

DRUG DELIVERY

OPTIMIZING DRUG TRANSPORT AND TARGETING

- Medicon Valley has a strong track record in pioneering drug delivery systems
- Disruptive innovation through collaboration between nanotech, medtech and pharma
- Efficient medicinal treatment increasingly relies on sophisticated drug delivery solutions

What is drug delivery?

Drug delivery is the process or method by which drugs are administered to patients so that they reach the diseased area. For drugs to be effective, they need to arrive where they are required in the body in the right concentration. Ensuring that drugs mainly target a diseased area is also highly desirable as it reduces the side effects, which may occur when drugs influence other parts of the body.

Drug delivery R&D focuses on developing new ways of getting drugs absorbed into the body, new ways of ensuring targeted delivery (i.e. that the drug is mainly active in the target area of the body), and new ways of ensuring sustained release (i.e. that the drug is released over a period of time in a controlled manner).

Why focus on drug delivery?

Optimizing drug delivery plays a central role in drug development. Many promising drug candidates are discarded, because there is no known method of directing them to the diseased area of the body. The blood-brain barrier is, for instance, notoriously difficult to penetrate, making it difficult to treat brain tumours or diseases such as epilepsy and Alzheimer's.

The shift towards treating patients with macromolecular biopharmaceuticals, such as protein-based and nucleic-acid-based drugs, is also intensifying the race to develop new innovative drug delivery systems – not least because biopharmaceuticals are key to personalizing medicine.

Biopharmaceuticals are difficult to deliver orally because they are vulnerable to enzymatic degradation in the gastrointestinal tract and their large molecular size makes them difficult to absorb.

The success of bringing new biopharmaceuticals to the market and tailoring treatment to the individual patient is therefore closely linked to the development of drug delivery systems.

Strongholds in Medicon Valley

Medicon Valley is home to several academic research groups developing new approaches for better drug delivery. Examples include the Section of Pharmaceutical Design and Drug Delivery at the University of Copenhagen, the Center for Nanomedicine and Theranostics at the Technical University of Denmark, the Drug Delivery Development Group at Lund University and the Biofilms Research Center for Biointerfaces at Malmö University.

Furthermore, the MAX IV facility and the ESS have the potential to accelerate innovation within drug delivery systems as detailed nano-scale structural information about potential drugs are a valuable asset to researchers designing new drug delivery systems.

Finally, developing drug delivery systems requires a great deal of collaboration between the different academic life science disciplines, biotech, medtech and pharmaceutical companies as well as hospitals. Medicon Valley, with its strong culture of collaboration, is therefore well equipped to foster innovation in this field – especially given the local industry's strong track record in pioneering drug delivery systems.



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