmohus og Kristianst.

Interreg



Medfinansieret af Den Europæiske Union

Øresund-Kattegat-Skagerrak

"Sund, sundare, Øresund"

Konferensrapport angående halsoskillnaderne mellan Danmark och Sverige

26-27 januari 2000 anordnades i Malmö den första vetenskapliga konferensen om halsoslag i Øresundsregionen med fokus på hals- och stjärtslagens roll i det förebyggande arbetet. Arrangör för konferensen var Medicon Valley Academy. Øresundsregionen definieras som ett område som omfattar hela Skåne och Köpenhamnsregionen (till och med väster om Roskilde och hela norra Själländ).

Totalt bor ca 3 miljoner människor i regionen.

Syftet med konferensen var att lägga grunden till nätverk mellan forskare och lärare vid universitet och högskolor, mellan ansvariga politiker och högre



Sammanfattat

- Den första vetenskapliga konferensen om halsoslag i Øresund anordnades i Malmö 26-27 januari 2000.
- Den maximala skillnaden i medellivslängd mellan Skånes och Köpenhamnsregionens olika kommuner och amter uppgår till 10 år för män och 7 år för kvinnor.
- Orsakerna till skillnaderna är högre dödlighet i cancer, kromat, kroniskt blodtryck och



Thelma Berger-Olofsson
Medicon Valley

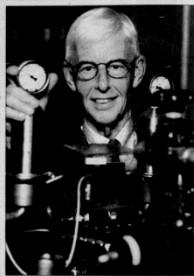


A Research Center for Health Sciences, Drug and Device Sciences, Health Education and Health Research



Øresundskomiteen

Medicon Valley i fokus



Medicon Valley är ett samarbetsprojekt mellan Danmark och Sverige som syftar till att skapa ett internationellt centrum för forskning och utveckling inom medicin och teknisk innovation. Projektet är finansierat av den Europeiska Unionen och de nordiska länderna. Det har som mål att stärka den vetenskapliga och tekniska kompetensen i regionen och att locka till internationella investeringar. Detta ska ske genom att skapa ett nätverk mellan forskare, företag och myndigheter. Projektet är ett exempel på samarbete mellan länder och regioner för att främja innovation och tillväxt.



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Adm. direktör U. Ball Hansen, Copenhagen Capacity. - Det är en stor nytta med ett så stort antal forskare och tekniska experter på Øresund. (Foto: Henrik Sørensen)

Ni investeringer i 1996

- Medicon Valley har investerat i 1996 i 100 projekter. De har en samlet værdi på 100 millioner kroner. De projekter, der er blevet gennemført, har en samlet værdi på 100 millioner kroner.
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København suger højteknologiske virksomheder til sig

Copenhagen Capacity gør dommedagspredikanten til skamme

I januar er der på et af de mest populære steder i København, nemlig på Øresund, en stor konference om højteknologiske virksomheder. Det er en konference, der er arrangeret af Copenhagen Capacity, som er en af de største virksomheder i Danmark. Konferencen er en del af et større projekt, som har som mål at tiltrække højteknologiske virksomheder til København. Dette sker ved at skabe et miljø, der er attraktivt for disse virksomheder. Dette indebærer bl.a. at skabe et netværk mellem virksomhederne og at tilbyde dem forskellige former for støtte og rådgivning.

Medicon Valley vil levere forskning i Nobelpris-klassen

Det ny dansk-svenske akademi skal udvikles til et europæisk kraftcenter på medico-området

Øresundskomiteen, vil i løbet af de næste år oprette et akademi for forskning i medicin og teknisk innovation. Akademiets formål er at skabe et miljø, der er attraktivt for forskere og tekniske eksperter. Dette sker ved at skabe et netværk mellem forskere og tekniske eksperter og at tilbyde dem forskellige former for støtte og rådgivning. Akademiets formål er at skabe et miljø, der er attraktivt for forskere og tekniske eksperter. Dette sker ved at skabe et netværk mellem forskere og tekniske eksperter og at tilbyde dem forskellige former for støtte og rådgivning.

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Den ny bestyrelse:

Den nye bestyrelse for Medicon Valley Academy, der præsenteres på et pressemøde i dag, inkluderer tre europaregjere i det nordtyske forskningsnetværk i Øresundskomiteen. Den nye bestyrelse består af tre europaregjere i det nordtyske forskningsnetværk i Øresundskomiteen. Den nye bestyrelse består af tre europaregjere i det nordtyske forskningsnetværk i Øresundskomiteen.

The Making of Medicon Valley Alliance

1997-2022



Medicon Valley Alliance

Medicon Valley Alliance 2022

- **300+ Swedish and Danish members;** universities, life science parks and incubators, regions, municipalities and life science companies.
- **Identifying, nurturing and strengthening strongholds** like: Oncology, Microbiome, MedTech, Stem Cell, Diabetes, etc through e.g. networks, conferences, events.
- **Facilitating “a meeting and market place”** for companies to share knowledge, find partners and/or customers.
- **Raising funds for regional research & development** stronghold projects
 - raised 34+ mil EUR alone in 2015-22 in EU funds excluding private and regional funds.
- **Promoting the region Medicon Valley** in the media and at international conferences thus supporting attracting life science conferences, talent and foreign direct investments and investors together with our partners.

The Making of Medicon Valley Alliance

1997-2022



Summary

Key Facts & Figures

1,150

companies

300

new Life Science companies have started in Medicon Valley over the past 5 years

20 to 37

beacons

(companies with 250+ regional employees) are based in Medicon Valley since 1997

5th & 10th

Place - Life Science export

per capita in 2021 for Denmark and Sweden respectively

15,000

Life Science researchers

are based in Medicon Valley's academic, clinical and research institutions

23,000

new jobs have been created by Medicon Valley beacons since 1997 -

Total of 65,500 jobs

7.3 x

higher turnover in 2021 compared to 1997 accumulated of the 10 largest Life Science companies in the Medicon Valley.

4,000 to 11,000

Life Science research publications have been published by Medicon Valley researchers in 1997 compared with 2021

67%

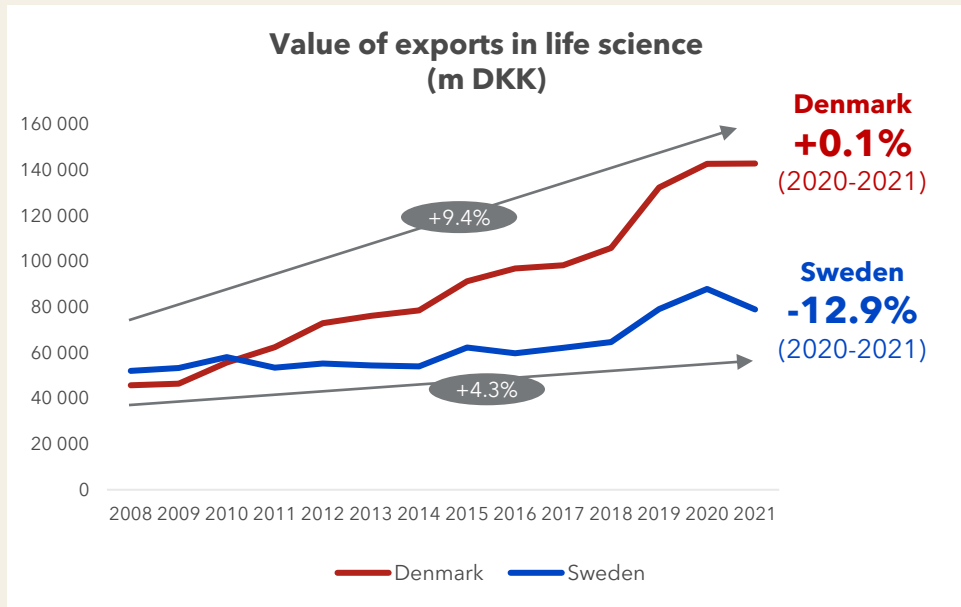
of all Danish and Swedish **Life Science patents are from Medicon Valley**- an increase of 41% from 2011

Exports and Patents in Denmark and Sweden



Life Science Exports in Denmark and Sweden

Danish life science exports were worth 143 bn DKK in 2021, while Swedish life science exports totaled 108 bn SEK. Life science exports comprised 18.2% and 6.6% of all exports in Denmark and Sweden respectively in 2021.



Figures are for medical and pharmaceutical products and medical instruments, apparatuses, etc.
Source: Statistics Denmark, SCB/Statistics Sweden, Riksbanken.

Global ranking in terms of life science exports per capita in 2021



5th place in 2020
(3 731 USD per capita)



10th place in 2020
(1 299 USD per capita)

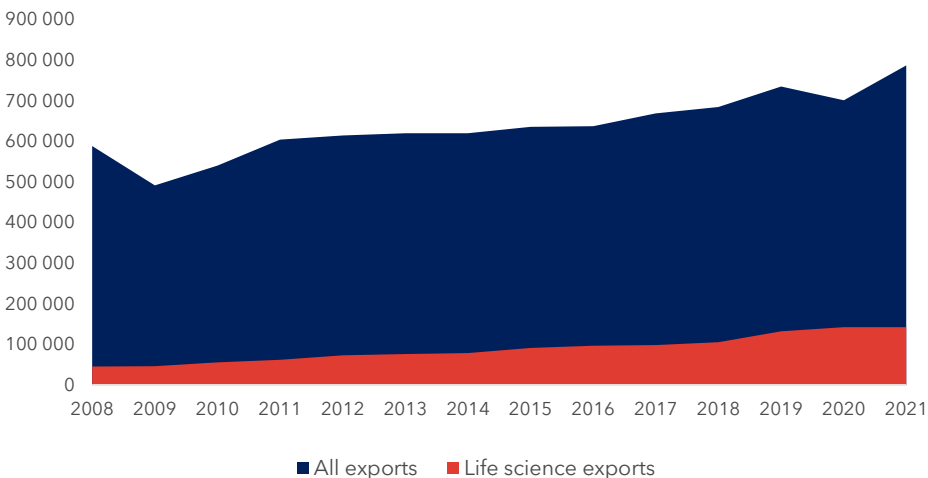
Source: UN Comtrade Database, World Bank and Danmarks Nationalbank.

Life Science Exports as a Proportion of all Exports

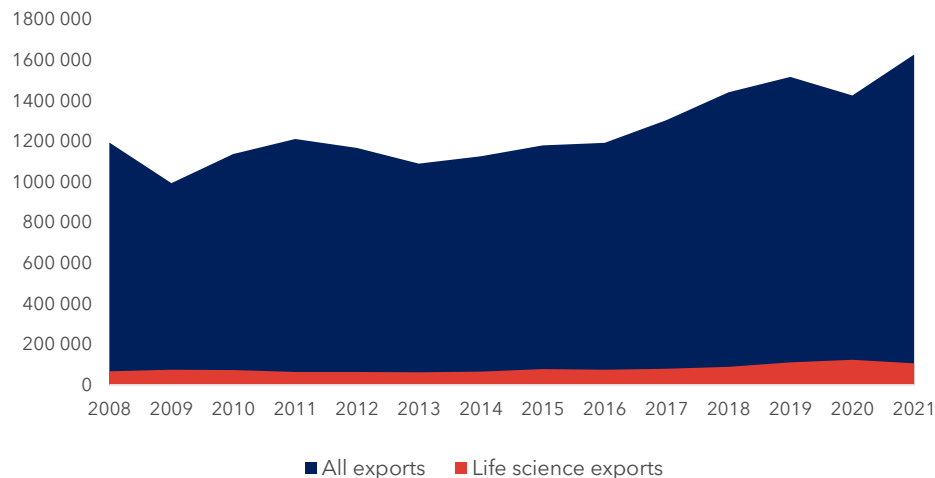
Life Science exports have more than doubled (128,5%) over the last 10 years in Denmark (2011-2021), where the Danish total export has increased 30% in the same time period.

In Sweden, life science exports has increased 66% the last decade (2011-2021), which again is a significant higher increase compared to the Swedish total export which had an increasement of 34% within the same time period.

**Life science exports versus total exports
in Denmark (m DKK)**



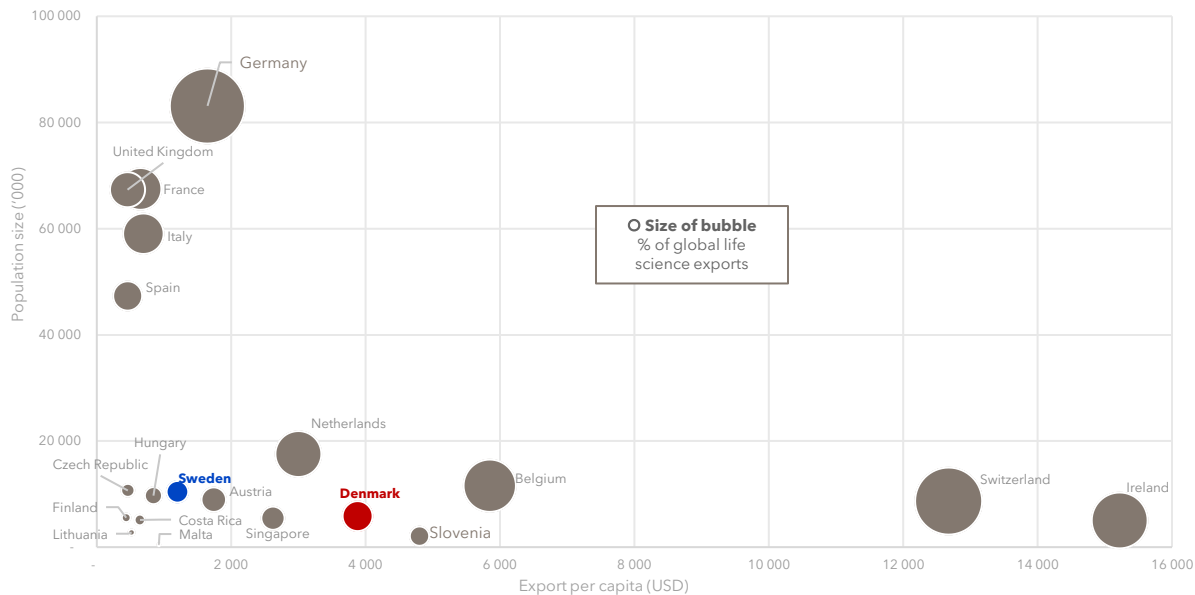
**Life science exports versus total exports
in Sweden (m SEK)**



Figures are for medical and pharmaceutical products and medical instruments, apparatuses, etc.
Source: Statistics Denmark, SCB/Statistics Sweden, Riksbanken.

Top 20 Countries with the most Life Science Exports Per Capita

Denmark is the world's 5th largest exporter of pharmaceuticals and MedTech measured in exports per capita in 2021, while Sweden holds 10th place on the global list.

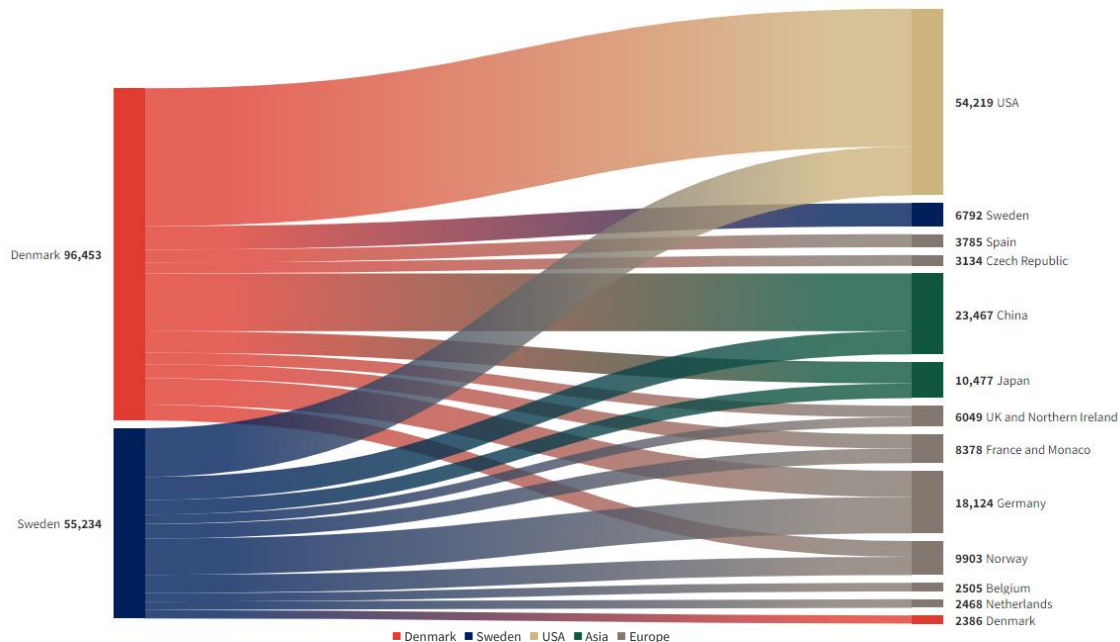


		Export per capita (USD)	% global life science exports
1	Ireland ¹	15 219	7.8%
2	Switzerland	12 676	11.3%
3	Belgium	5 846	6.9%
4	Slovenia	4 802	1.0%
5	Denmark	3 881	2.3%
6	Netherlands	3 000	5.4%
7	Singapore ¹	2 623	1.5%
8	Austria	1 741	1.6%
9	Germany	1 648	14.1%
10	Sweden	1 200	1.3%
11	Malta ¹	927	0.0%
12	Hungary	845	0.8%
13	Italy	695	4.2%
14	France	651	4.5%
15	Costa Rica ¹	643	0.3%
16	Lithuania	519	0.1%
17	Czech. Republic	464	0.5%
18	Spain	461	2.2%
19	United Kingdom	460	3.2%
20	Finland	442	0.3%

Principal Export Markets for Swedish and Danish Life Science

USA, China and Germany continue to remain as the top 3 principal export markets for both Denmark and Sweden. However, between 2020 and 2021, both Danish and Swedish export to USA with respectively 15% and 11%.

Principal export markets for Denmark and Sweden (2021)



Exports in 2021 in mDKK (Difference 2020-2021)

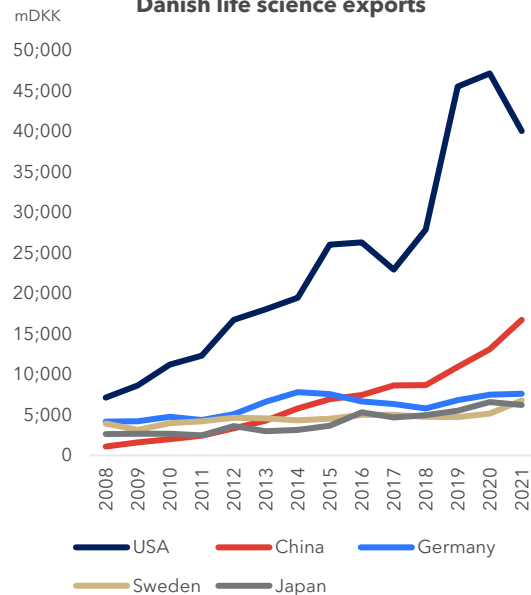
Export markets	Denmark	Sweden
USA	40,043 (↓ 15%)	14,176 (↓ 11%)
China	16,764 (↑ 28%)	6,703 (↓ 48%)
Germany	7,606 (↑ 1%)	10,518 (↑ 0%)
Japan	6,255 (↓ 5%)	4,222 (↓ 27%)
Norway	4,617 (↑ 24%)	5,286 (↑ 12%)
France & Monaco	4,125 (↓ 4%)	4,253 (↓ 1%)
United Kingdom & Northern Ireland	3,332 (↑ 20%)	2,717 (↑ 5%)
Sweden	6,792 (↑ 31%)	
Czech Republic	3,134 (↑ 2%)	
Spain	3,785 (↑ 27%)	
Belgium		2,505 (↑ 21%)
Netherlands		2,468 (↓ 19%)
Denmark		2,386 (↑ 12%)

Principal Export Markets for Swedish and Danish Life Science

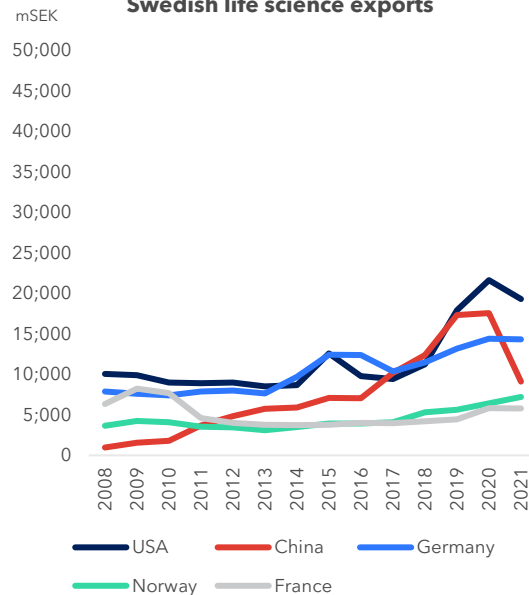
USA, China and Germany continue to remain as the top 3 principal export markets for Denmark and Sweden.

Principal export markets for Denmark and Sweden (2008-2021)

Danish life science exports



Swedish life science exports



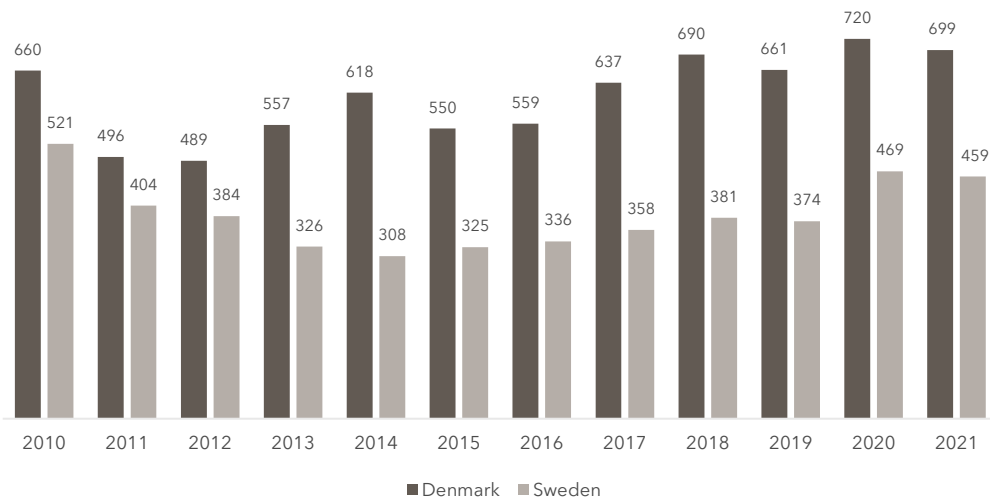
Exports in 2021 in mDKK (Annual growth 2008-2021)

Export markets	Denmark	Sweden
USA	40 043 (▲ 14%)	14 176 (▲ 5%)
China	16 764 (▲ 23%)	6 703 (▲ 19%)
Germany	7 606 (▲ 5%)	10 518 (▲ 5%)
Japan	6 255 (▲ 7%)	4 222 (▲ 16%)
Norway	4 617 (▲ 12%)	5 286 (▲ 5%)
France & Monaco	4 125 (▲ 2%)	4 253 (▼ 1%)
United Kingdom & Northern Ireland	3 332 (▲ 4%)	2 717 (▲ 1%)
Sweden	6 792 (▲ 4%)	
Czech Republic	3 134 (▲ 19%)	
Spain	3 785 (▲ 9%)	
Belgium		2 505 (▼ 3%)
Netherlands		2 468 (▲ 11%)
Denmark		2 386 (▲ 1%)

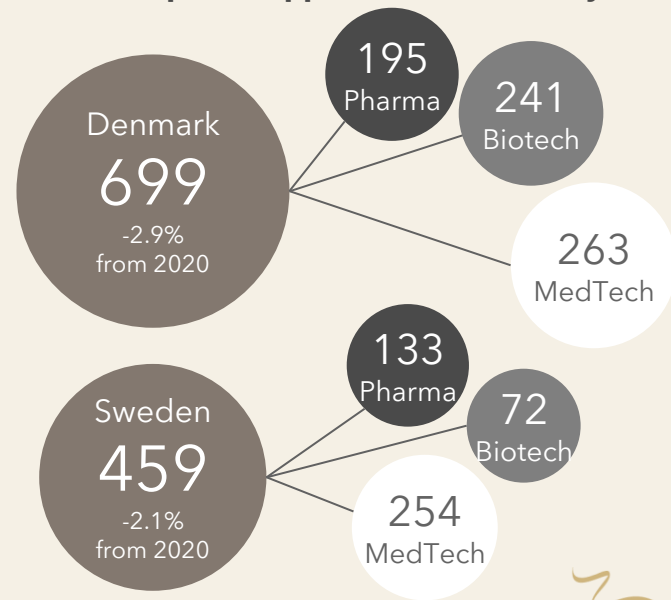
Denmark and Sweden Generated 1,158 Life Science Patents in 2021

There were 1,158 Danish and Swedish life science patent applications to the EPO in 2021, driven by a slight increase in MedTech (+2%) on the Danish side, and a strong increase in pharma patents (+24%) on the Swedish side. Conversely, there was a drop in Danish pharma patents (-13%) and Swedish biotech and MedTech patents (-20% and -7%) as compared to 2020.

Number of life science patent applications to EPO
from Denmark & Sweden



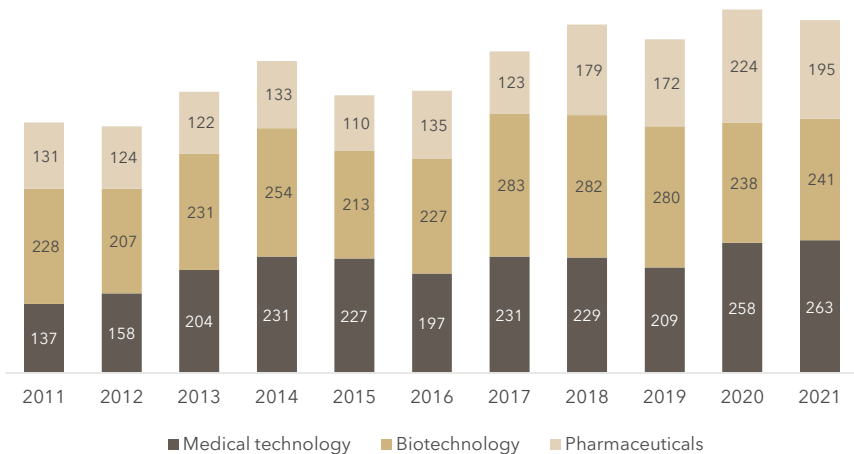
Life science patent applications in 2021 by field



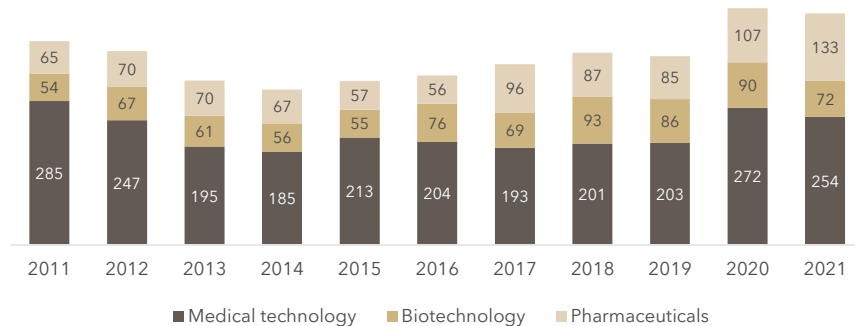
Life Science Patent Applications increase in Medtech and Pharma respectively in Denmark and Sweden

In Denmark, the Medtech area experienced the largest increase in patent volume (+92%) between 2011 and 2021, while in Sweden, it was the pharma area that experienced the highest growth (+105%).

Number of life science patent applications to EPO from Denmark



Number of life science patent applications to EPO from Sweden



Source: EPO

**Top 10
Technological
Fields
Represented in
Danish and
Swedish Patent
Applications for
the Period 2011-
2021 and in
2021 alone.**

Sweden				Denmark		
	Technology field	Number of applications		Technology field	Number of applications	
		2011-2021	2021		2011-2021	2021
1	Digital communication	11 726	1 446	Biotechnology	2 684	241
2	Transport	3 386	477	Medical technology	2 344	263
3	Telecommunications	2 552	277	Engines, pumps, turbines	2 269	342
4	Medical technology	2 452	254	Pharmaceuticals	1 648	195
5	Computer technology	2 108	224	Audio-visual technology	1 402	188
6	Measurement	1 564	174	Civil engineering	1 400	130
7	Mechanical elements	1 555	151	Other special machines	1 064	151
8	Civil engineering	1 493	158	Electrical machinery, apparatus, energy	1 009	123
9	Other special machines	1 177	111	Food chemistry	915	104
10	Machine tools	1 176	95	Measurement	857	105
...						
16	Pharmaceuticals	893	133			
19	Biotechnology	779	72			

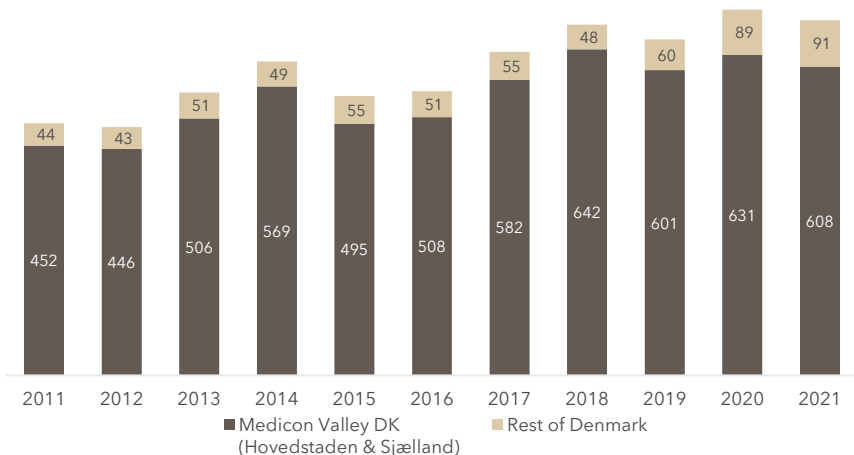
The year indicates the publication date, which is 18 months after the filing of the national application.

Technology fields within life science are denoted in bold.

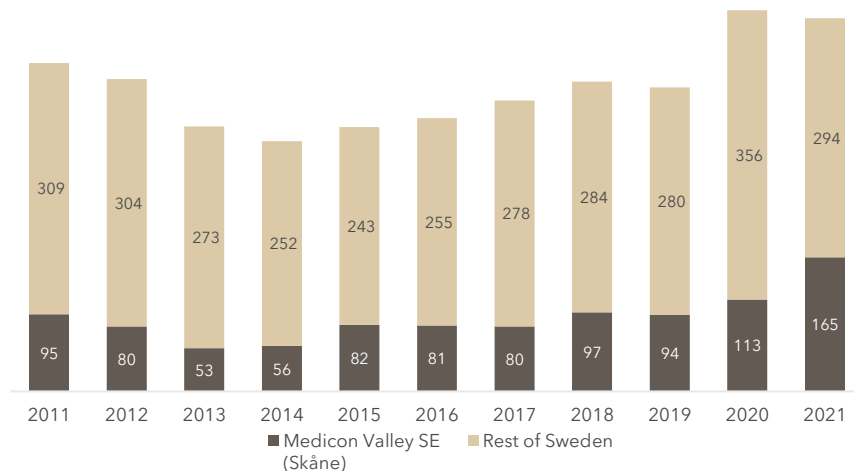
Medicon Valley is a Key Region for Danish & Swedish Life Science Patents

773 life science patents came from Medicon Valley in 2021, an increase of 41% from a decade ago. They represent 67% of all Danish and Swedish life science patents in 2021, with the Capital Region of Denmark and Region Zealand contributing 87% of Danish life science patents, and Skåne contributing 36% of Swedish life science patents in 2021. Skåne alone have increased its number of patent applications by 74% within the last 10 years.

Number of life science patent applications to EPO from Denmark



Number of life science patent applications to EPO from Sweden



Source: EPO
The year indicates the publication date, which is 18 months after the filing of the national application.

The Medicon Valley Eco-system

ØRESUNDSINSTITUTTET

25 YEARS
Medicon Valley Alliance



The **Öresund region** spans eastern Denmark and southern Sweden and covers:

3

administrative regions

4

million inhabitants

21,000

km² geographical area

Medicon Valley is the name for the Öresund region's life science cluster, which includes:

1,150

life science
companies

65,500

regional **employees** in
private life science
companies

12

**science parks,
incubators/accelerators**
focusing on life science

9

**universities & academic
institutions** performing
life science research

15,000

life science **researchers**
working and **35,300**
students at regional
universities

28

hospitals
engaged in
clinical research

Medicon Valley is one of EU's Leading Life Science Clusters

It represents a strong triple helix interplay of collaborations between industry, academic institutions and clinical environments in a concentrated geographical region spanning Denmark & Sweden.



Medicon Valley Alliance

Eastern Denmark

inhabitants ¹

2,672,300
inhabitants

66%
of Öresund's
population

life science
companies ²

700

↗ 200 since 2017

61%
of Öresund's
life science
companies

life science
employees ²

58,000

↗ 10,500 since 2017

89%
of Öresund's
life science
workforce

Largest
subsector ²

Pharma

~29,000 employees
(Represents **50%** of eastern
Denmark's life science workforce)

Concentration of
life science
employees ²

Gladsaxe, Copenhagen & Ballerup
municipalities

Southern Sweden

1,362,164
inhabitants

34%
of Öresund's
population

450

↗ 100 since 2015

39%
of Öresund's
life science
companies

7,500

↗ 1,500 since 2017

11%
of Öresund's
life science
workforce

MedTech

~3,100 employees
(Represents **41%** of southern
Sweden's life science workforce)

Malmö, Lund & Helsingborg
municipalities

Medicon Valley has Grown over the Past 5 Years

300 new life science companies have been founded over the past five years – more than one new company started every week. Most of these new companies are based in Copenhagen or Lund.

1 Region Zealand¹

- Life science researchers: 490 including -
- Professors: 34
- Doctoral students: 147
- Life science students: -

2 Roskilde University

- Life science researchers: 55 including -
- Professors: 6
- Doctoral students: 19
- Life science students: 427

3 Technical University of Denmark (DTU)

- Life science researchers: 1 254 including -
- Professors: 91
- Doctoral students: 487
- Life science students: 7 930

4 University of Copenhagen

- Life science researchers: 4 561 including -
- Professors: 658
- Doctoral students: 2 132
- Life science students: 17 099

5 The National Institute of Public Health (NIPH), University of Southern Denmark

- Life science researchers: 107 including -
- Professors: 9
- Doctoral students: 15
- Life science students: -

6 Region Hovedstaden¹

- Life science researchers: 4 182 including -
- Professors: 279
- Doctoral students: 915
- Life science students: -

7 Aalborg University in Copenhagen

- Life science researchers: 5 including -
- Professors: 3
- Doctoral students: -
- Life science students: 533

8 Statens Serum Institut

- Life science researchers: 150 including -
- Professors: n.a.
- Doctoral students: n.a.
- Life science students: -

9 Danish Cancer Society¹

- Life science researchers: 154 including -
- Professors: 10
- Doctoral students: 31
- Life science students: -

10 Malmö University

- Life science researchers: 240 including -
- Professors: 34
- Doctoral students: 99
- Life science students: 2 181

11 Region Skåne¹

- Life science researchers: ~1 800 including -
- Professors: 109
- Doctoral students: 749
- Life science students: -

12 The Swedish University of Agricultural Science in Alnarp

- Life science researchers: 224 including -
- Professors: 22
- Doctoral students: 75
- Life science students: 852

13 Lund University

- Life science researchers: 1 726 including -
- Professors: 279
- Doctoral students: 1 302
- Life science students: 5 332

14 Kristianstad University

- Life science researchers: 70 including -
- Professors: 20
- Doctoral students: 14
- Life science students: 1 005

- Universities
- Research institutions
- Regions

Source: The universities' and research institutions' own numbers. Life science researchers include professors, associate professors, lecturers, post docs, doctoral students, etc. Figures on researchers refers to those whose research, to at least 50 percent, is performed within a range of around 90 research topics in the life sciences. See Appendix 1 for more details.

Notes:
1) Researchers at the hospitals in the region often conduct research part-time. Some of the researchers at the hospitals and at the Danish Cancer Society also have part time positions at the universities in the region.
2) Copenhagen Business School (CBS) does not conduct life science research in the traditional science (and is therefore not included above), but life science is touched upon, for example through research in organisation and public management.

There are 14 Academic, Clinical and Research Institutions in Medicon Valley Focusing on Life Science

With a total of 15,000 life science researchers and 35,300 life science students, the region possesses a strong scientific knowledge base.

Medicon Valley Beacons & Science Parks over the Years



The Beacons are an Important Pillar of the Medicon Valley Eco-system

Today, Medicon Valley has 37 beacons (beacons being life science companies with more than 250 employees based in the region), an increase from 32 beacons in 2021.



65,500

regional employees

71%

of total life science
employment in Medicon
Valley

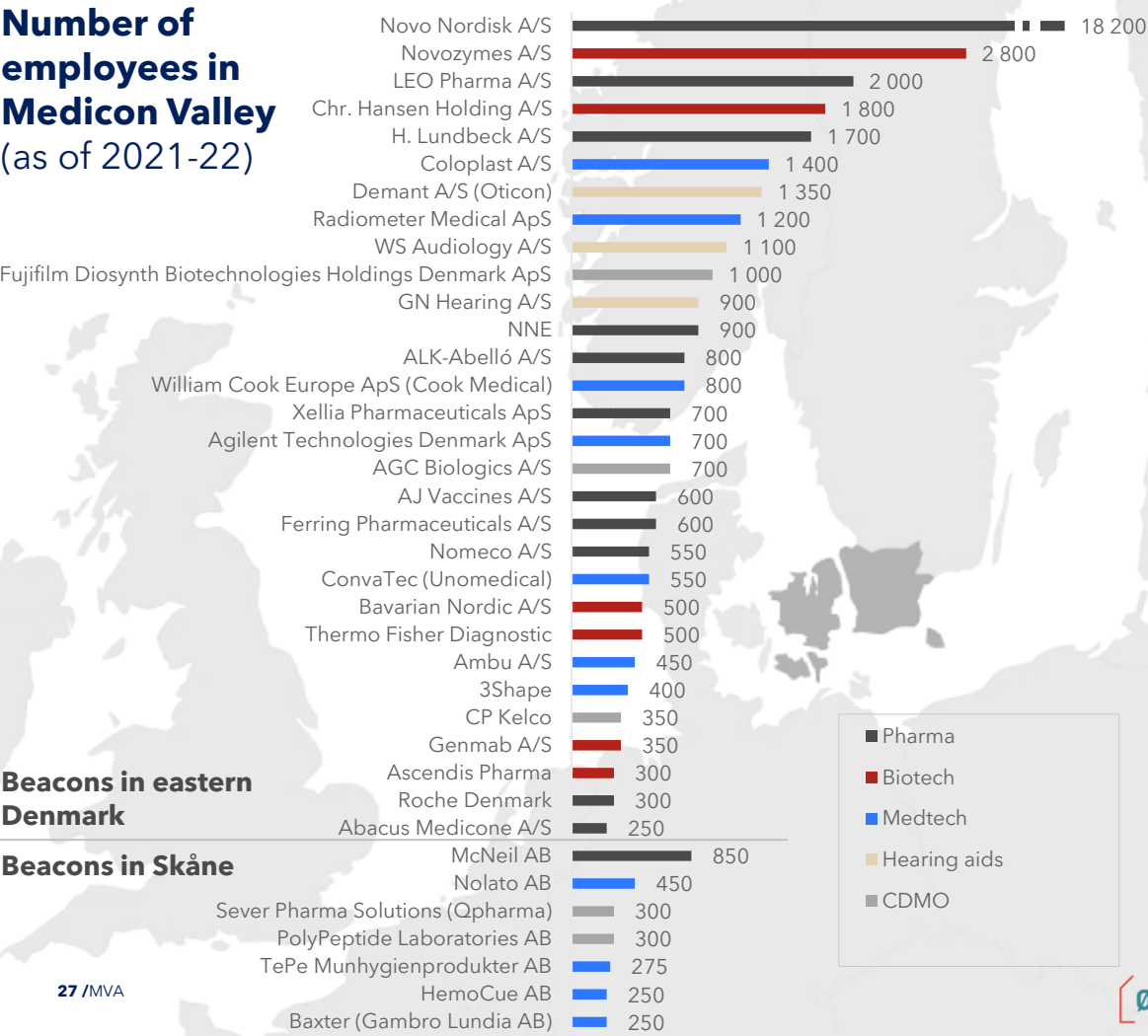
25

beacons are headquartered in
Medicon Valley

80+

facilities across Medicon
Valley

Number of employees in Medicon Valley (as of 2021-22)



Medicon Valley Beacons employ 71% of the Regional Life Science Workforce

Novo Nordisk is by far the largest employer, employing 28% of the region's total life science workforce.

Excluding Novo Nordisk, pharma beacons contribute most to the workforce, comprising 9,250 regional life science employees, followed by medtech beacons (6,725 employees).

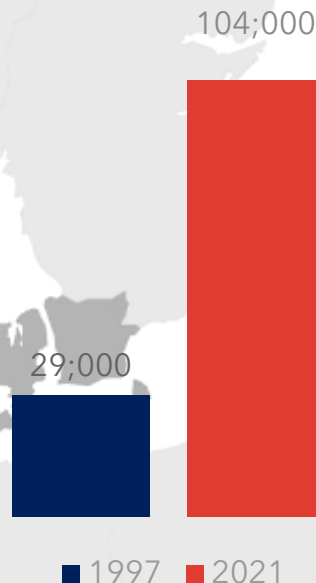
Beacons in eastern Denmark

Beacons in Skåne

Turnover in bil. DKK 1997 to 2021



No. of Employees Globally 1997 to 2021



Turnover & No. of Employees of the 10 Largest Life Science Companies in the Medicon Valley

Number of employees has multiplied 3.6 times and turnover 7.4 times between 1997 and 2021. This means that productivity has improved significantly.

12 Science Parks, Incubators and Accelerators Provide a Breeding Ground for Beacons of the Future

Today, they represent 1,750+ companies with a combined workforce of 21,200+ employees.



Ideon Science Park (incl. Ideon Innovation)

- Established **1983**
- **245 000** m²
- **400** companies¹
- **10 000** employees¹

Medicon Village (incl. SmiLe Incubator)

- Established **2012**
- **132 000** m²
- **180** companies
- **2 800** employees

DTU Science Park (incl. Futurebox)

- Established **2004 (1962)**
- **194 000** m²
- **300** companies¹
- **4 500** employees¹

Symbion (incl. COBIS)

- Established **1986**
- **55 700** m²
- **650+** companies¹
- **3 000** employees¹

BioInnovation Institute

- Established **2018**
- **12 500** m²
- **65** companies
- **150-200** employees

Medeon Science Park & Incubator

- Established **1985**
- **24 000** m²
- **60** companies
- **400-450** employees

Krinoва Incubator & Science Park

- Established **1999**
- **15 500** m²
- **100** companies¹
- **350** employees¹

Source: Information provided by the science parks and incubators.

Note 1: Number of companies and number of employees employed by these companies are not only involved in life science, but are also involved in other subject areas.

- Present in 1997
- Established within the past 25 years

Science park/ incubator/accelerator	Location	Land area, m ²	Year of establish- ment	Number of companies	Number of people employed by companies	Owner
DTU Science Park (incl. Futurebox)	Lyngby and Hørsholm	194,000	2004 (1962)	300 *	4,500 *	Technical University of Denmark, DTU
Symbion (incl. Copenhagen Bio Science Park, COBIS)	Copenhagen and Frederiksberg	55,700	1986	650+ *	3,000 *	Symbion Foundation and others ¹
BioInnovation Institute, BII	Copenhagen	12,500	2018	65	150-200	Independent fund supported by the Novo Nordisk Foundation
Ideon Science Park (incl. Ideon Innovation)	Lund	245,000	1983	400 *	10,000 *	Castellum and Wihlborgs ²
Medicon Village (incl. SmiLe Incubator)	Lund	132,000	2012	180	2,800	Mats Paulsson Foundation ³
Medeon Science Park & Incubator	Malmö	24,000	1985	60	400-450	Malmö City and Wihlborgs Fastigheter. SmiLe Incubator is owned by the Foundation STIL.
Krinova Incubator & Science Park	Kristianstad	15,500	1999	100 *	350 *	Kristianstad Municipality and others ⁴

Sources: Information provided by the science parks and incubators.

* Number of companies and number of employees employed by these companies are not only involved in life science but are also involved in other subject areas.

Note 1) Symbion Foundation, the University of Copenhagen, Copenhagen Business School, and several private actors.

Note 2) Castellum and Wihlborgs (Ideon AB) own the buildings. In addition, Ideon has the following brands: Ideon Open and Ideon Innovation.

Note 3) Mats Paulsson Foundation for Research, Innovation, and Societal Development (Medicon Village Innovation and Medicon Village Fastigets AB)

Note 4) Kristianstad Municipality owns 40%, 40% is owned by the municipality's subsidiary Kristianstads Industribyggnads AB, and 20% is owned by Kristianstad University.

There are 6 Science Parks and 6 Incubators/ Accelerators in Medicon Valley

The 6 incubators and accelerators, all reside in a science park except for BioInnovation Institute.

10 key highlights about Medicon Valley's beacons

1 **Novo Nordisk** has remained the largest company among the beacons. In 1998, they had approx. 9,000 employees in Denmark, 14,500 employees worldwide, and a turnover of 18 billion DKK. Today they have approx. 19,000 employees in Denmark, 48,000 employees globally, and a turnover of 140 billion DKK.

2 25 years ago, **Novozymes** was not an independent company, although the enzyme production started in the 1960s. Novozymes was spun out from Novo Nordisk in 2000 and is today the second largest company in Medicon Valley with 2,800 employees.

3 **LEO Pharma**, Denmark's oldest pharmaceutical company, was established in 1908. 25 years ago, LEO Pharma had approx. 1250 employees in Denmark and a turnover of 3.8 billion DKK; today, it has approx. 2,000 employees in Medicon Valley and a turnover of approx. 10 billion DKK.

4 25 years ago, **Ferring** was primarily a Malmö company, which employed approx. 250 employees. In 2002, the company consolidated in Ørestad, and today employs approx. 600 employees in the Medicon Valley region. The company expects to have up to 750 employees over the next years.

5 One of Malmö's largest life science companies, **PolyPeptide Laboratories**, had only operated as an independent company for two years in 1998. At that time, there were 50 employees in Malmö and the turnover was 71 million SEK. Today they have approx. 300 employees in Malmö and a turnover of approx. 800 million SEK and is in the process of expanding production threefold.

6 **Genmab** and **Ascendis Pharma**, which today are two successful biotech companies, did not exist 25 years ago. Genmab was founded in 1999 and Ascendis Pharma in 2007. Today, the companies together employ over 600 employees in Medicon Valley.

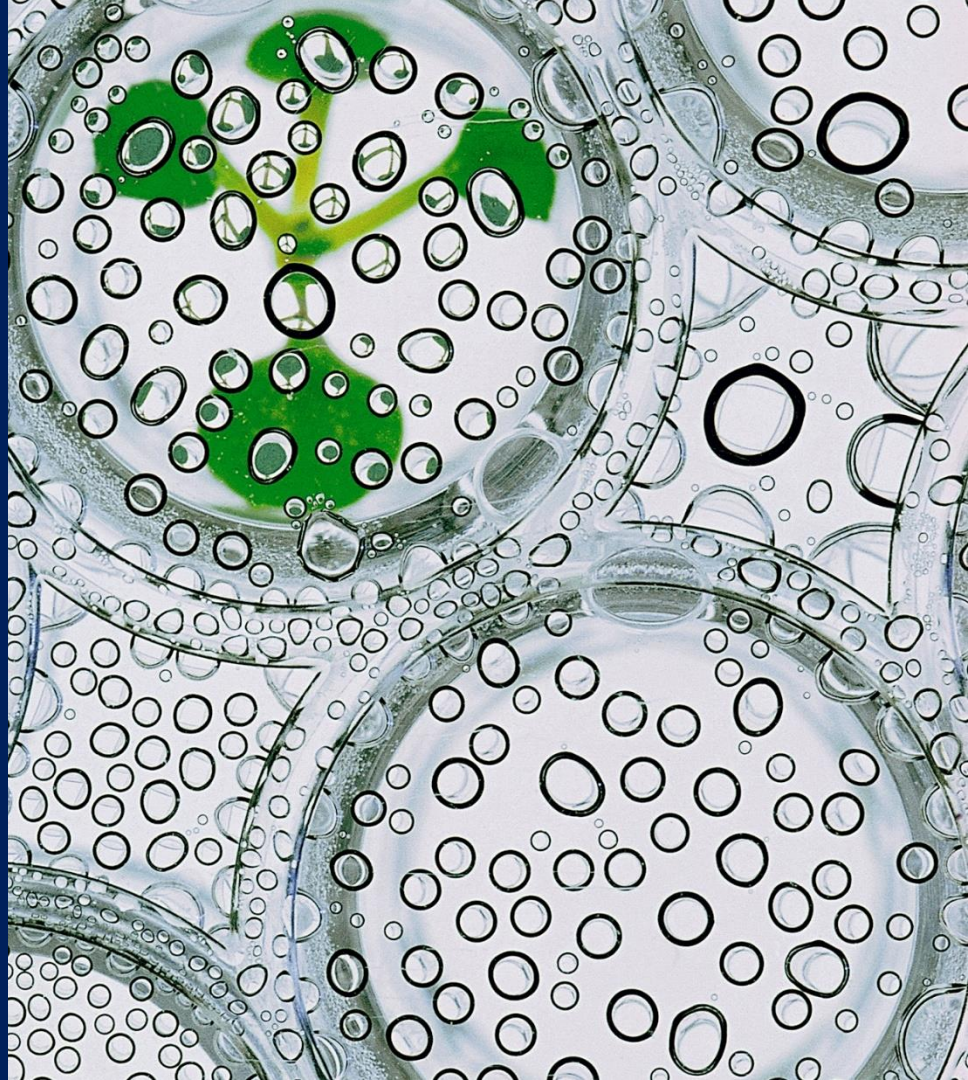
7 **Bavarian Nordic** was an early biotech company in 1998 with no turnover and 37 employees. Today, the company employs approx. 500 employees in Denmark, has a turnover of almost 2 billion DKK, and is the only company in the world that has a monkeypox vaccine.

8 25 years ago, **Fujifilm Diosynth Biotechnologies** was not part of Medicon Valley. American Biogen, who sold its pharmaceutical factory in Hillerød in 2019 to Fujifilm, first established itself in the region in 2001. Over the past few years, Fujifilm has chosen to invest 17 billion DKK in Biogen's former factory and expects to create 750 new jobs.

9 In 1998, **Nolato** had approx. 70 employees in their Medical Components department, which had a turnover of 64 million SEK. Today, the department's name has been changed to **Medical Solutions**, with a global turnover of 4 billion SEK and regionally employs approx. 450 employees.

10 Only a few companies were bigger in Medicon Valley 25 years ago than they are today. This applies to **Coloplast**, **CP Kelco**, and **Convatec** (form. Unomedical). The latter laid off 500 production jobs in Denmark in 2005. **Baxter**, who bought Gambro in 2013, decided in 2018 to move production from Lund to Italy and laid off approx. 600 production jobs. **McNeil** in Helsingborg has also been reduced by a few hundred jobs over the years due to several changes of ownership. In 2011, **AstraZeneca** shut down approx. 900 R&D jobs in Lund. In 2021 **Coloplast** buys the Swedish medical company **Atos Medical** for 10 bil. DKK.

Research Activity and University Performance in Medicon Valley

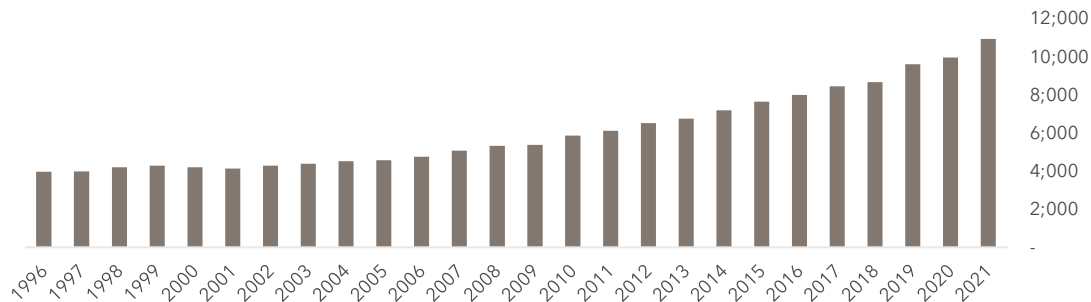


Research Activity has been rising steadily

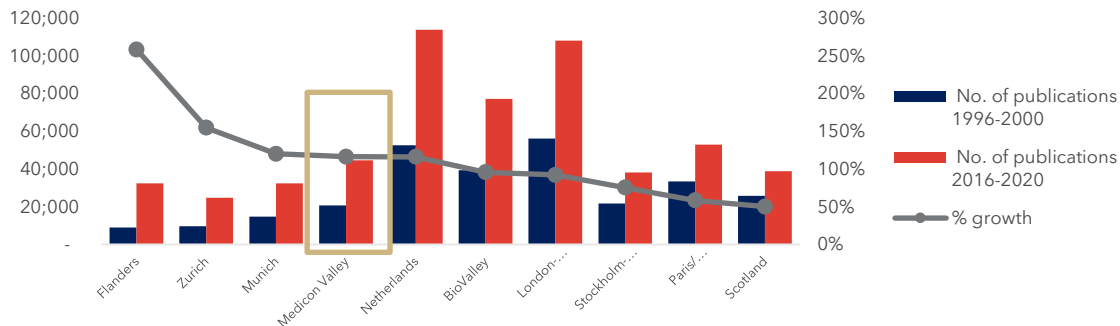
The volume of life science publications coming out of Medicon Valley has more than doubled between the years 1996 and 2021, with Medicon Valley publishing close to 11,000 life science research publications in 2021.

In comparison with 10 other European life science clusters, Medicon Valley maintained a relatively high growth rate between the periods 1996-2000 and 2016-2020, being the 4th cluster in terms of growth and 5th in terms of volume of publications in the period 2016-2020.

Volume of publications in Medicon Valley (1996-2021)



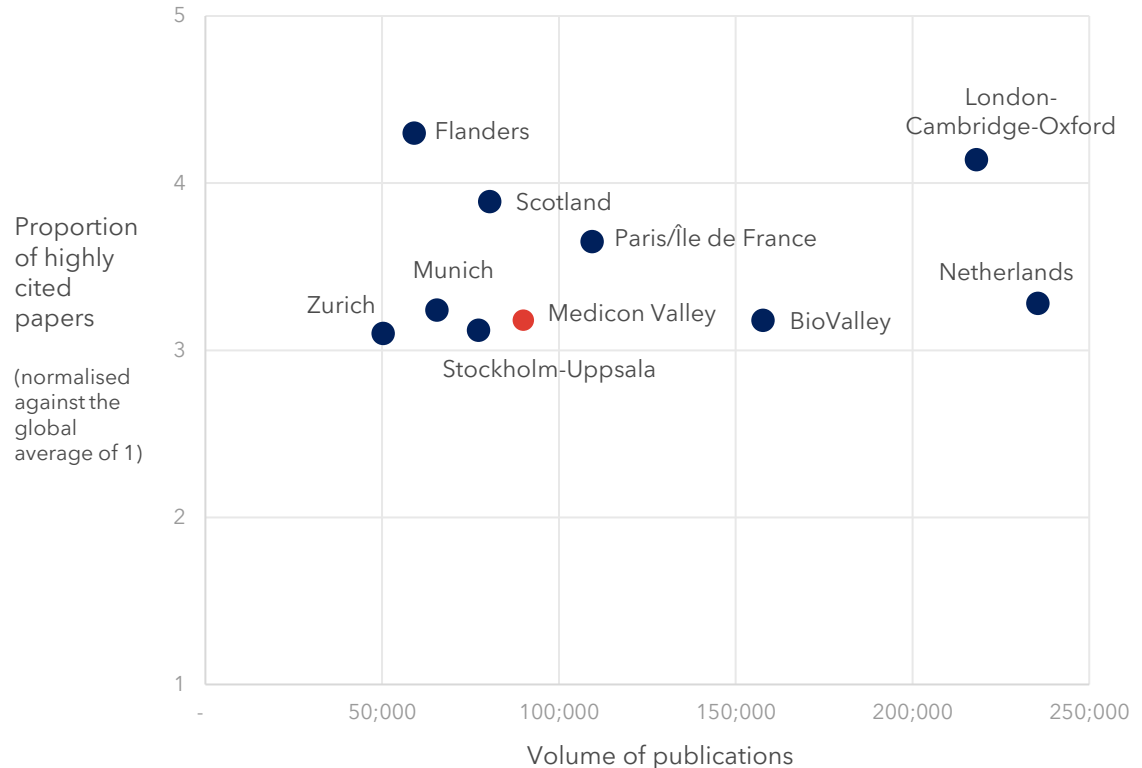
Volume of publications across compared clusters (1996-2000 versus 2016-2020)



Medicon Valley is among the top 5 when it comes to Research Paper Volumes

In terms of volume, Medicon Valley are placed 5th in comparison to the nine other European life science clusters and are placed 7th in terms of quality of publications¹.

Volume of publications vs proportion of highly cited papers across clusters (2011-2021)

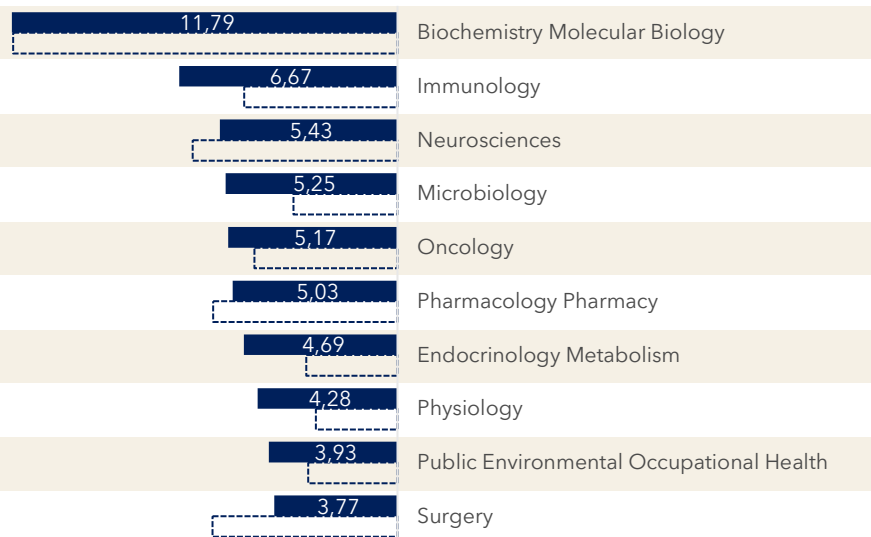


Note 1: The proportion of life science publications that were classified as highly cited by Web of Science was used as a measure of research quality. See Appendix 1 for more details on the methodology.

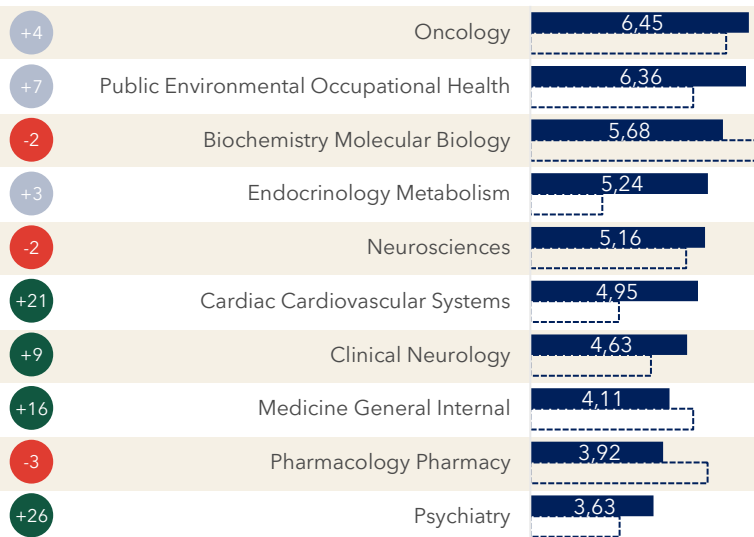
Continued strong Focus on Biochemistry & Molecular Biology

Over the past 25 years, biochemistry and molecular biology has remained as a top 3 research focus area in Medicon Valley when considering research volumes, while oncology has moved from 5th to 1st place.

1996-2000



2016-2020



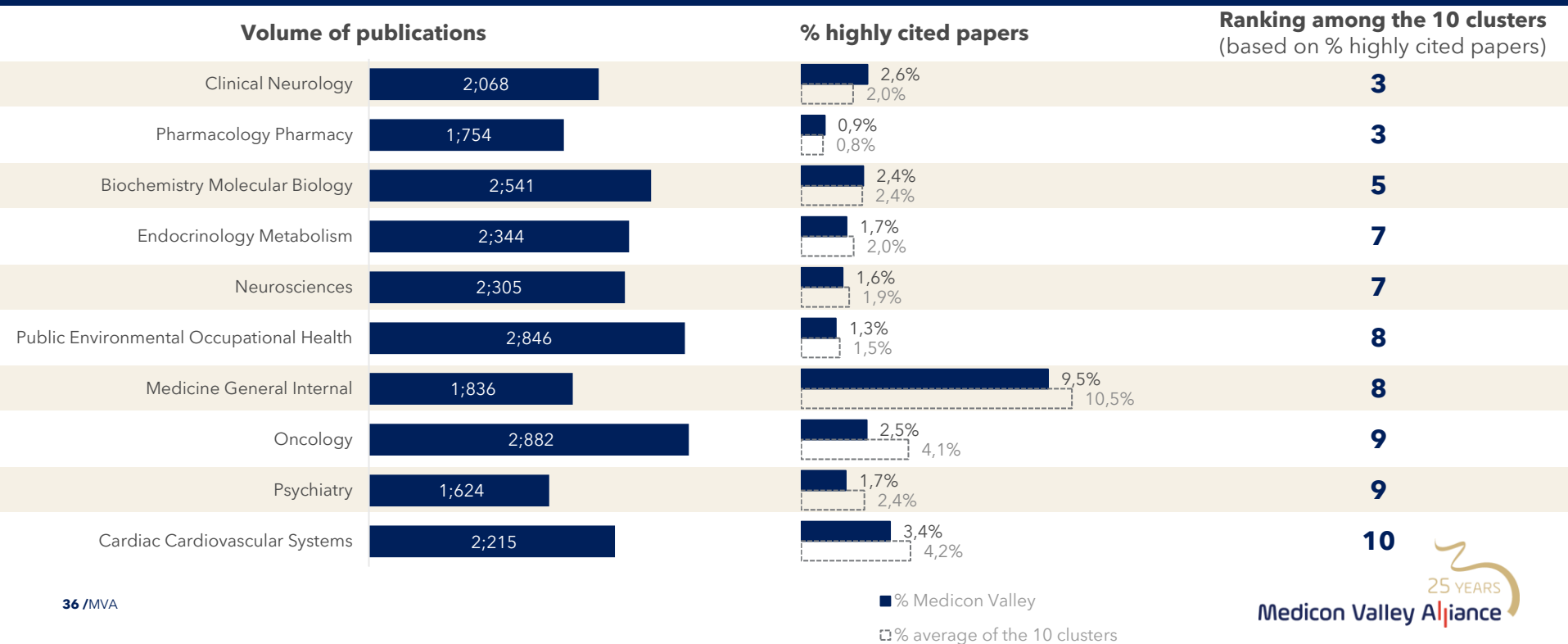
■ % of all publications (Medicon Valley) □ % of all publications (Global)

■ % of all publications (Medicon Valley) □ % of all publications (Global)

● Increase in rank since 1996-2000 ● Decrease in rank since 1996-2000 ● New to the top 10 in 2016-2020 (was not in the top 10 in 1996-2000)

Clinical Neurology & Pharmacology are comparatively Top Performers

Pharmacology Pharmacy and Clinical Neurology are the research fields in which Medicon Valley ranks highest in terms of the proportion of highly cited papers, coming in the 3rd place amongst the 10 other European life science hubs.



<div>Quality of Research across Clusters</div> <div>Ranking based on proportion of highly cited papers</div>										
	Oncology	Public Environmental Occupational Health	Biochemistry Molecular Biology	Endocrinology Metabolism	Neurosciences	Cardiac Cardiovascular Systems	Clinical Neurology	Medicine General Internal	Pharmacology Pharmacy	Psychiatry
1	Flanders	London-Cambridge-Oxford	Zurich	Flanders	Scotland	Zurich	Scotland	Flanders	Scotland	Scotland
2	London-Cambridge-Oxford	Paris/Île de France	London-Cambridge-Oxford	London-Cambridge-Oxford	Stockholm-Uppsala	Scotland	London-Cambridge-Oxford	Paris/Île de France	London-Cambridge-Oxford	Stockholm-Uppsala
3	Scotland	Scotland	Netherlands	Scotland	London-Cambridge-Oxford	Paris/Île de France	Medicon Valley	Scotland	Medicon Valley	Flanders
4	Paris/Île de France	BioValley	BioValley	Stockholm-Uppsala	Munich	London-Cambridge-Oxford	Stockholm-Uppsala	Munich	Stockholm-Uppsala	London-Cambridge-Oxford
5	Zurich	Zurich	Medicon Valley	Netherlands	BioValley	Munich	BioValley	BioValley	Netherlands	Netherlands
6	BioValley	Netherlands	Flanders	Paris/Île de France	Zurich	Stockholm-Uppsala	Paris/Île de France	Netherlands	Flanders	Zurich
7	Netherlands	Munich	Scotland	Medicon Valley	Medicon Valley	Flanders	Flanders	London-Cambridge-Oxford	Zurich	Munich
8	Munich	Medicon Valley	Stockholm-Uppsala	Zurich	Flanders	Netherlands	Netherlands	Medicon Valley	Munich	Paris/Île de France
9	Medicon Valley	Stockholm-Uppsala	Paris/Île de France	BioValley	Netherlands	BioValley	Munich	Stockholm-Uppsala	BioValley	Medicon Valley
10	Stockholm-Uppsala	Flanders	Munich	Munich	Paris/Île de France	Medicon Valley	Zurich	Zurich	Paris/Île de France	BioValley

Medicon Valley is well connected internationally

In its research, Medicon Valley collaborates with more than 180 countries today, spanning 94% of the globe. Its main collaborators – USA, Germany, and the UK – have remained consistent over the past 25 years.

Based on research papers published
1996-2000



Top 10 collaborators excluding Denmark and Sweden

1. USA
2. Germany
3. United Kingdom
4. Norway
5. Finland
6. Netherlands
7. France
8. Italy
9. Canada
10. Belgium

Based on research papers published
2016-2020

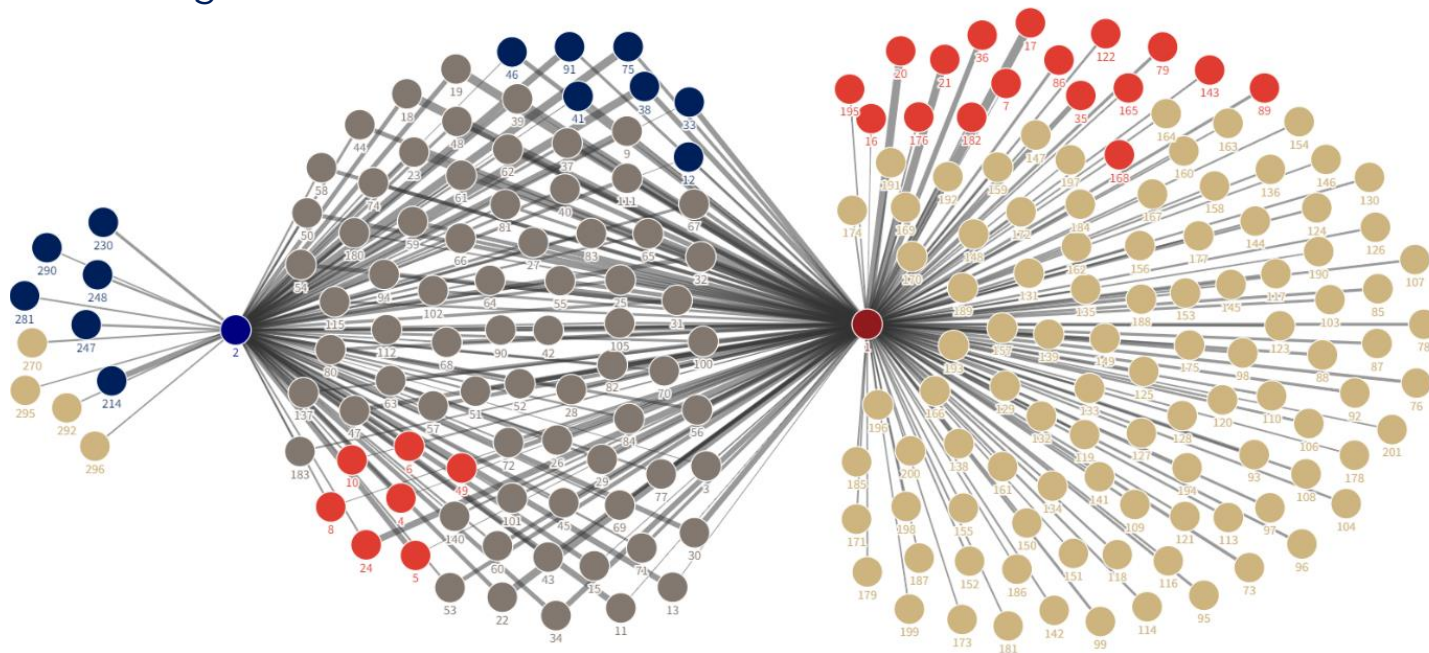


Top 10 collaborators excluding Denmark and Sweden

1. USA
2. United Kingdom
3. Germany
4. Netherlands
5. Italy
6. France
7. Spain
8. Norway
9. Australia
10. Canada

Medicon Valley's research collaboration network

The network diagram illustrates how the University of Copenhagen (1) and Lund University (2) are collaborating with over 200 institutions around the world



Danish research institutions |



Swedish research institutions |



International research institutions that primarily collaborate with Swedish or Danish institutions



International research institutions that collaborate with both Swedish and Danish institutions

*See institutions by numbers in Appendix
Threshold of key value above 170 (publications)

At the subject level, Medicon Valley universities have improved their international standing

This could reflect an overall improved position of Danish and Swedish universities, as the major Medicon Valley universities retain their comparative standing among their national counterparts.

	QS World Ranking - Life Science & Medicine			QS World Ranking - Natural Sciences			Times Higher Education - Clinical & Health			Times Higher Education - Life Sciences		
World rank	2022 rank	↑/↓	2021 rank	2022 rank	↑/↓	2021 rank	2023 rank	↑/↓	2022 rank	2023 rank	↑/↓	2022 rank
University of Copenhagen	27	↓	19	60	↖	82	71	↖	72	n.a.		n.a.
Lund University	65	↖	80	86	↖	117	99	↖	101-125	83	↓	75
Technical University of Denmark	272	↖	292	150	↖	165	251	↖	301-400	101-125	=	101-125
Rank among Danish and Swedish universities	2022 rank	↑/↓	2021 rank	2022 rank	↑/↓	2021 rank	2023 rank	↑/↓	2022 rank	2023 rank	↑/↓	2022 rank
University of Copenhagen	2	=	2	1	=	1	2	=	2	n.a.		n.a.
Lund University	4	=	4	4	=	4	3	↖	5	2	↖	3
Technical University of Denmark	11	=	11	6	=	6	8	↖	12	5	↖	7

Appendices

Appendix 1

Definitions & methods

About the numbers: Researchers & students

Figures for the number of researchers and students have been provided by the universities and the regions themselves.

Universities, regions and research institutions

All figures on researchers are headcounts and from 2021 unless otherwise noted. Student numbers indicate either the number of full-time equivalent students in 2020/2021 or the number of students in the 2020/2021 autumn term - see the information for each individual learning institution.

University of Copenhagen. The number of researchers and professors at the Faculty of Science are measured in annual work units; the figures were drawn up in July 2021. Number of doctoral students at departments and centres with life science activities. Students: registered 1 Oct 2021.

Lund University. The numbers apply to the total number of researchers in 2021 at the Faculty of Medicine, and a selected number of researchers at the Faculty of Science and researchers who primarily work in the life sciences at the following departments at Lund University's Faculty of Engineering (LTH): Immunotechnology (number of researchers for 2020), Automatic Control, Food Technology, the Department of Biomedical Engineering, the Department of Physics 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 LTH. Of the doctoral students, those at the Faculty of Medicine who are employed elsewhere and work part-time at the university have not been included in the total number of researchers. The number of students is for 2021, except for the those from LTH where the number is for 2020.

Technical University of Denmark (DTU). The information is for the number of annual work units for 2021 and applies to 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. Research in the life sciences was also performed at DTU Chemistry, DTU Electrical Engineering, DTU Nanotech, DTU Mechanical Engineering, and DTU Compute. Active students in 2021.

The Swedish University of Agricultural Sciences in

Alnarp. The number of students indicates full-time equivalent students for the academic year 2021/22.

Malmö University. The number of students indicates full-time equivalents in 2021.

Kristianstad University. The number of students indicates full-time equivalent students in educational programmes related to the life sciences in 2020. Other data is from 2019.

Roskilde University. Figures for researchers from the turn of the year 2016/17. Students: years of full-time study 2021.

Aalborg University in Copenhagen. Figures for researchers from 2022. Students: registered 1 Oct 2021.

The Capital Region of Denmark. Figures from 2020. The number of researchers indicates people who dedicate at least 10% of their working hours to research - often, but not always - in the life sciences. A number of researchers also have part-time positions at the University of Copenhagen.

Region Skåne. All professors also have part-time positions at Lund University. Head count for researchers - many conduct research part-time. The number of professors refers to positions funded or partially funded by Region Skåne; there may also be professors with external funding.

Region Zealand. Head count for researchers - many conduct research part-time. Figures from 2020.

The State Serum Institute. Head count. Figures from 2019.

Students

Figures on students refer to those studying specific programmes, that will either probably lead to a career in the life science- or health sector, contain some applications or offer some career opportunities in the life sciences, or contain life science elements in the educational programme itself.

The specific programmes at each university are listed in the following reports:
- Expertise Demands and -Matching. Higher Education and the Life Science Industry's Needs in Skåne, by Öresundsinstittutet, 2022
- Expertise Demands and -Matching. Higher Education

and the Life Science Industry's Needs in Eastern Denmark, by Öresundsinstittutet, 2022

Figures from Lund University and Malmö University might differ somewhat from these lists of programmes.

Researchers

Figures on researchers refers to professors, associate professors, lecturers, post docs, doctoral students, etc, whose research, to at least 50 percent, is performed within a range of the following research topics in the life sciences:

Agricultural engineering
Agriculture, dairy & animal science
Agriculture, multidisciplinary
Agronomy
Allergy
Anatomy & morphology
Andrology
Anesthesiology
Audiology & speech-language pathology
Behavioral sciences
Biochemical research methods
Biochemistry & molecular biology
Biology
Biophysics
Biotechnology & applied microbiology
Cardiac & cardiovascular systems
Cell & tissue engineering
Cell biology
Chemistry, medicinal
Clinical neurology
Critical care medicine
Dentistry/oral surgery & medicine
Dermatology
Developmental biology
Emergency medicine
Endocrinology & metabolism
Engineering, biomedical
Entomology
Evolutionary biology
Fisheries
Food science & technology
Gastroenterology & hepatology
Genetics & heredity
Geriatrics & gerontology
Gerontology
Health care sciences & services
Health policy & services
Hematology
Horticulture
Immunology
Infectious diseases
Integrative & complementary medicine
Marine & freshwater biology
Materials science, biomaterials
Mathematical & computational biology
Medical informatics
Medical laboratory technology
Medicine, general & internal
Medicine, research & experimental
Microbiology
Mycology
Neuroimaging
Neurosciences
Nursing
Nutrition & dietetics
Obstetrics & gynecology
Oncology
Ophthalmology
Ornithology
Orthopedics
Otorhinolaryngology
Parasitology
Pathology
Pediatrics
Peripheral vascular disease
Pharmacology & pharmacy
Physiology
Plant sciences
Primary health care
Psychiatry
Public, environmental & occupational health
Radiology, nuclear medicine & medical imaging
Rehabilitation
Reproductive biology
Respiratory system
Rheumatology
Social work
Soil science
Sport sciences
Substance abuse
Surgery
Toxicology
Transplantation
Tropical medicine
Urology & nephrology
Veterinary sciences
Virology
Zoology
Multidisciplinary sciences

About the numbers: Research publications

The analysis on research publications in life science covers Web of Science's [categories for Science & Technology \(Life Sciences & Biomedicine\)](#). It includes affiliations scoped to the Medicon Valley geographical region at city level (therefore includes all organisations including non-universities), and covers "classical articles" only.

The number of highly cited papers is based on [Web of Science's own classification](#) of highly cited papers (highly cited papers are only available for publications within the past ten years, i.e. from 2011).

The proportion of highly cited papers normalised against the global average of 1 is calculated as follows:

$$\left[\frac{\text{Number of highly cited papers for the specific cluster/region}}{\text{Total number of publications from the cluster region}} \right] \div \left[\frac{\text{Number of highly cited papers globally}}{\text{Total number of publications globally}} \right]$$

The nine leading European life science clusters that were chosen for benchmarking against Medicon Valley are the same clusters featured in the bibliometric comparison performed by the Dutch research institute CWTS at Leiden University on behalf of Medicon Valley Alliance in 2018. For more details, please refer to Medicon Valley Alliance's [State of Medicon Valley report for 2018, pages 39, 91-93](#). As the 2018 report notes, the clusters differ in terms of size and the number of research institutions. Some clusters are larger, more well positioned and conduct more research than others. The objective has been to represent the clusters' significance and research positions in relation to one another, and not to show how each cluster performs according to its own unique conditions – a project that would require a significantly larger scope than the present one.

Web of Science's categories for Science & Technology (Life Sciences & Biomedicine) include the following:

Agriculture	Genetics & Heredity	Physiology
Allergy	Geriatrics & Gerontology	Plant Sciences
Anatomy & Morphology	Health Care Sciences & Services	Psychiatry
Anesthesiology	Hematology	Public, Environmental & Occupational Health
Anthropology	Immunology	Radiology, Nuclear Medicine & Medical Imaging
Behavioral Sciences	Infectious Diseases	Rehabilitation
Biochemistry & Molecular Biology	Integrative & Complementary Medicine	Reproductive Biology
Biodiversity & Conservation	Legal Medicine	Research & Experimental Medicine
Biophysics	Marine & Freshwater Biology	Respiratory System
Biotechnology & Applied Microbiology	Mathematical & Computational Biology	Rheumatology
Cardiovascular System & Cardiology	Medical Ethics	Sport Sciences
Cell Biology	Medical Informatics	Substance Abuse
Critical Care Medicine	Medical Laboratory Technology	Surgery
Dentistry, Oral Surgery & Medicine	Microbiology	Toxicology
Dermatology	Mycology	Transplantation
Developmental Biology	Neurosciences & Neurology	Tropical Medicine
Emergency Medicine	Nursing	Urology & Nephrology
Endocrinology & Metabolism	Nutrition & Dietetics	Veterinary Sciences
Entomology	Obstetrics & Gynecology	Virology
Environmental Sciences & Ecology	Oncology	Zoology
Evolutionary Biology	Ophthalmology	
Fisheries	Orthopedics	
Food Science & Technology	Otorhinolaryngology	
Forestry	Paleontology	
Gastroenterology & Hepatology	Parasitology	
General & Internal Medicine	Pathology	
	Pediatrics	
	Pharmacology & Pharmacy	

Danish research institutions

4	RIGSHOSPITALET
5	AARHUS UNIVERSITY
6	UNIVERSITY OF SOUTHERN DENMARK
7	BISPEBJERG HOSPITAL
8	ODENSE UNIVERSITY HOSPITAL
10	AALBORG UNIVERSITY
16	TECHNICAL UNIVERSITY OF DENMARK
17	NOVO NORDISK FOUNDATION
20	STATENS SERUM INSTITUT
21	ZEALAND UNIV HOSPITAL
24	DANISH CANCER SOCIETY
35	GENTOFTE HOSPITAL
36	STENO DIABETES CENTER
49	KU LEUVEN
79	HERLEV GENTOFTE HOSP
86	NATIONAL RESEARCH CENTRE FOR THE WORKING ENVIRONMENT
89	NOVO NORDISK
122	NORDSJAELANDS HOSP
143	HOLBAEK HOSPITAL
165	FREDERIKSBERG UNIVERSITY HOSPITAL
168	DANISH HEART FDN
176	NAESTVED HOSPITAL
182	LUNDBECK FOUNDATION INITIATIVE FOR INTEGRATIVE PSYCHIATRIC RESEARCH IPSYCH
195	HERLEV GENTOFTE UNIV HOSP

Swedish research institutions

12	KAROLINSKA INSTITUTET
33	UNIVERSITY OF GOTHENBURG
38	KAROLINSKA UNIVERSITY HOSPITAL
41	SKANE UNIVERSITY HOSPITAL
46	UPPSALA UNIVERSITY
75	UMEA UNIVERSITY
91	SAHLGRENSKA UNIVERSITY HOSPITAL
214	LINKOPING UNIVERSITY
230	OREBRO UNIVERSITY
247	UPPSALA UNIVERSITY HOSPITAL
248	HELSINGBORGS HOSPITAL
281	SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES
290	MALMO UNIVERSITY

International research institutions that collaborate with both Swedish and Danish institutions

3	LEAGUE OF EUROPEAN RESEARCH UNIVERSITIES LERU
9	UNIVERSITY OF LONDON
11	UDICE FRENCH RESEARCH UNIVERSITIES
13	HARVARD UNIVERSITY
15	UNIVERSITY OF OSLO
18	UNIVERSITY OF CALIFORNIA SYSTEM
19	UNIVERSITY COLLEGE LONDON
22	INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE INSERM
23	UNIVERSITY OF HELSINKI
25	HARVARD MEDICAL SCHOOL
26	ERASMUS UNIVERSITY ROTTERDAM
27	ASSISTANCE PUBLIQUE HOPITAUX PARIS APHP
28	ERASMUS MC

29	UNIVERSITE DE PARIS
30	HELMHOLTZ ASSOCIATION
31	UNIVERSITY OF AMSTERDAM
32	UNIVERSITY OF OXFORD
34	IMPERIAL COLLEGE LONDON
37	UNIVERSITY OF TORONTO
39	UNIVERSITY OF CAMBRIDGE
40	NATIONAL INSTITUTES OF HEALTH NIH USA
42	UNIVERSITY OF TEXAS SYSTEM
43	HELSINKI UNIVERSITY CENTRAL HOSPITAL
44	STANFORD UNIVERSITY
45	KING S COLLEGE LONDON
47	UNIVERSITY OF SYDNEY
48	CIBER CENTRO DE INVESTIGACION BIOMEDICA EN RED
50	UNIVERSITY OF BERGEN
51	BRIGHAM WOMEN S HOSPITAL
52	LEIDEN UNIVERSITY
53	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS
54	FREE UNIVERSITY OF BERLIN
55	Vrije Universiteit Amsterdam
56	UTRECHT UNIVERSITY
57	HUMBOLDT UNIVERSITY OF BERLIN
58	LEIDEN UNIVERSITY EXCL LUMC
59	UNIVERSITY OF MELBOURNE
60	UNIVERSITY OF MUNICH
61	UNIVERSITY OF GRONINGEN
62	UNIVERSITY OF BARCELONA
63	CHARITE UNIVERSITÄTSMEDIZIN BERLIN
64	LEIDEN UNIVERSITY MEDICAL CENTER LUMC
65	JOHNS HOPKINS UNIVERSITY
66	UNIVERSITY OF MANCHESTER
67	RUPRECHT KARLS UNIVERSITY HEIDELBERG
68	ACADEMIC MEDICAL CENTER AMSTERDAM
69	MASSACHUSETTS GENERAL HOSPITAL
70	UNIVERSITY OF WASHINGTON
71	UNIVERSITY OF WASHINGTON SEATTLE
72	MAYO CLINIC
74	UNIVERSITY OF BRITISH COLUMBIA
77	UNIVERSITY OF EDINBURGH
80	UNIVERSITY OF CALIFORNIA LOS ANGELES
81	Radboud University Nijmegen
82	UTRECHT UNIVERSITY MEDICAL CENTER
83	HARVARD T H CHAN SCHOOL OF PUBLIC HEALTH
84	UNIVERSITE PARIS SACLAY
90	UNIVERSITY OF PENNSYLVANIA
94	PENNSYLVANIA COMMONWEALTH SYSTEM OF HIGHER EDUCATION PCSHE
100	ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI
101	UNIVERSITY OF CALIFORNIA SAN FRANCISCO
102	TECHNICAL UNIVERSITY OF MUNICH
105	UNIVERSITY OF TURKU
111	GERMAN CANCER RESEARCH CENTER DKFZ
112	UNICANCER
115	TAMPERE UNIVERSITY
137	UIT THE ARCTIC UNIVERSITY OF TROMSO
140	NATIONAL KAPODISTRIAN UNIVERSITY OF ATHENS
180	WORLD HEALTH ORGANIZATION
183	STATE UNIVERSITY SYSTEM OF FLORIDA

Medicon Valley's research collaboration network

Listed numbers are represented in the collaboration network graph

73	NORWEGIAN UNIVERSITY OF SCIENCE TECHNOLOGY NTNU
76	SORBONNE UNIVERSITY
78	GHENT UNIVERSITY
85	UNIVERSITY OF HAMBURG
87	UNIVERSITY OF BERN
88	UNIVERSITY OF GLASGOW
92	UNIVERSITY OF NORTH CAROLINA
93	DUKE UNIVERSITY
95	MAASTRICHT UNIVERSITY
96	UNIVERSITY OF BASEL
97	MEDICAL UNIVERSITY OF VIENNA
98	COLUMBIA UNIVERSITY
99	MONASH UNIVERSITY
103	UNIVERSITY OF ZURICH
104	UNIVERSITY OF NEW SOUTH WALES SYDNEY
106	UNIVERSITY HOSPITAL LEUVEN
107	YALE UNIVERSITY
108	UNIVERSITY OF CALIFORNIA SAN DIEGO
109	CHARLES UNIVERSITY PRAGUE
110	UNIVERSITY MEDICAL CENTER HAMBURG EPPENDORF
113	UNIVERSITY OF BRISTOL
114	MCGILL UNIVERSITY
116	UNIVERSITY OF QUEENSLAND
117	UNIVERSITY OF WESTERN AUSTRALIA
118	UNIVERSITY OF BIRMINGHAM
119	CHINESE ACADEMY OF SCIENCES
120	UNIVERSITY OF MICHIGAN
121	UNIVERSITY OF MICHIGAN SYSTEM
123	AUTONOMOUS UNIVERSITY OF BARCELONA
124	HOSPITAL CLINIC DE BARCELONA
125	MAX PLANCK SOCIETY
126	GUY S ST THOMAS NHS FOUNDATION TRUST
127	UNIVERSITY OF COLOGNE
128	EBERHARD KARLS UNIVERSITY OF TUBINGEN
129	QUEEN MARY UNIVERSITY LONDON
130	HAUKELAND UNIVERSITY HOSPITAL
131	UNIVERSITY OF NORTH CAROLINA CHAPEL HILL
132	UNIVERSITY OF MILAN
133	UNIVERSITY OF GENEVA
134	UNIVERSIDADE DO PORTO
135	HOSPITAL UNIVERSITARI VALL D'HEBRON
136	UNIVERSITE DE MONTREAL
138	UNIVERSITY OF SOUTHERN CALIFORNIA
139	NEWCASTLE UNIVERSITY UK
141	UNIVERSITY OF ICELAND
142	UNIVERSITY OF PITTSBURGH
144	NIH NATIONAL CANCER INSTITUTE NCI
145	TEL AVIV UNIVERSITY
146	UNIVERSIDADE DE SAO PAULO
147	MEDICAL UNIVERSITY OF INNSBRUCK
148	UNIVERSITY OF MINNESOTA SYSTEM
149	MASSACHUSETTS INSTITUTE OF TECHNOLOGY MIT
150	UNIVERSITY OF LAUSANNE
151	UNIVERSITY OF LIVERPOOL

152	US DEPARTMENT OF VETERANS AFFAIRS
153	BEIJING GENOMICS INSTITUTE BGI
154	UNIVERSITY HOSPITAL OF BERN
155	UNIVERSITY OF BONN
156	LONDON SCHOOL OF HYGIENE TROPICAL MEDICINE
157	HELMHOLTZ CENTER MUNICH GERMAN RESEARCH CENTER FOR ENVIRONMENTAL HEALTH
158	BAYLOR COLLEGE OF MEDICINE
159	NATIONAL UNIVERSITY OF SINGAPORE
160	UNIVERSITY OF EASTERN FINLAND
161	UNIVERSITY OF SOUTHAMPTON
162	UNIVERSITY OF MINNESOTA TWIN CITIES
163	UTAH SYSTEM OF HIGHER EDUCATION
164	UTMD ANDERSON CANCER CENTER
166	UNIVERSITY OF UTAH
167	VETERANS HEALTH ADMINISTRATION VHA
169	OHIO STATE UNIVERSITY
170	EMORY UNIVERSITY
171	VANDERBILT UNIVERSITY
172	CARDIFF UNIVERSITY
173	SAPIENZA UNIVERSITY ROME
174	UNIVERSITY HEALTH NETWORK TORONTO
175	LEIPZIG UNIVERSITY
177	ULM UNIVERSITY
178	HANNOVER MEDICAL SCHOOL
179	UNIVERSITY OF LEEDS
181	UNIVERSITY OF PADUA
184	CORNELL UNIVERSITY
185	UNIVERSITY OF BOLOGNA
186	UNIVERSITY OF COLORADO SYSTEM
187	UNIVERSITE DE LILLE ISITE
188	MEMORIAL SLOAN KETTERING CANCER CENTER
189	UNIVERSITY OF CALGARY
190	UNIVERSITY OF EXETER
191	BROAD INSTITUTE
192	UNIVERSITE LIBRE DE BRUXELLES
193	UNIVERSITY OF ANTWERP
194	CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS CSIC
196	WASHINGTON UNIVERSITY WUSTL
197	UNIVERSITY OF OULU
198	MCMMASTER UNIVERSITY
199	UNIVERSITY OF KIEL
200	DAVID GEFKEN SCHOOL OF MEDICINE AT UCLA
201	FRED HUTCHINSON CANCER CENTER
270	BOSTON UNIVERSITY
292	INTERNATIONAL AGENCY FOR RESEARCH ON CANCER IARC
295	FONDAZIONE IRCCS ISTITUTO NAZIONALE TUMORI MILAN
296	UNIVERSITY OF NORTH CAROLINA

Appendix 2

Top 10 research fields in Medicon Valley benchmarked against other major European clusters

The graphs show the performance of Medicon Valley and other clusters in terms of volume (number of research publications published between 2016 and 2020), and the proportion of these papers that are classified as highly cited by Web of Science.

Oncology

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



Public Environmental Occupational Health

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



Biochemistry Molecular Biology

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



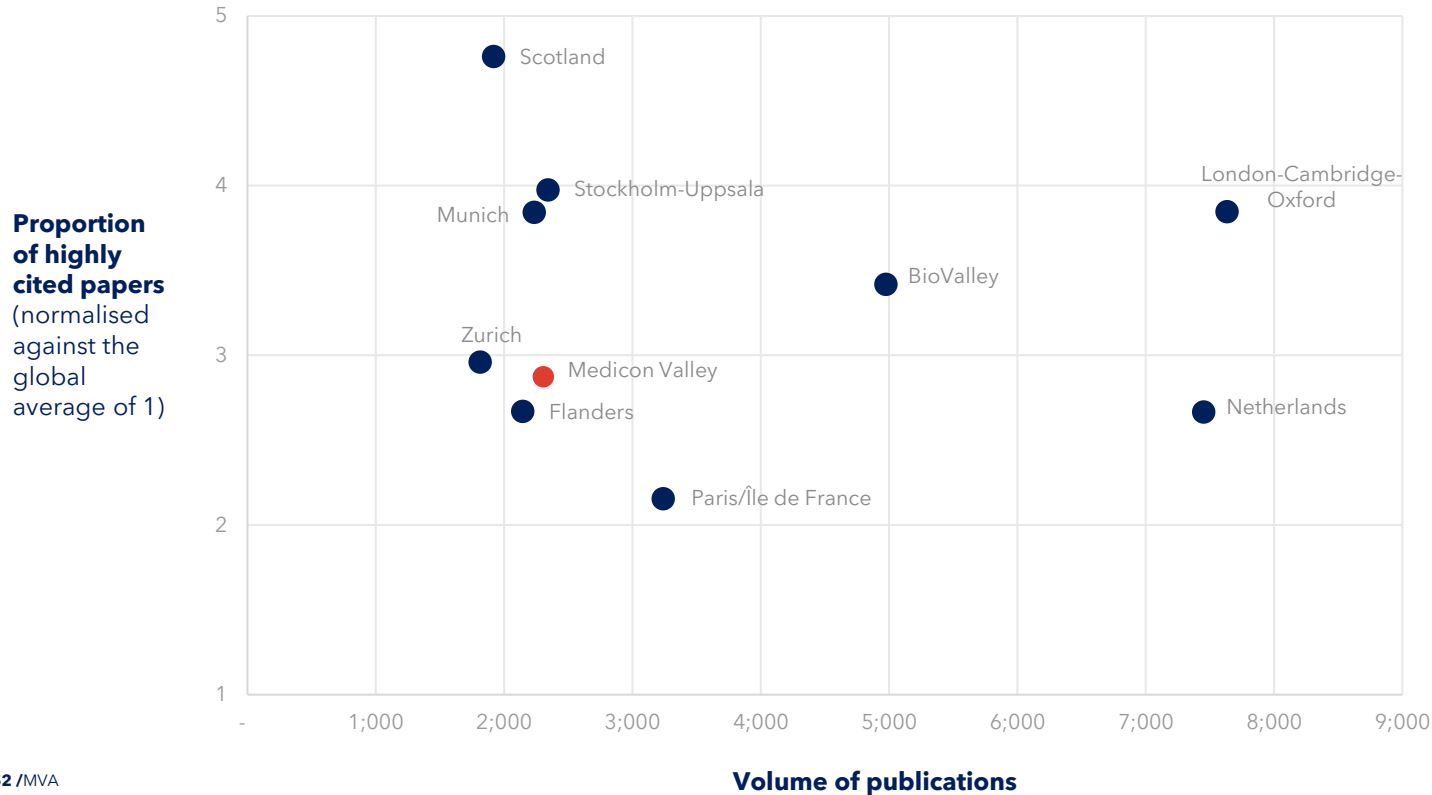
Endocrinology Metabolism

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



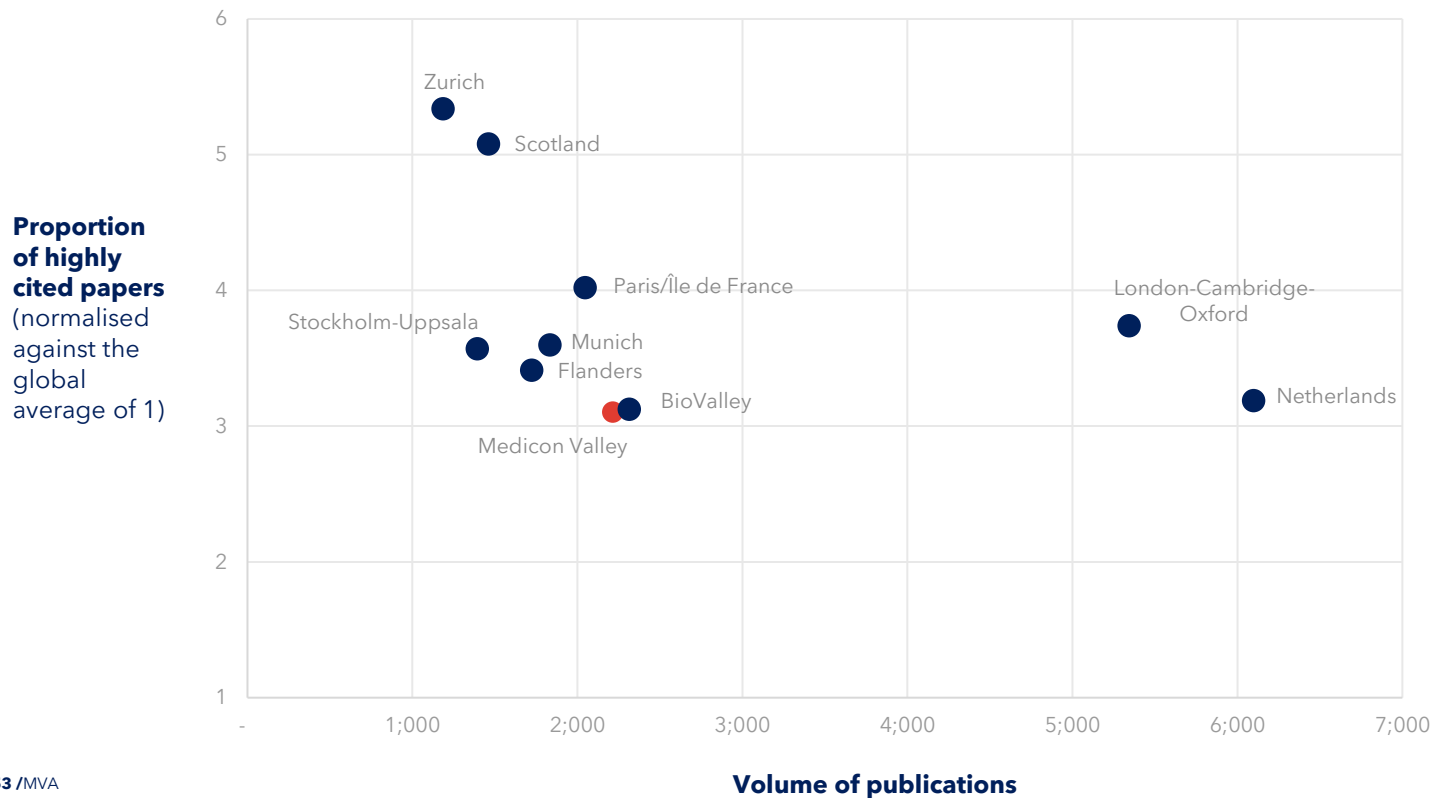
Neurosciences

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



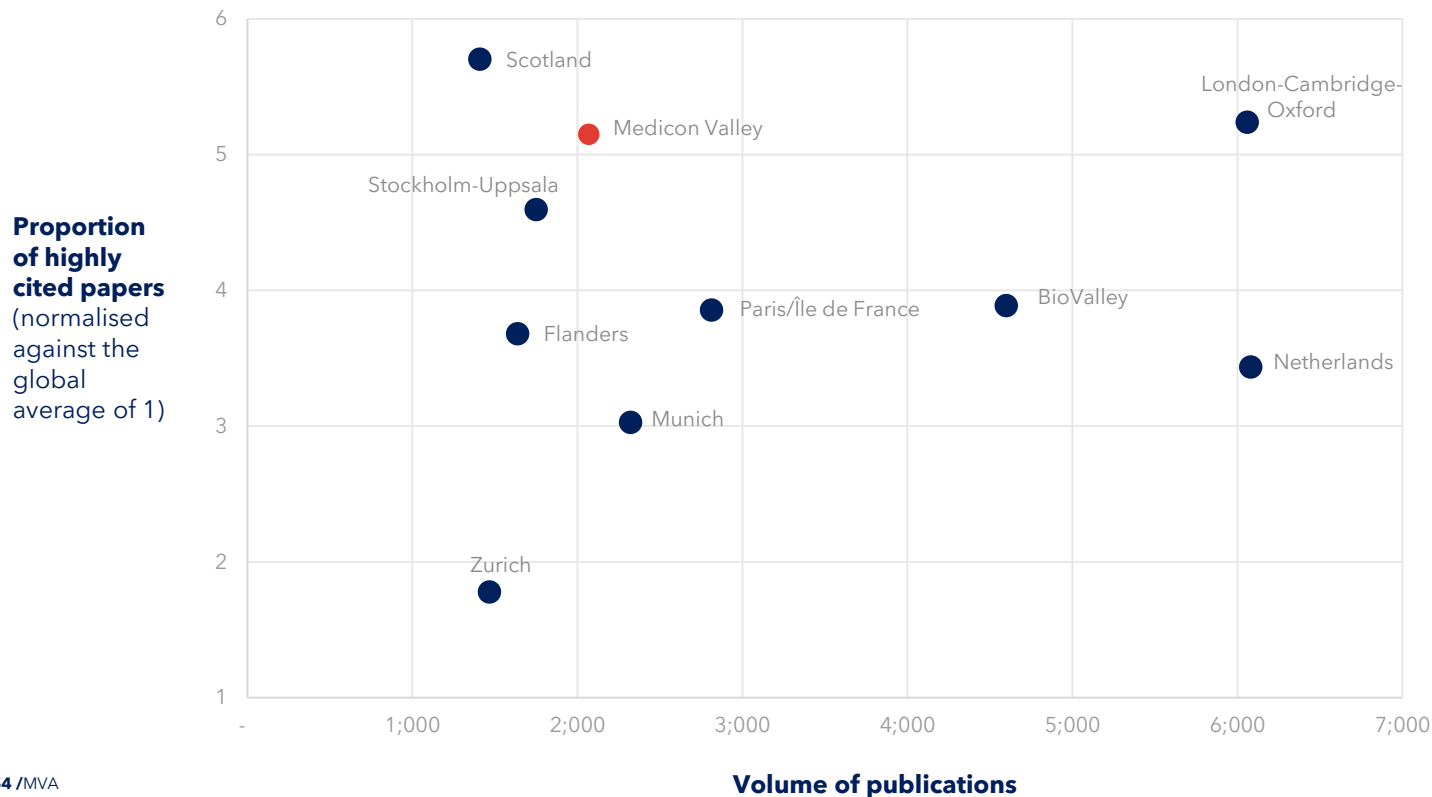
Cardiac Cardiovascular Systems

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



Clinical Neurology

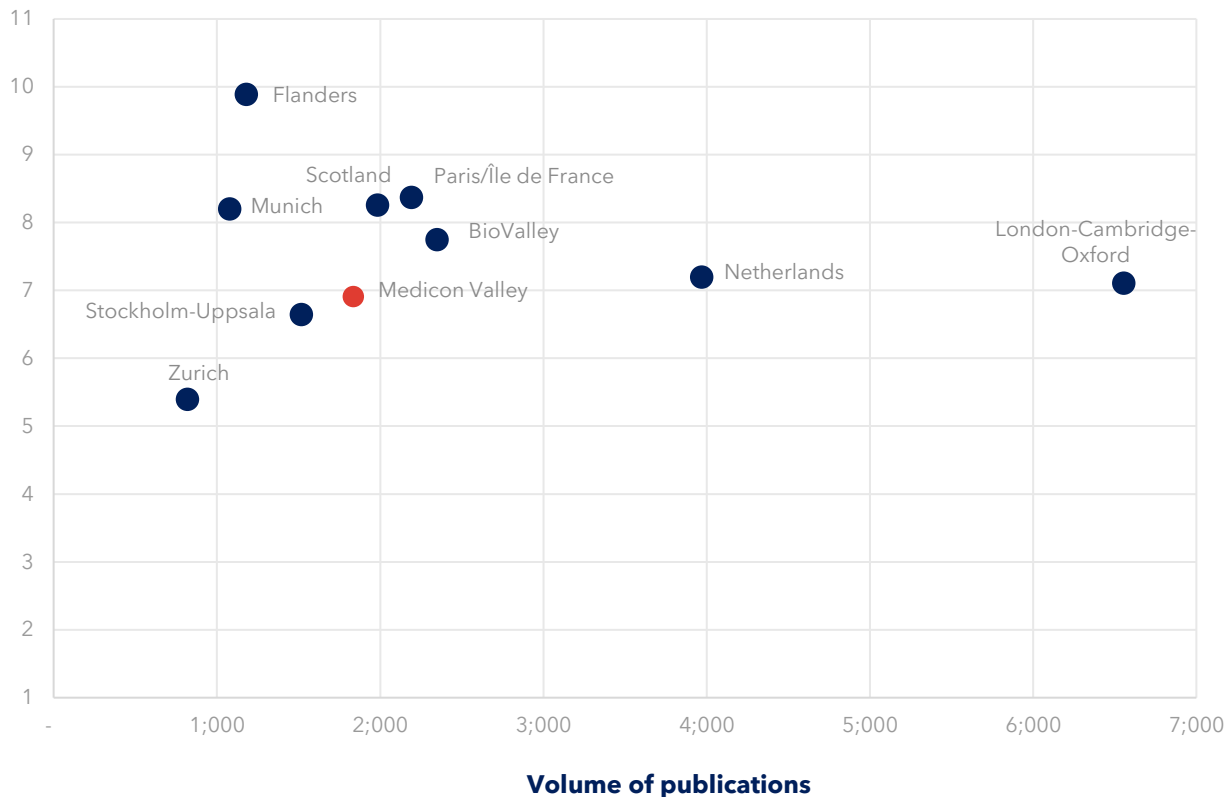
Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



Medicine General Internal

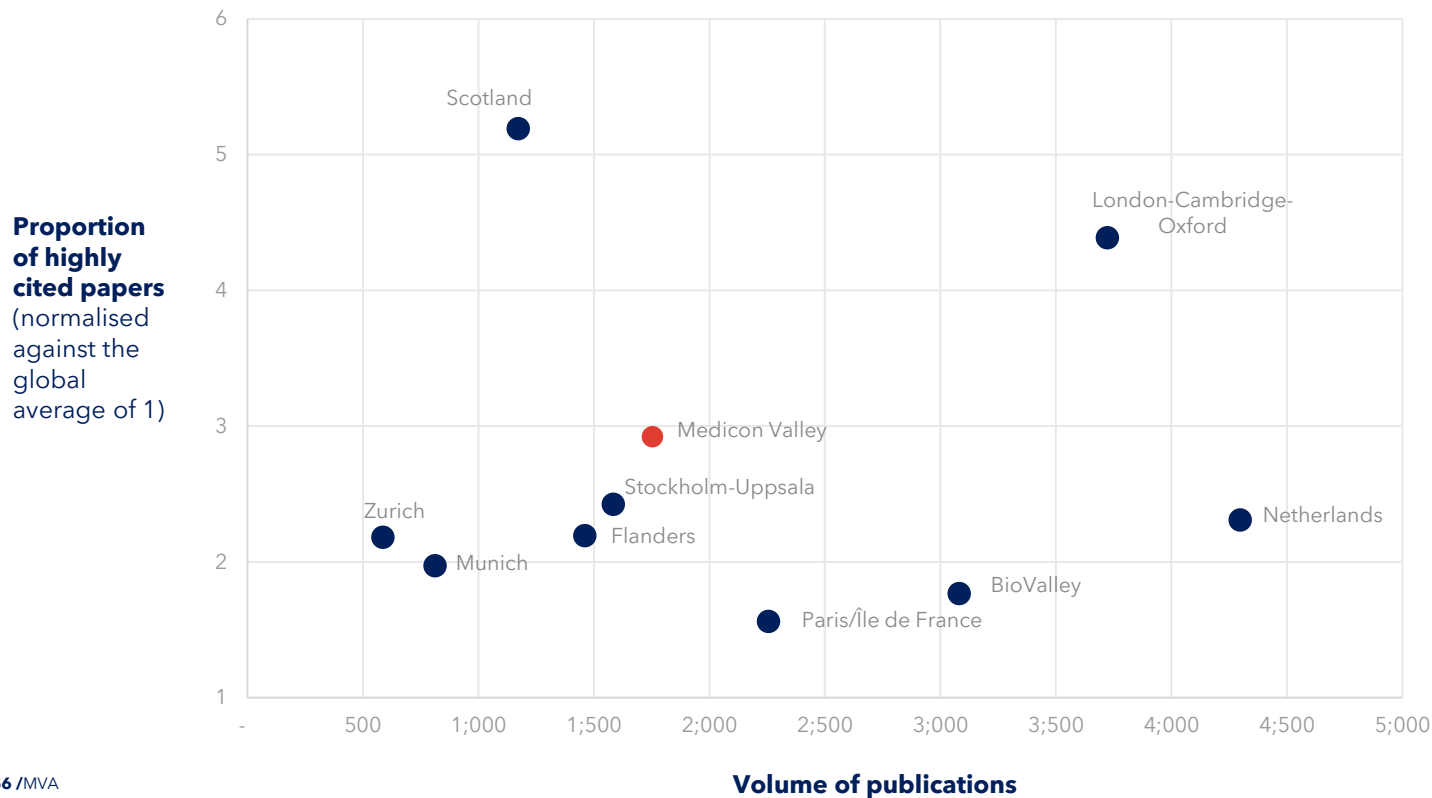
Volume of publications vs proportion of highly cited papers across clusters (2016-2020)

**Proportion
of highly
cited papers**
(normalised
against the
global
average of 1)



Pharmacology Pharmacy

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)



Psychiatry

Volume of publications vs proportion of highly cited papers across clusters (2016-2020)

Proportion of highly cited papers
(normalised against the global average of 1)



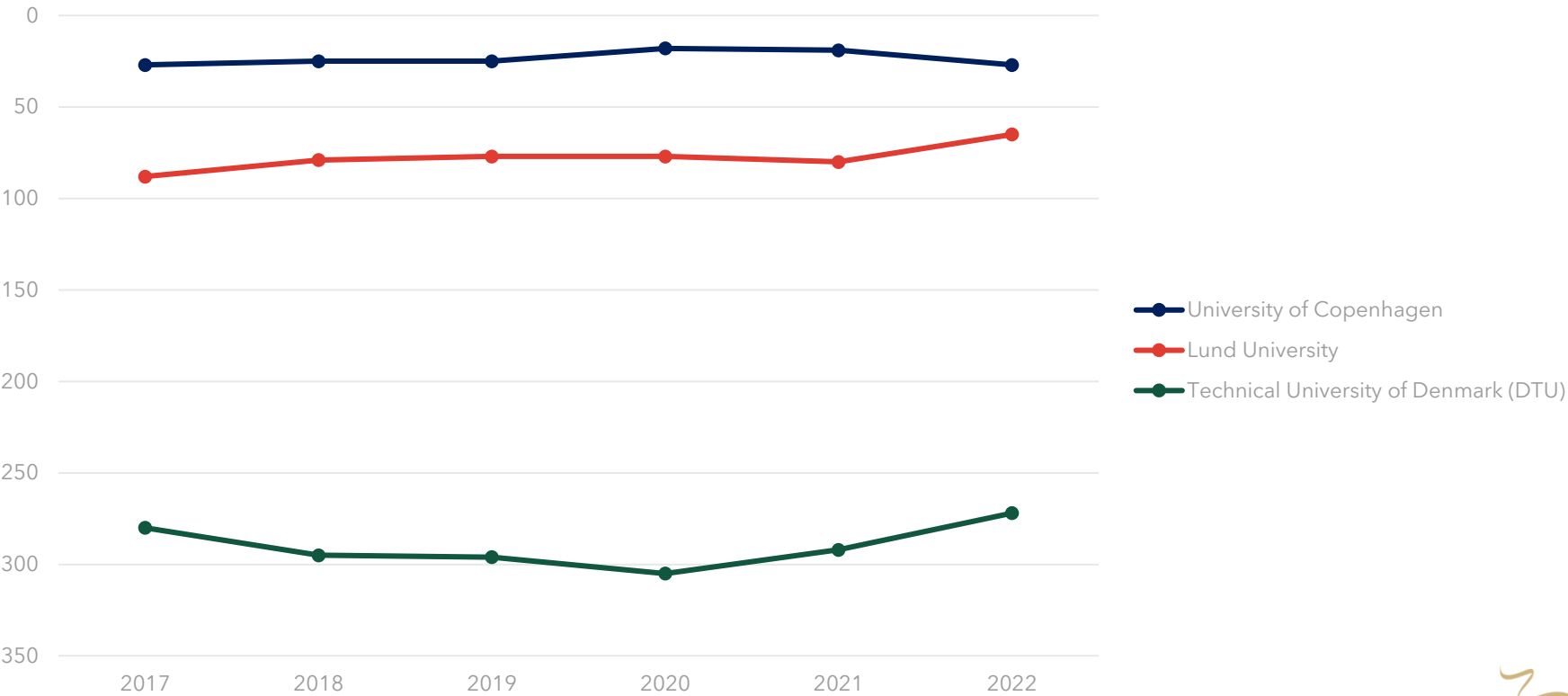
Appendix 3

Performance of Medicon Valley universities in various international ranking lists

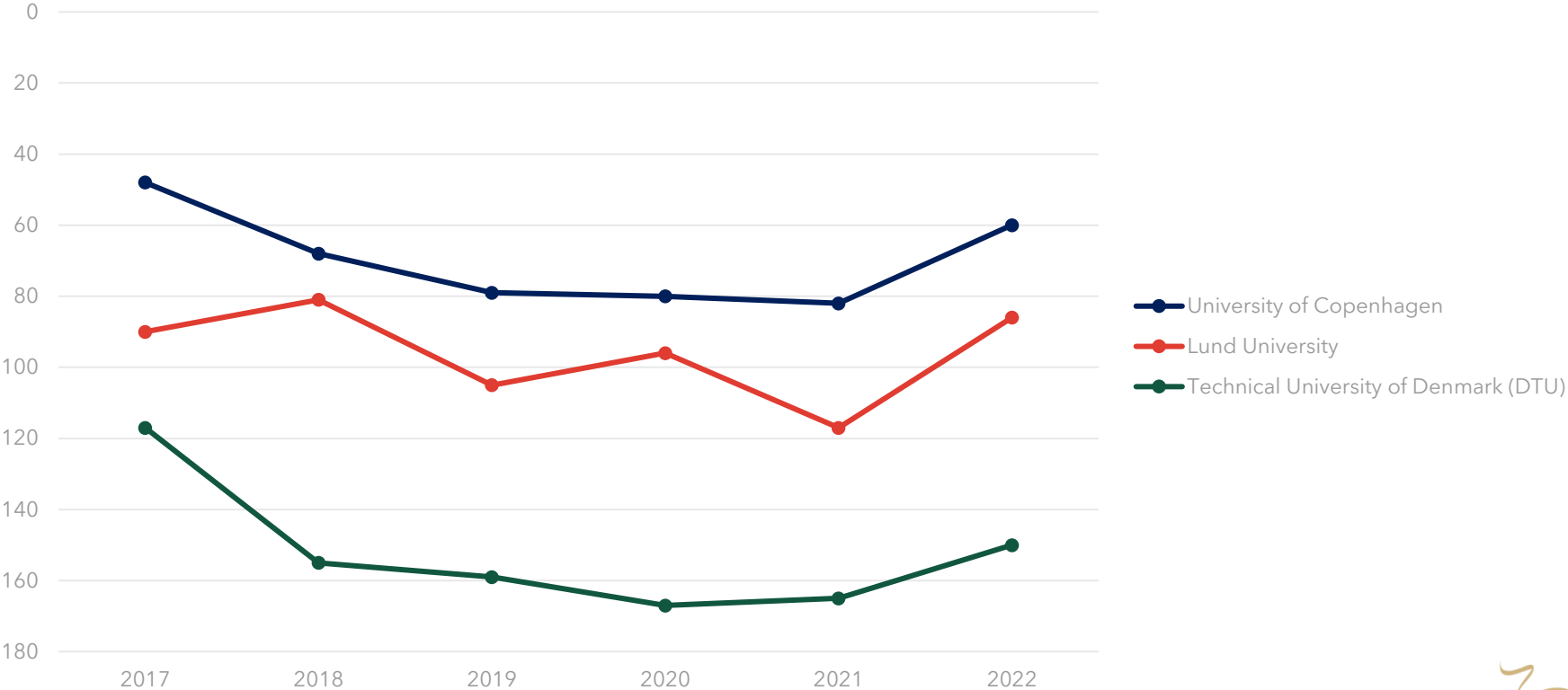
The graphs show the performance of Medicon Valley universities over time. [Times Higher Education's World University Rankings](#) goes back the furthest from 2011 and [QS World University Rankings](#) starts from 2017.

The rankings are research-based, but depending on the list in question, teacher density and international reputation may also have an impact.

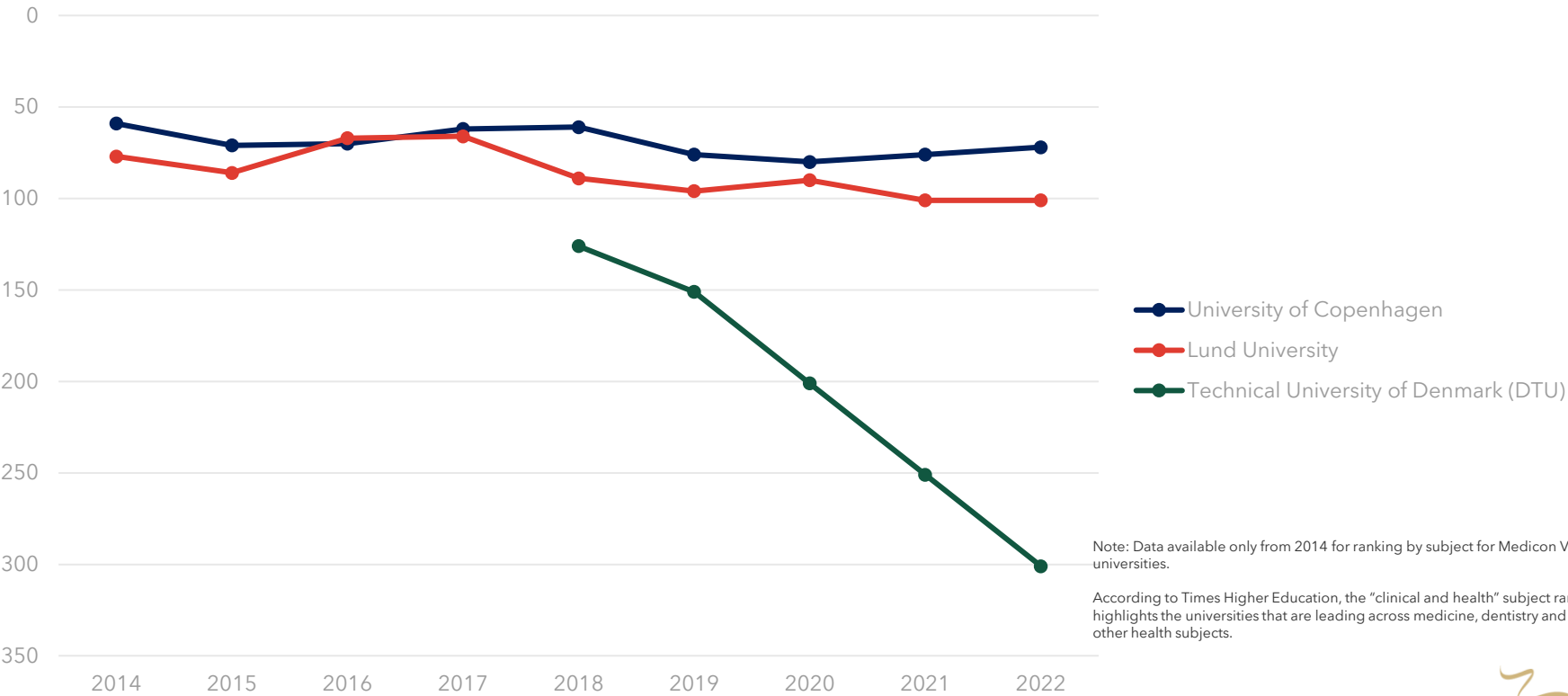
QS World University Rankings - Life Sciences & Medicine (2017-2022)



QS World University Rankings - Natural Sciences (2017-2022)



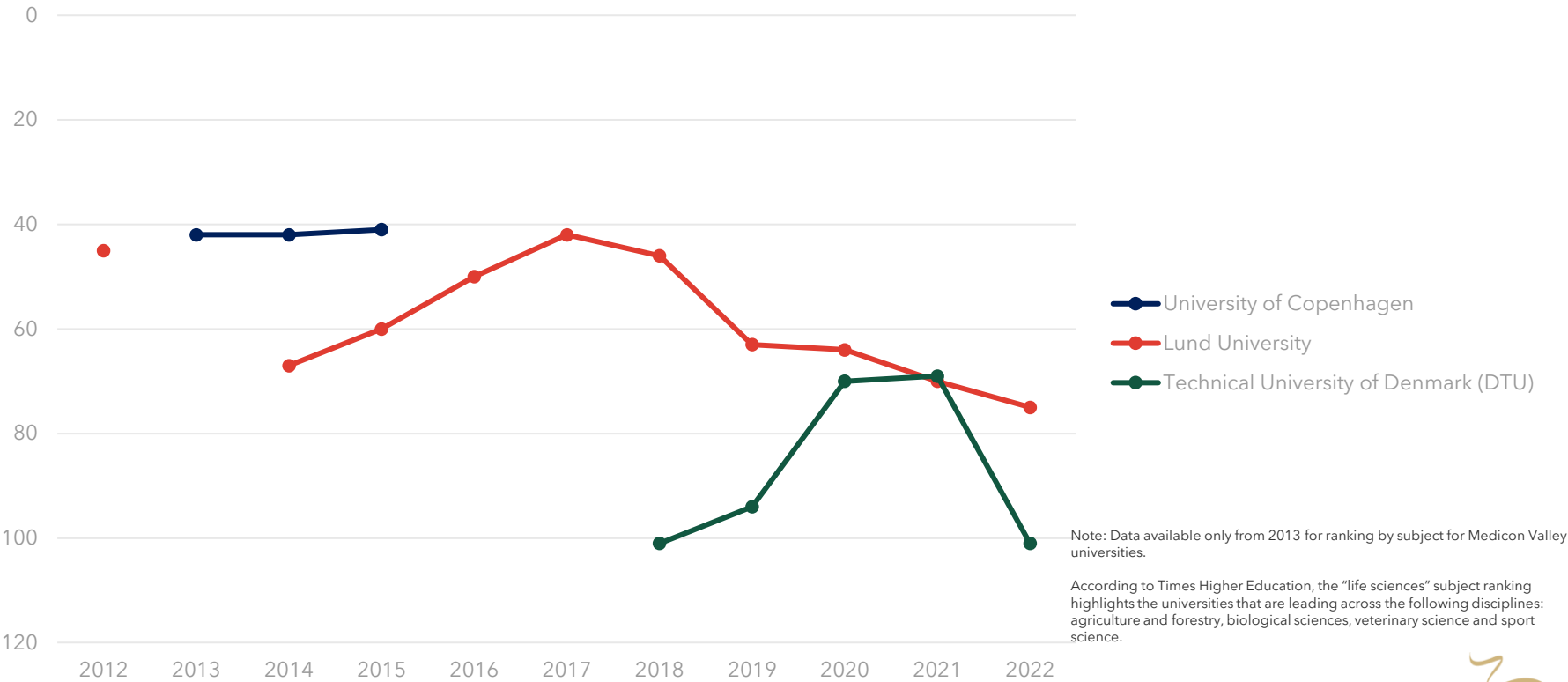
Times Higher Education's World University Rankings - Clinical & Health (2011-2022)



Note: Data available only from 2014 for ranking by subject for Medicon Valley universities.

According to Times Higher Education, the “clinical and health” subject ranking highlights the universities that are leading across medicine, dentistry and other health subjects.

Times Higher Education's World University Rankings - Life Sciences (2011-2022)



QS World Ranking by segments

By Faculty - Life Sciences & Medicine (2022)

Total of 502 on the list

2022 rank	2021 rank		Name of institution
1	1	=	Harvard University, USA
2	2	=	University of Oxford, UK
3	5	↗	Johns Hopkins University, USA
7	8	↗	Karolinska Institute, SE
27	19	↘	University of Copenhagen, DK
59	58	↘	Uppsala University, SE
65	80	↗	Lund University, SE
92	95	↗	University of Gothenburg, SE
116	85	↘	Aarhus University, DK
197	248	↗	Swedish University of Agricultural Sciences, SE*
197	196	↘	University of Southern Denmark, DK*
205	191	↘	Umeå University
209	238	↗	Stockholm University
272	292	↗	Technical University of Denmark
353	284	↘	Linköping University
401-450	348	↘	Aalborg University*

By Faculty - Natural Sciences (2022)

Total of 503 on the list

2022 rank	2021 rank		Name of institution
1	1	=	Massachusetts Institute of Technology, USA
2	3	↗	Harvard University, USA
3	4	↗	University of Cambridge, UK
60	82	↗	University of Copenhagen, DK
76	98	↗	Stockholm University, SE
78	85	↗	KTH Royal Institute of Technology, SE
86	117	↗	Lund University, SE
112	140	↗	Uppsala University, SE
150	165	↗	Technical University of Denmark, DK
176	184	↗	Chalmers University of Technology, SE
201	201	=	Aarhus University, DK
377	373	↘	University of Gothenburg, SE
384	396	↗	Linköping University, SE

- Performs life science research in Medicon Valley
- * Has a branch in the region

If a Medicon Valley university is not on the list, such as Malmö University, it is because they are not represented on the official listing from the QS World Ranking

Times Higher Education

By Subject - Clinical and Health (2023)

Total of 1 001 on the list

2023 rank	2022 rank		Name of institution
1	1	=	University of Oxford, UK
2	4	↗	University of Cambridge, UK
3	2	↘	Harvard University, US
19	13	↘	Karolinska Institute, SE
71	72	↗	University of Copenhagen, DK
99	101-125	↗	Lund University, SE
101-125	101-125	=	Aarhus University, DK
126-150	96	↘	Uppsala University, SE
126-150	126-150	=	University of Gothenburg, SE
201-250	251-300	↗	University of Southern Denmark, DK*
251-300	301-400	↗	Technical University of Denmark, DK
301-400	251-300	↘	Aalborg University, DK*
301-400	251-300	↘	Umeå University, SE
301-400	301-400	=	Örebro University, SE
401-500	301-400	↘	Linköping University, SE

By Subject - Life Sciences (2023)

Total of 1 017 on the list

2023 rank	2022 rank		Name of institution
1	1	=	Harvard University, US
2	2	=	University of Cambridge, UK
3	3	=	Massachusetts Institute of Technology, USA
52	56	↗	Uppsala University, SE
83	75	↘	Lund University, SE
83	85	↗	Stockholm University, SE
86	100	↗	Aarhus University, DK
101-125	101-125	=	Technical University of Denmark, DK
126-150	101-125	↘	Swedish University of Agricultural Sciences, SE*
176-200	201-250	↗	University of Gothenburg, SE
201-250	201-250	=	Chalmers University of Technology, SE
251-300	251-300	=	Umeå University, SE
301-400	251-300	↘	University of Southern Denmark, DK*
301-400	301-400	=	Linköping University, SE
401-500	301-400	↘	Örebro University, SE
n.a.	28		Karolinska Institute, SE
n.a.	301-400		Aalborg University, DK*

- Performs life science research in Medicon Valley
- * Has a branch in the region

According to Times Higher Education, the “clinical and health” subject ranking highlights the universities that are leading across medicine, dentistry and other health subjects.

The “life sciences” subject ranking highlights the universities that are leading across the following disciplines: agriculture and forestry, biological sciences, veterinary science and sport science.

If a Medicon Valley university is not on the list, such as Malmö University, it is because they are not represented on the official listing from Times Higher Education