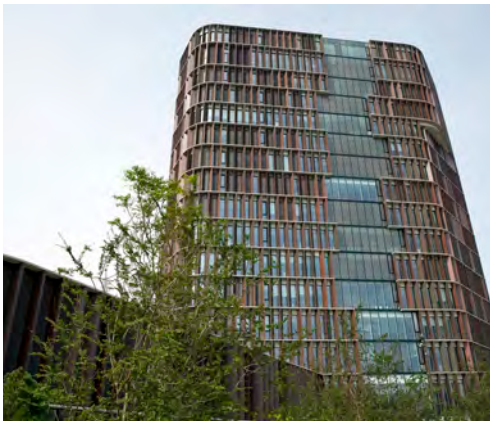
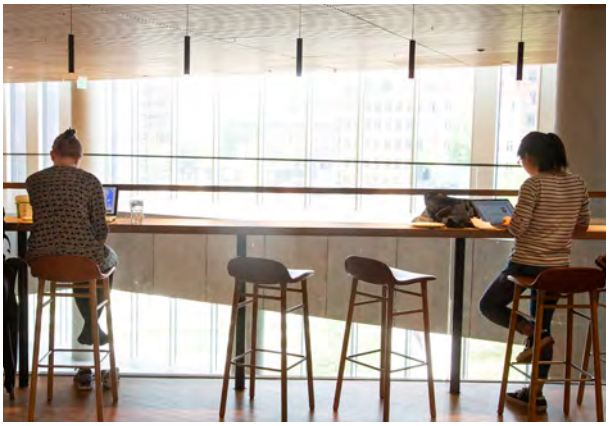
EXPERTISE DEMANDS AND -MATCHING

– higher education and the life science industry's needs in eastern Denmark





38 000 life science students in eastern Denmark

Expertise shortage in STEM subjects and legal- and commercial areas

Demand for study programmes in life science and IT

Medicon Valley Alliance

ØRESUNDS INSTITUTTET

Interreg Öresund-Kattegat-Skagerrak European Regional Development Fund EUROPEAN UNION

Greater Copenhagen LIFE SCIENCE analysis initiative

EXPERTISE DEMANDS AND -MATCHING
– higher education and the life science industry's needs in eastern Denmark

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, Anna Palmehag and Johan Wessman.

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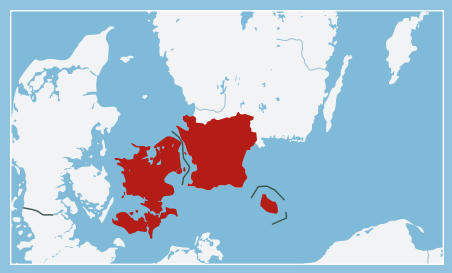
Cover photo: News Øresund and University College Absalon

DECEMBER 2022

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-Kattegatt-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'.

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PREFACE

Life science has become one of Denmark's export successes, feeding economic growth and increasing employment in the country. A large part of the Danish life science cluster is in eastern Denmark – the Danish part of the Danish-Swedish Medicon Valley.

The companies in eastern Denmark's life science sector have increased their employee numbers by 10 500 over five years, and are now investing DKK 45bn in new plants, research facilities and HQs, which is expected to create an additional 4 000 jobs in the Danish part of Medicon Valley. This was revealed in an earlier analysis within the Interreg-project Greater Copenhagen Life Science Analysis Initiative.

Success and the extensive investments in Danish life science bring into focus the need for education and expertise supply, so life science companies can maximise returns on their investments through new products and increased production and exports. We thus hereby present this fifth and final analysis for the Greater Copenhagen Life Science Analysis, entitled 'Expertise Demands and Matching – Higher education and the life science industry's needs in eastern Denmark'.

Companies in the life science cluster in eastern Denmark alone employ 58 000 people regionally today, and there are approximately 38 000 life science students and 160 life science educations in eastern Denmark. Furthermore, there are additional universities and science parks on the other side of the Øresund. With the joint labour market that spans the Øresund, there are currently around 900 trans-border commuters, 800 of whom live in Skåne and work in Denmark.

This analysis shows that there is general satisfaction with eastern Denmark's educational offering – but the challenge lies in not enough people choosing a programme in the natural sciences or technology. There are major recruitment needs in R&D, commercial and regulatory expertise, and IT, as well as a shortage of STEM specialists, regulatory and quality assurance experts, software profiles, production professionals and salespeople.

The aim of this analysis has been to provide an overview of the life science cluster's expertise needs and the higher education on offer, in order to contribute to continuing constructive efforts to improve access to skilled employees.

Copenhagen and Malmö, 13 december 2022

Johan Wessman
CEO
Øresundsinstituttet

PHOTO: NEWS ØRESUND

Copenhagen University

PHOTO: NEWS ØRESUND

Technical University of Denmark

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ABOUT EASTERN DENMARK AND SKÅNE

When we refer to eastern Denmark 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 in 2021, 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.

7 HIGHLIGHTS FROM THE REPORT

FIVE INSIGHTS FROM THE STUDY

The survey of the life sciences conducted in 2021-2022 includes input from around 50 companies from the sector and provides five insights into expertise needs and -shortages in eastern Denmark

- Greatest recruitment needs in R&D, commercial and regulatory expertise, and IT
- Shortage of STEM specialists, regulatory and quality assurance experts, software profiles, production professionals and salespeople
- General satisfaction with eastern Denmark's educational offering – but the challenge lies in too few choosing a programme in the natural sciences or technology
- Around every second life science company has experienced difficulty recruiting
- Employment on the rise in all subsectors and regions in eastern Denmark

PHOTO: UNIVERSITY COLLEGE ABSALON

For more on expertise needs and how actors from the sector recommend improving the compatibility of expertise needs in the industry and the educational sector, see pages 11-21

PHOTO: NOVO NORDISK

58 000 EMPLOYEES IN SECTOR

Around 58 000 people regionally work in around 700 life science companies in eastern Denmark; Øresundsinstituttet showed this in the 2022 report Life Science in Eastern Denmark – the Danish Part of Medicon Valley. Over the past five years, employment in the sector has risen, with 10 500 new positions in the life science companies identified in eastern Denmark, and around two hundred companies were founded – most of them in Copenhagen. Pharma is the largest subsector.

TECHNICAL UNIVERSITY OF DENMARK, COPENHAGEN UNIVERSITY, UNIVERSITY COLLEGE ABSALON AND THE STUDENT ORGANISATION SYNAPSE HAVE THEIR SAY

PHOTO: NEWS ØRESUND

For this report, representatives were interviewed from Copenhagen University's Faculty of Science and the Faculty of Health and Medical Sciences as well as from Graduate Studies and International Affairs at the Technical University of Denmark (DTU), Engineering and Science at University College Absalon and the Danish-Swedish student organisation Synapse. At DTU, programmes at the interface between IT and the life sciences are a steadily growing area. At the University of Copenhagen's Faculty of Science, work is underway to make digital postgraduate courses part of the faculty's core activities, on par with bachelor- and master programmes. According to the student organisation Synapse, universities in the region can still establish far more contact with the industry for the benefit of students.

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study programmes linked to the life sciences are offered at universities and university colleges in eastern Denmark. Around 55% of those are clearly oriented towards a career in the life science- or health sector.

PHOTO: NEWS ØRESUND & DTU

UNIVERSITIES INVESTING IN PROGRAMMES THAT LINK IT AND LIFE SCIENCE

"An almost insatiable need" – is how Philip Binning, DTU's Dean of Graduate Studies and International Relations describes the industry's request for study programmes that give expertise in both the life sciences and IT. All of the learning institutions interviewed for this report see the same demand – with new technologies such as AI, new treatment methods and larger data volumes, the need has increased for data- and software analysis in the life science sector. The universities thus report that work is being done to develop programmes that meet those requirements, or to integrate digitalisation and IT more in existing life science training.
A further challenge faced by universities and university colleges is attracting students to apply for the programmes the industry is asking for. The student organisation Synapse, which organises life science students, believes that universities could put more emphasis on career opportunities available in the life science sector, not only in academia.

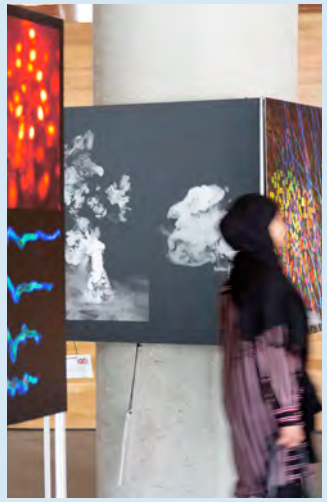

PHOTO: NEWS ØRESUND

"STAY IN DENMARK"

PHOTO: UNIVERSITY COLLEGE ABSALON

The University College Absalon has received special permission to offer its MSc in Biotechnology in both Danish and English.
"International students stay in Denmark and find employment in the industry, and a few go on to do a master's degree," says Conni Edith Simonsen, Head of the Centre for Engineering and Science.

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Of the 20 subjects that generated half of Medicon Valley's scientific publications in life science research between 2006-2016, 15 were cited more frequently than the international average. This was revealed in a study by the Dutch research institute CWTS. The largest research areas are biochemistry and molecular biology; endocrinology and metabolism; oncology; and neurosciences.

162 EDUCATIONAL PROGRAMMES IN EASTERN DENMARK LARGELY MATCH UP WITH THE LIFE SCIENCE SECTOR'S EXPERTISE NEEDS

There are around 38 000 life science students and 162 life science educations in eastern Denmark. Eastern Denmark's thriving life science sector employs around 58 000 people privately in the region. The sector comprises medicinal companies, biotech- and medtech enterprises, and contract manufacturers as well as health- and foodtech businesses. The educational programmes on offer for life science students in eastern Denmark correspond to the industry's expertise requirements. Nonetheless, more focus on certain key skills such as automation, digitalization, and transdisciplinary educations may improve links between the industry and the educational sector. This information was presented in the report 'Life Science in eastern Denmark – the Danish Part of Medicon Valley', published by Øresundsinstituttet in May 2022. Around 700 life science companies were identified in eastern Denmark, and around 87% of the 58 000 employees work in a life science company in the Capital Region of Denmark. The life science sector has experienced strong investment capacity, positive employment growth, and increased industrial policy attention over the past five years.

37 644 study in 162 life science programmes in eastern Denmark

162 life science programmes on various levels are offered at universities and university colleges in eastern Denmark. Around 38 000 students are affiliated with a life science programme at either the University of Copenhagen, the Technical University of Denmark, Roskilde University, Aalborg University in Copenhagen, University College Absalon or Copenhagen University College, according to the survey conducted by Øresundsinstituttet.

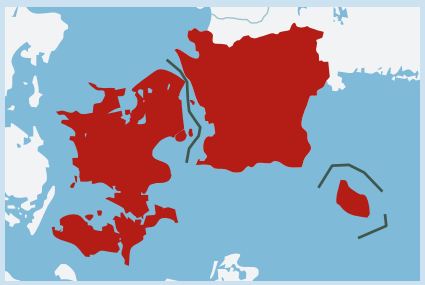
Many of the region's life science training programmes target healthcare, but many are also aimed at the life science sector. Examples include Master of Science and Master programmes in Chemical- and Bioengineering and Pharmaceutical Engineering at the Technical University of Denmark. Bioentrepreneurship can be studied at Copenhagen Business School. At University College Absalon, students can earn MSc in Mechanical Engineering, and at Copenhagen University College they can become bioanalysts. Roskilde University offers e.g. life science programmes in Medicinal Biology, and Pharmaceutics and Bioinformatics programmes at Copenhagen University can lead to careers in e.g. pharmaceutical or biotech companies.

Political agreement caps number of study places in largest university cities

Despite the many educational programmes on offer in eastern Denmark, a 'relocation agreement' has put learning institutions in a situation in which they can only start new programmes in Denmark's largest cities if they simultaneously cut back the number of study places in existing programmes in large urban centres. This coincides with universities – e.g. DTU – reporting increased demand from the private sector for new programmes that give expertise in the life sciences as well as IT, since digitalisation, automation and the use of advanced computer programming continue to become a more important part of pharmaceutical development. In spite of the agreement, the universities want to continue to develop new kinds of programmes or integrate digitalisation and IT more into existing life science programmes, and they also want to make postgraduate courses – where the focus is on digital competence and more – part of their core activities, according to interviewees in this report. Read more on pages 32-41.

MEDICON VALLEY EMPLOYS 65 500

The companies in the Danish-Swedish Medicon Valley cluster employ around 65 500 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'.

Satisfaction with educations on offer – but a wish for more focus on e.g. industry internships and transdisciplinary educational paths

The balance between the educational training on offer in the life sciences in eastern Denmark and the expertise needs in the regional life science industry is generally excellent, according to around 50 life science companies in the region questioned. Three out of four companies feel that the region's educational offering prepares students well for jobs in the private life science sector.

There is thus pronounced confidence that eastern Denmark's educational system matches up with the expertise that life science students in the region will need in the future labour market, according to the survey by Øresundsinstituttet. However, one-fourth of the companies point out that the educational offering could be improved with e.g. more focus on industry internships during training and following graduation, as well as more transdisciplinary educational paths that bring together e.g. clinical and technological disciplines. The major challenge throughout is that not enough people are choosing study programmes in the natural sciences or technology, according to learning institutions and companies in Øresundsinstituttet's survey. Read more on pages 14-15.

Demand for expertise in STEM, regulatory affairs and commercial fields

Although the life science sector is generally confident that the educational training on offer in eastern Denmark is pertinent, almost six out of ten life science companies in eastern Denmark had experienced challenges with recruitment, according to the survey conducted by Øresundsinstituttet. Ca 40% of the around 60 companies interviewed had not experienced recruiting difficulties, however. This indicates that recruitment difficulties may be experienced in different ways from company to company. This may depend on e.g. the area within the life sciences in which the company in question is active, the company's location within the region, and the resources that each company can allocate for searching the labour market and attracting professionals regionally, nationally, or from abroad. According to the survey, many of the skills in demand by most life science companies in eastern Denmark at the moment, regardless of subsector and company size, are also those in short supply: expertise in the STEM fields (Science, Technology, Engineering and Mathematics) and within the regulatory- and commercial fields. In other words, it may be difficult to recruit regulatory experts, production specialists, scientists, IT and digital developers, market access professionals or salespeople with professional knowledge of the field. Read more on pages 15-20.

Educational institutions and students view industry links differently

There is good contact between the life science sector and the universities and university colleges in the region, according to people from the learning institutions interviewed for this report, in part thanks to reference groups where industry representatives offer their perspectives on important expertise needs, which contributes to a continual exchange of information between academia and the industry.

Despite the many opportunities today, the student organisation Synapse, which represents life science students from the University of Copenhagen, the Technical University of Denmark, and CBS, finds that universities in the region have great possibilities to further improve contact with the industry and give even more information on career paths in the life sciences that are outside academia and research. The industry could also benefit from creating more attractive internship opportunities, and ultimately, the students themselves have a responsibility to gather information, says Synapse. There is –just like on the Swedish side of Medicon Valley – potentially an information gap between the opportunities that students perceive for contact with companies during their studies and the opportunities that factually exist at the learning institutions. Read more on pages 40-41.

Four strong research areas in Medicon Valley

Research in the life sciences in the Danish-Swedish Medicon Valley cluster is excellent in an international context, as a 2018 survey conducted by the Dutch research institute CWTS at Leiden University showed. Medicon Valley's four main research areas in terms of the number of scientific publications are biochemistry and molecular biology, endocrinology and metabolism, oncology, and neuroscience. These research topics have traditionally been excellent in the region, and they are frequently showcased by the universities themselves. The links to companies in the region are also many, e.g. Novo Nordisk, Lundbeck and Genmab on the Danish side of the Øresund. Read more on pages 42-51.


PHOTO: NEWS ØRESUND, COLOPLAST, HELIX LAB, NOVO NORDISK, NOVOZYMES

COMPANIES' EXPERTISE NEEDS

Shortage of expertise in regulatory affairs, production specialists, scientists and IT and digital experts in eastern Denmark

Around 58 000 people work in research, development and production of new medicines, health solutions and medical equipment in the ca 700 life science companies identified in eastern Denmark. The task of ensuring the sector's access to employees with the right expertise is important for public health as well as the economy, as the sector is responsible for around 20% of Denmark's total goods exports. In five years, the sector has seen regional employment growth of around 22%, according to the survey of the sector compiled by Øresundsinstituttet. The majority of people employed in the life science sector in eastern Denmark work in an enterprise located in a municipality within the Capital Region of Denmark; this is where job growth has been most notable over the past five years in relation to Region Zealand. Access to skilled labourers is important in the Copenhagen area, where most of the companies are concentrated, as well as in other places in eastern Denmark such as Kalundborg, Roskilde and Køge. The survey of companies compiled by Øresundsinstituttet and the poll of around 50 life science companies in eastern Denmark reveal that expertise in the natural sciences, commercial areas, regulatory affairs, production, IT and technical areas are the primary fields in which the identified life science companies in all subsectors see a shortage, as well as a need to recruit. There is overall satisfaction with the educational programmes on offer in eastern Denmark, although seven recommendations have been made to fortify the matching of competences between the educational sector and the industrial sector.

Over the past five years – between 2017-2021 – around 700 pharma-, biotech-, medtech-, foodtech- and healthtech companies and contract manufacturers identified in eastern Denmark have grown from employing a total of around 47 700 people to employing around 58 000 people. This was presented in the report 'Life Science in Eastern Denmark – the Danish Part of Medicon Valley', published by Øresundsinstituttet in May 2022.

The task of ensuring the sector's access to the right expertise is important for various reasons: the life science industry is in a period of growth; it has been highlighted as a national position of strength by the Danish Ministry of Industry, Business and Financial Affairs and others; it has proven itself resilient to fluctuations in the economy during the coronavirus pandemic and the financial crisis; and after many years of growth, it now comprises around 20% of Denmark's total goods exports.

In addition, the sector holds great potential for the future. Around 4 000 new jobs are expected to be generated in eastern Denmark in the coming years as a result of private facility-investments in new production-, lab- and office facilities in the sector for more than DKK 45bn, according to Øresundsinstituttet. Another 9 500 new jobs could potentially be created in the life science sector in Denmark by 2030, e.g. if research is commercialised more to become startups, according to a report from Damvad Analytics in April 2022. Ultimately, Danish life science can double its exports for a total of DKK 345bn by 2030 if the right framework is in place and continual adaptations are made, according to a 2021 analysis by the Danish Chamber of Commerce.

"Around 4 000 new jobs are expected in eastern Denmark in the coming years as a result of private investments in facilities."

Facility investments create broad need for expertise in sector

The life science sector in eastern Denmark comprises business activities that span the entire value chain. The business cluster sees R&D, commercial activities, logistics and distribution, and not least, highly specialised production. Numerous important actors in the sector, such as Novo Nordisk, Novozymes, LEO Pharma,

Lundbeck, Chr. Hansen, Fujifilm and AGC Biologics, have large plants in eastern Denmark that specialise in e.g. insulin production, neuromedicine, and enzyme development. Now and in the coming years, the life science companies are expanding their plants for a total of DKK 45bn in order to modernise their production processes and increase their capacity to meet increased demands. The result will be better production technology that can lead to better and safer pharmaceuticals. However, the plant expansions will also create the need for many new employees. Profiles with long, advanced educations in the STEM fields (Science, Technology, Engineering and Mathematics) are in demand, but profiles with medium-length vocational educations, as well as process- and mechanical operators, electricians and metalworkers who can manage and maintain production apparatuses also need to be recruited, according to the poll and in-depth interviews conducted by Øresundsinstituttet – read more on pages 14-15. This shows that there is a need in the sector for employees at many different educational levels, from PhDs to production staff.

Access to expertise particularly important for Copenhagen and capital city municipalities

Securing access to employees with the right qualifications for the life science companies in all of eastern Denmark is a local, regional, and national task. The task of supplying expertise to the sector also crosses national borders: at least 800 border commuters from Sweden work in leading life science companies in eastern Denmark, according to the survey compiled by Øresundsinstituttet in 2021 for the report 'Life Science Across the Øresund'. For example, more than 200 commuters from Sweden work at Novo Nordisk on the Danish side of the Øresund.

The task of procuring the necessary expertise for the sector is particularly important for decision-makers in Copenhagen and the capital city municipalities. This is due in part to the life science sector in eastern Denmark being primarily concentrated in 13 municipalities, the majority of which are located in the capital region, according to the survey by Øresundsinstituttet. These municipalities may be considered 'life science-centres' in which more than 1 000 people are employed locally in the life science industry. Around 86% of the ca 58 000 people employed regionally work in a company located in one of these 13 municipalities. Gladsaxe Municipality, the Municipality of Copenhagen, and Ballerup Municipality are the region's high-jumpers: they are home to life science companies that employ more than 5 000 people in each municipality.

PHOTO: ALK

Expertise supply in the sector is also important in relation to the so-called beacon companies with more than 250 regional employees. Øresundsinstituttet identified 30 life science companies of this size in eastern Denmark; of them, Novo Nordisk, Novozymes, LEO Pharma, Demant and Chr. Hansen are the five largest. The 30 beacon companies are primarily located in the capital area – albeit with facilities dispersed around eastern Denmark – and they are particularly important for the economy of the Øresund Region, the growth of the sector, and for competence exchange between large companies and startups across the region: there are repeated examples in the sector of employees in the region bringing industrial- and management experience from larger companies to smaller companies, even on the other side of the Øresund. More than three-quarters of all 58 000 employees in the life science industry in eastern Denmark work in large life science companies.

SEVEN RECOMMENDATIONS FROM THE INDUSTRY

1. MORE STEM MASTER'S GRADUATES ARE VITAL

Actors from the sector highlight the importance of educating more university students in Science, Technology, Engineering and Mathematics (STEM) subjects in various ways. Pharmacists, lab technicians, chemists, molecular biologists, engineers, and IT-specialists are some of the STEM-professionals important for the sector.

2. VOCATIONAL EDUCATION FOR PROCESS OPERATIONS AN IMPORTANT FOCUS

Professionals such as management operators and process operators with medium-length vocational training specialised in pharma are important for the pharmaceutical industry, where production is becoming increasingly digitalised, automatized, and complex. Companies report that professionals such as process operators with knowledge of automation are in great demand in eastern Denmark; the same is also true in Skåne. Other vocational training, for example for metalworkers and electricians, is also highlighted as important for the sector.

3. GIVE UNIVERSITY GRADUATES MORE PRACTICAL EXPERIENCE AND INDUSTRY CONTACT

Bridge-building between businesses and industrial life, more internship opportunities during education and the amassing of real-world skills – multiple companies emphasise this as important for students to learn more about industry expectations and gain familiarity with e.g. lab work. University graduates who have finished their training may also benefit from two-year trainee- and 'travel around-programmes' that can give young professionals new knowledge and let them experience different workplaces and issues in the industry, according to sector actors.

4. CREATE TRANSDISCIPLINARY PROGRAMMES THAT COMBINE CLINICAL AND TECHNICAL DISCIPLINES

The life science sector has grown broader in recent years due to new technologies and treatment approaches. Because of artificial intelligence, machine learning, and data, pharma- and medtech companies also collaborate more with app producers and software developers. It is important that the programmes on offer reflect developments in terms of shifting sectors and include transdisciplinary programmes that bring together clinical and technological disciplines, according to sector actors.

5. STRENGTHEN AUTOMATION- AND DIGITALISATION EXPERTISE IN EASTERN DENMARK

Professionals with expertise in automation and digitalisation related to the life sciences and pharmaceutical development may be difficult to recruit in eastern Denmark, according to people from the sector. Data software is becoming more important in production methods for accelerating the development of new medicines and medical equipment, and the coronavirus pandemic has shifted the formulation of new ways in which life science companies can e.g. test and connect with patients into overdrive, according to some companies. More graduates with expertise in automation, IT, and digitalisation are thus important, say sector actors.

6. REGULATORY AFFAIRS AND QUALITY ASSURANCE VITAL FOR SECTOR

Professionals with expertise and experience in regulatory affairs (RA) and quality assurance (QA) are in shortage in eastern Denmark and in the Øresund Region in general, according to players from the sector. This coincides with legal framework for the life science industry growing stricter in recent years, with new EU regulations in 2021 and 2022. Quality assurance and regulatory affairs are a large domain in pharmaceutical development and should thus be more in focus in university programmes or offered as independent courses or educational programmes, say sector actors.

7. ESTABLISH A MASTER'S PROGRAMME FOR PHARMACEUTICAL ENGINEERING

There is potential in a new engineering master's programme for specialisation in pharmaceutical production, according to Novo Nordisk. Locating the programme close to production sites would be advantageous, as the skilled employees educated could be recruited and retained locally, they say. The Technical University of Denmark (DTU) is working to instate a new master's programme in biomanufacturing in Kalundborg with around 40 places of study locally. The programme would be available for study at earliest in the autumn term of 2024.

ABOUT THE RESULTS. From 2021-2022, Øresundsinstituttet communicated via e-mail, telephone, and surveys with ca 50 life science companies of various sizes and from different subsectors in eastern Denmark for the report 'Life Science in Eastern Denmark – the Danish Part of Medicon Valley'. The aim was to generate new knowledge relevant to the labour force about the sector's regional expertise needs- and shortages. One aspect of plotting out this knowledge was also analysing how the private life science industry views the balance between the education on offer in eastern Denmark in relation to the need for specific expertise in the industry. In other words: Does the educational system in eastern Denmark match up with the expertise that the region's life science companies will need for the future labour force? The question is complex, and this mini-analysis develops the material gathered by Øresundsinstituttet between 2021-2022 to offer a response. While the results can neither be generalised nor considered comprehensive for the sector as a whole, they provide indications of how private players from the sector view the question and how regional and national initiatives can be utilised to strengthen one of Denmark's commercial positions of strength.

Life science survey offers four insights on expertise needs and -shortages in eastern Denmark

The areas of expertise for which life science companies in eastern Denmark consider it difficult to recruit are predominantly related to the STEM disciplines (Science, Technology, Engineering and Mathematics). Expertise in e.g. regulatory affairs and quality assurance pose a recruitment challenge. This is one of the four main conclusions about expertise needs and -shortages that can be drawn from Øresundinstituttet's mapping out of the life science sector in eastern Denmark in 2020-2021. The results that follow are extracted from the report 'Life Science in Eastern Denmark – the Danish Part of Medicon Valley', published in May 2022.

Recruitment needs greatest in R&D, sales and marketing

Of the 14 potential areas for recruitment, the majority of the ca 50 companies interviewed would like to recruit more personnel with scientific expertise and skills in sales and marketing – see the table on page 15. Researchers with niche knowledge and commercial profiles who know the market are important for companies. Small-, medium- and large life science companies in all subsectors reported in the survey that they need recruits in these subject areas. In other words, numerous life science companies in eastern Denmark need new researchers, new marketing people, lab technicians, engineers; process operators, IT-specialists, and more are also in demand. Furthermore, the expertise that life science businesses in eastern Denmark deem to be in short supply can be summarised in five main areas: 1) Regulatory experts and quality assurance professionals; 2) Technicians, vocational professionals, engineers, and production specialists; 3) Researchers with a background in the natural sciences; 4) IT- and software profiles and digital specialists, and 5) Salespeople, market access-specialists and commercial profiles. There is a shortage of expertise in these subject areas, according to ca 50 large- and small life science companies from all subsectors.

General satisfaction with education on offer in eastern Denmark – but there is room for improvement

There is general satisfaction when it comes to the balance between the educational training on offer in the life sciences in eastern Denmark and the needs for expertise in the life science industry. When asked 'Is there a good balance between the education on offer in the region and the demand for particular competences in the sector?', 44 life science companies responded yes, whilst 14 answered no – see the diagram on page 15. Numerous companies report that the education on offer regionally is sound, and that they believe the challenge lies in an insufficient number of people choosing a programme in the natural sciences or technology.

Around every other life science company faces recruitment challenges

42% of the around 60 life science companies that responded to this question in the survey report that they have not experienced difficulties recruiting specific expertise in eastern Denmark, not least due to successful employer branding work – see the table on page 15. Around 58% of the businesses interviewed report that recruiting certain expertise has been a challenge. More than half of the companies interviewed thus experience difficulty recruiting. In Skåne, around every second life science company has experienced or faces relative difficulties recruiting specific expertise to their businesses. Life science companies in eastern Denmark are finding that new, skilled employees with specialised STEM-knowledge have grown more difficult to access in the past few years, during which the sector has grown despite the pandemic.

Increasing employment in all subsectors in eastern Denmark

More than half of the life science companies in eastern Denmark have increased their number of employees in the past five years; the same is true in Skåne. This information is based on data gathered on 616 of the 697 life science companies identified – see the table on page 15. The positive employment development between 2017-2021 is seen in all subsectors in the life sciences in eastern Denmark. Around 58 000 people are thus employed by the life science companies, according to the most recent figures available. 68% of the companies interviewed expect to take on more employees in the coming years. This attests to optimism and belief in the future in the sector in spite of current geopolitical and macroeconomic insecurities – see the table on page 15.

COMPANIES PLAN TO RECRUIT MOST IN R&D

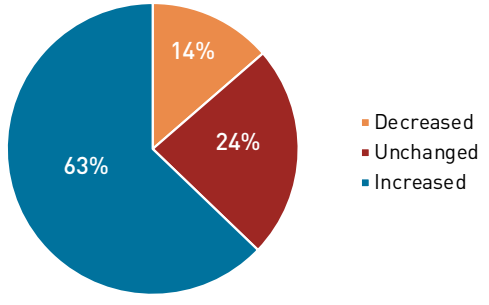
Area for recruitment	Number of companies
R&D	34
Sales	33
Regulatory Affairs	30
Business Development	24
IT and Technology	22
Marketing	20
Production	19
Laboratory	18
Storage and logistics	15
Economy	15
Human Resources	14
Distribution	10
Communication	10
Law	7

Source: Questionnaire with ca. 50 respondents from life science companies in eastern Denmark. Responses in multiple categories were possible.

METHOD

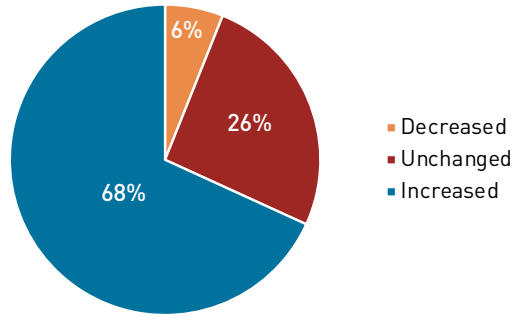
Between early 2021 and the spring of 2022, life science companies in eastern Denmark with more than 100 employees were contacted via telephone or email with a survey link from a database. Smaller companies in science parks in eastern Denmark were also contacted in this manner. Around 50 life science companies in eastern Denmark with varying staff sizes and in various subsectors contributed to the survey of expertise.

CHANGE IN THE COMPANIES' EMPLOYEE NUMBERS SINCE 2017



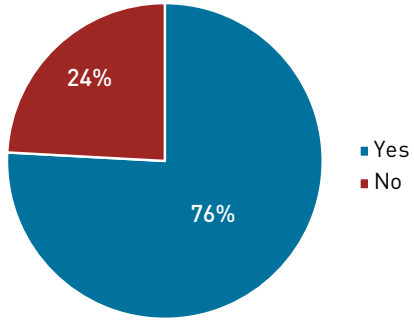
Based on data from 616 companies. Source: Statistics Denmark, Bisnode, Central Business Register and data from the companies.

HOW DO YOU EXPECT EMPLOYEE NUMBERS TO DEVELOP IN THE COMING YEARS?



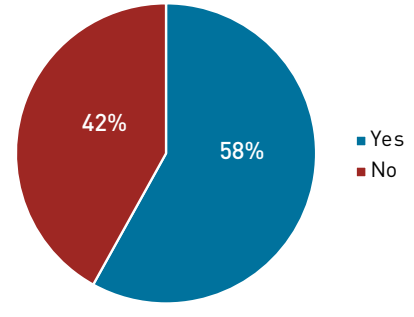
Based on survey responses from 66 companies.

DO TRAINING AND EDUCATION CORRESPOND WELL TO THE DEMAND FOR EXPERTISE?



Based on survey responses from 58 companies.

IT IS DIFFICULT TO RECRUIT SPECIFIC EXPERTISE?



Based on survey responses from 62 companies.

Important to increase knowledge of e.g. automation, digitalisation and entrepreneurship

A good research environment, a high level of education, foundations with strong capital resources and good infrastructure: these are some factors that the life science companies interviewed by Øresundsinstituttet between 2021-2022 consider valuable in eastern Denmark. When it comes to future required expertise, various efforts will be necessary to strengthen the climate in the sector. Greater focus on the educational system for industrial automation, digitalisation, regulatory affairs, quality assurance, and transdisciplinary education are important, according to a number of industry leaders who had their say in the report 'Life Science in Eastern Denmark – the Danish Part of Medicon Valley', published by Øresundsinstituttet in May 2022.

AGC BIOLOGICS. The CDMO company **AGC Biologics** has been one of the fastest growing life science companies in eastern Denmark in recent years. The number of employees has more than tripled since 2016, and today the company employs ca 700 people in the region. Increased demand has led the company to invest DKK 1.2bn in a new production facility adjacent to its existing facility in Søborg. The investment is expected to generate around 250-300 new jobs regionally in the coming years. Some of the skills in demand are manufacturing, process development, quality assurance, and quality control scientists. The company's site lead in Copenhagen **Andrea Porchia** finds that the skilled labour demand in the region has grown over the past years.

PHOTO: NEWS ØRESUND

– We are many companies looking for the same competences. We are working on a recruitment strategy and along with bringing in people from outside, we are also putting efforts into internal training and career paths. We are looking at collaborations with various universities.

PHOTO: ELOS MEDTECH

ELOS MEDTECH. Based in Hillerød with around 170 employees, the medtech company **Elos Medtech** has gone from being the sole subcontractor supplying larger medtech companies with advanced small parts such as screws and components related to dental implants to developing and marketing its own products and brands, as well offering consultations on production design, commercialisation, and quality assurance in medtech. Coupled with growth in the company in general, the new profile has meant that finding enough of the right expertise has been a challenge, says **Peter Ohlsen**, Chief Financial Officer.

– Concretely speaking, we have and will continue to have a need for additional expertise in metalwork manufacturing of small components with very small tolerances; quality assurance; regulatory affairs; development engineers for the dental segment; and international sales and marketing. And finally, we will also need IT resources with a focus on optimising primarily administrative processes.

PHOTO: LUNDBECK

LUNDBECK. One of Medicon Valley's largest life science companies, **Lundbeck**, whose specialty is neurological medicine, is currently in the process of strategically restructuring its research to strengthen its pipeline. That calls for many new specialists and advanced digital expertise, and many such professionals are in short supply in Medicon Valley, says **Elise Hauge**, Executive Vice President for People and Communication at Lundbeck, whose global headquarters employs around 1 500 people and is located in Valby, Copenhagen.

– We need to appraise where digitalisation can be used more in our clinical tests, but also how to maintain contact with people who are testing our products, for example via an app, so we can gather real time evidence. We're looking to recruit a lot of people with digital expertise. So are a lot of other companies and industries. Digital expertise is hard to find.

– My colleagues at other pharma companies are also concerned about the future. We don't see it getting easier to recruit highly skilled labourers in the future. In that sense, we see it increasingly becoming a problem.

PHOTO: NOVO NORDISK

NOVO NORDISK. **Novo Nordisk**'s manufacturing facility in the harbour city Kalundborg in north-western Zealand is the sector's largest production facility in Medicon Valley, employing around 3 300 people and manufacturing around half of the world's insulin. The Danish global pharmaceutical company is investing DKK 18bn in its production in Kalundborg. Four new plants will be built, existing facilities will be expanded, and more than 400 new employees will be recruited to keep pace with sales growth and the demand for the company's diabetes products. A master's programme in pharmaceutical engineering would boost Denmark as a manufacturing nation and Medicon Valley as a whole, says **Michael Hallgren**, who is Senior Vice President at Novo Nordisk API Manufacturing in Kalundborg and in the US.

– We are currently hiring new colleagues for various roles, including – but not limited to – Automation and Robotics Engineers, Process Engineers, Development Scientists, Data Scientists, Process Scientists, Process Operators, Project Managers, Associate Managers and Quality Assurance Professionals.

– A next step to strengthen both Medicon Valley and Denmark as a manufacturing nation on the whole could be establishing an educational programme specifically for pharma. Locating it near manufacturing sites that take on graduates would be an advantage and give the pipeline a local context, making it easier to recruit and retain skilled employees locally. Concretely, we see potential in for example master-level training in pharmaceutical engineering. In addition, there is a need for ordinary training programmes and continuing education on multiple levels, specifically in the Industry 4.0 and sustainability transformation of Denmark as a manufacturing nation.

KLIFO. From its headquarters in Glostrup, Denmark, the drug development consultancy **KLIFO** with around 150 employees has grown beyond national borders in recent years and advises biotech- and pharmaceutical companies in Medicon Valley and beyond on e.g. regulatory expertise. Many startups and large, firmly established life science companies with R&D and production result in a diverse, regional labour market, and that hones expertise so employees can move smoothly between smaller biotech companies and Big Pharma, says **Alejandra Mørk**, CEO of KLIFO.

– Until 2021, we were always able to find the people we wanted. And many people have come to KLIFO looking for job opportunities. But in 2021 it became very clear that those people are in very high demand, she says, adding that the greatest shortage of candidates is in "the entire quality assurance field".

PHOTO: NEWS ØRESUND

– Quality assurance is a gigantic domain in pharmaceutical development. And the areas of pharmaceutical technology and pharmaceutical regulation have been downgraded in importance in our educational systems over many years now.

COOK MEDICAL. More than 50 years have gone by since the privately-owned American medtech producer **Cook Medical** set up with two employees in Denmark. Today, more than 800 people work at Cook Medical in Bjæverskov, about 50km southwest of Copenhagen. Every year, the company invests around DKK 100m to further develop the company, which manufactures vascular implants used in the healthcare sector. The balance between the education on offer regionally and the industry's expertise needs is excellent, but the life science sector in eastern Denmark is challenged because there are too few science graduates with the right qualifications, according to **Thomas Gabriel**, Managing Director of Cook Medical in Denmark.

– It would benefit the sector if more people completed master's educations nationally in Science, Technology, Engineering and Mathematics (STEM); the educations currently offered are largely excellent. As we see it, the mix of programmes in Denmark is actually quite alright. The issue is very simply that there aren't enough graduates. There's by and large a need for many more STEM graduates. And there's also a need for skilled staff electricians, smiths, and similar professionals.

PHOTO: COOK MEDICA

SYMPHOGEN. The Danish biotech company **Symphogen** based in Ballerup northwest of Copenhagen with around 135 employees was moving toward an IPO for several years but was ultimately acquired by the French Servier in 2020. Around 30 more employees have since started working in Ballerup, where plans for more recruitment are also underway. Beyond the scientific employees, who are in great demand, the sector in the Copenhagen area would benefit from more transdisciplinary project managers with life science expertise and trainee programmes for new graduates, according to **Karin Garre**, General Manager of Symphogen.

– How do we balance what we can and want to do ourselves and what we can purchase 'in town', and what possibilities do we have when it comes to using AI to 'handle' our data and optimise how we plan projects and processes. Employees who can do that would be valuable for us.

PHOTO: NEWS ØRESUND

– Two-year trainee- and 'travel around-programmes' for new graduates might be able to bring innovation to companies and foster young professionals by giving them new knowledge, introducing methods and letting them experience different workplaces and issues.

WS AUDIOLOGY. The world's third-largest hearing aid company, **WS Audiology**, employs 11 000 people around the globe and around 1 050 in the region at its headquarters in Lynge in Zealand, and it has twofold experience of the challenge of recruiting skilled employees. The company fusion in 2019 was a boost for talent recruitment from around the globe, as WS Audiology became a global operator. Like other life science companies however, the company has felt the overall shortage of special IT-expertise and sought to combat the challenge with graduate programmes, more brand awareness, and a focus on diversity, says Senior HR Director of WS Audiology in Denmark **Malene Brostrøm**.

– We are a growing company and therefore we will need a wide range of talents from many different areas, everything from our highly specialised R&D people, to marketing, operations, finance, and more.

PHOTO: WS AUDIOLOGY

– Highly skilled IT-workers and software engineers are in high demand everywhere, so like many other companies, we are fighting for these talents.

PHOTO: SYMPHOGEN

FERROSAN MEDICAL DEVICES.

The medtech company **Ferrosan Medical Devices** employs around 240 people in Søborg northwest of Copenhagen, manufacturing products to stop bleeding during surgery and more. With backing from a Swedish private equity company, the company will be putting a double-digit percent of its turnover into modernising its production machinery over the next few years with automation and digital control. Recruiting IT- and tech-expertise in Medicon Valley is difficult however, and that is a great challenge for the cluster, says CEO **Rasmus Hother le Fevre**.

FOTO: NEWS ØRESUND

– We can't get enough people in automation and digitalisation. They are very difficult to recruit. There's a real shortage there.

– We need to continue to ensure that the health sector has the resources it needs – not only to treat patients, but that it also has enough left over to look toward the future and work with the industry to develop health solutions for tomorrow, whether those solutions are in medicine or medtech.

MONSENSO.

The Copenhagen-based healthtech company **Monsenso** develops apps and software solutions to promote better mental health in patients with mental- and neurological conditions. More educations that combine tech and health would benefit Medicon Valley, where it is difficult to recruit software developers, user experience designers, and interprofessional profiles with psychiatric expertise and an interest in tech and computer science, says CEO **Thomas Lethenborg**.

PHOTO: MONSENSO

– Combining traditional medicine and healthtech solutions has great practical value; we can improve medicines and make them more effective and reduce the risks with studies because we can set up more focused clinical studies with specific target groups.

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 Øresundsinstituttet 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. Over 200 people travel from Sweden across the Øresund to work at the company in Denmark.

The study was conducted for the report Life Science Across the Øresund, which was presented in June 2021 by Øresundsinstituttet.

PHOTO: NEWS ØRESUND

Examples of life science companies in eastern Denmark 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

+20

At least 20 Danish CEOs/managing directors work in large, medium-sized, and small life science companies in Skåne. The Danish CEOs head both private- and listed companies. The number of Danish directors has risen since 2017.

Dorte X. Gram, CEO of PILA Pharma in Malmö

Søren Tulstrup, CEO of Hansa Biopharma in Lund.

PHOTO: NEWS ØRESUND & HANSA BIOPHARMA

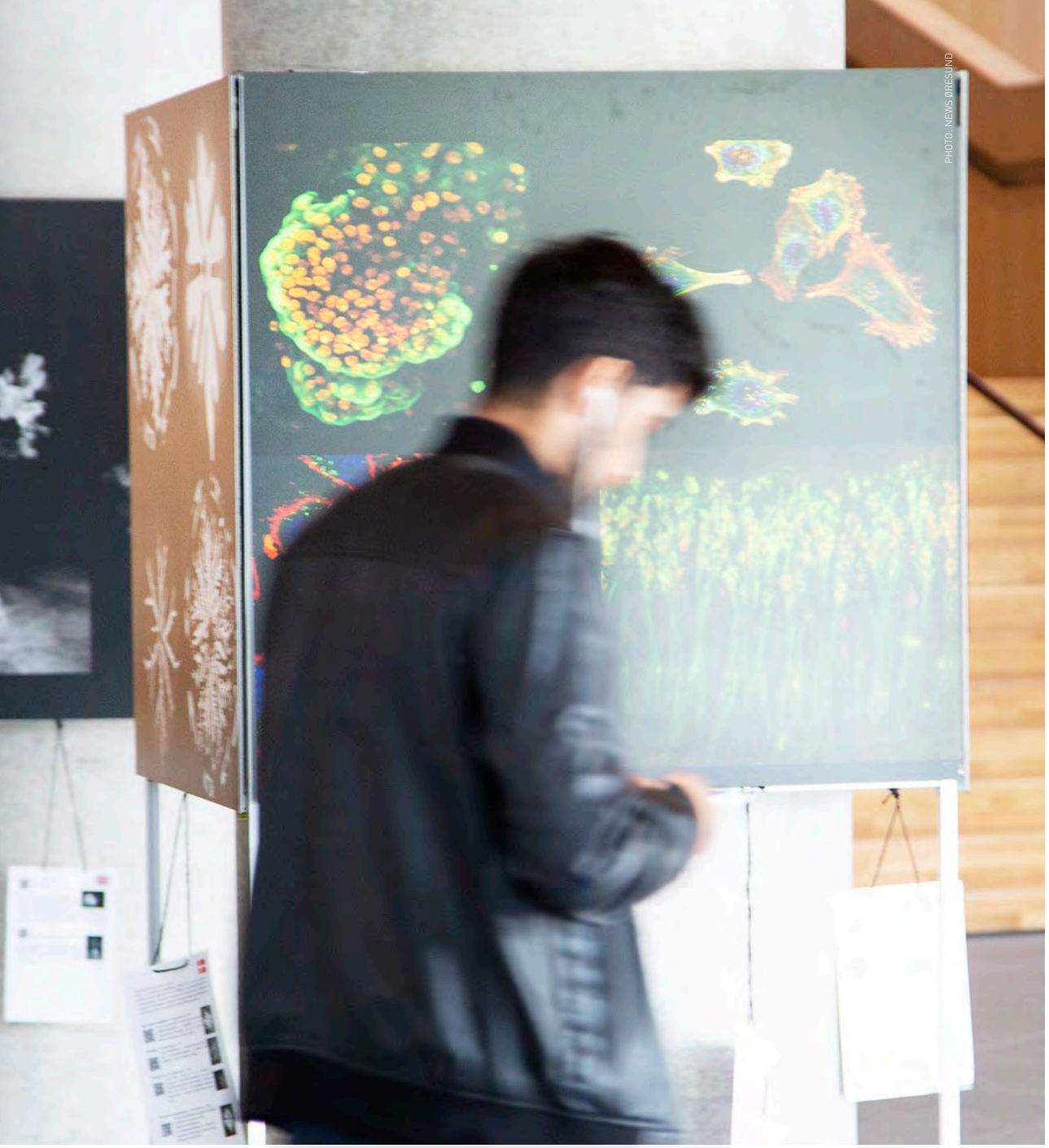
SWEDEN AND DENMARK INCREASE R&D DEDUCTIONS

In 2022, the Danish government permanently raised the deduction for R&D expenses to 130%. In Sweden, the R&D deductions were doubled in 2020, going from 10 to 20%, so companies' employer's social security contributions are lower. Among other things, the new tax conditions should make investments more attractive for companies from abroad.

DENMARK AND SWEDEN WANT NEW TAX SCHEME FOR ØRESUND COMMUTERS

PHOTO: NEWS ØRESUND

Official restrictions due to the corona pandemic have made it difficult to fulfil the requirement of being physically present in one's country of employment 50% of the time. Sweden and Denmark thus began renegotiating the 'Øresund Agreement' in 2021-2022, in order to make it more adaptable to a more flexible labour market. When the new regulations will become effective has not yet been announced.



EDUCATION

Danish universities and university colleges aim to meet the life science sector's digitalisation wishes

In 2021, 37 600 students were enrolled in one of the 162 programmes in eastern Denmark that are in some way related to the life sciences or target the life science sector. Digitalisation and IT are areas that all of the universities and university colleges interviewed seek to strengthen within educational programmes; this is in part a response to an explicit request from the industry. But there are also challenges for the institutions. For example, there is a political directive to move educational programmes away from the urban centres, and there is also the task of attracting a sufficient number of students to apply for the programmes requested by the life science sector.

Life science programmes on various levels are offered at numerous universities and university colleges in eastern Denmark: the University of Copenhagen, the Technical University of Denmark (DTU), Roskilde University, Aalborg University in Copenhagen, Copenhagen Business School (CBS), University College Absalon, and Copenhagen University College. The contact is good between the life science sector and the universities resp. university colleges, according to interviewees from the institutions. The universities' system of panels with representatives from the industry, hospitals, and other parts of society participate in e.g. discussions about programmes that may be necessary in the future, and they can provide perspectives on the existing programmes and contribute to a continuous exchange of information between academia and the industry.

Numerous new educational programmes have been established in recent years in response to requests from the life science sector, for example Bachelor and Master programmes in Medicine and Technology, offered jointly by DTU, the University of Copenhagen, and Rigshospital, and the two Bachelor of Engineering programmes in Biotechnology and Mechanical Engineering offered by the University College Absalon in Kalundborg.

Other programmes are underway, e.g., a Bachelor in Bioinformatics at the University of Copenhagen.

Discussions between academia and the industry are frequently also about how to update existing programmes. More digitalisation skills– combined with more classic life science subjects, if possible – are a clear request from the life science sector; this is something that all of the universities and university colleges interviewed are seeking to implement in various ways in existing and new programmes.

The challenge of attracting students

Sourcing employees and the right skills for the life science sector is more than just offering the right programmes at universities and university colleges. A challenge facing seats of learning – and in extension, the life science sector – can also be getting students to apply for the programmes relevant for the industry. To succeed, the industry will also have to share the responsibility, say representatives of the universities and university colleges.

Another current challenge for the learning institutions is that political agreements in Denmark – such as moving educational programmes from urban centres and limiting the number of programmes offered in English – have made it more difficult, at least temporarily, to develop new life science programmes at some universities. For example, the University of Copenhagen is currently unable to start any new educational programmes without reducing the number of places in the existing programmes.

University College Absalon has had to apply for an exemption in order to be able to offer its programme Bachelor of Engineering in Biotechnology in English; this has added an element of uncertainty.

Increased interest in continuing professional development

The Danish Ministry of Higher Education and Science has started a committee for continuing education in which the University of Copenhagen, the Danish Chamber of Commerce, and the Confederation of Danish Industry are represented, and the need for continuing professional development in the life science sector are discussed.

Continuing professional education is a growing field, according to some interviewees. They also see life science companies' increasing interest in having their employees attend courses offered at universities and university colleges, or in paying for a training programme tailored to their needs. At the same time, one interviewee pointed out that the industry could be more attentive when it comes to the opportunities already available.

PHOTO: NEWS ØRESUND

BROAD SELECTION OF LIFE SCIENCE PROGRAMMES IN EASTERN DENMARK

In 2021, a total of 24 767 students in eastern Denmark were enrolled in programmes that will probably lead to a career in the life science- or health sector; 10 516 studied programmes that either involve some applications related to the life science sector and/or might lead to a career in the sector, and 2 361 people were in programmes in which life science is part of the study programme, although it is less probable that they will work in the life science sector. Here is a list of programmes offered by universities and university colleges in the Danish part of Medicon Valley.

Colour key:

- Probable career in the life science- or health sector
- Some applications or career opportunies in the life sciences
- Programme includes life science elements

University of Copenhagen		Number of students
	Bachelor Programmes	
	Audiology and Speech Sciences	113
	Biochemistry	301
	Biology	544
	Biotechnology	217
	Pharmaceutics	752
	Public Health Science	213
With DTU	Food and Nutrition	293
	Medicine	1 939
With DTU	Medicine and Engineering	admitted to DTU
	Medicinal Chemistry	87
	Molecular Biomedicine	218
	Odontology	304
	Psychology	760
	Health and Informatics	149
	Dental Hygiene	225
	Veterinary Medicine	606
	Computer Science	656
	Physics	381
	Chemistry	129
	Nanoscience	108
	Natural Resources	223
	Animal and Dairy Science	137
	Physical Activity and Sport	366
	Machine Learning and Computer Science	172
	Geography and Geoinformatics	267
	Geology-Geoscience	107
	Landscape Architecture	200
	Master programmes	
	Audiology and Speech Sciences	71
With CBS & DTU	Bioentrepreneurship	admitted to CBS
	Bioinformatics	110
	Biochemistry	163
	Biology	385
	Biotechnology	106
	Pharmaceutical Sciences	65
	Pharmaceutics	346
	Public Health Science	157
	Food Innovation and Health	70
	Global Health	120
	Human Nutrition	68
	Human Biology	87
	Human Physiology	124
	Immunology and Inflammation	70
	Clinical Nutrition	53
With DTU	Quantitative Biology and Disease Modelling	Admitted to DTU
	Pharmaceutical Sciences	105
	Medicine	1741
With DTU	Medicine and Engineering (Master of Science in Engineering)	Admitted to DTU
	Medicinal Chemistry	57
	Molecular Biomedicine	89
	Neuroscience	56

Selection and colour coding:
These programmes were selected based on information provided on the websites of the seats of learning. Data on the number of students was provided by the universities. Undergraduate programmes were included in some cases as their higher-level programmes potentially focus on the life sciences. The colour coding showing the relationship of the education to the life sciences was done during the analysis phase to render the list of educations more accessible and to show why particular educations were included in the list. It is schematic, and an education may belong to multiple categories.

Sources: University of Copenhagen, Technical University of Denmark, Copenhagen Business School, Aalborg University in Copenhagen, Roskilde University, Copenhagen School of Marine Engineering and Technology Management, University College Copenhagen and University College Absalon.

PHOTO: NEWS ØRESUND

University of Copenhagen

University of Copenhagen (UCPH)		Number of students
	Master programmes cont.	
	Odontology	178
	Psychology	580
With DTU	Health and Informatics	53
	Health, Master programme	77
	Veterinary Medicine	481
	Agricultural Science	99
	Computer Science	279*
	Physics	335
	Food Science and Technology	99
	Food Science/Dairy Engineering	87
	Integrated Food Studies	60
	Chemistry	111
	Environmental Science	116
	Nanoscience	77
	Social Data Science	93
	Statistics	86
With four international universities	Sustainable Forestry- and Nature Management	admitted via another university
	Geography and Geoinformatics	135
	Geology-Geoscience	102
	Animal Science	66
	Landscape Architecture	142
	Environmental and Natural Resource Economics	79
	Nature Management	110
	Environment and Development	73
	Forest and Nature Management	71

*Additional 11 Masters for working professionals

Copenhagen Business School (CBS)		Number of students
	Master programmes	
With UCPH & DTU	MSc in Business Administration and Bioentrepreneurship	19
	MSc programme in Business Administration and Innovation in Health Care	73

Technical University of Denmark (DTU)		Number of students
	Master of Science in Engineering programmes	
With UCPH	Food Safety and -Quality	120
	Chemistry and Bioengineering	273
	Chemical Engineering and International Business	81
With UCPH	Health Engineering	121
	Electrical Engineering	322
	Export Engineering	352
	Fisheries Technology	14
	Bachelor programmes	
With UCPH	Food and Nutrition	admitted to UCPH
	Life Science and Engineering*	489
With UCPH	Medicine and Engineering	213
	Computer Science and Management	134
	Design and Innovation	231
	Electrical Engineering	210
	Physics and Nanotechnology	203
	General Engineering	414
	Chemistry and Engineering	242
	Artificial Intelligence and Data	258
	Mathematics and Engineering	230
	Manufacturing and Construction	210
	Environmental Engineering	172
	Master programmes	
	Applied Chemistry	117
	Advanced Materials and Health Technology	22
	Bioinformatics and Systems Biology	152
	Biotechnology	207
With CBS & UCPH	Business Administration and Bioentrepreneurship	admitted to CBS
	Pharmaceutical Design and Engineering	147
	Food Technology	106
	Chemical and Biochemical Engineering	218
	Quantitative Biology and and Disease Modelling	34

** A new programme as of the summer of 2021 that consolidates three former educational programmes: Bioengineering, Human Life Science Engineering, and Quantitative Biology and Disease Modelling

DTU cont.		Number of students
	Master programmes cont.	
With UCPH	Medicine and Technology	170
	Health and Informatics	admitted to UCPH
	Autonomous Systems	183
	Electrical Engineering	253
	Photonics Engineering	34
	Physics and Nanotechnology	145
	Industrial Engineering and Management	313
	Communication Technology and Systems Design	37
	Mechanical Engineering	219
	Engineering Acoustics	66
	Mathematical Modelling and Computing	329
	Materials and Manufacturing Engineering	101
	Aquatic Science and Technology	59
	Sustainable Energy	377
	Design and Innovation	165
	Environmental Technology	187

Roskilde University*		Number of students
	Past programmes	
*Roskilde University reorganised all Master's programmes prior to the 2022 autumn term	Natural Science, bachelor programme (includes students with the module Bioprocess Science as part of their bachelor studies)	175
	Chemistry (Master programme + corresponding bachelor module)	23
	Medicinal Biology (Master programme + corresponding bachelor module)	51
	Molecular Biology (Master programme + corresponding bachelor module	48
	TEKSAM (Master's programme + corresponding bachelor module)	95
	Environmental Risk (Master programme)	13
	Environmental Biology (Master programme + corresponding bachelor module)	22
	Future programmes	
With Region Zealand and & SSI	Bioprocess Science	To begin 2022
	Medicinal Biology	To begin 2022
	Molecular Biology	To begin 2022
	Chemical Biology	To begin 2022
	Mathematical Bioscience	To begin 2022
	Molecular Health Science	To begin 2022
	Transdisciplinary Health Studies	To begin 2022
	Physics and Scientific Modelling	To begin 2022
	Chemistry	To begin 2022
	Environmental Biology	To begin 2022
	TekSam - Environmental Planning	To begin 2022
	Sustainable Transition (TekSam)	To begin 2022
	Environmental Science	To begin 2022

Aalborg University in Copenhagen		Number of students
	Bachelor programmes	
	Sustainable Design	120
	Techno-Anthropology	152
	Master programmes	
	Techno-Anthropology	82
	Sustainable Design	93
	Service Systems Design	85

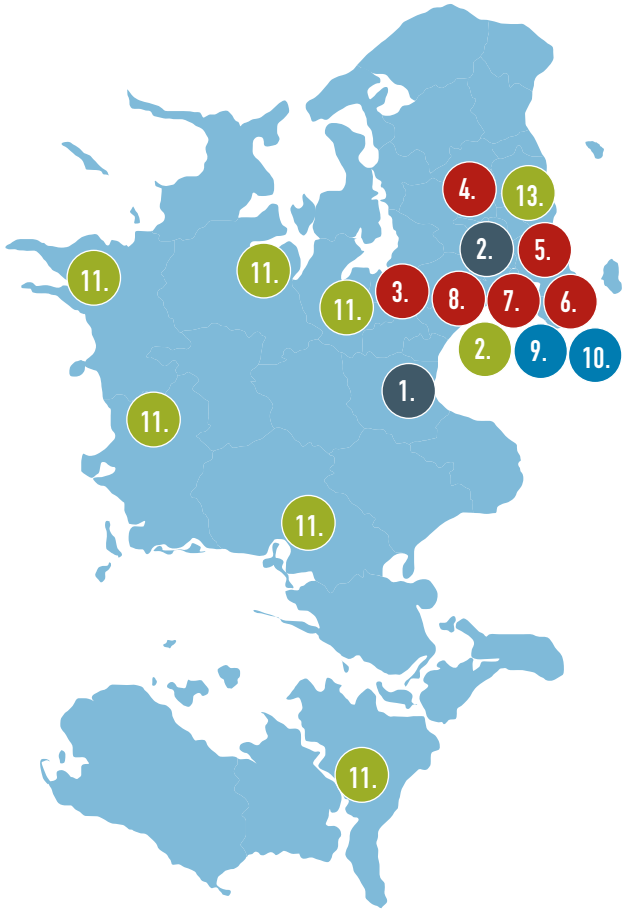
University College Copenhagen	Programmes	Number of students
	Bioanalytics	416
	Midwifery	370
	Laboratory Assistant	360
	Radiography	253
	Occupational Therapy	432
	Physiotherapy	944
	Laboratory Technology	23
	Nursing	4014
	Health and Nutrition	652
	PsychomotorTherapy	236

University College Absalon		Number of students
	Bachelor of Engineering programmes	
	Bioanalytics	231
	Occupational Therapy	225
	Physiotherapy	510
	Midwifery	To begin autumn 2022
	Radiography	To begin autumn 2022
	Nursing	1 878
	Health and Nutrition	250
	Master of Science in Engineering programmes	
	Biotechnology	51
	Biotechnology, taught in English	68
	Mechanical Engineering	25

Copenhagen School of Marine Engineering and Technology Management	Bachelor programme	Number of students
	Technology Management and Marine Engineering	626

UNIVERSITIES, REGIONS AND RESEARCH INSTITUTIONS IN THE LIFE SCIENCES

The University of Copenhagen is by far the largest research institution in the life sciences in eastern Denmark – and in Medicon Valley on the whole – and it is also the university with the largest number of life science students in the region. Research in the life sciences in eastern Denmark takes place at five universities, two regions, and two large research institutions.



Source: The universities' and research institutions' own numbers.
Life science researchers includes professors, associate professors, lecturers, post docs, doctoral students, etc.
See footnotes in the Appendix for more information about the figures.

From State of Medicon Valley 2021. Data on the number of students is new for this analysis.

PHOTO: NEWS ØRESUND

1. REGION ZEALAND*
Life science researchers: 490
of which professors: 34
of which doctoral students: 147
Life science students: -

PHOTO: NEWS ØRESUND

2. REGION HOVEDSTADEN*
Life science researchers: 4182
of which professors: 279
of which doctoral students: 915
Life science students: -

PHOTO: NEWS ØRESUND

3. ROSKILDE UNIVERSITY
Life science researchers: 55
of which professors: 6
of which doctoral students: 19
Life science students: 427

PHOTO: NEWS ØRESUND

4. TECHNICAL UNIVERSITY OF DENMARK (DTU)
Life science researchers: 1 254
of which professors: 91
of which doctoral students: 478
Life science students: 7 930

PHOTO: NEWS ØRESUND

5. UNIVERSITY OF COPENHAGEN
Life science researchers: 4 561
of which professors: 658
of which doctoral students: 2 132
Life science students: 17 099

PHOTO: NEWS ØRESUND

6. THE NATIONAL INSTITUTE OF PUBLIC HEALTH (NIPH), UNIVERSITY OF SOUTHERN DENMARK
Life science researchers: 107
of which professors: 9
of which doctoral students: 15
Life science students: -

PHOTO: NEWS ØRESUND

7. AALBORG UNIVERSITY IN COPENHAGEN
Life science researchers: 5
of which professors: 3
of which doctoral students: 0
Life science students: 532

PHOTO: BJARKE MACCARTHY/CBS

8. CBS
Life science researchers: 0**
of which professors: 0**
of which doctoral students: 0**
Life science students: 92

PHOTO: NEWS ØRESUND

9. STATE SERUM INSTITUTE
Life science researchers: 150
of which professors: n.a.
of which doctoral students: n.a.
Life science students: -

PHOTO: NEWS ØRESUND

10. DANISH CANCER SOCIETY*
Life science researchers: 154
of which professors: 10
of which doctoral students: 31
Life science students: -

PHOTO: UNIVERSITY COLLEGE ABSALON

11. UNIVERSITY COLLEGE ABSALON
Life science researchers: n.a.
of which professors: n.a.
of which doctoral students: n.a.
Life science students: 3 238

12. UNIVERSITY COLLEGE COPENHAGEN
Life science researchers: n.a.
of which professors: n.a.
of which doctoral students: n.a.
Life science students: 7 700

13. COPENHAGEN SCHOOL OF MARINE ENGINEERING AND TECHNOLOGY MANAGEMENT
Life science researchers: n.a.
of which professors: n.a.
of which doctoral students: n.a.
Life science students: 626

* 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 universities in the region.

**CBS conducts research in e.g. development, strategy, growth, and recruitment in the life science industry, but not specifically in the life sciences per se.

PHOTO: NEWS ØRESUND

DTU invests in programmes that link IT and the life sciences

The industry's need for educational training programmes in the interface between IT and the life sciences is currently enormous, so these are a growing area at the Technical University of Denmark (DTU), says Philip Binning, Dean of Graduate Studies and International Affairs at DTU. The link to society is vital for DTU, and there are close contacts to the life science sector, he says.

For DTU, whose main campus is north of Copenhagen in Lyngby, industry contacts are framed in many reference groups. There are groups for the university more broadly, for research institutions, and for individual programmes. Life science enterprises are an important part of them, particularly when it comes to research institutions and educations with focus on the area.

– We have close contacts with the industry that originate in DTU's mission to boost science and technology for society's benefit, and it is thus important that we are sensitive to society's needs. Contact with businesses is fundamental for DTU, especially because we're a technical university. If measured in terms of how much our university collaborates with the industry, we are global leaders when it comes to co-publications between researchers and business enterprises. We're also closely linked when it comes to students, says Philip Binning.

The life sciences currently make up around one-third of DTU's total activity in education and research, he says. In 2021, around 8 000 students studied in a programme linked to life science, as data compiled for this report shows (see p 27). Some of the largest programmes are the bachelor programmes Life Science and Engineering and the master programme Chemical and Biochemical Engineering.

– There is a cluster of companies that are located close to DTU and that work in the life sciences. The region is a global hot spot and that's something we support. There is a symbiosis between DTU and these companies, and it is truly exciting.

Programmes in demand added continually

In recent years, the industry has increasingly requested educations that provide instruction in both IT and the life sciences, says Philip Binning – which the analysis in hand also shows.

– Combining traditional medicine and health-tech solutions has great practical value; we can improve medicines and make them more effective and reduce the risks with studies because we can set up more focused clinical studies with specific target groups, says e.g. the Copenhagen-based health-tech-company Monsenso in the report 'Life Science in Eastern Denmark', published by Øresundsinstituttet in May 2022.

DTU is aware of this and works with it in many ways, both in educational training and in research, Philip Binning points out.

– We have a very rich palette of educational programmes in the life sciences, and one of them is our programme in Bioinformatics and System biology, which admitted 72 students this autumn. For comparison, there were just half as many students two years ago. We are continuously increasing the number of places in the programmes in demand, because the response we're getting from the industry is that the need for programmes in the interface between IT and life science is almost insatiable. The area is large and growing, he says.

According to Philip Binning, it is also important to arouse students' interest in the programmes and inform them so they really apply for the programmes that the industry is calling for. Very good collaboration with companies is a necessity in order to succeed with that, he emphasises.

"The need for programmes in the interface between IT and life science is almost insatiable."

– Our newest programme at the moment is in Information Technology. We're continously developing our programmes and introducing new lines of study to match what is in demand. And once again, there is no question that IT as a whole and the overlap with the life sciences are in the midst of an intense development phase. Some of our courses in artificial intelligence are among the most popular courses at DTU, and students from all lines of study take them.

Another new educational venture linking both IT and life science has to do with the programme Medicine and Technology, which is offered jointly with the University of Copenhagen and Rigshospital; there will now be an elective focus on digital health.

Students will come into contact with the industry frequently during their studies, as final projects will be done in collaboration with companies. On average, around 45% of the final projects in DTU's bachelor programmes involve arrangements with business enterprises, for example, someone from the company acts as co-supervisor, or a company shares its data.

PHOTO: DTU

Philip Binning.

In addition, Philip Binning also highlights the more practically oriented graduate engineering programmes, which include a six-month internship in the industry.

Continuing education a growing area

DTU also works with programmes aimed at people who are already active in the life science industry.

– We also work with continuing professional development, because companies also need to keep their employees up to date; we offer an increasing number of trainings like that. We have prepared courses, but companies also contact us and ask for our help and then we arrange accordingly. That is a growing area at DTU, he says.

The trend of universities investing more in free-standing courses and contract educations for companies in the health sector to make continued education possible for individuals and company employees is also clearly discernible on the Swedish side of Medicon Valley, as shown in the report 'Expertise Demands and -Matching – Higher education and the life science industry's needs in Skåne', published by Øresundsinstituttet in February 2022.

Philip Binning finds that DTU has a good selection of programmes on offer in the life sciences, from pharmaceutical technology to bioinformatics, medtech, foodtech, and biotech. He believes that the current development is set to continue in the future.

– I don't think that we've seen the last of the interface between the digital world and life science. The development in question is very wide-reaching, and we are following it closely. We'll grow our portfolio in that area and adapt our programmes in the years to come, he says.

Basic digital skills now an objective in all KU Sund programmes

Demands from the life science sector have prompted the formation of new master programmes in Neuroscience and Immunology and Inflammation at the University of Copenhagen's Faculty of Health and Medical Sciences. Jørgen Kurtzhals, who recently took over as Associate Dean of the faculty, believes that university and industry flourish together. Starting up new programmes has become more difficult however, he says, as political demands to move study places away from major urban centres would mean that places would need to be removed when others are created – it is a challenge that the university is fighting hard to resolve.

Most of the programmes offered at the Faculty of Health and Medical Sciences have bearing for the life science sector: examples are pharmaceutical science, human biology, and clinical educations. In addition, new programmes are continuously being developed, says Jørgen Kurtzhals.

The master's programmes in Neuroscience and in Immunology and Inflammation, which started in 2020 and 2016, respectively, were established after the life science sector approached the university with requests. Initially, the neuroscience programme was mean to start up at Aarhus University, but it was eventually located at the University of Copenhagen.

Another example of a newly founded programme is the master's in Personalised Medicine, a post-graduate education offered jointly by the University of Copenhagen, Aalborg University, the University of Southern Denmark, and the Technical University of Denmark (DTU).

– We have a very close ongoing dialogue and know each other well, says Jørgen Kurtzhals, referring to the collaboration between the universities.

Contact between universities and the life science sector also takes place via panels that have been set up for each programme.

– We have a formal panel, and we meet with it twice a year. At the med school, where I worked previously, there are representatives from hospitals as well as from the life science industry and municipalities, and sometimes trade unions. We discuss contemporary issues and whether members feel there are things that need improving in the programmes. The discussions may also deal with needs for a new programme, he says.

At the moment however, starting up new programmes at the University of Copenhagen is difficult due to the political decision in Denmark to move educational training away from the major urban centres, says Jørgen Kurtzhals.

"As a university, we want to challenge and question, and I believe that dialogue to be important and an advantage for the industry."

– We've ended up in a peculiar situation because our government has decided to regionalise educational programmes in Denmark, meaning that we need to close down six per cent of the places in our bachelor- and master programmes at the University of Copenhagen. Until 2030, we won't be able to open up any new bachelor- or master programmes without closing down space in existing programmes, he says.

All programmes to give digital know-how

The life science sector is currently calling for employees with expertise in fields such as pharmaceutical science and medicine paired with e.g. digitalisation and technology. This is evident in the report 'Life Science in Eastern Denmark – the Danish part of Medicon Valley', which was published by Øresundsinstituttet this May. One example of how the Faculty of Health and Medical Sciences is working with the matter is the introduction of a requirement that all programmes give at minimum basic digital competence, says Jørgen Kurtzhals.

– We're currently revising the regulations for study programmes in all areas. In Medicine, we're planning a lot of development related to digitalisation and similar expertise, but also related to management expertise and transdisciplinary competence, which is also important for developing our life science industry.

Jørgen Kurtzhals also highlights the possibility that companies have to let their employees continue their education at universities, e.g. by doing master's programmes or specially tailored programmes financed by the companies themselves. He says that the life science sector doesn't always take advantage of the opportunities that are available, however.

– There was a big demand for the master's in Personalised Medicine and there were a lot of applicants, but not many of them were from the industry. To strengthen the area of continuing professional development we also need a demand, but of course we could also have stronger communication about the opportunities related to the industry, he says.

Medical education in close collaboration with regions

In addition to the life science sector, the faculty also has close links to the health sector, not least via the educational programme in medicine, which is one of the largest programmes in the life sciences in eastern Denmark with around 1 900 bachelor- and 1 700 master students annually. The medical programme in particular is closely linked to working life, as a large part of it is carried out as internships at hospitals and private clinics.

– This happens via Copenhagen University Hospital (KUH). The highest administration in the Capital Region of Denmark, Region Zealand and the Faculty of Health and Medical Sciences at the University of Copenhagen comprise the board of KUH, and we work continuously with alignment of our candidates and the health sector's needs, he says.

Many students also connect with working life through student jobs. According to a study environment poll by the Faculty of Health and Medical Sciences, 73% of students at the faculty have paid work alongside their studies; this is somewhat higher than in the university on the whole.

In addition to giving students solid expertise in subject areas such as e.g. odontology and pharmacology, Jørgen Kurtzhals also believes it is important to emphasis the universities' role in relation to the life science and health sectors in another respect. This has to do with e.g. giving students a perspective on everything from sustainability to ethical questions within their fields.

– We also look at the life science industry in a constructively critical way. In my experience, the Danish life science industry has a high demand for ethical stances and critical standpoints. Companies don't just want to be rubbed the right way; they also want to meet resistance and to understand how society is developing. As a university, we want to challenge and question, and I believe that dialogue to be important and an advantage for the industry, he says.

In the future, Jørgen Kurtzhals would also like to link programmes to the universities' strong research centres in a more definitive way.

– Right now we have a structure in which our research centres have a lot of freedom to focus on research, and of course new breakthroughs are made all the time. That's somewhere I feel we should be more active and incorporate the study programmes. If there is a breakthrough, like now in the stem cell field, where we're starting a new centre right now, educational intentions aren't directly integrated with R&D in undertakings like that. I think it could be interesting to work with that, he says.

PHOTO: UNIVERSITY OF COPENHAGEN

Jørgen Kurtzhals, Associate Dean of the Faculty of Health and Medical Sciences at the University of Copenhagen.

PHOTO: UNIVERSITY OF COPENHAGEN

Grete Bertelsen, , Vice-Dean of MSc and Master's Programme, the Faculty of Science at the University of Copenhagen.

Science faculty at University of Copenhagen believes in strong continuing education in life sciences

Continuing professional development – both of the kind that gives university credits and is given via companies – is an area in which the Faculty of Science at the University of Copenhagen is currently putting a lot of effort. In recent years, the faculty has collaborated extensively with Novo Nordisk. The university is now discussing how continuing professional development can become part of its core activities, says Grete Bertelsen, Vice-Dean of MSc and Master's Programme at the faculty.

For years, the Faculty of Science has worked with the Danish pharmaceutical company Novo Nordisk, which is Medicon Valley's largest company with its ca 18 000 employees, and has developed a comprehensive educational package for them.

– Together with Novo, we discuss the courses needed in data science, and then we create them. The price is of course higher than for other educations. We've had great success recent years, and I think we'll continue to do so in the future, says Grete Bertelsen.

She is also on the Ministry of Higher Education and Science's committee for continuing professional development in the life sciences, together with representatives from the Confederation of Danish Industry, the Danish Chamber of Commerce, and others.

– We discuss the needs within the life science industry and how we can help each other to offer courses that are relevant for the sector, she says.

Grete Bertelsen sees great interest in the field, both from the ministry, universities, and business enterprises.

– There is also a lot of focus on it in the EU, so I believe it is a general tendency. We have an ongoing discussion at the university about how we can make continuing professional development part of our core activities, just like bachelor- and master programmes, she says.

Bachelor supplements bioinformatics

As far as existing undergraduate programmes at the university go, the Faculty of Science – which has around 10 000 students – has a new endeavour underway: supplementing the Master's programme in bioinformatics with a bachelor programme in the same field. This is being done with the Faculty of Health and Medical Science at the same university.

Grete Bertelsen expects the application to be submitted to the Ministry of Higher Education and Science this autumn; the ministry needs to approve all new educational programmes before they can commence the following year.

The programme is a response to wishes that the life science sector expressed via panels in place at the faculty that include e.g. company representatives from Novozymes, Chr. Hansen and Lundbeck.

– Our panel of representatives has been saying for years that a master's programme is not enough. They want to see more students – also Danish students – and we believe that there will be more students if we offer a bachelor as well. We are also broadening the scope of the programme, and we're adding Health Informatics and more.

"Today, 40% of all bachelor students at the Faculty of Science also study IT-intensive programmes – a few years ago, it was 30%."

More IT-students at the Faculty of Science

A one-year data steward-programme at the faculty was also recently approved by the ministry. The programme is meant to give expertise needed to e.g. be responsible for how data is handled at a company. However, due to political plans in Denmark to move educational places from urban centres, it is currently difficult for the University of Copenhagen to start new programmes without reducing the number of places in existing programmes – so whether the programme will become a reality is still uncertain.

– If I allocate 50 places for the data steward-programme, we need to cut back another programme, says Grete Bertelsen.

One of the goals at the Faculty of Science is to get more students to apply for IT-intensive programmes that give expertise in demand in e.g. the life science sector.

– Areas in which we'd like to have more graduates and for which there's a demand are maths and the digital field. We are making efforts to encourage more people to apply for programmes linked to IT, for example mathematical programmes. Today, 40% of all bachelor students at the Faculty of Science also study IT-intensive programmes – a few years ago, it was 30%, she says.

Together with sustainability, innovation, and preventative health (the latter of which is currently underway), digitalisation is an aspect that the faculty sees as a focus area in all of its programmes, says Grete Bertelsen.

Close ties between food industry and Food Science

There are many interfaces between the Faculty of Science and the life science sector. Part of this are the faculty's panels, where each subject area has its own panel. In addition, a digitalisation committee was created in 2016 in which both the life science sector and players such as Danske Bank participate to discuss e.g. educational questions.

There are also specific forums that have been established by and for various departments at the faculty.

– An example is the Department of Food Science, which has rich contacts with the food industry. There is a forum that has existed since 2007 where there are concrete discussions about e.g. our dairy programme, says Grete Bertelsen.

She emphasises that the faculty wants all of its programmes to have as much contact with industry as possible.

– For instance, students can write their final theses with a company – around 33% of our students do this. In the master- and bachelor programmes, students can also use 15 credits to conduct a project in a public organisation or a company. That might be e.g. in the life science sector, a municipality, or an upper-secondary school, she says.

PHOTO: UNIVERSITY COLLEGE ABSALON

In 2021 the University College Absalon opened its new campus in Kalundborg.

Absalon is working hard to attract students to the life sciences

The University College Absalon offers two Bachelor of Engineering programmes and one bioanalysis programme in Kalundborg in response to a pronounced demand from the life science sector. The major challenge is getting enough students to apply to them, says Conni Edith Simonsen, Head of the Centre for Engineering and Science at Absalon in Kalundborg.

In 2021 Absalon opened its new campus in Kalundborg, close to the life science enterprises that operate in the municipality. There are around 250 students in the three programmes offered on the campus (100 of whom were admitted in 2021). The university college has several campuses in Zealand. The biotech programme has been offered for six years; the mechanical engineering programme started two years ago and will see its first graduates next year. Both Bachelor of Engineering programmes target the life science sector.

– They were established in response to the great demand in the sector here in Kalundborg, which is apparent from the expansion in the biotech industry happening now, says Conni Edith Simonsen.

Among the life science companies broadening their operations in the municipality are e.g. Novo Nordisk, which is investing DKK 18bn in expanded production facilities in Kalundborg; Chr. Hansen, and Remilk, which recently announced that it will be locating a large plant in Kalundborg. Novo Nordisk is also one of numerous enterprises that has experienced difficulties recruiting sufficient skilled workers.

– Without access to the skilled labourers they need, companies cannot grow, so the programmes are determined to a large extent by their needs, says Conni Edith Simonsen.

International students find work in Danish industry

The biotech programme is offered in both Danish and English. Absalon received special permission to offer the programme in English despite politically-motivated cutbacks to educational programmes in English in Denmark. Both Danish and international students are enrolled in the English-language programme.

– Because of the major need and the pressure from the industry, we have been permitted to continue to offer the programme. Only two classes have graduated to date, but the international students remain in Denmark and find employment in the industry, and several go on to continue their studies, she says.

Working with schools to encourage more applications

Getting young people interested in applying to the programmes is the greatest challenge, says Conni Edith Simonsen. Absalon actively works with upper-secondary schools and businesses to that end, in order to attract young people to the sector in different ways.

– We work quite a lot with upper-secondary schools and bridge-building. Today for example, we had a meeting where we discussed how we can collaborate more. Perhaps the upper-secondary teachers could come to us, get inspired and pass that on to pupils in their schools. We also discussed activities where pupils can come and visit us, she says, and goes on:

– Many Danish students take a sabbatical year or two after upper-secondary school. Through various activities, we're seeking to arouse interest, so that young people in upper-secondary schools are already interested in these programmes, which are directed specifically at the industry. We hope to generate interest in groups that perhaps don't exactly believe that they're interested in science, and to organise activities that let them come visit us and test things out, she says.

One way in which Absalon tries to attract youth is through a biotech cup, where each team has a case for which a business that operates locally is responsible.

The university college also makes use of its networks around Europe, which spread information about the programmes in Kalundborg and ensure that applicants have the necessary skills.

– With the development we're seeing in the industry, we need even more graduates. We need more young people, says Conni Edith Simonsen.

Close industry contact throughout tuition

A mentor system for students in the engineering programmes puts students in early semesters in contact with young people who have recently begun working in the sector. From the fourth or fifth semester, students also have a mentor from a business – someone with whom they can discuss career possibilities and the specialisations to choose during their final semester.

PHOTO: UNIVERSITY COLLEGE ABSALON

Conni Edit Simonsen, Head of the Centre for Engineering and Science at the University College Absalon in Kalundborg.

– Our international students need this in particular. It's also a way to retain them, so they stay and find work here, she says.

Businesses also get involved in the educational programmes as guest lecturers or by offering study visits for students. They sometimes participate as examiners. Internships in the industry are also part of the bachelor programmes, and most students also complete their final projects at a company.

That contact provides valuable feedback to Absalon, according to Conni Edith Simonsen.

– Occasionally businesses express that they expect students to have certain knowledge or competences of a particular level, and occasionally they have other types of feedback, she says.

The university college has an overarching council with industry representatives. Among other things, it discusses educational programmes. Conni Edith Simonsen finds that there is a strong demand from businesses to educate more students in the existing programmes.

– If we were to supplement that, it would be with something in digitalisation, as well as some electronics. That could either be a third engineering programme or a specialisation within one of our existing programmes. Digitalisation is a desire we have definitely heard expressed, she says.

In addition, Absalon is also planning an adult education programme due to start this autumn where the focus is on mechanical engineering and automation. Here as well, the university college is considering supplementing with elements related to programming and digitalisation.

Student organisation Synapse wants more information from universities on industry careers

Universities tend to train students more for a career in academia than in the life science sector, says Kasper Budolph Pedersen, Vice-Chairperson of Synapse, a non-profit organisation for life science students in Scandinavia with branches in Copenhagen, Lund and elsewhere. 'There is definitely room for improvement', he says. He calls for more information about the industry during studies and a more active interest from companies.

– Universities could start with better information about what's happening out in the industry, and what opportunities there are – and perhaps even collaborate more with business enterprises. With big players in Denmark such as e.g. Novo Nordisk, Lundbeck, Ferring and Chr. Hansen, it makes a lot of sense to try and align with their needs, says Kasper Budolph Pedersen, who studies Pharmaceutical Design and Engineering at the Technical University of Denmark (DTU).

Based on Synapse's contact with companies in the life science sector, he believes that universities have great potential to improve contact with the industry, if that means meeting companies' needs in terms of educational programmes or conducting research projects together. Kasper Budolph Pedersen also believes it is relevant to include students in the discussion.

– I believe that we can help each other, as industry, academia, and students – a trinity – if we sit down and talk to each other. Within academia, interest in the university realm tends to be stronger than interest in the industry, but it is important to remember that students are on their way to the industry, and I believe it's important to take them along, he says.

One reason Synapse was founded in 2014 was to help influence universities to better prepare students for working life. Kasper Budolph Pedersen believes that even with student counselling and programmes that invite companies to speak about their business activity, there is even more that could be done.

FACTS ABOUT SYNAPSE – LIFE SCIENCE CONNECT

Student-led, non-profit organisation created at the University of Copenhagen in 2014. The organisation works to bridge the gap between academia and the life science industry for a smoother transition from student- to professional life by e.g. arranging networking events, company visits, and summer schools. Synapse – Life Science Connect consists of two organisations: Synapse Sweden and Synapse Denmark. Synapse Denmark has branches in Copenhagen and Aalborg. A Synapse team was formed in Lund in 2020, and in 2021 it established an independent organisation in Sweden called 'Synapse – Life Science Connect Sweden'.

PHOTO: LUND UNIVERSITY

Kasper Budolph Pedersen

– It's largely a question of opening up opportunities and giving information about what life science has to offer. One doesn't need to conduct research, as universities teach – there are many other job options, and universities could also present them more and even help students look in that direction, he says.

"Within academia, interest in the university realm tends to be stronger than interest in the industry."

Calling for more involvement from future employers

Kasper Budolph Pedersen also believes that business enterprises could do more for students, for example by creating attractive internship opportunities, giving interested students a positive reception, and by going out to universities to meet students and seeing what their needs are.

– If an employer wants clever employees, it may be necessary to think about the time, money, and human power that needs to be invested for opportunities to attract them as students, he says.

Life science students can also better inform themselves about the options available after graduation, says Kasper Budolph Pedersen.

– Perhaps students' initial ideas aren't what's in demand; many other things are also interesting. Students also have a responsibility to get informed. Luckily, we see a lot of students at our events, and by coming to the events they make an active choice to access knowledge that isn't part of the curriculum. I believe that people need to make an active choice, he says.

RESEARCH

Above average citation frequency for 15 of 20 research areas in the life sciences

Molecular biology, endocrinology, and oncology are three research areas of excellence in Medicon Valley, and their history in the region is long. Scientific publications produced by the region's researchers in each of these three fields have all been cited notably more frequently than the international average for the respective areas. This was revealed by a survey conducted by the Dutch research institute CWTS at Leiden University.

CWTS' study of the scientific publications and citations in the life sciences in Medicon Valley, which covered the period 2006 to 2017, showed that Medicon Valley is an excellent research cluster. Of the 20 fields that comprise half of the total life science research in the region, 15 have been cited more than the international average.

As stated above, the three largest fields are biochemistry and molecular biology, endocrinology and metabolism, and oncology. These are followed by neurosciences. In all of the cases, university research is complemented by research and development in companies in the region, such as e.g. Novo Nordisk, Lundbeck and Genmab on the Danish side of the Øresund and Hansa Biopharma, Alligator Bioscience and Camurus on the Swedish side.

"Of the 20 fields that comprise half of the total life science research in the region, 15 have been cited more than the international average."

The three areas in which Medicon Valley-researchers were cited most frequently according to CWTS' review are medicine: general and internal; cell biology; and genetics and heredity. All of these are included on the list of the 20 main research areas in the life sciences in the region.

Although life science research in Medicon Valley is a strong contender in an international comparison, the competition in Europe is stiff. CWTS' analysis also includes a comparison of ten excellent European clusters in the area; in it, Medicon Valley places just below the middle in terms of the number of scientific publications as well as citations. It is worth noting however that the number of scientific publications in the life sciences in Medicon Valley increased significantly during the decade studied by CWTS – it was the greatest percentual increase seen in the ten clusters in the comparison.

The life science clusters in the comparison include both larger clusters, such as London-Cambridge-Oxford and Netherlands, and somewhat smaller clusters like Île de France (Paris) and the German-French-Swiss cluster BioValley. In general, Medicon Valley is often closer to Stockholm-Uppsala, which is another cluster in the comparison.

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-sectoral 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.

A factor that markedly increases the number of citations of scientific publications is international collaboration, CWTS' analysis shows. In Medicon Valley, there are 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 in the report 'Life Science across the Øresund' in June 2021 assert that these should be able to be broadened and become more plentiful. National focus when it comes to research funding and different taxation and health insurance systems are two examples of obstacles that were pointed out.

TWO UNIVERSITIES IN THE ØRESUND REGION IN THE TOP 100 ON NEW RANKINGS OF THE WORLD'S BEST UNIVERSITIES

The University of Copenhagen and Lund University are among the top 100 best universities in the world. This was revealed in 2022 in a new publication by the British analytics company QS, which produces the renowned QS World University Ranking. Based on six indicators such as research- and instruction quality, the University of Copenhagen comes in 82nd, and Lund University placed 95. Elsewhere on the list are e.g. the Technical University of Denmark (DTU) at number 104. More than 1 400 universities from all over the globe are considered in the survey. Another university ranking list, from Leiden University (CWTS), was published in June 2022. In the category 'Biomedical and Health Sciences', the University of Copenhagen placed 14th out of around 1 200 universities around the globe. Karolinska Institute in Stockholm came in 28th, and Lund University took 95th place.

PHOTO: NEWS ØRESUND

PHOTO: NEWS ØRESUND

Jens Nielsen, CEO of BioInnovation Institute (BII) in Copenhagen.

POTENTIAL FOR MORE EARLY LIFE SCIENCE START-UP DEVELOPMENT IN DENMARK

The life science sector in Denmark could potentially create an additional 9 500 jobs by 2030, according to a 2022 report from Damvad Analytics on behalf of the Novo Nordisk Foundation. This could be done via increased commercialisation of life science research at Danish universities, e.g. with more research publications becoming patent applications and new companies. Doing this would require improved tax incentives to make risky investments in life science startups more attractive. BioInnovation Institute (BII), which receives funding from the Novo Nordisk Foundation, is a life science incubator in Copenhagen that supports life science entrepreneurs by commercialising their research. BII increased its startup funding in 2021 and is placing increasing focus on incubating startups from the Nordic countries and beyond. A new rental contract in 2021 will enable BII to grow with more lab space in the coming years.

ESS AND MAX IV HAVE SWEDISH AND DANISH CONNECTIONS

Danish and Swedish actors are building up an advanced research infrastructure in Lund at European Spallation Source (ESS) and MAX IV Laboratory.

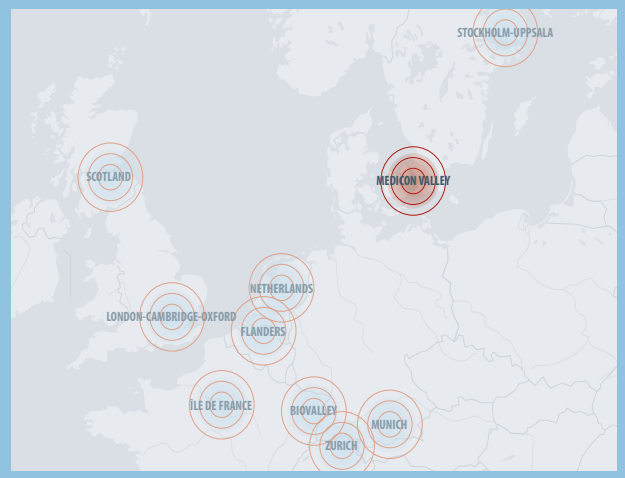
The research institutions European Spallation Source (ESS) and MAX IV Laboratory are both situated in Lund. In 2027, will ESS be the world's largest and most advanced neutron source and will furnish new knowledge in e.g. materials research, which can be used to develop new drugs, materials, fuels and more. Denmark and Sweden are host countries for the ESS facility, whose data centre is located at Copenhagen Bio Science Park (COBIS). Not far from the ESS facility is Sweden's national MAX IV Laboratory, which is part of Lund University. Research within e.g. materials science, chemistry and structural biology take place there. A number of Danish public organisations and universities, as well as the Novo Nordisk Foundation, are helping build up advanced research infrastructure in both of these research institutions in Lund. Bifrost and Heimdal at ESS and DanMAX and MicroMAX at MAX IV Laboratory are the names of advanced instruments financed by Danish public- and private actors.

PHOTO: NEWS ØRESUND

PHOTO: NEWS ØRESUND

BIOCHEMISTRY AND MOLECULAR BIOLOGY LARGEST IN LIFE SCIENCES IN MEDICON VALLEY

Of the 20 fields that comprise half of the total life science research in the region, 15 have been cited more than the international average between 2006-2017. This was shown by an analysis conducted by the research institute CTWS at Leiden University in Netherlands on behalf of Medicon Valley Alliance. The region's three largest fields in the life sciences are biochemistry and molecular biology, endocrinology and metabolism, and oncology. The analysis also shows that Medicon Valley places approximately in the middle in a comparison of ten excellent European life science clusters.



A unique comparison of ten European clusters

On behalf of Medicon Valley Alliance, the Dutch research institute CWTS at Leiden University performed a bibliometric comparison of ten leading European life science clusters based on their total influence in the research world.

20

MAJOR FIELDS OF RESEARCH. The 20 largest fields of research were responsible for more than 50% of the total number of scientific publications in the life sciences in Medicon Valley during the period examined.

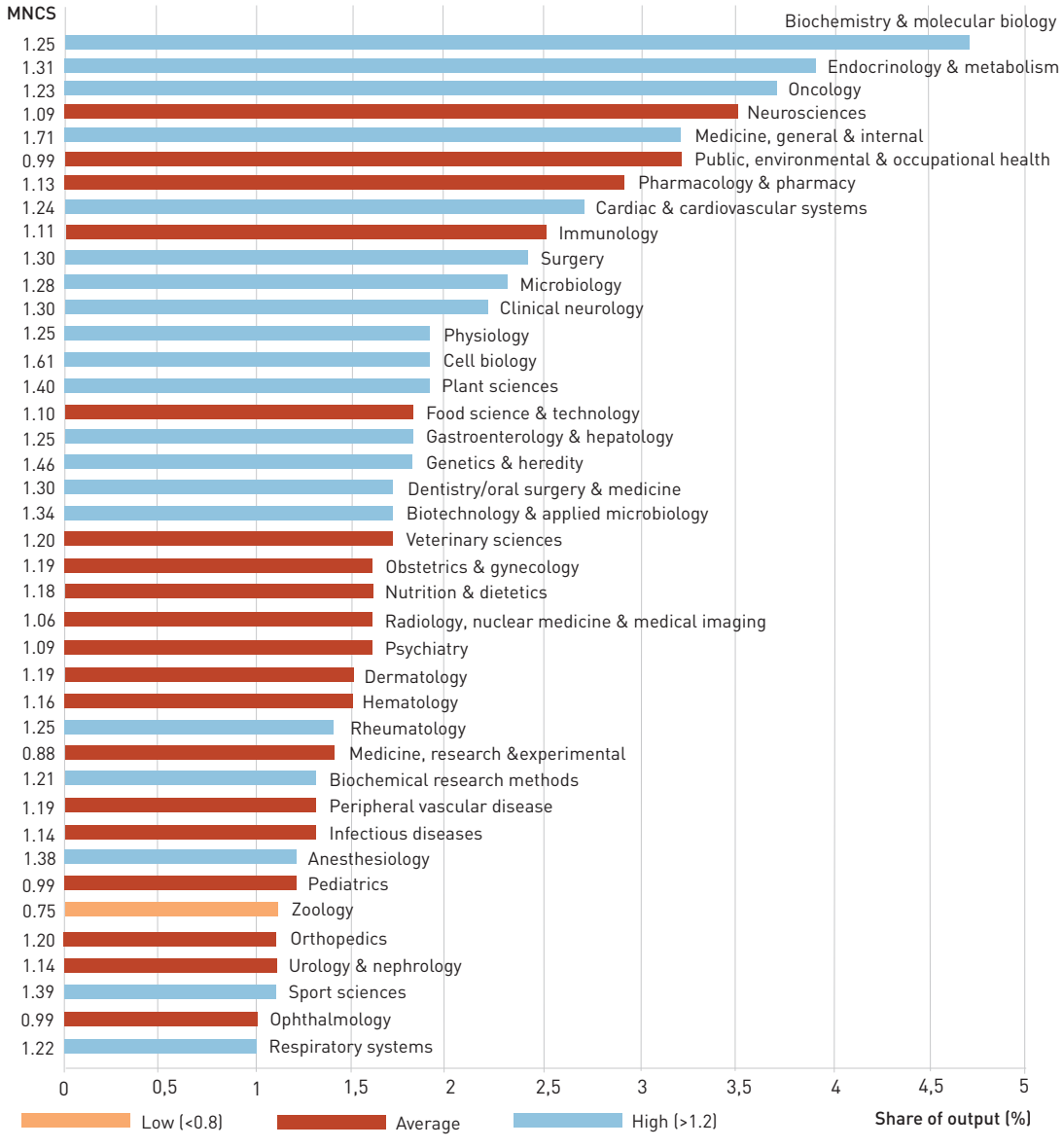
Greatest increase

The number of scientific publications in Medicon Valley increased 23% from the period 2006-2009 to the period 2013-2016; the increase was percentually greater than in any other cluster in the study.

54% The percentage of the scientific publications in Medicon Valley that resulted from international collaborations. 26% were published in cooperation with other researchers in the same country, and 19% were by researchers or groups without collaborative partners.

MAIN FIELDS OF RESEARCH AND THEIR IMPACT

The diagram shows the 40 subject areas in which research institutions in Medicon Valley produced the greatest number of scientific publications from 2006-2016, as well as the citation degree of these publications in relation to the international average in each respective research area (MNCS) from 2006-2017. 1 indicates that a publication has been cited as frequently as the calculated average for its field of research. In the diagram, the colour blue indicates an MNCS score over 1.2 (above average), red an MNCS score of 0.8-1.2 (average), and orange an MNCS score below 0.8 (below average).



Source: CWTS B.V.

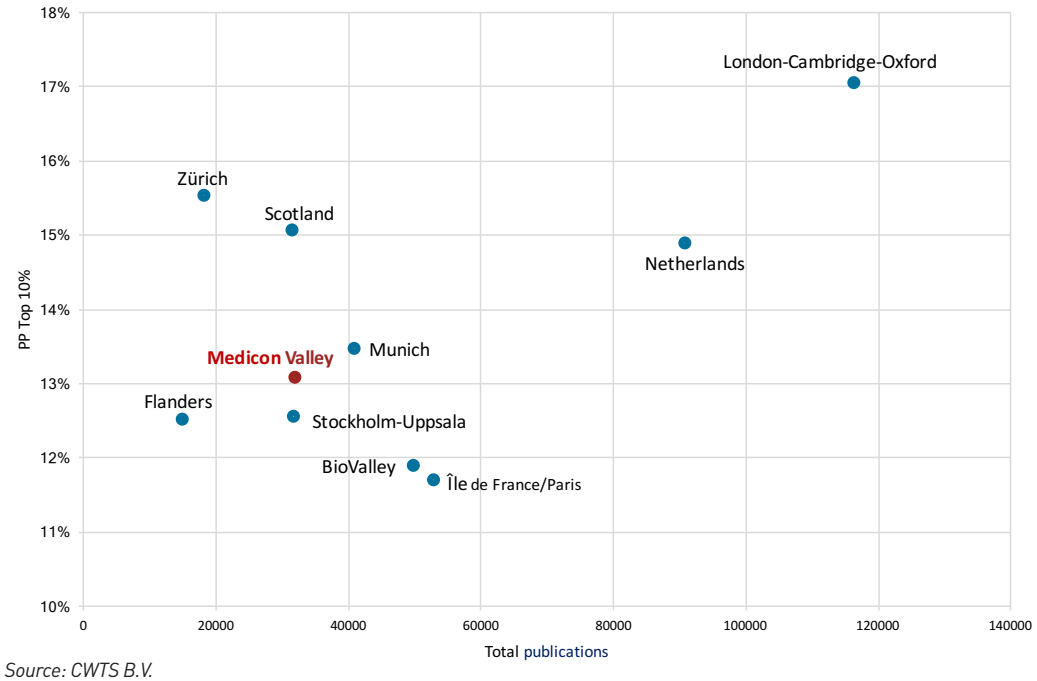
• The five subject areas in which Medicon Valley's research institutions produced the greatest number of scientific publications from 2006-2016 were Biochemistry & Molecular Biology (4.7% of total publications), Endocrinology & Metabolism (3.9%), Oncology (3.7%), Neuroscience (3.5%) and Medicine, General & Internal (3.2%).

OVERALL VISIBILITY OF THE REGIONS (2006-2016/17)

• Researchers in Medicon Valley published 32 027 scientific articles in the field life science between 2006-2016, according to CWTS' review of Web of Science.

• Around 13% of the publications from Medicon Valley were in the 10% most frequently cited for their fields in the entire period of 2006-2017.

• In relation to the nine other life science clusters included in the study, Medicon Valley places in the middle. As far as the number of publications is concerned, Medicon Valley holds a sixth place, and when it comes to the frequency with which these articles are cited in their respective fields, it also comes in sixth. According to CWTS, the group of clusters is very strong.



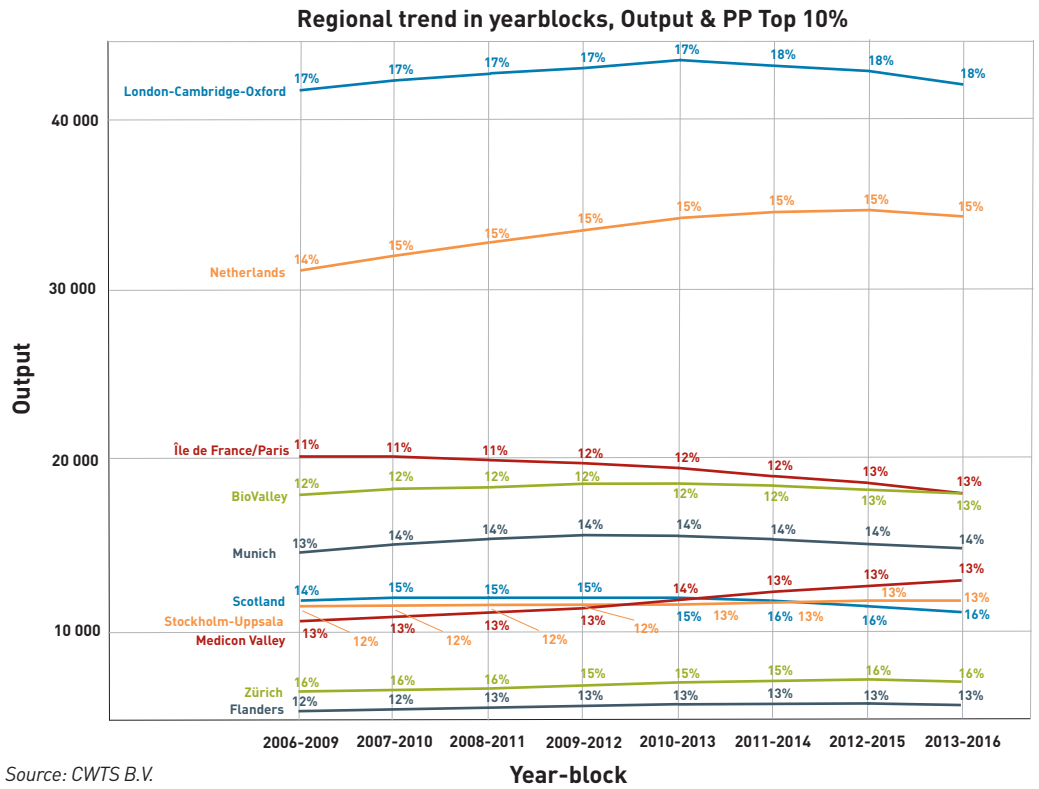
Source: CWTS B.V.

The diagram shows the total number of publications from 2006-2016 and the number of these that are among the 10% most frequently cited in their fields (PP Top 10%) from 2006-2017.

DEVELOPMENT OVER TIME, 2006 TO 2016/17

• Since 2006, the number of publications in life science by researchers in Medicon Valley has increased steadily, going from just over 10 465 in the first interval studied (2006-2009) to around 12 902 in the most recent interval studied (2013-2016). In absolute numbers, this increase is greater than in any of the other clusters in the comparison, with the exception of the Netherlands. Percentually, it is the greatest increase of all. Most of the other clusters have remained at approximately the same level when it comes to publications in life science for all of the time intervals in the period.

• From 2006-2017, the number of articles among the 10% most frequently cited in their fields remained at the same level – 13% – for Medicon Valley's life science researchers, with the exception of the period from 2010-2013, when the number temporarily increased to 14%. The majority of the other clusters in the comparison have increased their respective numbers of publications among the most frequently cited 10% by one percentage point, or in some cases two.



Source: CWTS B.V.

The diagram shows the number of publications (output) for each four-year interval from 2006-2016, and how many of these were among the 10% in their fields (PP Top 10%) from 2006-2017.

A UNIQUE COMPARISON OF TEN EUROPEAN LIFE SCIENCE CLUSTERS

• On behalf of Medicon Valley Alliance, the research institute CWTS at Leiden University conducted a comparison of the bibliometric performance of ten life science clusters in Europe, one of which is Medicon Valley:

- London-Cambridge-Oxford
- Netherlands
- Île de France/Paris
- Flanders
- Stockholm-Uppsala
- Scotland
- Medicon Valley
- Zurich
- BioValley (a German-French-Swiss cluster that includes Basel, Alsace, Freiburg, Karlsruhe, Mulhouse and Strasbourg)
- Munich

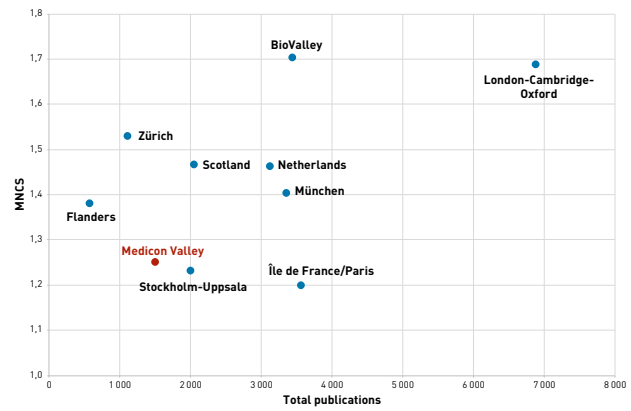
• In the report, clusters are defined as areas in which universities and other research institutions are fairly densely located in a specific geographic area, where internal collaboration is customary or habitual, and where there is an established cluster organisation of some kind. The clusters differ 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. For more on how the compilation of the clusters was carried out, see the report State of Medicon Valley 2018, published by Medicon Valley Alliance and prepared by Øresundsinstituttet.

• The comparison has been done for the years 2006-2016. Citations have also been counted through 2017. The source was the research database Web of Science, and the publications selected for these regions were limited to those designated to the higher-level category of "Medical and Life Sciences".

• All of the scientific publications in the relevant categories and journals from each region were counted, regardless of whether the research was conducted at e.g. a university, university hospital, other research institutions, or at a commercial enterprise.

The diagram below shows the number of scientific publications (total publications) in the respective subject area from 2006-2016, as well as the citation degree of these publications in relation to the international average in the respective research areas (MNCS) from 2006-2017. 1 indicates that a publication has been cited as frequently as the average for its respective field of research.

BIOCHEMISTRY AND MOLECULAR BIOLOGY

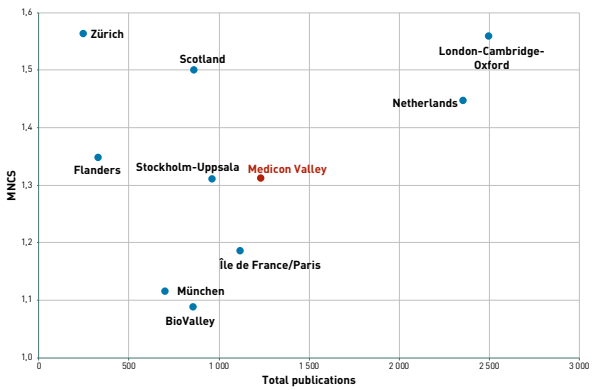


Source: CWTS B.V.

• Compared with the other life science clusters in the analysis, Medicon Valley places eighth for both the number of publications and for the citation frequency of the publications in relation to the international average in each respective field of research.

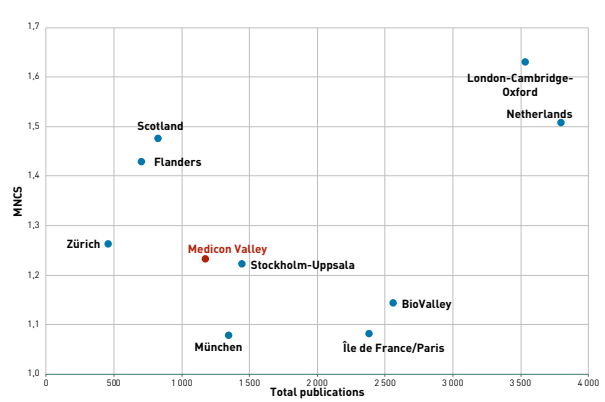
The diagrams below show the number of scientific publications (total publications) in the respective subject area from 2006-2016, as well as the citation degree of these publications in relation to the international average in the respective research areas (MNCS) from 2006-2017. 1 indicates that a publication has been cited as frequently as the average for its respective field of research.

ENDOCRINOLOGY & METABOLISM



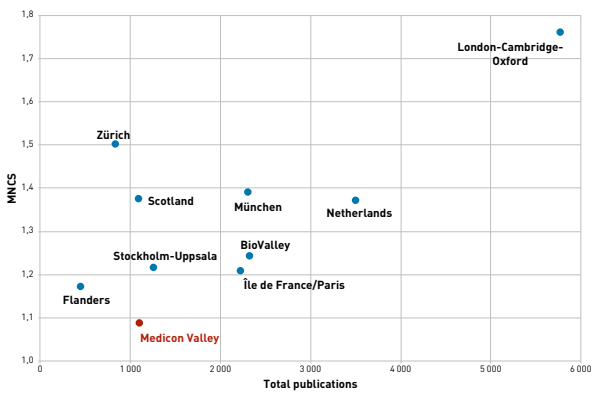
• Medicon Valley places third compared to the other life science clusters in the analysis. Only London-Cambridge-Oxford and the Netherlands produced a greater number of scientific publications than Medicon Valley during the period in question.
• In terms of the number of citations with regard to the international average in each respective field of research, Medicon Valley is at the middle and shares sixth place with Stockholm-Uppsala.

ONCOLOGY



• Medicon Valley is just below the average compared to the other life science clusters in terms of both the number of citations (seventh place) and citation frequency (sixth place).

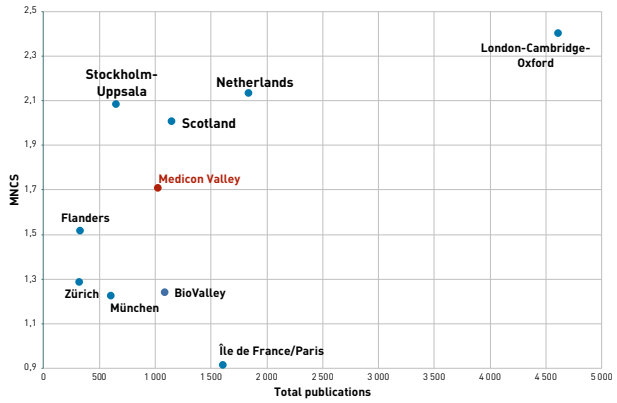
NEUROSCIENCES



• Medicon Valley's citation frequency is the lowest of all ten clusters in the comparison, and it places seventh for the number of publications.

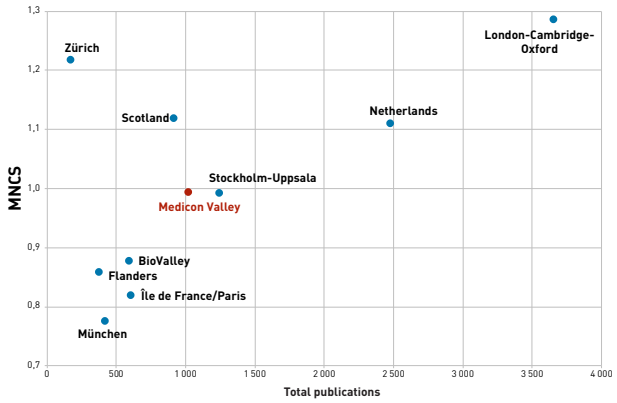
The diagrams below show the number of scientific publications (total publications) in the respective subject area from 2006-2016, as well as the citation degree of these publications in relation to the international average in the respective research areas (MNCS) from 2006-2017. 1 indicates that a publication has been cited as frequently as the average for its respective field of research.

MEDICINE, GENERAL & INTERNAL



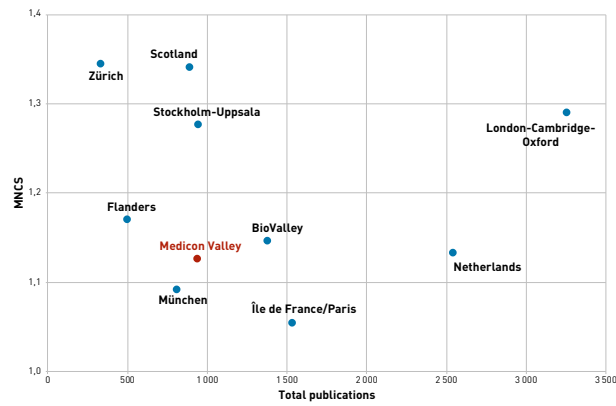
• Medicon Valley is close to the median compared to the other life science clusters, despite the high MNCS score of 1.71. Medicon Valley places fourth for citation frequency and sixth for the number of publications.

PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH



• Medicon Valley is close to the middle compared to the other selected life science clusters, despite the relatively low MNCS score. Medicon Valley places fourth for the number of publications and fifth for citation frequency.

PHARMACOLOGY & PHARMACY



• With an MNCS score of 1.13, the region shares seventh place in a comparison of the life science clusters' citation frequency. Medicon Valley comes in sixth for the number of scientific publications.

ABOUT THIS REPORT

This is the sixth 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 report focuses on how companies' needs for expertise match up with the university educations on offer in eastern Denmark. The description of eastern Denmark's life science companies' expertise needs was first published in May of 2022 in the report *Life Science in Eastern Denmark – the Danish Part of Medicon Valley*, which was based on interviews conducted with life science companies in eastern Denmark, as well as their responses to a questionnaire. A corresponding report for Skåne was published in 2020.

The chapters on companies' expertise needs and on education focus on the perspectives and wishes of the life science sector in eastern Denmark regarding recruitment and the life science educations offered at universities in eastern Denmark. The chapter on research comprises all of Medicon Valley; i.e., it also includes Skåne.

ABOUT THE FIGURES

Companies' expertise needs, pages 10-21
Data on life science companies' expertise needs is from the report *Life Science in Eastern Denmark – the Danish Part of Medicon Valley*, published in May 2022 as part of the Interreg-project Greater Copenhagen Life Science Analysis Initiative. Around 700 life science companies were identified in eastern Denmark for the report. 18 of these were interviewed about their expertise needs and future recruitment plans. An additional around 50 companies responded to more in-depth questions posed in a questionnaire developed by Øresundsinstituttet. The interviews with companies were conducted between September 2021 and May 2022.

Life science educations in eastern Denmark, pages 22-29
The compilation of educations offered was prepared by Øresundsinstituttet based on information provided on the websites of the seats of learning, and with feedback from the respective universities.

To be included in the compilation, the education needed to probably lead to a career in the life science- or health sector, to contain some applications or offer some career opportunities in the life sciences, or the educational programme itself needed to contain life science elements.

Data on the number of students in each educational programme was provided by the respective universities.

Life science students, universities, research institutions and regions, pages 30-31
Figures for the number of researchers and students have been provided by the universities and the regions themselves. All figures on researchers are headcounts and from 2021 unless otherwise noted. Student numbers indicate either the number of full-time equivalent students or the number of students in the 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.

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.

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.

CBS. Students: years of full-time study 2021.

University College Absalon. Number of students in 2021.

University College Copenhagen. Students: registered 1 Oct 2021.

Copenhagen School of Marine Enginerring and Technology Management. Students: years of full-time study 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 Zealand. Head count for researchers – many conduct research part-time. Figures from 2020.

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

INTERVIEW LIST

- **Philip Binning**, Senior Vice President Dean of Graduate Studies and International Affairs at DTU, 2 July 2022
- **Kasper Budolph Pedersen**, Vice Chairperson of Synapse Life Science Connect Denmark, 7 July 2022
- **Conni Edith Simonsen**, Head of the Centre for Engineering and Science at University College Absalon, 13 July 2022
- **Jørgen Kurtzhals**, Associate Dean for Education at the Faculty of Health and Medical Sciences (SUND) at the University of Copenhagen, 21 July 2022
- **Grete Bertelsen**, Vice Dean of MSc and Master's Programme at the Faculty of Science (SCIENCE) at the University of Copenhagen, 22 July 2022

REFERENCES

- Benchmark Life Science Regions Research for Medicon Valley Alliance 2006-2016/17. CWTS, 2018
- Greater Copenhagen Life Science Analysis Initiative, Life Science in Eastern Denmark - the Danish part of Medicon Valley, May 2022
- Greater Copenhagen Life Science Analysis Initiative, Life Science across the Øresund, June 2020
- Greater Copenhagen Life Science Analysis Initiative, Life Science in Skåne, November 2020
- Copenhagen University
- QS World University Rankings
- State of Medicon Valley – An Analysis of Life Science in Greater Copenhagen. Medicon Valley Alliance, 2021

GREATER COPENHAGEN LIFE SCIENCE ANALYSIS INITIATIVE

Between 2019-2022, Øresundsinstituttet has surveyed the life science industry in the Øresund region in collaboration with the cluster organisation Medicon Valley Alliance in an EU-funded Interreg-project by the name of Greater Copenhagen Life Science Analysis Initiative.

The project aimed to generate more knowledge about the region's life science businesses. A total of around 65 500 people work in private life science companies in Medicon Valley, har projektet fastslået. Throughout the duration of the project, the life science sector's companies have been meticulously mapped out in a database to reveal the size of the cluster. The demand for skilled labourers and future needs for expertise was also focus areas. Øresundsinstituttet has both interviewing and visiting companies, preparing and analysing statistics on employment numbers. Six reports has been published within the project period, including blandt andet *Life Science in Skåne* (2020), *Life Science Across the Øresund* (2021), *Expertise demands and -matching – higher education and the life science industry's needs in Skåne* (2022) and *Life Science in Eastern Denmark – the Danish Part of Medicon Valley* (2022).

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 Öresund-Kattegatt-Skagerrak and will continue until 30 June 2022. The project's lead partner is Medicon Valley Alliance, and the partner is Øresundsinstituttet.

The primary objective of the GCLSAI-project developed and managed jointly by the Danish-Swedish organizations Øresundsinstituttet 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 labour 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 labour market life science related issues a common statistic point of departure and methodology
- help to eliminate obstacles to the free movement of labour (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 fine-tune 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 Øresundsinstituttet, 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.oresundsinstituttet.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

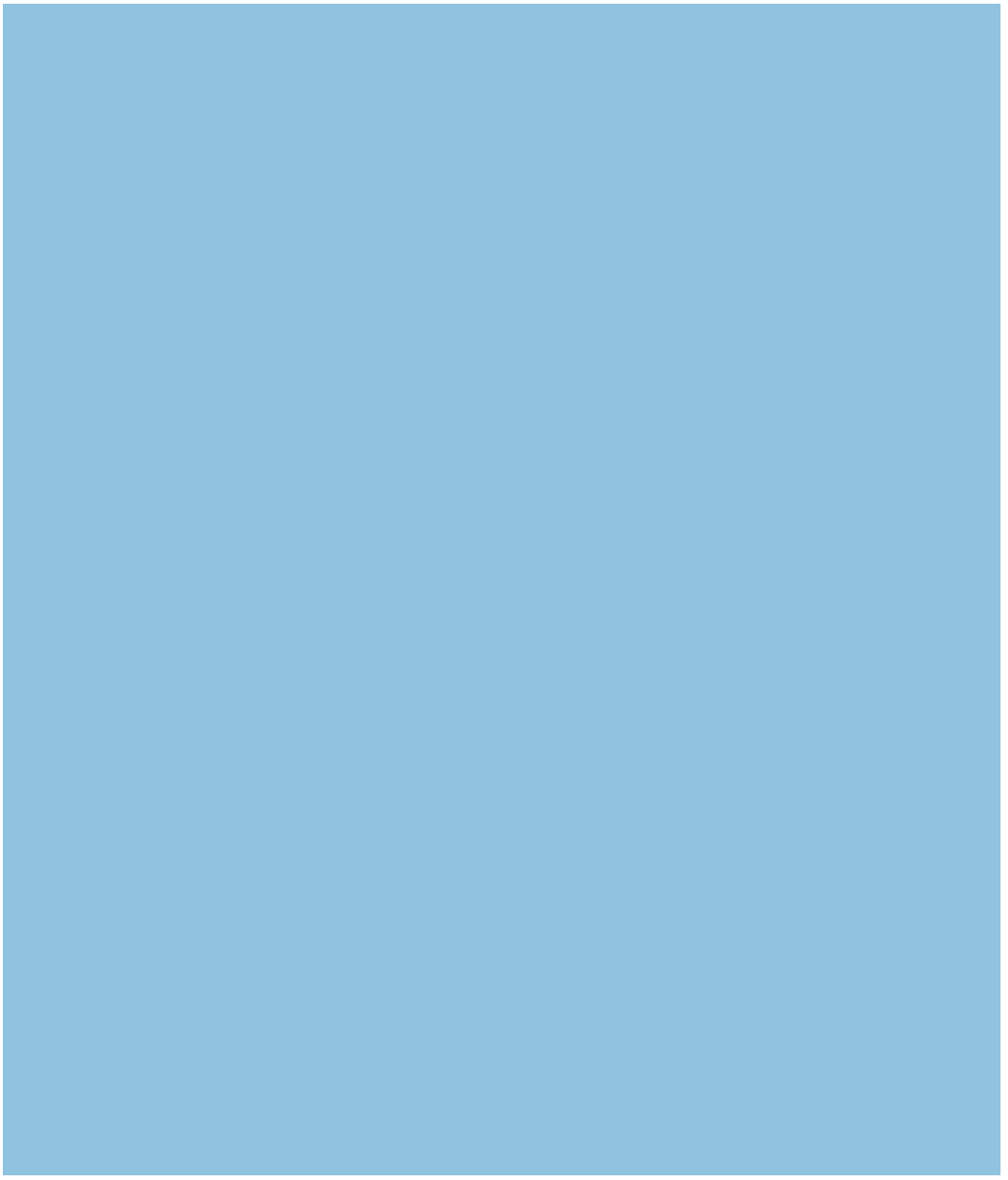
The vision is to be a well-known and respected member-driven contributor to the realisation and positioning of Medicon Valley as the most competitive and vital life science cluster in Northern Europe.

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.



medicon valley alliance
Creating Opportunities

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European Regional Development Fund

EUROPEAN UNION

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LIFE SCIENCE
analysis initiative