



Special theme:

THE BEACONS OF MEDICON VALLEY

STATE OF MEDICON VALLEY 2021

An Analysis of Life Science
in Greater Copenhagen

medicon valley alliance

Creating Opportunities

STATE OF MEDICON VALLEY 2021

An Analysis of Life Science in Greater Copenhagen

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November 2021

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PREFACE

Throughout the coronavirus pandemic, the life science cluster in Denmark and Sweden has once again demonstrated its strength with continued growth. The sector's contribution to society's development is tangible, with increased exports, more patents and increasing tax revenue and the work being done in SARS-CoV-2 research and vaccine development.

The same positive trend is observed regionally in the Danish-Swedish Medicon Valley. In this analysis, we go under the surface for a close examination of the development of the life science cluster's regional beacons – the companies with more than 250 employees in Medicon Valley. There are 32 of these companies, 25 of them in eastern Denmark and seven in Skåne, and together they employ 86 per cent of all those employed in life science companies in Medicon Valley. The number of people who work in Medicon Valley's beacon companies has increased over the past five years, and all the while construction and plans have progressed for new or expanded plants and new research facilities and headquarters. There is also a leitmotif linking the companies' successes and university research, as the largest Danish companies' industrial foundation owners continue to grant billions for research and to generate new businesses from university research.

In this and in previous reports, we have also noted that the region's science parks are continuing to thrive, and that many new life science companies are being created – frequently with a biotech focus. The new companies are emerging as a result of Medicon Valley's strong academic position with its nine universities and higher learning institutions conducting research in the field. Meanwhile, two material research facilities are growing on the other side of the Øresund in the university city Lund, and they are expected to have an important impact on pharmaceutical development of the future: MAX IV, which is already operational, and European Spallation Source, ESS, which will be operative in 2023 and whose data centre is in Copenhagen.

With its 300 members, the Danish-Swedish network organization Medicon Valley Alliance has a unique opportunity to build bridges between national and regional initiatives, as well as to create stronger links between the industry, academia and public healthcare providers in the region. In the years to come, Medicon Valley Alliance will place a strong emphasis on strengthening the organisation's role as a facilitator of increased collaboration between our members, for the benefit of life science in Sweden and Denmark.

Copenhagen and Malmö
8 November 2021

Anette Steenberg
CEO Medicon Valley Alliance

43 000

Together, Medicon Valley's beacon companies employ around 43 000 people in the region, around 40 500 of whom are in Zealand and 2 500 in Skåne. Five years ago, the region's beacon companies employed a total of around 39 000 people. Approximately 4 000 new jobs have thus been added in these companies. Medicon Valley has 32 beacons, or companies with over 250 employees.

New plants and domiciles

Fujifilm Diosynth Biotechnologies, which purchased Biogen's factory for biopharmaceuticals in Hillerød in 2019, is now doubling the size of its Danish facility. That means that Fujifilm has invested a total of around 12bn DKK in Hillerød. Since 2000, Novo Nordisk has invested 18bn DKK in its plant in Kalundborg, where half of the world's insulin is produced. In early 2022 Ferring Pharmaceuticals will move into Soundport in Kastrup, which will be the company's new Danish headquarters and the Ferring Group's largest R&D centre, with room enough for 750 employees. Starting in 2023 the biotech company Genmab will lease newly built headquarters in Valby, Copenhagen, where there will be space for about 700 employees.

MAJOR GROWTH IN TAX REVENUE

The Swedish life science sector contributed 2.3% of the total revenue from income- and corporation tax in Sweden in 2019, equivalent to 16.3bn SEK. Danish tax revenue from the life science sector comprises 3.4% of the total revenue from corporations and income. In 2019, the life science sector contributed 20.9bn DKK.



PHOTO: NEWS ØRESUND

NOVO NORDISK PRE-EMINENT. The largest beacon company in Medicon Valley is the global diabetes concern Novo Nordisk, which employs around 16 900 people in Zealand and about 100 people in the Swedish offices in Malmö. The company's largest production facility worldwide is in Kalundborg in northwest Zealand. The plant is also the largest life science plant in Medicon Valley with its 3 200 employees.

86%

The 32 beacon companies identified employ around 86% of Medicon Valley's total of around 50 000 employees.

LEO PHARMA AND FERRING APPOINT NEW CHAIRPEOPLE WITH A NOVO NORDISK BACKGROUND. This summer, the Novo Nordisk Foundation's chairperson and Novo Nordisk's former CEO Lars Rebién Sørensen became the new chair of Ferring Pharmaceuticals. The former financial director of Novo Nordisk Jesper Brandgaard was also appointed new chairperson of the board at LEO Pharma.

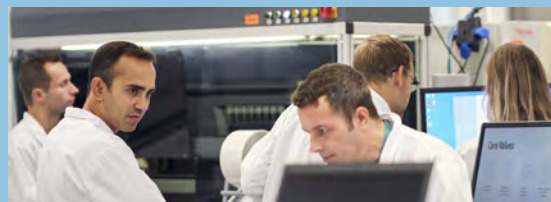


PHOTO: GENMAB - TUALA HJARRUP

2020 was a record year for exports in life science. The Danish life science sector exported for 143bn DKK. The Swedish life science sector also had a record year, with exports of 124bn SEK – an increase of 10.4% since 2019.

THE BEACONS OF MEDICON VALLEY INVEST IN THE REGION

Medicon Valley's largest companies are growing and scaling up. 32 regional beacon companies, 25 in Zealand and in Skåne. A total of 43 000 employees, or around 86% of everyone employed in the region's life science cluster – that's how it looks when Medicon Valley's largest companies – those with more than 250 employees each – are mapped out. And the beacon companies are investing in the region. Fujifilm Diosynth Biotechnologies is doubling capacity at its Danish plant in Hillerød, Ferring is moving to its new Danish headquarters Soundport in Kastrup, LEO Pharma is building a facility adjacent to its headquarters in Ballerup, and Genmab is constructing new headquarters in Valby, Copenhagen. In addition, since 2000 Novo Nordisk has invested 18bn DKK in its Kalundborg site, where over half of the world's insulin is produced.

Danish Novo Nordisk is unequivocally Medicon Valley's largest company, with more than 17 000 employees in the region. The company is also a giant in an international context. Its plant in Kalundborg has more than 3 200 employees and makes more than half of the world's insulin. The investments made in Denmark in recent years “underline Novo Nordisk's ambition to remain a strong presence in Denmark and in Kalundborg”, says Michael Hallgren, Senior Vice President, Novo Nordisk Manufacturing Kalundborg, in an interview conducted for this report. Novo Nordisk has had important research successes in recent years, and expectations have been high for the company's new GLP-1 drugs, which are based on the molecule semaglutide and have resulted in e.g. the pharmaceutical Rybelsus, a tablet for treating Type 2 diabetes. The American Food and Drug Administration (FDA) also approved the semaglutide for treating obesity in 2021.

A phase of restructuring and renewal

A number of Medicon Valley's beacons have undergone changes in the past few years. LEO Pharma for example modified its ownership structure, research, and management, and Lundbeck is currently in the process of strategically restructuring its research.

New plants and domiciles

At the same time, over half of the large life science companies are adding on to their existing facilities or moving to new, larger headquarters, for

PHOTO: LUNDBECK

example Ferring Pharmaceuticals, which is building new Danish headquarters and an R&D centre, and Genmab, which is constructing new global headquarters.

– We're running out of space. We have three different locations in Copenhagen, and we expect to expand even more in the coming years, so we'd like to have all our staff in Denmark under the same roof, says Birgitte Stephensen, Senior Vice President IPR & Legal at Genmab, in an interview on pages 53-54.

Others are increasing their production capacity, e.g. LEO Pharma, Novo Nordisk, Chr Hansen, AGC Biologics and Bavarian Nordic in Zealand. In Skåne, McNeil, PolyPeptide, and Sever Pharma Solutions (QPharma) are also making new investments in their respective facilities in the region.

Two new board chairs with a Novo Nordisk history

In 2021, two of Medicon Valley's regional beacons recruited new chairpersons of the board with a background from Novo Nordisk. In July 2021, Lars Rebien Sørensen was appointed new board chair at Ferring Pharmaceuticals, which has its origins in Malmö and is currently completing a large new R&D centre and Danish headquarters, Soundport, near Copenhagen Airport in Kastrup. Ferring has been headquartered in Switzerland for many years. Lars Rebien Sørensen is also chair of the board of the Novo Nordisk Foundation and Novo Holdings and was administrative director of Novo Nordisk from 2000 to 2016.

In August 2021, the former financial director of Novo Nordisk Jesper Brandgaard became the new chairperson of the board at LEO Pharma. He left Novo Nordisk for a career at the helm in 2019, and he is also vice chair of Chr Hansen Holding and vice chair of William Demant Invest.

Five years, 4 000 more employees

Most of the region's life science companies in the large-scale category have seen their employee numbers rise over the past five years. Around 4 000 new jobs have been created in these companies, according to

figures compiled by ØresundsInstitutet through the Interreg-project Greater Copenhagen Life Science Analysis Initiative and from data from e.g. the company register Bisnode – see more on page 21. Many of the 32 large life science companies expect that they will have still more employees in the region in the next few years.

Need for employees will intensify

Lundbeck is in the process of strategically restructuring its research, and 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. The company thinks that more skilled labourers from abroad, more commuters across the Danish-Swedish border and more STEM admissions would benefit the Medicon Valley cluster.

– 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 this increasingly becoming a problem, she says in an interview on pages 50-52.

Jens Fricke, the director of Polypeptide Group in Malmö, agrees. The competition for employees is stiffening.

– The demand for good labour in the region has grown over the past years. A lot of companies, both in Malmö-Lund and in Copenhagen, are growing and largely seeking the same expertise. Because of that, along with bringing in people from outside, we're also putting efforts into internal training and career paths, he says in an interview on pages 55-56.

Novo would like to see a graduate-level programme in pharmaceutical engineering.

– A next step in strengthening both Medicon Valley and Denmark as a nation 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 food chain a local context, making it easier to recruit and retain skilled labourers locally. Concretely, we see potential in for example graduate-level training



PHOTO: NEWS ØRESUND

PHOTO: NEWS ØRESUND

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 nation, says Michael Hallgren, Senior Vice President, Novo Nordisk Manufacturing Kalundborg, in an interview on pages 44-46.

The life science sector has fared well in the pandemic

2020 was a record year for exports in the life science industry in Denmark and Sweden, despite the coronavirus pandemic and a general decline in exports in both countries. There was also a rise in

the number of patent applications to the European Patent Office. The latest tax revenue figures from the life science sector, for 2019, also show major growth. The life science sector's successes are accompanied by competition for investments and establishments. Life science is on the agenda in both Denmark and Sweden; a new life science strategy was adopted in Denmark this spring, and Vinnova has been appointed to map out the sector in Sweden. Within that competition, Stockholm Chamber of Commerce recently presented seven actions for strengthening the sector. Region Stockholm's goal is for Stockholm to become one of the world's leading life science regions by 2025.

LIFE SCIENCE DEFINITION

Life science can be defined as the study of living organisms (including microorganisms, plants, animals and human beings), but when describing

a life science cluster, life science is seen in a broader context. It includes the pharmaceutical, biotechnology and medical technology

industries, as well as the academic institutions conducting research within life science and hospitals treating patients in the clinic.

Interviewees in this analysis include:



Michael Hallgren, Senior Vice President Novo Nordisk Manufacturing Kalundborg, pages 44-46



Elise Hauge, Executive Vice President for People and Communication Lundbeck, pages 50-52



Dennis Schmidt Pedersen, Executive Vice President for Global People and -Communications LEO Pharma, pages 47-49



Birgitte Stephensen, Senior Vice President IPR & Legal Genmab, pages 53-54



Jens Fricke, Site Director PolyPeptide Group, pages 55-57



Jody Lodge, CEO McNeil, pages 58-59

PHOTO: NOVO NORDISK, LUNDBECK, LEO PHARMA, GENMAB, POLYPEPTIDE, NEWS ØRESUND

FACTS AND FIGURES: New successes in Medicon Valley

With 2020 as a record year for both Danish and Swedish life science exports, with more patent applications and increased tax revenue, new successes have been noted in Swedish and Danish life science. There are at least 45 600 employees in the life science sector in Medicon Valley.

- The number of employees in the life science sector was 45 600 in Medicon Valley 2019; of these, 40 400 were in eastern Denmark and 5 200 in Skåne, according to figures from Statistics Denmark and Statistics Sweden (SCB) based on statistic sector codes. An ongoing manual review of Medicon Valley's life science sector indicates that the figures are higher in actuality.
- A new study shows that a total of over 900 border commuters could be identified in Medicon Valley. 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.
- Danish tax revenue from the life science sector comprises 3.4% of the total revenue from corporations and income in 2019. The total corporation- and income tax from the life science sector in Sweden comprised 2.3% of the total tax revenue.
- 717 Danish patent applications were submitted to EPO in the life science field last year. That corresponds to an 8.5% increase from 2019. That is the highest level since 2010, the first year for the statistics accessible today. The number of Swedish applications was 445, an 19% increase from 2019.
- 2020 was a record year for exports in the life science industry. Danish export value has more than doubled since 2010 to 143bn DKK in 2020. The Swedish life science sector also had a record year in 2020, with exports of 124bn SEK – an increase of 10.4% since 2019.

GROWTH IN TAX REVENUE AND EXPORTS IN THE LIFE SCIENCE SECTOR

2020 was a record year for exports in the life science industry in Denmark and Sweden, despite the coronavirus pandemic and a general decline in exports in both countries. There was also a rise in the number of patent applications to the European Patent Office. The latest tax revenue figures from the life science sector, for 2019, also show major growth.

In spite of the coronavirus pandemic, figures for exports and patents in the Swedish and Danish life science sectors evidence new successes. 2020 was a record year for exports in the life science industry. Denmark exported for 143bn DKK in 2020. Compared to 2019, which was also a record year, the export value in 2020 was 7.7% higher. The Swedish life science sector also had a record year, with exports of 124bn SEK – an increase of 10.4% since 2019. When it comes to patent applications submitted to the European Patent Office, EPO, the number increased again in 2020 after a slight decline under 2019. Danish applications in the life sciences increased 8.5%, and the number of

Swedish applications rose 19%.

The most recent available tax revenue figures, from 2019, show major growth in tax revenue from the life science sector in both Denmark and Sweden. And employment numbers from Statistics Sweden and Statistics Denmark indicate that the number of people employed in Medicon Valley was 45 600 in 2019. However, as the figures are based on sector codes, it may be assumed that these estimates are on the low side. An ongoing manual review of the life science sector in Medicon Valley indicates that the figures are higher. Read more on pages 10-11.

EMPLOYMENT IN MEDICON VALLEY

The number of people employed in Medicon Valley was 45 600 in 2019, which is the most recent year for which statistics are available from Statistics Sweden and Statistics Denmark. The Capital Region of Denmark is responsible for nearly 75% of the employment in Medicon Valley, and its share of employment in Danish life science is almost exactly the same size. However, an ongoing review indicates that the figures of employees in Medicon Valley are higher in actuality.

The number of employees in the life science sector was 44 600 in Denmark in 2019; in Sweden, the corresponding figure was 34 700. The number of employees in Medicon Valley was 45 600; of these, 40 400 are in eastern Denmark and 5 200 in Skåne. The figures may be compared with the two clusters in Sweden: Västra Götaland, which employs 7 500 people, and Stockholm-Uppsala, which employs 17 400.

The figures are based on the most recent statistics available from Statistics Sweden (SCB) and Statistics Denmark. Due to a change in method in SCB's register-based labour market statistics, the figures are not comparable with figures from previous years. The figures may also be seen as a tentative estimate, as many businesses with some or all activities in the life sciences are registered with other sector codes than those used in the statistics. The figures presented in the 'Beacons' chapter of this report and in the Greater Copenhagen Life Science Analysis Initiative project, GCLSAI, in which a manual survey of the regions' companies

is conducted, is thus higher.

Figures from GCLSAI on pages 18-59 show that the beacons of Medicon Valley employ 43 000 in the region equivalent to 86% of the total employment, which is estimated to be 50 000 people. In the past five years, the 32 beacon companies, which employ more than 250 people, have employed an additional 4 000. As far as the distribution of the 32 beacon companies is concerned, 25 are in Zealand and seven in Skåne. The largest of the companies is Novo Nordisk, which employs around 16 900 people in Zealand and about 100 people in the Swedish offices in Malmö.

GCLSAI also studied the number of commuters in Medicon Valley. A report from June of this year shows that the number of border commuters who work in life science companies on the other side of the Øresund has been calculated to at least 900 people, 800 of whom work at life science companies in Zealand and 100 of whom travel in the opposite direction.

EMPLOYMENT IN LIFE SCIENCE BY REGION IN DENMARK AND SWEDEN



Source: Statistics Sweden, Statistics Denmark and information from the biggest life science companies.

* The figures from Statistics Denmark have been adjusted due to a systematic review of the employment figures for the Danish municipalities in Medicon Valley. Read more about the methods used on pages 83-87, in the Appendix. SCB's register-based labour market statistics, RAMS, has changed its method and source, and comparisons with earlier statistics are thus no longer possible. The number of employees picked up statistically, by sector codes, may be considered a tentative estimate, as many businesses with some or all of their activities in the life sciences are registered with an incorrect sector code.

45 600 employed in Medicon Valley

The number of employees in Medicon Valley is 45 600, according to the most recent available statistics from Statistics Denmark and Statistics Sweden from 2019. 40 400 of them are in eastern Denmark, and 5 200 are in Skåne. The Capital Region of Denmark is responsible for nearly 75% of the employment in Medicon Valley. Due to a method change at SCB, statistics are not fully comparable with previous statistics.

The public statistics probably underestimate the employee numbers. In the project "Greater Copenhagen Life Science Analysis Initiative", which is headed by Medicon Valley Alliance and ØresundsInstitutet, a statistic review of the number of employees in Medicon Valley's companies is currently underway, and preliminary results reveal that there are nearly 50 000 employees. Read more on pages 18-59.

More than 900 border commuters

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



PHOTO: NEWS ØRESUND

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

Source: Greater Copenhagen Life Science Analysis Initiative



PHOTO: LUNDBECK

MAJOR GROWTH IN TAX REVENUE FROM THE LIFE SCIENCE SECTOR

The Swedish life science sector contributed 2.3% of the total revenue from income- and corporation tax in Sweden in 2019, equivalent to 16.3bn SEK. Tax revenue from Sweden's life science companies increased 12% from 2018 to 2019, and income tax from employees in the life science sector increased 6%. Danish tax revenue from the life science sector comprises 3.4% of the total revenue from corporations and income. In 2019, the life science sector contributed 20.9bn DKK to the state coffers. That is a 41% increase from the previous year.

Higher tax revenue from Swedish life science companies

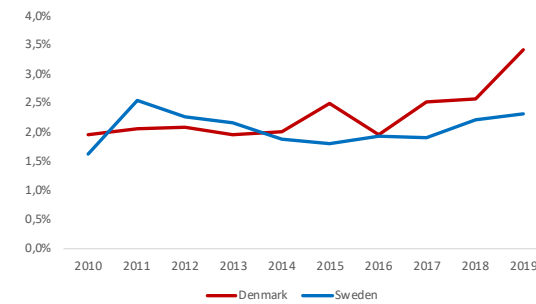
In total, life science companies in Sweden contributed 8.6bn SEK in corporation tax in 2019. In the past two years, the life science sector paid more in corporation tax than their companies' employees paid in income tax. In the past, tax revenue from income tax was higher. In 2019, employees in the Swedish life science industry paid income tax equivalent to 7.7bn SEK. This is a 6% increase from 2018. In 2019, the total corporation- and income tax from the life science sector comprised 2.3% of the total tax revenue, equivalent to 16.3bn SEK.

On the whole, the corporation tax paid by Swedish life science companies increased and in 2019, which is the most recent year for which figures are available, the sector contributed nearly 5% of the total state revenue from corporation tax. Between 2018 and 2019, tax revenue from life science companies in Sweden rose 12%. That is slightly less than the general growth in corporation tax revenue, which was 13%. It should however be taken into consideration that the previous year had seen record growth, as corporation tax from the life science sector increased 34%. The increase was greatest among companies with wholesale trade of medical devices and pharmaceutical goods.

Between 2018 and 2019, tax revenue from the sector instead decreased 25%. The manufacturing of pharmaceuticals as well as of radiation equipment and medical and dental equipment increased.

Seen in a longer perspective, tax revenue, primarily from corporation tax, has increased significantly. The comparison year 2010 was an extraordinarily poor year for Swedish life science. Corporation tax revenue was nearly four times higher in 2019. The

THE LIFE SCIENCE SECTOR'S SHARE OF THE TOTAL INCOME- AND CORPORATION TAXES



Source: Statistics Denmark, the Swedish Tax Agency and Statistics Sweden

TAX CONTRIBUTIONS IN LIFE SCIENCE 2019

	Denmark (billion DKK)	Euro (million)	Sweden (billion SEK)	Euro (million)
Income tax	10.3	1 379	7.7	729
Corporation tax	10.6	1 420	8.6	808
Income and corporation tax	20.9	2 799	16.3	1 537

Source: Sveriges Riksbank and Danmarks Nationalbank. Converted to Euros using the average Euro exchange rate for 2019 [10.5892 SEK for 1 Euro and 7.465978 DKK for 1 Euro]. Because of differences in the Danish and Swedish tax systems, the tax figures are not directly comparable. Read more about the sources and differences in the Appendix on pages 83-87.

average annual growth was 15.7% in the period 2010-2019. Income tax from the sector has increased an average of 1.7% annually.

Significant growth in corporation tax paid by the Danish life science sector

The Danish life science sector contributed 3.4% of the total income- and corporation tax paid in Denmark in 2019. That is equivalent to 20.9bn DKK. Employees in the life science sector paid income tax and labour market contributions worth 10.3bn DKK in 2019. That is a 10% increase compared with 2018, and seen in the period 2010-2019, it is an annual growth of 5.9%. In 2019, income tax revenue was 67% higher than in 2010. The statistical basis* for corporation tax in Denmark has been adjusted for this report, and thus the figures cannot be compared with figures from previous reports. In the past, a selection was made from multiple sectors, but based on two specific criteria. For the report in hand, fewer sectors have been selected, but all companies in those sectors have been included. Utilising this method, corporation tax from life science companies rose to 10.6bn DKK in 2019. That is nearly double the figure from the previous year. Seen over a longer period of time, from 2010-2019, the average annual growth is 17.6%. Tax revenue from corporation tax can vary significantly, as large companies' losses or gains may impact the total amount of taxable income from the sector and thus the total corporation tax. Furthermore, a change in sector category for an individual

workplace can have a great impact on the total sum. This has influenced the figures for 2019.

* Footnote: The population and the calculation method for corporation tax in the life science sector have been adjusted with respect to the methods used in previous reports. This is due to a change in Statistics Denmark's method of linking financial units to concerns that made it impossible to recreate figures using the criteria utilised in the past. The population for the statistics in this report are workplaces in the sectors (DB07): CF, 266, 325 and 464610. The entire period 2008-2019 has been updated with figures for this population. The sectors are thus the same as those used for the Swedish statistics. It is however important to note that corporation tax is paid on the company/concern level, and the main sector of a workplace does not necessarily correspond to the company's main sector.

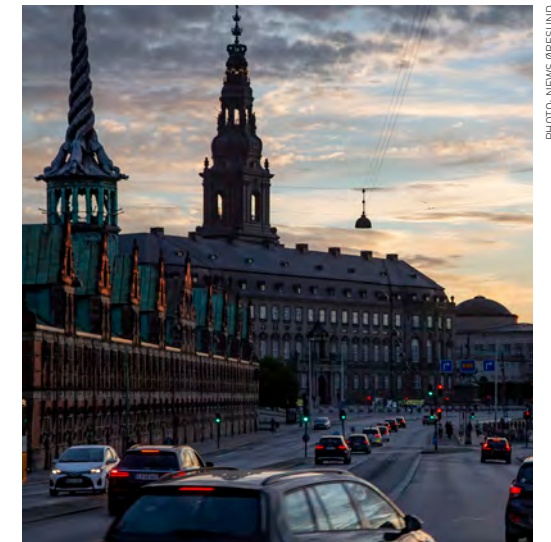
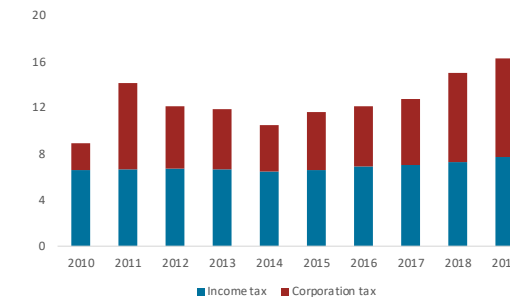


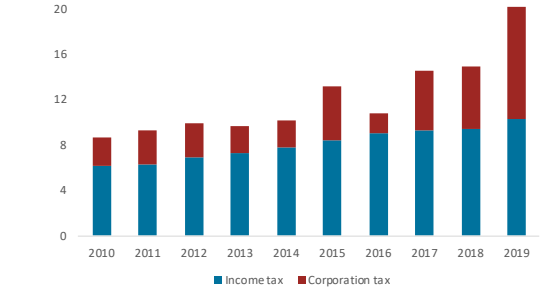
PHOTO: NEWS BRESLUND

THE LIFE SCIENCE SECTOR'S TOTAL CONTRIBUTIONS FROM INCOME- AND CORPORATION TAX IN SWEDEN (IN BILLIONS OF SEK)



Source: Statistics Denmark, the Swedish Tax Agency and Statistics Sweden

THE LIFE SCIENCE SECTOR'S TOTAL CONTRIBUTIONS FROM INCOME- AND CORPORATION TAX IN DENMARK (IN BILLIONS OF DKK)



PATENT APPLICATIONS ON THE RISE AGAIN IN DENMARK AND SWEDEN

Following a slight decline in both Swedish and Danish patent applications to the European Patent Office, EPO, in the life science field in 2019, the number began to increase again in 2020. 717 Danish life science patent applications were submitted in 2020 – an 8.5% increase from the previous year – and the number of Swedish applications was 445, an 19% increase from 2019.

717 Danish patent applications were submitted to EPO in the life science field last year. That corresponds to an 8.5% increase compared to 2019. That is the highest level since 2010, the first year for the statistics accessible today. In 2010, there were 660 Danish patent applications in the life sciences. Between 2019-2020, the number of applications in medical technology and pharmaceuticals increased, while applications in biotechnology decreased.

There were 445 Swedish applications for life science patents in 2020, which is nearly 19% higher than the previous year and 14.5% lower than in 2010, when the number of applications was 521. In Sweden as well, the number of patent applications has increased most in medical technology and pharmaceuticals – 24% and 19%, respectively. The number of applications in biotechnology has also increased, although not as much. The number of applications in the various fields differ in the two countries however, with 224 applications in biotechnology and 245 in pharmaceuticals in Denmark and 93 and 101, respectively in the same areas in Sweden.

There are Danish and Swedish companies on



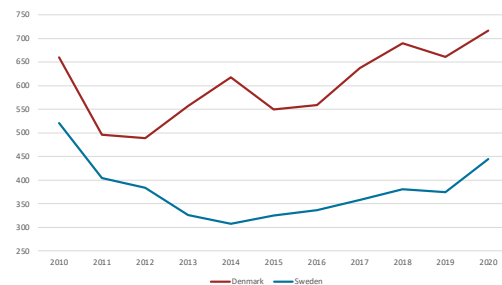
PHOTO: NOVOZYMES

717

Danish life science patent applications to the EPO in 2020. The number of Swedish patent requests was 445.

the EPO's list of last year's 25 top applicants: Danish Novozymes came in 3rd place for biotechnology with its 68 applications and Novo Nordisk came in number 15 for pharmaceuticals with 30 applications.

NUMBER OF LIFE SCIENCE PATENT APPLICATIONS TO EPO FROM SWEDEN AND DENMARK



Source: EPO

TOP TEN TECHNOLOGICAL FIELDS REPRESENTED IN DANISH AND SWEDISH PATENT APPLICATIONS FOR THE PERIOD 2010-2020 AND 2020 (IN PARENTHESES)

SWEDEN			DENMARK	
Place	Technology field	Number of applications	Technology field	Number of applications
1	Digital communication	11 047 (1 275)	Biotechnology	2 786 (224)
2	Transport	3 110 (349)	Medical technology	2 229 (248)
3	Telecommunications	2 601 (243)	Engines, pumps, turbines	2 040 (281)
4	Medical technology	2 518 (251)	Pharmaceuticals	1 619 (245)
5	Computer technology	2 084 (223)	Civil engineering	1 387 (140)
6	Mechanical elements	1 520 (129)	Audio-visual technology	1 277 (106)
7	Measurement	1 487 (161)	Other special machines	988 (108)
8	Civil engineering	1 469 (155)	Electrical machinery, apparatus, energy	925 (101)
9	Machine tools	1 181 (98)	Food chemistry	917 (102)
10	Other special machines	1 143 (113)	Measurement	798 (73)
...				
16	Pharmaceuticals	881 (101)		
19	Biotechnology	763 (93)		

Source: EPO. Understanding this table: The first figure denotes the number of patent applications for the entire period of 2010-2020 within the respective technological fields. The figure for the number of patent applications in 2020 is in parentheses. The year indicates the publication date, which is 18 months after the filing of the national application.

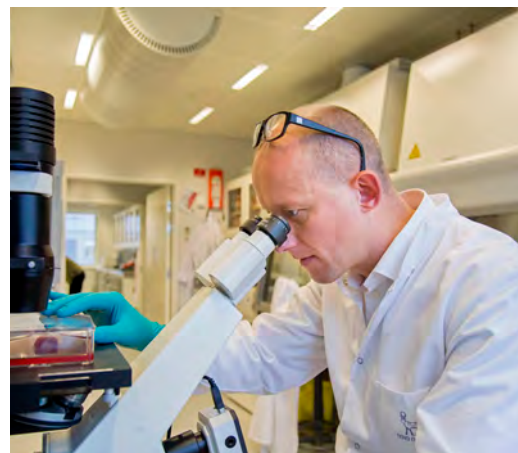
ANOTHER RECORD YEAR FOR SWEDISH AND DANISH LIFE SCIENCE

Despite the corona crisis and a general decline in exports in both Denmark and Sweden, 2020 was a record year for exports in the life science industry. In 2020, the Danish life science sector exported for 143bn DKK. The export of Danish pharma- and medtech products has thus continued to grow. Export value has more than doubled since 2010. The Swedish life science sector also had a record year, with exports of 124bn SEK – an increase of 66% since 2010.

In spite of the corona crisis and the initial uncertainty about how the pandemic would affect the life science sector and industry overall, the figures from 2020 show that it was yet another record year for exports. On the whole, 2020 was the worst year for Danish exports since the financial crisis, but the Danish life science industry's exports were record-high. Exports were 143bn DKK in 2020. Compared to 2019, which was also a record year,

the export value in 2020 was 7.7% higher. Exports have grown substantially since 2010, with an average annual growth of around 10%, and exports in 2020 were more than double what they were in 2010. As regards the life science sector's share of the total Danish exports, it now makes up 20.4%.

The growth is primarily driven by medical- and pharmaceutical products, and such products also comprise the largest part of the life science exports





Over 32 million patients around the globe receive medicine from Novo Nordisk's manufacturing facilities in Kalundborg, says Michael Hallgren, Senior Vice President, Novo Nordisk Manufacturing Kalundborg, in an interview on p. 43.

– 96% of exports in 2020. The export of medtech products has risen 9% since 2010, and dropped 1.4% between 2019 and 2020.

Sweden's exports also declined on the whole in 2020. However, the Swedish life science sector exported for 124bn SEK, equivalent to 88bn DKK, in 2020. That is 10.4% more than in 2019. Considered over a longer period, development of Swedish life science exports has been varied. Exports fell from 2010 to 2013, as they did in 2016

as well, but have increased since 2017. The average annual growth was 5.2% in the period 2010-2020. Seen as a share of Sweden's total exports, the life science sector's exports comprise 8.7%.

Growth since 2010 has primarily been driven by medical- and pharmaceutical products. Together with medicine, the sector is responsible for 93% of life science exports, while medtech products are responsible for 7%. The export of medtech products has increased significantly over the past year however – 26%.

THE TOP 20 COUNTRIES WITH THE MOST LIFE SCIENCE EXPORTS PER CAPITA

Denmark is the world's fifth largest exporter of pharmaceuticals and medtech measured in exports per capita in 2020, while Sweden holds tenth place on the global list.

Country	Export per capita, USD	Percentage of global life science export	Country	Export per capita, USD	Percentage of global life science export
Ireland	15 321	9.2%	Hungary	815	1.0%
Switzerland	11 232	11.6%	Malta*	730	0.0%
Belgium	4 448	6.2%	Italy	674	4.8%
Slovenia	3 931	1.0%	France	629	5.1%
Denmark	3 731	2.6%	Costa Rica*	574	0.4%
Netherlands	2 708	5.7%	United Kingdom	428	3.4%
Singapore	2 519	1.7%	Czechia	406	0.5%
Austria	1 604	1.7%	Finland	389	0.3%
Germany	1 385	13.8%	China, Hong Kong SAR	364	0.3%
Sweden	1 299	1.6%	Israel	341	0.4%

Source: UN Comtrade Database, World Bank and Danmarks Nationalbank. * Calculated with export figures from 2019; figures for 2020 are not available.

Strong position on the global market

Denmark and Sweden are both important exporters of life science products on the global market. The country that exports the most in terms of economic value is Germany, which contributes 14% of the total global life science exports, followed by Switzerland and the USA. Denmark is number 11 on the list, and Sweden is number 16. If exports are adjusted to the countries' populations however, Denmark is in fifth place and Sweden tenth, with exports of 3 731 respective 1 299 USD per capita.

The USA, China and Germany are the three largest trade partners for both countries.

One-third of the Danish life science sector's export value goes to the USA, equivalent to 47bn DKK. Exports to the USA have increased an average of 15% annually since 2010. Danish exports to China have also increased significantly in the past ten years, equivalent to an average annual growth of 21% in the period 2010-2020, and the country is now second on the Danish life science

export list. It is followed by Germany, Japan, and Sweden.

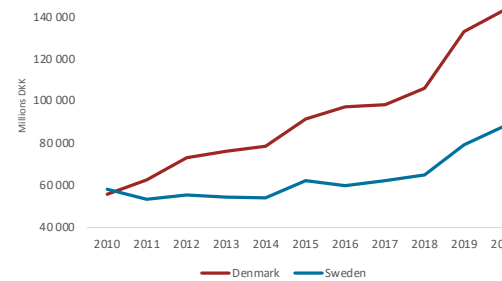
The USA was also the largest trade partner for the Swedish life science industry in 2020. The country receives 18% of Swedish life science exports, and exports grew an average of 9% per year between 2010-2020. Exports to China increased even more in that period, with an average annual growth of 26%. As with Denmark, the next largest export markets are Germany and Japan, followed by Norway.

THE PRINCIPAL EXPORT MARKETS FOR DANISH LIFE SCIENCE

	Exports in millions (DKK) 2020	Annual growth 10-20
USA	47 194	15%
China	13 112	21%
Germany	7 503	5%
Japan	6 579	9%
Sweden	5 169	3%
France and Monaco	4 299	4%
Norway	3 717	12%
Czechia	3 064	23%
Spain	2 986	9%
Finland	2 791	3%

Source: Statistics Denmark

VALUE OF EXPORTS IN LIFE SCIENCE, IN MILLIONS (DKK)



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

LIFE SCIENCE EXPORTS IN DENMARK AND SWEDEN IN 2020

	Millions DKK	Export share 2020	Growth (one year)	Annual growth 2010-2020
Denmark	142 958	20.4%	7.7%	9.9%
Sweden	88 075	8.7%	10.4%	5.2%

Source: Statistics Denmark and SCB/Statistics Sweden and Riksbanken. Figures are for medical and pharmaceutical products and medical instruments, apparatuses etc. Annual growth is calculated with figures in national currency

THE PRINCIPAL EXPORT MARKETS FOR SWEDISH LIFE SCIENCE

	Exports in millions (DKK) 2020	Annual growth 10-20
USA	15 381	9%
China	12 503	26%
Germany	10 239	7%
Japan	5 589	21%
Norway	4 579	5%
Australia	3 138	1%
France	4 152	-3%
Great Britain and Northern Ireland	2 499	-8%
Belgium	2 004	-7%
Netherlands	2 947	19%

Source: SCB/Statistics Sweden and Riksbanken. * Annual growth is calculated with figures in national currency.

THE BEACONS OF MEDICON VALLEY: Growth and new investments

PHOTO: NOVO NORDISK

The majority of Medicon Valley's beacon companies employ more people in the region today than they did five years ago. Parallel to the positive employment development for individual companies and Medicon Valley on the whole, more than half of the largest life science companies are investing in and expanding their facilities. Novo Nordisk is unquestionably the largest company in Medicon Valley with its 17 000 employees in the region, but it has decreased its staff numbers slightly due to optimisation and automatization at its plants.

- 32 life science companies with more than 250 employees in the region were identified in Medicon Valley. 25 of them are in Zealand, and seven of the same size are located in Skåne. In total, the beacon companies employ around 43 000 people in Medicon Valley, equivalent to 86% of Medicon Valley's total employment.
- The majority of the regional employees in Medicon Valley's largest life science companies work in Zealand. Around 40 500 were identified as working in a life science companies with over 250 employees in Zealand, and 2 500 work in a beacon company in Skåne.
- Since 2016/2017, around 4 000 new jobs in the region have been created in the 32 largest life science companies identified in Medicon Valley – a positive employment growth of around 10.3%. Employment development has been most positive in Zealand.

THE BEACONS OF MEDICON VALLEY ARE RESPONSIBLE FOR 86% OF THE TOTAL LIFE SCIENCE EMPLOYMENT IN THE REGION

The life science sector in Medicon Valley is growing rapidly. Many of the sector's large companies are increasing capacity at their manufacturing facilities in the region, whilst others are moving to new, larger headquarters with room for more employees. Since 2017, the 32 regional beacon companies identified in Medicon Valley with more than 250 employees in the region have grown by around ca. 4 000 employees. They are thus important for the macroeconomy and employment in the Øresund Region on the whole, as they employ nearly 43 000 people. This category of large companies is thus responsible for employing 86% of the total of 50 000 people employed in Medicon Valley's life science companies. The region's six science parks on both shores of the Øresund are also continuing to expand their facilities to meet small companies' high demand for lab space. Despite the optimism, companies are increasingly pointing out the challenge posed by a shortage of skilled labourers.

Employment is developing positively on the whole for the 32 beacon companies with more than 250 employees identified in Medicon Valley. Of these, seven are located in Skåne and 25 in Zealand. Together, the companies employ almost 43 000 people in Medicon Valley. The vast majority of them are employed in Zealand, where the employment development is also most notable.

Most of the region's life science companies in the large-scale category have seen their employee numbers rise over the past five years. Around 4 000

new jobs have been created in these companies, according to figures compiled by Øresundsinstittutet and from accessible data in e.g. the company register Bisnode – see more on page 21.

The employment improvements are being seen in all subsectors. Pharma- and biotech companies like Xellia Pharmaceuticals, Abacus Medicine and Genmab, for example, have all experienced substantial growth in employee numbers. The lattermost of these even hit a milestone with 1 000 employees around the globe this July; founded in Copenhagen

A partial mapping of all of Medicon Valley's companies

This review of the beacons of Medicon Valley is based on material produced as part of a survey of all the life science companies in the region. The work is being conducted in the Interreg-project Greater Copenhagen Life Science Analysis Initiative, which is headed by ØresundsInstitutet and Medicon Valley Alliance. Read more on page 2.

23 years ago, it is now one of the world's most valuable biotech companies. Medical device companies such as Coloplast, Radiometer and Ambu have also seen their staff numbers grow over the past five years. Ambu, like Genmab, has more than doubled its number of employees in Zealand.

Notably in that respect, the diabetes concern Novo Nordisk, which is unquestionably Medicon Valley's largest company with its approximately 16 900 employees in Zealand and around 100 employees at its Swedish country offices in Malmö, currently has around 300 fewer employees in Zealand than it had five years ago.

On the Swedish side of Medicon Valley, the seven largest life science companies in Skåne, with more than 250 employees, have seen neither notable positive nor negative employment growth overall. The stagnation in Skåne's larger company-category on the whole may primarily be explained by the plans for the American international medical device manufacturer Baxter, which acquired the dialysis equipment division of Gambro in 2013, to move its production from Lund to Italy in 2022.

As a result of those plans, rather than employing around 800 people, as it did in 2015, Baxter will have around 150 employees in Lund when the move is complete and R&D activities have been resumed, according to the company. There are currently around 230 working at Baxter in Lund. It is important to note that if Baxter's employee decline is omitted from the statistics for the past five years, employment in Skåne's largest life science companies has seen positive development, with

moderate- to significant growth. Two companies – Sever Pharma Solutions (formerly QPharma) and Nolato Medical Solutions – have grown by over 100 employees in the past five years.

More than half of businesses adding on

Not only have many of the Øresund Region's large life science companies engaged more employees; many of the 32 large life science companies expect that they will have still more employees in the region in the next few years. At the same time, over half of the large life science companies are adding on to their existing facilities or moving to new, larger headquarters, as e.g. Ferring Pharmaceuticals, which is building new Danish headquarters and an R&D centre, and Genmab, which is constructing new global headquarters. Others are increasing their production capacity, e.g. LEO Pharma, Novo Nordisk, Chr. Hansen, AGC Biologics and Bavarian Nordic in Zealand. In Skåne, McNeil, PolyPeptide, and Sever Pharma Solutions (QPharma) are also making new investments in their respective facilities in the region. Numerous companies, including e.g. PolyPeptide in Malmö, expect the scaling up of their facilities to lead to more employees. Fujifilm

Diosynth Biotechnologies (FDB) is following suit in Zealand. Last year, the contract research and manufacturing organisation FDB in Hillerød announced that it will go from 800 to 1 100 employees in 2023 due to a 6bn DKK investment in its Danish factory, and earlier this year it announced its first results, which exceeded expectations with a turnover of 2.7bn DKK.

Many of the region's larger life science companies have acquired or merged with other companies recently. This summer, the Malmö-based contract development and manufacturing organisation QPharma consolidated with Disphar International BV, changing their company name to Sever Pharma Solutions. In October, it was made public that Atos Medical, which is not included on the list of beacon companies, as it currently employs just 200 people in the region, had acquired the German medtech concern Tracoe Medical, including its subsidiaries MC Europe in the Netherlands and Kapitex Healthcare in Great Britain. Another Malmö-company to announce an acquisition this autumn was

"We don't see it getting easier to recruit skilled labourers in the future. In that sense, we see it increasingly becoming a problem."

EMPLOYEE NUMBER RISING IN MEDICON VALLEY'S BEACON COMPANIES

Beacon companies with more than 250 employees in Medicon Valley are employing increasing numbers of people, and the number of life science companies in that category is also growing. These companies 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.

32 BEACONS IN MEDICON VALLEY

32 beacon companies with over 250 employees in Medicon Valley were identified. 25 are in Zealand, and 7 were identified in Skåne.



PHOTO: NEWS ØRESUND

NOVO NORDISK IS BIGGEST. The largest beacon company in Medicon Valley is the global diabetes concern Novo Nordisk, which employs around 16 900 people in Zealand and about 100 people in the Swedish offices in Malmö.

The largest life science companies on the Danish side include Novo Nordisk, Novozymes and LEO Pharma. On the Swedish side, the largest life science companies are McNeil, Nolato Medical Solutions, PolyPeptide Laboratories and Sever Pharma Solutions (QPharma).

THE REGION'S BEACON COMPANIES EMPLOY:

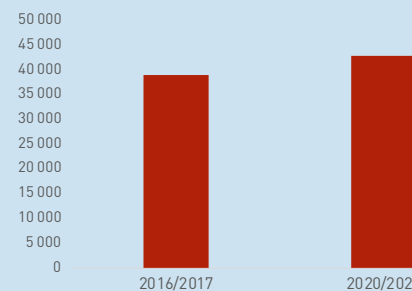
43 000

Together, the regional beacon companies employ around 43 000 people in Medicon Valley, around 40 500 of whom are in Zealand and 2 500 in Skåne. Five years ago, the region's beacon companies employed a total of around 39 000 people. Approximately 4 000 new jobs have thus been added in these companies, according to figures compiled by ØresundsInstitutet and from data accessible via Bisnode, annual reports, etc.

FIVE YEARS, 4 000 MORE EMPLOYEES

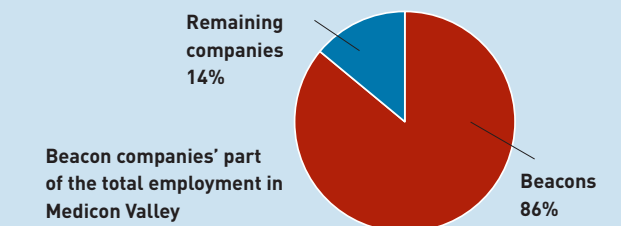
Employment development in the beacon companies

Number of employees in Medicon Valley



86% of total employment

The 32 beacon companies identified are responsible for around 86% of the total employment of around 50 000 employees in Medicon Valley*.



*Figures for the total number of employees here are from the survey in Greater Copenhagen Life Science Analysis Initiative, and they are higher than those based on sector codes from SCB and Statistics Denmark that appear on pages 10-11.

In Zealand, companies such as e.g. Zealand Pharma, Klifo, and Ferrosan Medical Devices are approaching the 'large company' category, just as Arjo, Atos Medical and Rechon Life Science do in Skåne. Each employs around 200 to 240 people.

Source: Information was primarily retrieved from the companies, their websites, and their annual reports, as well as from the company register Bisnode and news sources. The number of employees is rounded off. Please note that these figures may have changed since they were reported, and that some companies were only able to supply figures from 2018 and 2019. The definition of 'beacon' and thus a 'large' company is based on the EU's defining framework for micro-companies (0-9 employees), small companies (10-49 companies), medium-sized companies (50-249 employees) and large companies (> 250 employees).

the medtech company with a focus on oral health, TePe, which acquired Proxident. Novo Nordisk and Lundbeck in Zealand have also acquired American biotech companies for multi-billion sums.

It thus appears that the positive employment development in the region's large life science companies will continue over the next few years, also considering that the investment climate in the Øresund Region is advancing according to a various people active in the sector interviewed for the report 'Life Science Across the Øresund' in June 2021, published by Øresundsinstituttet.

Among other things, that is because the ecosystem has matured, boards and management teams have become more international, and many life science investors and private equity companies from abroad have gotten a taste for investing in the sector and in the innovation at hospitals, universities, science parks and companies in Medicon Valley.

Employee shortage a growing problem

While the life science sector's many investments, expansions and rising employee numbers are positive, many of the region's large companies, such

"At least 900 border commuters were identified as part of the Danish-Swedish life science cluster."

as H Lundbeck, LEO Pharma and Demant, also warn that the shortage of skilled labourers is starting to become a greater challenge. Engineers, research specialists and people with advanced IT- and digital expertise that can be used in pharmaceutical development are some of the profiles in shortage.

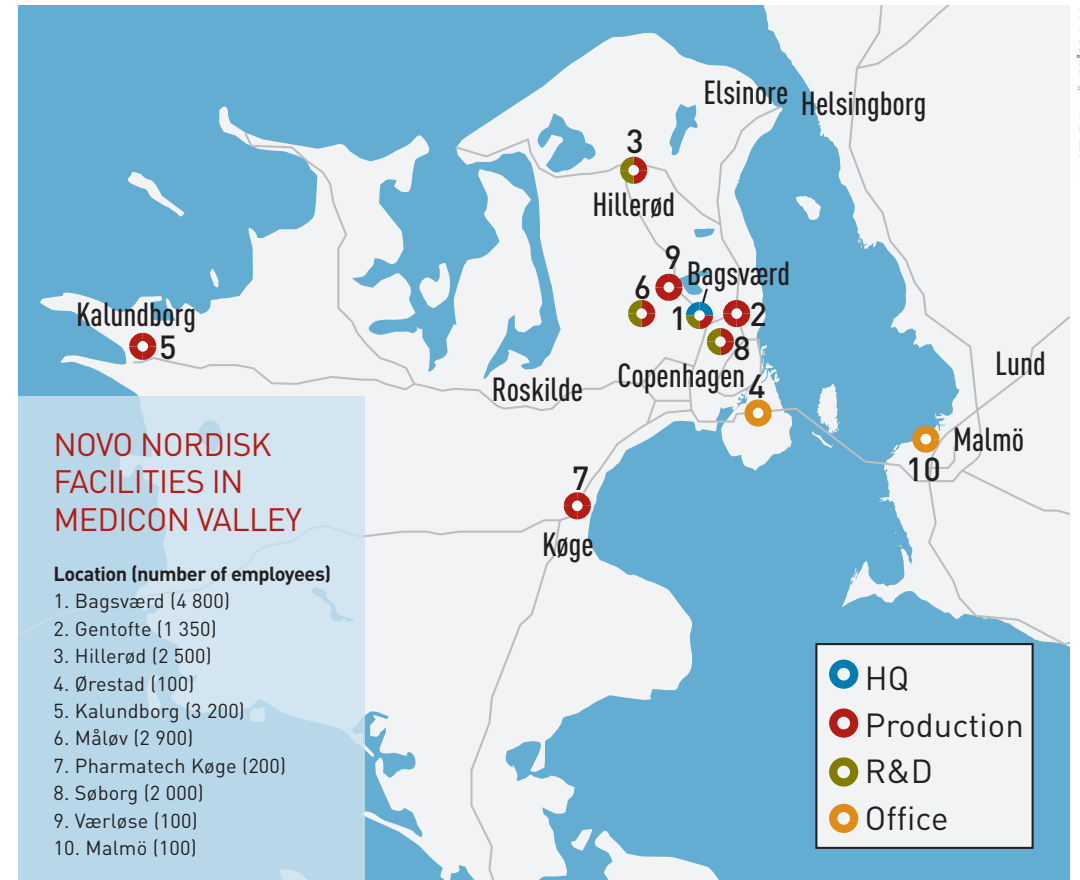
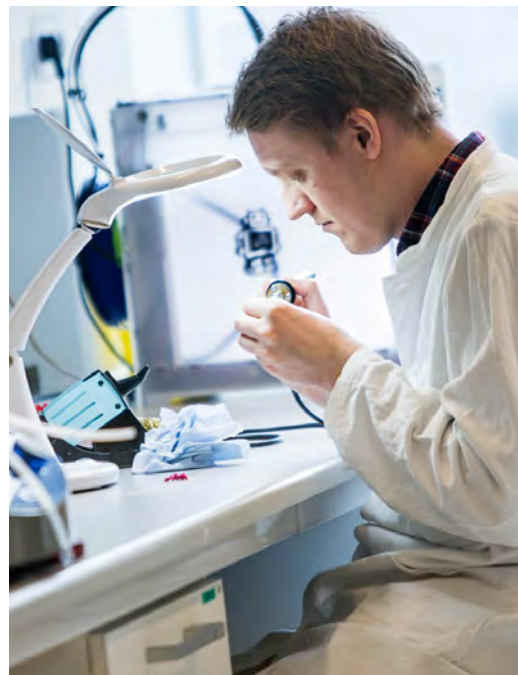
– We don't see it getting easier to recruit skilled labourers in the future. In that sense, we see it increasingly becoming a problem, says

Elise Hauge, Executive Vice President for People and Communication at H Lundbeck. She speaks about the challenge in more detail on page 50-52.

Parallel to the acute shortage of labourers around the sector, admissions to higher education programmes in Science, Technology, Engineering and Mathematics (STEM) in Denmark fell 5% from 2020. Compared to 2019 however, 2021 admissions are 4% higher, and according to the Ministry of Higher Education and Science, the admissions number has been rising since 2017. Nonetheless, the Confederation of Danish Industry and the Danish Chamber of Commerce have expressed concern about this year's development. Speaking to Børsen earlier this year, the latter estimated that there is a shortage of a total of 1 000 employees in the sector on the Danish side of the Øresund.

The consequences of a labour shortage include medicines taking a longer time to reach the market, which in turn risks decreasing production, lower turnover, and less growth, according to the Confederation of Danish Employers and others. For that reason, many of Medicon Valley's larger life science companies, such as Novo Nordisk, Ferring Pharmaceuticals and Lundbeck, recruit skilled labourers from abroad and from across the Øresund, frequently for specialist positions.

In the report 'Life Science Across the Øresund', published by Øresundsinstituttet in June 2021, at least 900 border commuters were identified as part of the Danish-Swedish life science cluster. At least 800 commute from Skåne to work at life science companies in Zealand, and at least 100 commute from Zealand to work at life science companies in Skåne. Although many of the larger companies in Medicon Valley choose to recruit from abroad, many find that engaging employees from abroad entails a great deal of bureaucracy with authorities and results in excessively long processing times.



Source: Novo Nordisk. The number of employees is rounded off. Please note that these figures may have changed since they were reported.

NOVO NORDISK IS MEDICON VALLEY'S LARGEST COMPANY

Novo Nordisk is Denmark's largest pharmaceutical company and the most valuable company in Scandinavia. With its hundred years of history, the diabetes concern is indisputably Medicon Valley's largest life science company, with around 16 900 employees in Zealand and about 17 000 employees in total in the Medicon Valley-cluster, if the Swedish country offices are included.

The company's largest production facility worldwide is in Kalundborg in northwest Zealand. The plant is also the largest life science plan in Medicon Valley with its 3 200 employees, and over 32 million patients around the world receive medicine linked to the facility in

Kalundborg. Since the start of the new millennium, the company has kept up investments in production facilities in various locations in Zealand. The current global headquarters, north of Copenhagen in Bagsværd, were established in 2014, but the company's presence in Bagsværd goes back to the 1950s. The company's roots are in Copenhagen in the 1920s, however. In addition to being Medicon Valley's largest life science company today, Novo Nordisk is also the life science company with the most border commuters in Medicon Valley. Around 200 employees live in Sweden/Skåne and commute to Novo Nordisk's various location in Zealand, and there are Danes working at the company's Malmö offices.

BEACON COMPANIES' FACILITIES IN MEDICON VALLEY

ZEALAND

1. Novo Nordisk A/S
2. Novozymes A/S
3. LEO Pharma A/S
4. Demant A/S (Oticon)
5. Chr. Hansen Holding A/S
6. H. Lundbeck A/S
7. Coloplast A/S
8. Radiometer Medical ApS
9. Widex A/S (WS Audiology A/S)
10. GN Hearing A/S
11. Fujifilm Diosynth Biotechnologies Holdings Denmark ApS
12. ALK-Abelló A/S
13. William Cook Europe ApS (Cook Medical)
14. Xellia Pharmaceuticals ApS
15. Agilent Technologies Denmark ApS
16. AGC Biologics A/S
17. AJ Vaccines A/S
18. Ferring Pharmaceuticals A/S
19. Nomeco A/S
20. ConvaTec (Unomedical)
21. Bavarian Nordic A/S
22. Ambu A/S
23. Genmab A/S
24. Roche Danmark
25. Abacus Medicine A/S)

SKÅNE

26. McNeil AB
27. Nolato AB (Medical Solutions)
28. Sever Pharma Solutions (QPharma AB)
29. PolyPeptide Laboratories AB (Sweden)
30. TePe Munhygienprodukter AB
31. HemoCue AB
32. Baxter Medical AB (Gambro Lundia AB)

Source: The companies were identified using customised data from Statistics Denmark (DST) and Statistics Sweden (SCB). Information regarding functions at the companies' facilities was gathered via the companies' responses to Øresundsinstitutet's database survey and from information on the companies' websites.

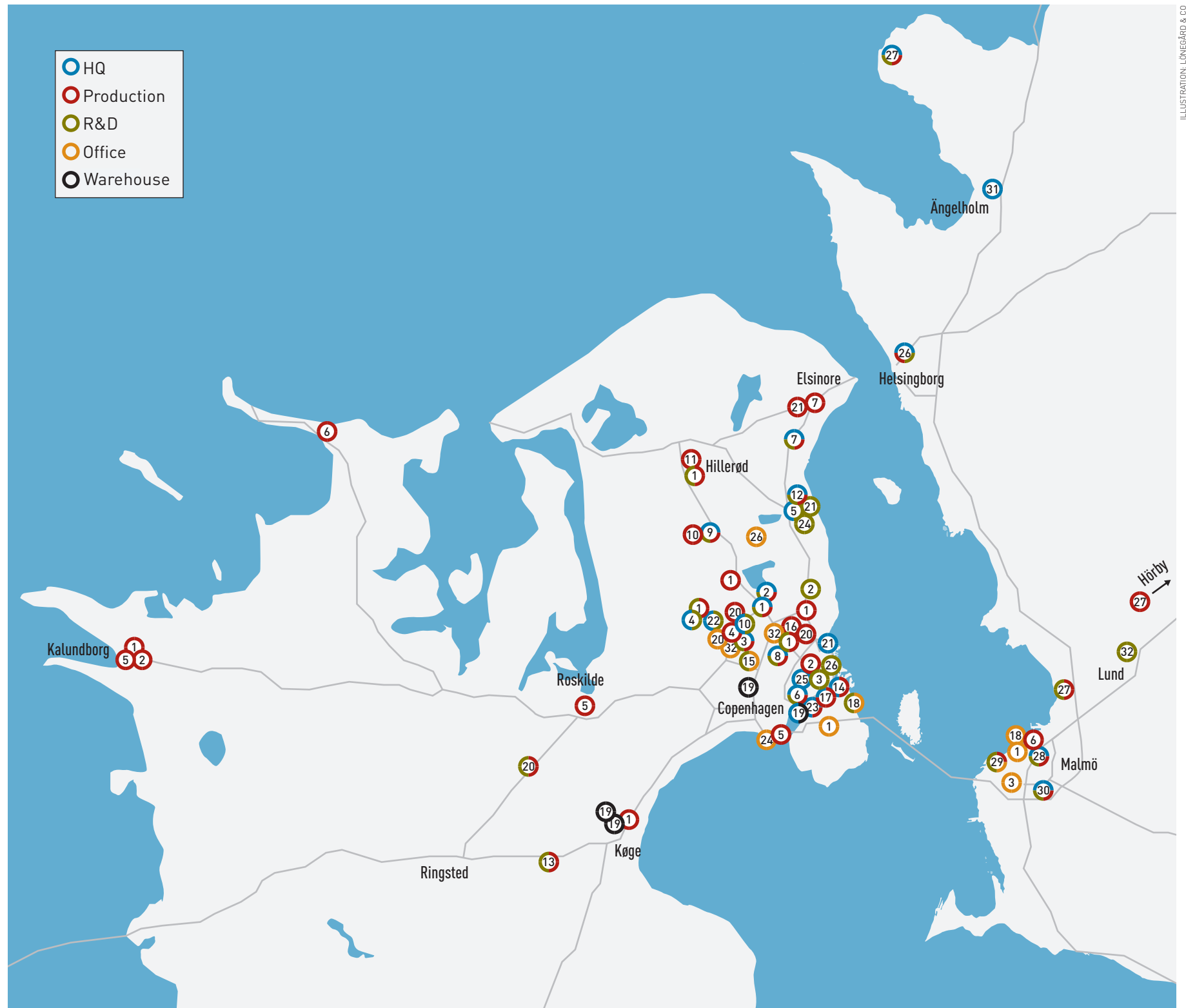


ILLUSTRATION: LÖNGBÄRD & CO

A new name for one of Malmö's largest life science companies

In the summer of 2021, Malmö-based CDMO QPharma merged with Disphar International BV and changed its name to Sever Pharma Solutions. The headquarters are still in Malmö, and at the end of the year, the company will decide whether to expand its plant in Malmö by 300 employees.

Beacons seek acquisitions abroad

Several of the region's largest life science companies made acquisitions in 2020 and 2021, ranging from entire life science businesses to intellectual rights worth millions or billions. Among them were Novo Nordisk, LEO Pharma, Lundbeck and Abacus Medicine in Zealand and TePe and Nolato in Skåne.



PHOTO: NEWS ØRESUND

NEW DOMICILES MAKE ROOM FOR MORE EMPLOYEES.

In 2021, Abacus Medicine moved into its new headquarters in Copenhagen; with more than 5000m2, the company can grow from around 250 to about 300 employees in Denmark. In early 2022, Ferring Pharmaceuticals will move to Soundport in Kastrup, which will be the company's new Danish headquarters and Ferring Group's largest R&D centre, with enough space for 750 employees. The company employed around 600 at its former base in Ørestad. Biotech company Genmab will lease newly built headquarters in Valby, Copenhagen, from 2023, where there will be room enough for around 700 employees. Read more on pages 53-54.

12

bn DKK is about how much Fujifilm Diosynth Biotechnologies (FDB), a subsidiary of the Japanese Fujifilm conglomerate, has put into the purchase and expansion of Biogen's plant in Hillerød, Zealand. The contract manufacturer will employ around 1 100 people in Zealand in about two years. The turnover in their first 2020/2021 annual report exceeded the company's expectations at 2.7bn DKK.



PHOTO: NEWS ØRESUND

More employees in globally leading hearing aid cluster

There is a globally leading cluster of hearing aid manufacturers in the Copenhagen area, employing around 3 800 in Zealand: Demant, WS Audiology and GN Hearing. The companies employ around 900 more people total today than five years ago.



PHOTO: BAVARIAN NORDIC

800

mn DKK is how much Bavarian Nordic received in national funds this August to complete development of a SARS-CoV-2 vaccine. Some of the production will be in Zealand.

€450

million – That's how much the investment company Nordic Capital, whose largest offices are in Stockholm, invested in Denmark's oldest pharma company LEO Pharma in 2021. After 35 years, the LEO Foundation is no longer the sole owner of LEO Pharma; Nordic Capital has an owner's share of around one-fifth of the company. The company's heads – which include the new board chair Jesper Brandgaard from Novo Nordisk – plan to list the pharmaceutical company in four or five years. Read more on pages 47-49.



PHOTO: NEWS ØRESUND

THE LARGEST COMPANIES ARE SCALING UP THEIR MANUFACTURING FACILITIES. Both in Skåne and in Zealand, the largest life science companies are upping their production capacity. This includes PolyPeptide and Sever Pharma Solutions (QPharma) in Malmö and Chr. Hansen and Novo Nordisk in Kalundborg, AGC Biologics in Søborg, LEO Pharma in Ballerup and Bavarian Nordic in Hørsholm.

New chair of the board at Ferring

In July 2021, Lars Rebie Sørensen was appointed new board chair at Ferring Pharmaceuticals, which has its origins in Malmö and is currently completing a large new R&D centre and Danish headquarters near Copenhagen Airport in Kastrup. Lars Rebie Sørensen is also chair of the board of the Novo Nordisk Foundation and Novo Holdings, and was CEO of Novo Nordisk from 2000 to 2016. The change means that Frederik Paulsen, who became board chair of Ferring Pharmaceuticals in 1988 and is the son of the founder Dr Frederik Paulsen, will instead become honorary chairman.

PHOTO: NEWS ØRESUND



18

bn DKK is how much Novo Nordisk has invested in its facility in Kalundborg since the turn of the millennium. With 3 200 employees, it is Medicon Valley's largest plant. Due to optimisation and automatization however, the number of employees in Kalundborg has decreased by around 300 over the past five years. Read more on page 44-46.



PHOTO: NEWS ØRESUND

There are at least 900 border commuters in the Øresund Region's life science companies, according to the report Life Science Across the Øresund. Novo Nordisk, Ferring Pharmaceuticals and LEO Pharma employ the largest number of border commuters.

STOCKHOLM-UPPSALA WANTS TO BE ONE OF THE WORLD'S FIVE LEADING LIFE SCIENCE REGIONS BY 2025.

The goal was set by Region Stockholm in a new report that also states that around 21 000 people are employed in 1 500 life science companies.

DANISH FOUNDATIONS PRIMARY OWNERS OF MEDICON VALLEY'S BIGGEST BEACONS

There are 32 regional beacon companies in the Danish-Swedish Medicon Valley – life science companies with more than 250 employees in eastern Denmark and Skåne. The largest of them are owned primarily by Danish industrial foundations. The Danish ownership structure means that the ownership majority of the foundation-owned companies remains within the country. Rules for industrial foundations entail that they must distribute a certain share of profits from company ownership to e.g. university research. Numerous foundations also invest in new companies in the life sciences. The Novo Nordisk Foundation has even constructed the independent foundation BioInnovation Institute, the task of which is to contribute, as an incubator and an accelerator, to the creation of more new life science companies from university research.

The three largest independent Danish foundations with corporate interests in the life sciences are:

- **NOVO NORDISK FOUNDATION**
- **LUNDBECK FOUNDATION**
- **LEO FOUNDATION**



THE NOVO NORDISK FOUNDATION

The history of the Novo Nordisk Foundation dates back to 1923. It is an industrial foundation whose objective is to act as majority shareholder in the publicly traded **Novo Nordisk** and **Novozymes** (read more about the companies on pages 30-31), as well as to support scientific, humanitarian, and social causes. The Foundation also invests in life science companies.

The Novo Nordisk Foundation assumed its current, independent form in two steps. First, in 1989, Novo Foundation and Nordisk Insulinlaboratorium merged to become the Novo Nordisk Foundation, and the two foundations' companies merged to become Novo Nordisk. In a second step in 1999/2000, the foundation split from the company's corporate activities, and the company was separated into a life science company, which re-

tained the name Novo Nordisk, and a company for the enzyme business, which was dubbed **Novozymes**. Both companies are listed, and the foundation is their majority shareholder.

Novo Holdings is the Foundation's wholly owned subsidiary. It manages the Foundation's endowment and its controlling interests in the publicly traded companies Novo Nordisk and Novozymes. Via the platforms Seeds, Ventures, Growth and Principal Investments, investments are made in external biotech companies at various stages of development. Novo Holdings has investments in the life sciences around the globe totalling around 10.4bn Euro, including investments in the Danish companies **Chr. Hansen**, **Sonion** and **Xellia Pharmaceuticals**.



THE LUNDBECK FOUNDATION

An industrial foundation whose objective is to maintain and expand the activities of **H Lundbeck** (read more about the company on pages 50-52), and to provide funding for scientific research. The Foundation, established in 1954, is the largest shareholder in the publicly traded companies H Lundbeck and **ALK-Abelló**, as well as in **Falck A/S**. The Foundation also invests in life science companies.



LEO FOUNDATION

LEO Foundation was established in 1984 to secure the future of **LEO Pharma** (read more about the company on pages 47-49) as an independent, research-based Danish pharmaceutical company.

Conditions are favourable for the emergence of new life science companies in Medicon Valley that may grow to become beacon companies, thanks to the good R&D environment with nine universities and six thriving science parks on both sides of the Øresund.



SIX SCIENCE PARKS IN MEDICON VALLEY

Beacon companies of the future have opportunities to develop at Medicon Valley's six thriving science parks. On the Danish side of the strait is **Copenhagen Bio Science Park, COBIS**, which houses both life science startups, the BioInnovation Institute and the European Spallation Source's data centre DMSC. COBIS is owned by Symbion, another flourishing community/open workspace. On the outskirts of Copenhagen is **DTU Science Park**. On the Swedish side of the Øresund are **Ideon Science Park** and **Medicon Village**, with the incubator SmiLe, in Lund; **Medeon Science Park** in Malmö, and **Krinova Science Park** in Kristianstad.

The Foundation also supports international research with focus on medical dermatology. Until late spring/early summer 2021, LEO Pharma was wholly owned by the LEO Foundation. In July 2021, Nordic Capital became a minority shareholder of LEO Pharma when it invested 450mn Euro in the company.

Other industrial foundations that are major shareholders of life science companies in Medicon Valley:

WILLIAM DEMANT FONDEN is the majority shareholder of **Demant A/S** and **William Demant Invest A/S**.

DR FREDERIK PAULSEN FOUNDATION owns **Ferring Pharmaceuticals**, which was started in Sweden and now has a major R&D facility, Soundport, in Kastrup and headquarters in Switzerland.



NINE UNIVERSITIES WITH A LIFE SCIENCE FOCUS

Medicon Valley's / Greater Copenhagen's academic spectrum in the life sciences is broad, with nine learning institutions conducting research in the field. Life science research is also conducted at numerous research institutions and on behalf of the regions. Globally leading diabetes research and neuroscientific research take place at the **University of Copenhagen**, as well as at **Lund University**. The learning institutions also have other strong life science research, for example on metabolic diseases and plant biology. In addition, **DTU, Technical University of Denmark** and **Malmö University** are both highly advanced in areas such as bioengineering and biological surfaces. Read more on pages 66-67.

32 BEACONS IN MEDICON VALLEY

According to the EU's classification, companies with more than 250 employees are considered 'large' companies. Based on that definition, Øresundsinstittet identified 32 life science companies in Medicon Valley as regional beacons with over 250 employees in the region. The companies in this category are important for the economy of the Øresund Region, as they employ around 43 000 of the approx. 50 000 people who work in the life science industry in Medicon Valley. The beacons are described here in descending size order.

COMPANY OVERVIEW ZEALAND

PHOTO: NOVO NORDISK



NOVO NORDISK A/S

Novo Nordisk is a Danish company and Denmark's largest pharmaceutical company, and its history goes back about one hundred years, to the founding of Nordisk Insulinlaboratorium in 1923 and Novo Terapeutisk Laboratorium in 1925. The two companies merged in 1989 to become Novo Nordisk, which is now a globally leading insulin manufacturer with a growing staff of around 45 300 people. The company also makes drugs for obesity, haemophilia, and growth disorders, but around 80% of its turnover is from diabetes-related products. Novo Nordisk is Scandinavia's most valuable company, and it is among the top-ten largest pharmaceutical companies in the world in terms of market value. In 2020, Novo Nordisk beat stock market records with a market value of over 1000bn DKK. Recent years' growth and optimism have been borne by e.g. the company's so-called GLP-1-drugs, which are based on the molecule semaglutide. Another GLP-1-drug was added to the product series in 2019, with a new diabetes drug which enables patients to take a tablet rather than an injection. In terms of sales, the diabetes tablet got off to a good start. The optimism surrounding Novo Nordisk is also due to the American Food and Drug Administration (FDA) approval of the semaglutide for treating obesity in

2021, and that the semaglutide-molecule might very well have a preventative effect against Alzheimer's. Novo Nordisk has thus begun to venture into new disease areas in recent years – including cardiac diseases – this was emphasised by the company's 2020 acquisition of the American biotech company Corvidia Therapeutics for 4.8bn DKK. In Medicon Valley, Novo Nordisk continues to make massive investments in manufacturing facilities in Zealand, such as the factories in Måløv and Kalundborg, to meet the future demand for e.g. the new diabetes tablet. However, the company has dismissed around 300 employees in Zealand over the past five years, whilst the number of employees has increased at the Swedish country office in Malmö, which employs around 100 people today. In terms of ownership, Novo Nordisk's A-shares are fully controlled by Novo Holdings, which manages the Novo Nordisk Foundation's activities, and the company's B-shares are listed in Copenhagen and New York.

Global company turnover: 127bn DKK (2020)

Subsector: Pharma

Headquarters: Bagsværd

Facilities in Medicon Valley: 12 – headquarters, production, and R&D in Bagsværd, production and/or R&D in Kalundborg, Gentofte, Hillerød, Måløv, Køge, Søborg, Værløse, and offices in Ørestad and Malmö

Employees in Medicon Valley 2020/2021 (2017): 17 000 (17 300)

Employees globally: around 45 300

Publicly traded: Yes/No. If yes, where? Yes – Nasdaq Copenhagen (Main Market) since 1974 and New York Stock Exchange

PHOTO: NOVOZYMES



NOVOZYMES A/S

The Danish company Novozymes was founded in 2000 as a demerger from Novo Nordisk. Novozymes is a publicly traded biotechnology company and a globally leading manufacturer of industrial enzymes used in e.g. detergents, as well as a major producer of microorganisms. The enzyme business, which was separated from Novo Nordisk over twenty years ago, had already started back in the 1960s. Novozymes has grown since then, and today it employs around 6 200 people around the globe and is one of around 80 life science companies in the Øresund Region to be part of a growing microbiome cluster, along with e.g. Chr. Hansen and Ferring Pharmaceuticals. Novozymes' strategic focus on microbiome research and the field of user health were emphasised further in 2020, when the company acquired the American Microbiome Labs for 780mn DKK, as well as the Irish PrecisionBiotics for 600mn DKK, to strengthen its position in the probiotics market. A new, 30 000m² innovation campus was inaugurated in Kgs Lyngby in 2019, close to DTU Science Park, to which around 800 employees are associated. Despite green solutions and top placements on patent application lists, Novozymes' turnover and employee numbers in Denmark and worldwide have been stagnant over the past five years. It was thus notable that Novozymes' new CEO – the Spanish Ester Baiget – was brought in from beyond the company's ranks, as the company's key employees have traditionally had a long career at Novozymes or Novo Nordisk. Novozymes is listed, like Novo Nordisk, which is controlled by Novo Holdings, which manages the activities of the Novo Nordisk Foundation.

Global company turnover: 14bn DKK (2020)

Subsector: Biotech

Headquarters: Bagsværd

Facilities in Medicon Valley: 4 – headquarters, R&D, and production in Bagsværd, R&D in Kgs Lyngby and production in Copenhagen and Kalundborg

Employees in Medicon Valley 2020/2021 (2017): 2 600 (2 600)

Employees globally: around 6 200

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 2000



PHOTO: NEWS ØRESUND

LEO PHARMA A/S

The Danish company LEO Pharma is Denmark's oldest pharmaceutical company, founded in 1908. Just a few years after it was founded, LEO Pharma expanded with its first subsidiary, AB LEO in Helsingborg. Today, the company is a leader in dermatology, with products for skin disorders such as psoriasis and acne, and its atopic dermatitis treatment Tralokinumab is currently on its way to the European market following important approval by the European Medicines Agency/CHMP in 2021. Earlier this year however, the American Food and Drug Administration requested additional data on the dermatitis treatment, which is a major investment for LEO Pharma and has the potential to become a blockbuster drug with annual sales of over 1bn USD. The company is changing in various ways, both in terms of research and design; in recent years, LEO Pharma has put more strategic focus on biopharmaceuticals than on over-the-counter products such as salves and creams. As a result, there have been e.g. more acquisitions, a large-scale collaboration with British-Swedish AstraZeneca, but also the sell-off of ten pharmaceutical products to Swedish Karo Pharma for 90mn Euro. Research efforts have also become more collaborative, with an open innovation platform being established for use by regional and global industry players as well as university students. LEO Pharma is also changing in terms of ownership; in 2021, the LEO Foundation decided to bring its 35 years as the pharmaceutical company's only owner to an end, entering an agreement with the Nordic Capital that makes the private equity company a minority owner. Nordic Capital invested 450mn Euro in the company; this will be used to implement the goals set in LEO Pharma's 2030-strategy, which will eliminate around 650 jobs in the coming years. At the

same time, 400 new jobs will be created to further adapt the company's product portfolio and pipeline. LEO Pharma employs around 6 000 people worldwide. LEO Pharma is currently building a new factory near its headquarters in Zealand for 1.5bn DKK. In 2021, the former financial director of Novo Nordisk Jesper Brandgaard became the new chairperson of the board at LEO Pharma; according to him, stock market listing could possibly benefit LEO Pharma in four to five years.

Global company turnover: 10.1bn DKK (2020)

Subsector: Pharma

Headquarters: Ballerup

Facilities in Medicon Valley: 3 – headquarters and production in Ballerup, R&D in Copenhagen and offices in Malmö

Employees in Medicon Valley 2020/2021 (2017):

2 400 (2 100)

Employees globally: around 6 000

Publicly traded: No



PHOTO: NEWS ØRESUND

DEMANT A/S

Demant is a Danish company and a globally-leading hearing healthcare concern with a history that goes back over a hundred years. The company has five areas of business: in addition to developing and manufacturing hearing aids, it also works with diagnostic equipment, hearing implants and headsets. The company also heads a global network with more than 2 500 clinics. A hacking attack in 2019 and the coronavirus pandemic in 2020 hit Demant hard, but the company, which has around 16 500 employees worldwide, has since restored its growth and gained additional market shares in the USA. In Medicon Valley, the number of employees at the company's headquarters has increased robustly over the past five years, but like others in the sector, the company has faced challenges due to a shortage of qualified labourers in e.g. software development. The majority shareholder of Demant is the William Demant Foundation, which was established in 1957 by the founder Hans Demant's son, William Demant. The foundation

was called Oticon Foundation until 2019.

Global company turnover: 14.5bn DKK (2020)

Subsector: Hearing aids

Headquarters: Smørum

Facilities in Medicon Valley: 5 – headquarters and R&D in Smørum, R&D and production in Ballerup and hearing clinics in Nærum, Slagelse and Snekersten

Employees in Medicon Valley 2020/2021 (2017):

1 800 (1 500)

Employees globally: around 16 500

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 1996



PHOTO: NEWS ØRESUND

CHR. HANSEN HOLDING A/S

Chr. Hansen is a Danish bioscience company with 3 700 employees worldwide and two areas of commercial activity, in food cultures and enzymes and health and nutrition. The products target multiple markets, e.g. in the food industry, agriculture, the biotech industry and the pharmaceutical industry, and the company has operations globally and two production facilities in Zealand. In 2020, Chr. Hansen took over a factory in Kalundborg, where Novo Nordisk also has large production facilities. In the years to come, the bioscience plans to recruit several hundred new employees to the facility and invest around 200mn Euro in preparing the Kalundborg site for the production of human milk oligosaccharides (HMOs). In addition, the company is one of around 80 other companies in Medicon Valley in a growing cluster of microbiome companies that conduct research on the micro-organisms in the body and in nature. Novozymes is also in the cluster. In 2019, the company put 45mn Euro into a collaboration with the Swiss life science company Lonza, aimed at strengthening Chr. Hansen's position in the field of microbiomes and creating new bacteria-based drugs. The collaboration will bring more employees to the company, as well as new production facilities in Denmark, and lead to growth in the health and nutrition division. With around 22%

of shares, Novo Holdings – which also owns Novo Nordisk and Novozymes – holds the largest share in the enzyme and ingredients company.

Global company turnover: 1.1bn EUR (2020/2021)

Subsector: Biotech

Headquarters: Hørsholm

Facilities in Medicon Valley: 4 – headquarters in Hørsholm, production in Avedøre, Kalundborg and Roskilde

Employees in Medicon Valley 2020/2021 (2017):

1 800 (1 500)

Employees globally: around 3 700

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 2010



PHOTO: LUNDBECK

H. LUNDBECK A/S

The Danish company Lundbeck is one of Denmark's oldest pharmaceutical companies and specialises in pharmaceuticals targeting brain diseases. Lundbeck has 5 700 employees around the globe, and since 2019 the company has been implementing a large-scale strategic restructuring of its R&D activities with greater focus on manufacturing biopharmaceuticals. As a result, a total of 150 employees were dismissed in Denmark and around the globe in 2020, but just as many new professionals were engaged, and there were acquisitions worth billions of two American biotech companies to strengthen the company's pipeline and the influx of new competences to the company. Investments in R&D also increased, and in the next two or three years, they will amount to around 20% of turnover. This is to ensure e.g. the development of new migraine drugs. In terms of the number of employees around the globe and in Denmark, Lundbeck has seen robust growth as an organisation since the large cutbacks and elimination of jobs in 2015 under former CEO Kåre Schultz. In addition to the headquarters in Valby, Copenhagen, Lundbeck's facilities in Medicon Valley include a factory in Zealand and a sales office in Malmö. The Lundbeck Foundation is behind the company and owns 70% of its shares; the remaining shares are publicly traded.

Global company turnover: 17.7bn DKK (2020)

Subsector: Pharma

Headquarters: Valby

Facilities in Medicon Valley: 3 – headquarters, R&D and production in Valby, production in Lumsås and offices in Malmö

Employees in Medicon Valley 2020/2021 (2017): 1 600 (1 700)

Employees globally: around 5 700

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 1999



PHOTO: COLOPLAST

COLOPLAST A/S

Coloplast is a Danish company and the largest medtech company in Zealand, followed by Radiometer and Ambu. The company develops and manufactures medical devices and services for intimate hygiene. Coloplast is a global leader in the stoma- and continence markets, with smaller market shares in urology and skin- and wound care. Coloplast's number of employees has grown in Medicon Valley and worldwide over the past five years, and the company has undertaken a number of company acquisitions in the USA in order to increase its market shares, e.g. for stoma. In 2021, Coloplast signed an important agreement regarding stoma products with Vizient, the USA's largest purchasing organisation, and the following year, the company entered another significant agreement with the American purchaser Premier. Around 12 500 people around the world are employed in the medtech company.

Global company turnover: 18.5bn DKK (2019/2020)

Subsector: Medtech

Headquarters: Humlebæk

Facilities in Medicon Valley: 2 – headquarters, R&D, and production in Humlebæk and production in Mørdrup

Employees in Medicon Valley 2020/2021 (2017): 1 300 (1 200)

Employees globally: around 12 500

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 1983

PHOTO: NEWS ØRESUND



RADIOMETER MEDICAL ApS

Radiometer is a Danish company specialised in medical equipment such as blood gas analysers, which are used in hospitals, clinics, and labs in more than 130 countries. Around 4 000 employees around the globe are associated with Radiometer. Of these, nearly 1 250 work for the company in Zealand, where the organisation's staff has increased by several hundred over the past five years. In 2013, Radiometer acquired the medtech company HemoCue in Ängelholm, Skåne for 1.7bn DKK. Both companies are part of the American Danaher Group, which has around 69 000 employees around the globe.

Global company turnover: 22.3bn USD (2020)

Subsector: Medtech

Headquarters: Brønshøj

Facilities in Medicon Valley: 1 – headquarters, R&D, and production in Brønshøj

Employees in Medicon Valley 2020/2021 (2017): 1 200 (1 000)

Employees globally: around 4 000, around 69 000 in the Danaher Group

Publicly traded: No

PHOTO: WS AUDIOLOGY



WS AUDIOLOGY A/S

WS Audiology is a Danish international company and the third-largest hearing aid company in the world. The company is a product of a 2019 merger between Danish Widex and the Singaporean company Sivantos. There has been a shift in the majority shares since the merger. The Swedish private equity company EQT

reduced its shareholding in WS Audiology to 49% in 2021. The private equity company confirmed in 2021 however that it currently has no plans to exit but continues to be a long-term shareholder in the hearing aid company, which employs around 11 000 people worldwide. The majority share is held by the Danish families Tøpholm and Westermann. WS Audiology had to dismiss employees in Denmark and abroad due to the coronavirus pandemic, but has slightly increased the number of employees in Denmark in recent years and saw turnover increase in 2021.

Global company turnover: 1.7bn EUR (2019/2020)

Subsector: Hearing aids

Headquarters: Lyngø

Facilities in Medicon Valley: 1 – headquarters, R&D, and production in Lyngø

Employees in Medicon Valley 2020/2021 (2017): 1 000 (800)

Employees globally: around 11 000

Publicly traded: No



PHOTO: GN HEARING

GN HEARING A/S

GN Hearing is a Danish company that develops and manufactures hearing aids. The company is part of GN Store Nord, which was originally founded as a telegraph company. The headset division GN Audio is also part of the group. GN Group has around 6 500 employees worldwide; of them, GN Hearing employs around 4 400 worldwide. Despite an increase in the number of employees in Denmark over the past five years, GN Hearings' earnings in 2020 were particularly hard-hit by the pandemic closures in the health care sector around the world. As a result, the company had to dismiss more than 300 employees. Nonetheless, GN Hearing has kept up its R&D investments and used 2021 to come back after the pandemic. In 2021, Nordea proposed that the GN Group sell off its hearing aid division, which GN Hearing declined to do. GN Group recently cut the growth expectation outlook for its hearing aid division due to delayed

deliveries to its product development and appointed a new head of R&D.

Global company turnover: 13.4bn DKK (2020)

Subsector: Hearing aids

Headquarters: Ballerup

Facilities in Medicon Valley: 2 – headquarters and R&D in Ballerup and production in Præstø

Employees in Medicon Valley 2020/2021 (2017): 900 (550)

Employees globally: ca 4 400, around 6 500 in the GN Group

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 1869

PHOTO: NEWS ØRESUND



FUJIFILM DIOSYNTH BIOTECHNOLOGIES ApS

Fujifilm Diosynth Biotechnologies (FDB) is a Tokyo-based, Japanese-owned subsidiary of the Fujifilm-conglomerate. FDB is a global contract research- and manufacturing company specialising in the manufacturing of biopharmaceuticals for external clients. Until 2019, its factory in Hillerød was owned by the American Biogen and employed around 800 people. Following the acquisition, FDB invested around 6bn DKK in the production facility – approximately the same sum it paid for the factory in 2019. The investment and the current expansion of the factory have already led to an increase in the number of employees, and 1 100 people are expected to work at the site by 2023. In the first financial year of 2020/2021, the factory's turnover amounted to 2.7bn DKK, exceeding FDB's expectations. Some of the company's clients are e.g. the Bill & Melinda Gates Foundation, which had antibody treatments for covid-19 manufactured at the facility.

Global company turnover: 2.2bn JPY (2020/2021)

Subsector: CDMO

Global headquarters: Tokyo, Japan

Headquarters in Medicon Valley: Hillerød

Facilities in Medicon Valley: 1 – production in Hillerød

Employees in Medicon Valley 2020/2021 (2019): 900 (800)

Employees globally: around 77 000 in the Fujifilm-Group

Publicly traded: No



PHOTO: ALK-ABELLÓ

ALK-ABELLÓ A/S

The Danish pharmaceutical company ALK-Abelló is one of the oldest of its kind in Denmark. It develops and manufactures tablets for allergy treatment and 'allergy vaccines'. In 2021, the allergy immunotherapy company entered a major agreement with a Chinese company that will sell ALK-Abelló's adrenaline autoinjectors in China; the agreement secured the Danish company an up-front payment of 90mn DKK. In the years to come, the company will work to assume a leading position in the market for adrenaline autoinjectors in the USA, and it expects to submit an application to the American FDA in 2024 at the latest. In Denmark, the company is also part of DTU Science Park, and its workforce and turnover in the country have grown substantially in recent years. ALK-Abelló was formerly part of the Danish bioscience company Chr. Hansen and was listed in 2005. With around 40% of shares, Lundbeck Foundation is a primary shareholder in ALK-Abelló. There are around 2500 employees associated with ALK-Abelló around the globe.

Global company turnover: 3.5bn DKK (2020)

Subsector: Pharma

Headquarters: Hørsholm

Facilities in Medicon Valley: 1 – headquarters, R&D, and production in Hørsholm

Employees in Medicon Valley 2020/2021 (2017): 850 (750)

Employees globally: 2 500

Publicly traded: Yes – Nasdaq Copenhagen (Main Market) since 2005

PHOTO: NEWS ØRESUND



WILLIAM COOK EUROPE ApS

Cook Medical is an American company that manufactures medical devices for use in minimally invasive procedures within a wide range of medical specialties such as aortic intervention, interventional radiology, and endoscopy, and more. The global headquarters are in the USA and the first European site, William Cook Europe, was established in Denmark in 1969. The Danish site has since grown in size, and today it manufactures e.g. stent grafts, vena cava filters, wire guides, needles, catheters, and airway management devices. The site also manages areas such as quality assurance, regulatory affairs, R&D, and a variety of other functions to support the company's business locally as well as globally. Furthermore, William Cook Europe LifeScience Services support the sister companies with batch certification of advanced therapy medicinal products, e.g. cell therapy products.

Global turnover: 1.3bn DKK (2020)

Subsector: Medtech

Global headquarters: Bloomington, Indiana, USA

Headquarters in Medicin Valley: Bjæverskov

Facilities in Medicin Valley: 1 – R&D and production in Bjæverskov

Employees in Medicin Valley 2020/2021 (2017): 800 (700)

Employees globally: +10 000

Publicly traded: No

PHOTO: NEWS ØRESUND



XELLIA PHARMACEUTICALS ApS

Xellia Pharmaceuticals is a Danish antibiotics manufacturer headquartered in Amager, Copen-

hagen, which is also the location of its largest manufacturing facility. Nearly 700 of the company's approximately 1 800 employees work at the Copenhagen site. The number of employees at Xellia Pharmaceuticals has grown noticeably in recent years, both in Denmark and around the globe. The company's first internally developed product was approved by the American Food and Drug Administration (FDA) in 2019, and a new factory in the USA was ready for operations in 2021. The company's history started more than a hundred years ago in Norway with what was called Apothekernes Laboratorium. It acquired and merged with the Danish pharmaceutical company Dumex and became Alpharma. In 2013, Xellia Pharmaceuticals was acquired by Novo Holdings for around 4bn DKK.

Global company turnover: 318mn USD (2020)

Subsector: Pharma

Headquarters in Medicin Valley: Copenhagen

Facilities in Medicin Valley: 1 – headquarters and production in Copenhagen

Employees in Medicin Valley 2020/2021 (2017): 700 (500)

Employees globally: around 1 800

Publicly traded: No



PHOTO: NEWS ØRESUND

AGILENT TECHNOLOGIES DENMARK ApS

Agilent Technologies is an American company. In 2012, the Swedish private equity company EQT decided to sell the medical device company Dako to the American Agilent Technologies for 12.8bn DKK. Since the acquisition by Agilent Technologies, the turnover has increased significantly in Denmark, where the company specialises in instruments for tissue-based pathology. Agilent Technologies employs around 16 400 people worldwide. In the spring of 2021, the country general manager for Denmark Simon Østergaard left for the medtech company CellaVision in Lund.

Global company turnover: 5.3bn USD (2020)

Subsector: Medtech

PHOTO: NEWS ØRESUND



AJ VACCINES A/S

AJ Vaccines is a Saudi-owned pharmaceutical company, and in the spring of 2021 the company was in discussions with the State Serum Institute (SSI) in Copenhagen about manufacturing SARS-CoV-2 vaccines in Denmark. The public call for tenders for national vaccine production in Denmark was cancelled in September 2021, when the Danish government contributed 800mn DKK in national funds to the vaccine company Bavarian Nordic. AJ Vaccines develops and manufactures vaccines for tetanus, diphtheria, tuberculosis, pertussis, and polio. In 2020, it entered a multi-year agreement with UNICEF for the delivery of polio vaccines. In 2016, SSI sold the institute's vaccine production to AJ Vaccines for around 15mn DKK. AJ Vaccines is owned by the Aljomaih Group, which invested around 2bn DKK in the company's production apparatus close to SSI. The company's employee numbers have increased only modestly in recent years.

Global turnover: 352mn DKK (2020)

Subsector: Pharma

Headquarters: Copenhagen

Facilities in Medicin Valley: 1 – headquarters and production in Copenhagen

Employees in Medicin Valley 2020/2021 (2017): 600 (600)

Employees globally: +600

Publicly traded: No

PHOTO: NEWS ØRESUND



AGC BIOLOGICS A/S

AGC Biologics is an American global company that produces e.g. protein-based antibodies and enzymes for other life science companies. The company's employee numbers have more than tripled in the past five years, and large investments have been made continuously in its facility in Zealand. AGC Biologic's new, 19 000m2 production facility in Søborg will be completed in 2023, which will double the company's manufacturing capacity and lead to the recruitment of 250-300 new employees over the next few years. Investments in the factory expansion amount to 1.2bn DKK. Among other things, the facility in Zealand manufactured the Danish-developed SARS-CoV-2 vaccine to which Bavarian Nordic now owns the rights. AGC Biologics is the product of the convergence of Japanese AGC Asahi Glass and the Danish-American CMC Biologics following the 2016 Japanese acquisition of CMC Biologics for around 3.5bn DKK. Around 2000 employees are associated with AGC Biologics worldwide.

Global turnover: 1.5bn DKK (2020)

Subsector: CDMO

Global headquarters: Seattle, Washington, USA

Headquarters in Medicin Valley: Søborg

Facilities in Medicin Valley: 1 – production in Søborg

Employees in Medicin Valley 2020/2021 (2016): 650 (200)

Employees globally: around 2 000

Publicly traded: No



PHOTO: NEWS ØRESUND

FERRING PHARMACEUTICALS A/S

Ferring Pharmaceuticals' roots are firmly planted around the Øresund; the company's story began in

Malmö in 1950, when Dr Frederik Paulsen founded Nordiske Hormonlaboratoriet. Today, Ferring Pharmaceuticals is a global leader in reproductive medicine and female health with focus on gastroenterology, microbiome, and uro-oncology. In early 2022, the company plans to move its Danish headquarters from Ørestad to Kastrup to the new, 37 500m² location Soundport, close to Copenhagen Airport. The new base is the largest R&D centre in Ferring Group, whose global headquarters are in Switzerland, and Ferring Pharmaceuticals employs around 6 500 people around the world. Ferring expects its number of employees in Denmark to increase from 600 to 750 in the years to come. More than 100 employees residing in Skåne commute to the Danish company. In July 2021, Lars Rebién Sørensen became the new chairperson of Ferring Pharmaceuticals. He is board chair of the Novo Nordisk Foundation and was CEO of Novo Nordisk for many years. Earlier this year, Ferring became the first industrial company to enter an innovation collaboration agreement with BioInnovation Institute in Copenhagen. Together, the two players will work to identify new startups and share specialised knowledge.

Global company turnover: 1.9bn EUR (2020)
Subsector: Pharma
Global headquarters: Saint-Prex, Switzerland
Headquarters in Medicin Valley: Kastrup
Facilities in Medicin Valley: 2 – offices and R&D-centre in Kastrup and offices in Malmö
Employees in Medicin Valley 2020/2021 (2017): 600 (550)
Employees globally: around 6 500
Publicly traded: No



NOMECO A/S

Nomeco is a Danish company specialised in health logistics and functions as a pharmaceutical wholesaler and supplier for pharmacies, hospitals, and the pharmaceutical industry. The company's history goes back over two hundred years to the wholesale

companies Mecobenzon A/S and Nordisk Dorge & Kemikalie A/S, which merged to become Nomeco A/S in 1991. Today, the company has distribution centres in several locations in Denmark, and it is the largest pharmaceutical wholesaler on the Danish side of Medicin Valley. With a total of around 700 employees in Denmark, in recent years Nomeco has grown robustly in terms of its employee numbers in Zealand, and in 2019 the company consolidated its position with the construction of a new pharmaceutical warehouse near Copenhagen in Køge. With over 60 000 pallet spaces in a ca 25 000m² building equipped with fully automated cranes, the warehouse serves pharmaceutical wholesalers in Scandinavia and the Baltic countries. The German pharmaceutical trader PHOENIX, which owns Nomeco, constructed the warehouse for around half a billion DKK in the German group's largest single logistics investment to date.

Global turnover: 7.5bn DKK (2021)
Subsector: Pharma
Headquarters: Copenhagen V
Facilities in Medicin Valley: 5 – headquarters and warehouse in Copenhagen, warehouses in two locations in Køge and a warehouse in Brøndby
Employees in Medicin Valley 2020/2021 (2017): 550 (450)
Employees globally: around 39 000 in the PHOENIX Group
Publicly traded: No



CONVATEC (UNOMEDICAL A/S)

The British company ConvaTec manufactures medical products and technologies focused on e.g. ostomy care, wound care, and subcutaneous infusion therapy. ConvaTec's global operations employ nearly 10 000 people, and the international headquarters is in England. In 2008, it acquired the Danish company Unomedical, which is now part of the ConvaTecGroup. ConvaTec's activities in Denmark are focused at four sites in Zealand: in Ballerup,

Herlev, Østed and Søborg. The company's number of employees in Denmark has increased sharply in recent years, and in Denmark ConvaTec is recruiting employees for e.g. management, development, and sales and marketing. This October, ConvaTec inaugurated its new location in Søborg, and production is expanding in Østed. Novo Holdings invested 8.7bn DKK in ConvaTec in 2017.

Global company turnover: 1.9bn USD (2020)
Subsector: Medtech
Global headquarters: Reading, Berkshire, United Kingdom
Headquarters in Medicin Valley: Søborg
Facilities in Medicin Valley: 4 – offices in Søborg and Ballerup, production in Herlev, production and R&D in Østed
Employees in Medicin Valley 2020/2021 (2017): 550 (300)
Employees globally: around 10 000
Publicly traded: Yes – London Stock Exchange



BAVARIAN NORDIC A/S

The Danish company Bavarian Nordic is currently developing a booster vaccine for the coronavirus SARS-CoV-2. In August 2021, the company received 800mn DKK in national funds from the Danish government to complete development of the vaccine. If the final phases go according to plan, it is expected to receive approval from the relevant authorities in early 2023. The vaccine was originally developed by the biotech company AdaptVac; AdaptVac sold Bavarian Nordic the commercial rights to the vaccine via a license agreement. In 2019, Bavarian Nordic took an important step in the diversification of its commercial activities when it acquired two vaccines, one for rabies and one for tick-borne encephalitis, from the British pharmaceutical company GlaxoSmithKline. In addition, the company has developed a smallpox vaccine that is under continual production and delivery, primarily to the American government. Bavarian Nordic has also developed an ebola vaccine, to which Janssen

has the rights. Due to the company's commercial expansion and its numerous development projects, the total number of employees in Denmark, Germany, Switzerland, and the USA – 750 today – is expected to increase to meet the demands of the continued increase in production in Denmark and more.

Global company turnover: 1.8bn DKK (2020)
Subsector: Biotech
Headquarters: Hellerup
Facilities in Medicin Valley: 3 – headquarters in Hellerup, production in Kvistgård and R&D in Hørsholm
Employees in Medicin Valley 2020/2021 (2017): 500 (250)
Employees globally: +750
Publicly traded: Yes, Nasdaq Copenhagen (Main Market) since 1998



AMBU A/S

The Danish medical device company Ambu has a major focus on investing in its selling power and product development, and the company also plans to launch twenty new endoscopes over the next three years. The number of employees has increased exponentially over the past five years, both at the company's headquarters in Ballerup and in the USA, where more than 250 salespeople have been taken on in recent years. Further, Ambu plans to double the size of its R&D division over the next three years. In June, the American Food and Drug Administration (FDA) approved a new Ambu bronchoscope that European health authorities also approved in September. Today, Ambu employs around 4 200 people around the globe. It was founded by the German engineer Holger Hesse in 1937 under the name Testa-Laboratorium.

Global company turnover: 3.6bn DKK (2019/2020)
Subsector: Medtech
Headquarters: Ballerup
Facilities in Medicin Valley: 1
Employees in Medicin Valley 2020/2021 (2017):

450 (200)

Employees globally: around 4 200

Publicly traded: Yes, Nasdaq Copenhagen (Main Market) since 1992

PHOTO: TUALA HJARNØ - GENMAB



GENMAB A/S

The Danish company Genmab specialises in the creation and development of therapeutics for treating e.g. bone marrow cancer. Genmab collaborates with international life science companies such as Janssen, Horizon Therapeutics and Novartis, which sell Genmab's products. In 2020, the biotech company entered into an agreement worth billions of crowns with the American company AbbVie; together, they will develop therapeutics for treating lymphoma. In 2023, Genmab will move to its new global headquarters in Valby, Copenhagen. The 12 500m2 headquarters will be nearly four times larger than the company's current headquarters in Copenhagen, and it will accommodate around 700 employees. Genmab reached a milestone in 2021 when its number of employees around the globe hit 1000, and its number of employees in Denmark in e.g. clinical operations has nearly quadrupled over the past four years. This year, Genmab's commercial functions will be diversified in line with its ambition to market its therapeutics itself, which the company is doing for the first time with Tivdak, its newly approved drug for recurrent cervical and metastatic cancer. The cancer drug Darzalex accounts for around 73% of Genmab's turnover.

Global company turnover: 10.1bn DKK (2020)

Subsector: Biotech

Headquarters: Copenhagen

Facilities in Medicon Valley: 3 – headquarters in three locations in Copenhagen

Employees in Medicon Valley 2020/2021 (2017): 300 (50)

Employees globally: +1000

Publicly traded: Yes, Nasdaq Copenhagen (Main Market) since 2000



PHOTO: NEWS ØRESUND

ROCHE

The Swiss company Roche specialises in e.g. tissue-based cancer diagnostics, drugs for treating e.g. lung disease and tools to help monitor diabetes. In recent years, Roche has entered into a number of collaborations in Denmark, with the Technical University of Denmark (DTU), Copenhagen Business School (CBS), the University of Copenhagen and Aarhus University, to support research training and bring more research to the market. In 2022, Roche's Danish branch will move to new offices in Carlsberg City District in Copenhagen. Roche Innovation Center Copenhagen will remain north of Copenhagen at DTU Science Park in Hørsholm. In 2021, the company set a goal of increased collaboration with life science startups at and related to DTU, offering support with competence, experience and expertise.

Global company turnover: 15.1bn CHF (2020)

Subsector: Pharma

Global headquarters: Basel, Switzerland

Headquarters in Medicon Valley: Hvidovre

Facilities in Medicon Valley: 2 – offices in Hvidovre and R&D in Hørsholm

Employees in Medicon Valley 2020/2021 (2017): 300 (300)

Employees globally: ca 90 000

Publicly traded: Yes, SIX Swiss Exchange Zurich



PHOTO: NEWS ØRESUND

ABACUS MEDICINE A/S

The Danish parallel distributor Abacus Medicine supplies prescription medicine to hospitals, pharmaceutical companies, pharmacies, and pharmaceutical wholesalers. The company's turnover has

details have not yet been determined.

Global company turnover: 82.6bn USD (2020)

Branches in the life sciences: Pharma

Global headquarters: New Brunswick, New Jersey, USA

Headquarters in Medicon Valley: Helsingborg

Facilities in Medicon Valley: 3 – headquarters, production, and R&D in Helsingborg, offices in Birkerød and R&D in Copenhagen

Employees in Medicon Valley 2020/2021 (2017): 850 (800)

Employees globally: +130 000 in Johnson & Johnson
Listed: No



PHOTO: NEWS ØRESUND

NOLATO (MEDICAL SOLUTIONS)

Nolato is a Swedish company. Medical Solutions is one of three divisions of the publicly traded Nolato. The division's activity is in plastic- and silicone products, manufacturing everything from asthma inhalers to insulin pens, urine catheters and pregnancy tests to plastic pharmaceutical packaging. Nolato Medical Solutions' headquarters are in Torekov (Båstad) and its production facilities are located in Torekov, Hörby and Lomma. In 2017, Nolato invested in a new 3 700m2 building in Hörby, bringing the total area of Nolato's plant in Hörby up to 11 000m2. The new building was completed in 2019 and is Nolato's second expansion in just ten years. The factory was also expanded by around 3700 m2 in 2011.

Global company turnover: 9.4bn SEK (2020)

Branches in the life sciences: Medtech

Headquarters: Torekov

Facilities in Medicon Valley: 3 – headquarters and production in Torekov, production and R&D in Lomma and production in Hörby

Employees in Medicon Valley 2020/2021 (2017): 450 (350)

Employees globally: around 2 514 in Medical Solutions, +6 700 in the concern as a whole

Listed: Yes – Nasdaq in Stockholm (Main Market) since 1984

more than doubled over the past five years, as has its number of employees in Denmark and around the globe; today, Abacus Medicine employs over 1000 people. Abacus Medicine's first acquisition was the purchase of the Dutch wholesaler Pluripharm in 2020. It was the largest single investment made by the company to date. In 2021, Abacus Medicine supplied pharmaceutical distribution and -storage services in Denmark's covid-19 vaccine programme and moved to new, larger headquarters in Copenhagen. With more than 5000m2, the company now has room to grow to around 300 employees in Denmark.

Global company turnover: 664mn EUR (2020)

Subsector: Pharma

Headquarters: Copenhagen

Facilities in Medicon Valley: 1 – headquarters in Copenhagen

Employees in Medicon Valley 2020/2021 (2017): 250 (75)

Employees globally: +1000

Publicly traded: No

**COMPANY OVERVIEW
SKÅNE**

PHOTO: NEWS ØRESUND



MCNEIL AB

McNeil is a Swedish subsidiary of the American Johnson & Johnson, which is one of the world's largest pharmaceutical companies. The Helsingborg-based pharmaceuticals manufacturer McNeil is over a hundred years old and is best known for its production of the stop-smoking product Nicorette. Today, it also produces the nasal spray for allergies Rhinocort at its plant in Helsingborg. In 2019, 20mn Euro were invested in Helsingborg to expand the capacity on site and implement the new product Rhinocort in production. The company reports that it expects demand to increase in the future, which will mean additional investments in Helsingborg to boost capacity, but the



SEVER PHARMA SOLUTIONS

Sever Pharma Solutions is a Swedish-Dutch company. In late June 2021, the CDMO QPharma merged with Disphar International BV under the name Sever Pharma Solutions. Its headquarters are in still in Malmö. Today, Sever Pharma Solutions is one of Malmö's largest life science companies, manufacturing among other things products for HIV and unwanted pregnancy. QPharma, now Sever Pharma Solutions, increased its production capacity in Malmö in 2018 and now has other plans for expansion in the city. The details of the company's future scale-up will be decided in conjunction with the company's budget process in November, according to the CEO Kenneth Stokholm. The company is also working on acquiring other R&D companies in the USA.

Global turnover: 440mn SEK (2020)

Branches in the life sciences: CDMO

Headquarters: Malmö

Facilities in Medicin Valley: 1 – headquarters, R&D, and production in Malmö

Employees in Medicin Valley 2020/2021 (2017): 300 (150)

Employees globally: 350

Listed: No



POLYPEPTIDE LABORATORIES AB

PolyPeptide is a Swedish international CDMO in Malmö that does not develop its own pharmaceuticals, but instead manufactures products and processes and provides regulatory support that other companies can use to further develop e.g. pharmaceuticals and cosmetics. PolyPeptide pro-

duces peptides, and its clients range from researchers and small biotech companies to big pharma. Today, PolyPeptide is in an expansion phase, and in the spring of 2021, it received approval to triple its production volume in Malmö to a total of 1 000 kilos. In 2022, the facility in Malmö will be scaled up, thus increasing the company's production capacity. In the second quarter of 2021, the PolyPeptide Group was listed in Switzerland. The listing generated 172mn Euro. The group has a total of around 900 employees worldwide. PolyPeptide was founded by Frederik Paulsen Sr in Limhamn in 1952; at the time, it was called Nordiska Hormonlaboratoriet, and it later became Ferring Pharmaceuticals. The name PolyPeptide emerged in 1996, when the company separated from Ferring and the PolyPeptide Group was created. Today PolyPeptide's main owner is the holding company Draupnir Holding BV.

Global company turnover: 223mn EUR (2020)

Branches in the life sciences: CDMO

Global headquarters: Zug, Switzerland

Headquarters in Medicin Valley: Malmö

Facilities in Medicin Valley: 1 – production and some global functions in Malmö

Employees in Medicin Valley 2020/2021 (2017): 300 (200)

Employees globally: Around 1 000

Listed: Yes – Swiss Stock Exchange



TEPE MUNHYGIENPRODUKTER AB

TePe is a Swedish international company in oral health that started with a collaboration with Malmö's School of Dentistry in 1960. TePe's products are developed, distributed and sold from its headquarters in Malmö. The company has a total of around 370 employees worldwide, about 270 of whom are in Malmö. Today, TePe has eight subsidiaries around the world. The company's global expansion commenced when the first subsidiary was founded in Germany in 1997. In September 2021, TePe acquired the Swedish company Proxident AB, which develops, markets, and sells oral health products for and to

pharmacies and shops. With the acquisition, TePe is strengthening its position in oral health on the Scandinavian market and entering a new market segment with chemical products.

Global turnover: 793mn SEK (2020)

Branches in the life sciences: Medtech

Headquarters: Malmö

Facilities in Medicin Valley: 1 – headquarters, production and R&D in Malmö

Employees in Medicin Valley 2020/2021 (2017): 275 (200)

Employees globally: around 400

Listed: No



HEMOCUE AB

HemoCue is a Swedish company specialising in point of care testing equipment for e.g. blood tests. It was founded in 1988, but its research activities started in 1974 at the hospital in Kristianstad. The headquarters are located in Ängelholm. In 2013 HemoCue was acquired by the Danish Radiometer Medical and became part of the American listed tech- and medtech group Danaher. The group's turnover totalled 22,3bn USD in 2020. It has ca 60 000 employees. The medtech company HemoCue also has links to LEO, which signed its first license agreement with two regional innovators in 1979 and established the company HemoCue in 1988.

Global company turnover: 22.3bn USD (2020)

Branches in the life sciences: Medtech

Headquarters in Medicin Valley: Ängelholm

Facilities in Medicin Valley: 1 – headquarters, production, and R&D in Ängelholm

Employees in Medicin Valley 2020/2021 (2017): 250 (250)

Employees globally: around 400, about 69 000 in the Danaher concern

Listed: No



BAXTER (GAMBRO)

Baxter is an American company specialising in medical equipment for critical care, nutritional therapy, renal therapy, and surgery. The medtech company Baxter in Lund, which was formerly Gambro, has researched and produced equipment for dialysis treatments for kidney- and liver diseases since 1964. In 2012, the American global medtech company Baxter International Inc presented a 4bn USD offer for Gambro, an agreement that was approved in 2013. Baxter's acquisition has led to notable changes in R&D and production, resulting in the company's personnel in Lund going from around 900 before the acquisition to around 230 today. The goal is to move all production to Italy by 2022, and around 150 employees will remain in Lund. Among other things, the facility in Lund will work with research support functions, regulatory affairs, and patent issues.

Global company turnover: 11.7bn USD (2020)

Branches in the life sciences: Medtech

Global headquarters: Deerfield, Illinois, USA

Headquarters in Medicin Valley: Lund

Facilities in Medicin Valley: 2 – R&D in Lund and production until 2022, and offices in Søborg

Employees in Medicin Valley 2020/2021 (2017): 275 (700)

Employees globally: around 50 000

Listed: Yes – New York Stock Exchange

Source: Information about the companies was primarily retrieved from their websites, annual reports, and news coverage on e.g. MedWatch. Figures related to turnover, annual results and employee numbers were retrieved directly from the companies or from their websites, annual reports or from the company register Bisnode. The number of employees is rounded off. Please note that these figures may have changed since they were reported, and that some companies were only able to supply figures from 2018 and 2019. The definition of 'beacon' and thus a 'large' company is based on the EU's defining framework for micro-companies (0-9 employees), small companies (10-49 companies), medium-sized companies (50-249 employees) and large companies (> 250 employees). Please note that a differentiation is made between 'global company turnover', which refers to the concern's total turnover, and 'global turnover', which refers to the turnover of the company in question, if providing the global company turnover would have been unfeasible, irrelevant or misleading.



INTERVIEW:

NOVO NORDISK KEEPS INVESTMENTS IN MEDICON VALLEY'S LARGEST PRODUCTION FACILITY WITH OVER 3 000 EMPLOYEES

Novo Nordisk's plant in the port of Kalundborg in northwest Zealand is the sector's largest manufacturing facility in Medicon Valley with over 3 000 employees. More than half of the world's insulin is produced there. In 2022, work will commence on a motorway connection to the city, and infrastructural improvements will make it easier to attract and retain skilled labourers and ensure stability for continued growth in Kalundborg, says Michael Hallgren, Senior Vice President at Novo Nordisk Manufacturing Kalundborg. He believes that a graduate programme in pharmaceutical engineering would also benefit Denmark as a manufacturing nation, as well as Medicon Valley.

With an area of 1 200 000m², equivalent to 168 football pitches, and a staff of around 3 200, Novo Nordisk's production facility in Kalundborg is more than just the diabetes concern's largest manufacturing site in Medicon Valley; it is also their largest in the world.

The manufacturing facilities Kalundborg in northwest Zealand were first established in 1969. Since the turn of the millennium and until today, the pharmaceutical company has invested more than 18bn DKK in the Kalundborg site, says

Michael Hallgren, Senior Vice President at Novo Nordisk Manufacturing in Kalundborg.

In 2020 alone, 2bn DKK was invested in the factory in which around half of the world's insulin is made by genetically modifying yeast. Earlier this year, Novo Nordisk also invested 500mn DKK in the plant in Måløv, Zealand, where there are around 800 employees, for the production of a new diabetes tablet for treating Type-2 diabetes. There are a total of around 2 800 employees at the site in Måløv.

– Investments in the facilities underline Novo

Nordisk's ambition to remain a strong presence in Denmark and in Kalundborg, says Michael Hallgren.

The Kalundborg-site also produces ingredients for the diabetes tablet and other pharmaceuticals for obesity and diabetes, as well as a number of biopharmaceutical products. Michael Hallgren calls the facility "a cornerstone of Novo Nordisk's global production setup". The facility is thus very important for diabetics all over the world.

– Most of the products that Novo Nordisk manufactures and markets around the globe have their base in our Kalundborg plant, and over 32 million patients around the globe receive medicine from Novo Nordisk's manufacturing facilities in Kalundborg, says Michael Hallgren, whose responsibilities also include a newly constructed plant in the USA that will have 500 employees in the future.

The number of employees at the Kalundborg site has decreased by around 3 00 over the past five years, going from about 3 500 in 2017 to 3 200 in 2021, according to figures supplied by the company. According to Michael Hallgren, the decrease is primarily due to optimising and automatization at the plant.

New motorway paves way for stability, and better growth and recruitment possibilities

For years, Novo Nordisk has collaborated with the rest of the biotech industry and Kalundborg Municipality on e.g. specifically marketing employment opportunities in the city, and setting up residency initiatives and programmes to help spouses of employees to find jobs. One decisive initiative that will make it easier to recruit employees and commuters in the future was the Danish Parliament's decision in June 2021 to allocate 1.9bn DKK starting next year to complete the 30km of motorway to Kalundborg, says Michael Hallgren. Novo Nordisk was not alone in wanting the project to reach completion, he says; other industry actors in the city shared that wish – e.g. Novozymes, Chr. Hansen, Ørsted and Equinor Refining Denmark, which has Denmark's largest oil refinery in the city, as well as AP Møller – Mærsk, which moved its container terminal in Zealand from Copenhagen to Kalundborg this year.

– The announcement of the completion of the

"Investments in the facilities underline Novo Nordisk's ambition to remain a strong presence in Denmark and in Kalundborg."

Kalundborg motorway ensures the stability of the framework conditions for the infrastructural area, and that creates the best possible conditions for continued growth and development, says Michael Hallgren.

It will be possible to travel the entire distance between Kalundborg and Copenhagen by motorway and continue to Skåne or elsewhere; that infra-

structural expansion will mean a lot when it comes to attracting life science commuters and employees, says Michael Hallgren.

– The same is true of the local education initiative, where the industry and educational institutions work together to build a strong food chain of qualified employees locally; the Kalundborg motorway will be a very decisive factor for the industry in attracting and retaining enough

qualified employees, says Michael Hallgren, adding that it has sometimes been difficult for Novo Nordisk to recruit qualified employees to Kalundborg.

– Our experience has been that it is particularly challenging to attract experienced academic and technical profiles that support Industry 4.0– development of our production facilities. On top of that, we need more graduate-level profiles whose education is specifically oriented to work in pharmaceutical production, he says.

Novo wishes for a graduate-level programme in pharmaceutical engineering

Institutions like the University College Absalon make it possible to train as e.g. a biotech engineer, a machine engineer or a bioanalyst in Kalundborg today. From January 2022, graduate students in



Denmark and from abroad will have new opportunities to do thesis projects in Industry 4.0 and sustainability in collaboration with the industry in Kalundborg with Helix Lab, a public-private educational and research centre, says Michael Hallgren, who believes that the educations could be even stronger still.

– 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 food chain a local context, making it easier to recruit and retain skilled labourers locally. Concretely, we see potential in for example graduate-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, says Michael Hallgren. He adds:

– Test-, demo- and upscaling facilities would also strengthen the attractiveness for investments and startups. Those parameters would also strengthen Medicon Valley and the entire sector. ■

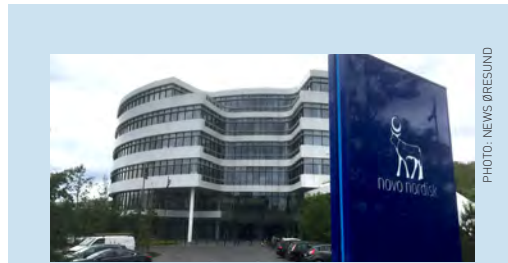


PHOTO: NEWS ØRESUND

NOVO NORDISK

- **Founded:** 1923
- **Branches in life sciences:** Pharma
- **Focus area:** Diabetes, haemophilia, overweight and obesity
- **Ownership:** Novo Nordisk Foundation and listed
- **CEO:** Lars Fruergaard-Jørgensen
- **Headquarters:** Bagsværd
- **Turnover 2020:** 127bn DKK
- **Gross year-end result 2020:** 53bn DKK
- **Total number of employees in Medicon Valley:** around 17 000
- **Total number of employees globally:** around 45 300



PHOTO: NOVO NORDISK

Michael Hallgren,
Senior Vice President,
Novo Nordisk Manu-
facturing Kalundborg.



PHOTO: NEWS ØRESUND

LEO PHARMA MAKES CHANGES TO ITS OWNERSHIP STRUCTURE, RESEARCH, AND MANAGEMENT AND INCREASES ITS PRESENCE IN MEDICON VALLEY WITH A NEW FACTORY

Denmark's oldest pharmaceutical company LEO Pharma has embarked on a growth journey: the company is building a new plant in Zealand for 1.5bn DKK, boosting collaborations with external partners, and has installed a new chair of the board from Novo Nordisk. On top of that, the private equity company Nordic Capital, whose largest base is in Stockholm, has become the company's new minority owner; next year, it will co-fund a large research facility that will shift LEO Pharma's focus from chemical- to biological pharmaceutical production. The new ownership structure is a milestone, says Dennis Schmidt Pedersen, Executive Vice President for Global People and Communications at LEO Pharma.

In March 2021, one of Medicon Valley's largest life science companies made a big change: After 35 years as LEO Pharma's sole owner, the LEO Foundation entered an agreement with the international private equity company Nordic Capital, whose largest offices are in Stockholm, which became a minority owner and took on 25% of the ownership.

The new, shared ownership, where Nordic Ca-

pital is investing 450mn Euro in the company to e.g. bring new products to the market, is a "strong confirmation" of the pharmaceutical company's growth plans until 2030, says Dennis Schmidt Pedersen, Executive Vice President for Global People and Communications at LEO Pharma.

– When the LEO Foundation announced Nordic Capital's investment in LEO Pharma earlier



PHOTO: LEO PHARMA

Construction of LEO Pharma's new plant started in 2019. The facility is the largest production project in LEO Pharma's history, with a budget of 1.5bn DKK.

this year, it represented a significant milestone in our ambitions to strengthen our global leadership in medical dermatology. Nordic Capital is a leading global healthcare private equity investor, and their deep medical expertise and strong track record of supporting value creation in innovative healthcare businesses globally will help us accelerate innovation and growth to realize our 2030-strategy, he says.

“Denmark is one of the world’s leading life science nations, and when it comes to innovation, we do have a competitive edge.”

Research work transformed

LEO Pharma’s 2030-strategy means more than just major changes to the ownership structure. The company’s R&D division will also undergo significant development as LEO Pharma continues to increase its focus on the production of biopharmaceuticals using e.g. molecules and proteins, and moves away from chemical pharmaceutical products such as salves and creams.

All in all, the pharmaceutical company, which employs around 6 000 people worldwide, will eli-

minate up to 650 jobs; at the same time, 400 new jobs will be created globally in the concern in order to adapt and diversify the company’s portfolio and its pipeline for dermatological products for e.g. psoriasis, acne and eczema.

While the strategy will mean that LEO Pharma’s net staff will decrease slightly, it will also accelerate more innovation and lead to more pharmaceuticals for treating skin diseases reaching the market, according to Dennis Schmidt Pedersen, who points out that LEO Pharma has more than doubled its investments

in R&D over the past decade.

– We aim to deliver first- or best-in-class treatments in indications with high unmet needs every second or third year – both through partnerships and by accelerating our R&D pipeline initiatives, he says.

New partnerships beget new pharma

Another change at LEO Pharma is that the research approach and company culture have become more

flexible and collaborative, says Dennis Schmidt Pedersen, and as he sees it, collaboration in the sector is one of Medicon Valley’s particular strengths.

– Denmark is one of the world’s leading life science nations, and when it comes to innovation, we do have a competitive edge. We are good at it. And one of the reasons for this is our industry’s tradition for collaboration and partnerships across borders. Our ability to work together with scientists, universities, and other pharma companies, both within our region and globally, is a very important factor for innovation and thus growth, he says.

An example is the atopic dermatitis treatment Tralokinumab, which was approved by the European Medicines Agency/CHMP in 2021 and will soon be on the European market, and for which the company is currently seeking approval in the USA. Tralokinumab is a result of a partnership with the international Swedish-British pharmaceutical company AstraZeneca that started in 2016.

Over the past five years, LEO Pharma has also worked with an Open Innovation platform, where other life science companies and university students can test molecules in LEO Pharma’s labs and potentially form new collaborations, as has already been the case.

New chair of board says listing probable

Denmark’s oldest pharmaceutical company was founded in 1908 under the name København Løveapoteks Kemiske Fabrik. Another major change for the company in 2021 was when Jesper Brandgaard, who was Novo Nordisk’s financial director for many years, became the new chairperson of LEO Pharma’s board of directors.

According to Børsen, he believes that listing LEO Pharma in four or five years would probably benefit the company; thus, in the future, the company might – like Novo Nordisk, Novozymes and Demant – be both foundation-owned and publicly traded.

In the meantime, LEO Pharma continues to strengthen its position in Medicon Valley, among other things with a 1.5bn DKK investment in a new facility near its headquarters in Ballerup. The new facility will be inaugurated in 2023, and it will manufacture the preparation Fucidin, for treating skin infections.

– The installation work at LEO Pharma’s new state-of-the-art production plant for Fucidin is in its final phase and is expected to be ready for test production in 2022 and commercial production



PHOTO: LEO PHARMA

Dennis Schmidt Pedersen, Executive Vice President for Global People and Communications LEO Pharma.

in 2023. Once ready, the plant will be digitalized to an extent which will set new standards for techniques, automation and data analysis in the pharma industry, says Dennis Schmidt Pedersen. ■



PHOTO: LEO PHARMA

LEO PHARMA

- **Founded:** 1908
- **Branches in life sciences:** Pharma
- **Focus area:** Dermatology and inflammatory skin diseases
- **Ownership:** Private
- **CEO:** Catherine Mazzacco
- **Headquarters:** Ballerup
- **Turnover 2020:** 10.1 bn DKK
- **Gross year-end result 2020:** 1bn DKK
- **Total number of employees in Medicon Valley:** around 2 400
- **Total number of employees globally:** around 6 000



PHOTO: LUNDBECK

Lundbeck's global headquarters in Valby, which has production- and R&D facilities.

INTERVIEW:

LUNDBECK: SKILLED LABOURERS FROM ABROAD AND FOCUS ON EDUCATION TO OVERCOME THE CHALLENGE OF MEDICON VALLEY'S LABOUR FORCE SHORTAGE

One of Medicon Valley's largest life science companies, H 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. According to Lundbeck, more skilled labourers from abroad, more commuters across the Danish-Swedish border and more STEM admissions would benefit the Medicon Valley cluster.

In 2019, Lundbeck presented its new growth strategy, "Expand and Invest to Grow". Among other things, the strategy has resulted in the pharma company acquiring two biotech companies in the USA for more than 15bn DKK. This has ensured Lundbeck access to new competences and new knowledge on the development of biopharmaceuticals, which will become an even more important way to manufacture new drugs in the future, says Elise Hauge, Executive Vice President for People

and Communication at Lundbeck.

– Lundbeck has changed over the past few years. Traditionally, our company's medicines have been based on small molecules, and that's one way of researching, and now we are moving more toward biological products, which is another way of working, she says.

The shift in Lundbeck's R&D work has meant that the company had to dismiss around 100 employees in Denmark in 2020. The overwhelming

majority of these positions have since been filled by new employees with specific knowledge related to biological products, Elise Hauge explains.

While Lundbeck has successfully recruited new employees and found a new head of research for early development in line with the company's growth strategy, the pharmaceutical company currently has a total of around 50 vacant positions at its factory in Lumsås in Zealand and at its headquarters in Valby, Copenhagen. The development of new medicines may be delayed as a result, says Elise Hauge.

– In Lumsås, it's partly a question of getting engineers for production. In Valby, we particularly need specialists in neurological research, PhD graduates and doctors, says Elise Hauge, adding that the coronavirus pandemic has accelerated the need for even more digital competences.

– 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, she says.

More specialist training is important

According to Elise Hauge, there aren't enough life science-specialists in Medicon Valley – and she knows that many other companies in the sector, such as the hearing aid manufacturer Demant and the dermatology company LEO Pharma as well, have a shortage of highly qualified labourers.

– 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, says Elise Hauge. She sees recruiting the right people as decisive in relation to other challenges in the sector.

– If we don't have the right people at Lundbeck, we cannot function as a company. Recruiting the right people, and in the numbers that we need, is really vital, she says.

To help find ways to overcome the challenges, Lundbeck and Elise Hauge have been invited to join a working group on behalf of the so-called

"We have to accept that we need to recruit from abroad. There just aren't enough neurological researchers in Denmark."

Reformkommission, headed by Nina Smith, the renowned Danish professor of economics. The commission was created by the Danish government in October 2020, and in late 2022, it will present solutions for e.g. securing education and training for the future; as Elise Hauge sees it, that is absolutely pivotal for maintaining and expanding Medicon Valley's leading position as an international hub for the life sciences.

– Personally, I'm concerned about whether we are educating enough people and whether we're educating them right. That's one part we can do better in Denmark, she says. She mentions that Lundbeck is working to encourage more upper

secondary students to choose STEM-subjects (Science, Technology, Engineering, Mathematics), for example with the competition Drug Hunters.

Make it easier to recruit from abroad

According to Elise Hauge, the other structural challenge in Medicon Valley is the shortage of skilled labourers.

– We have to accept that we need to recruit from abroad. There just aren't enough neurological researchers in Denmark, so we must bring them from abroad. And that isn't always easy, says Elise Hauge. She mentions that it sometimes takes months for the authorities to process work- and residence permits for workers coming to Denmark



PHOTO: NEWS ØRESUND

Elise Hauge, Executive Vice President for People and Communication in Lundbeck.

from abroad, and she sees that as an "uncertainty factor".

Due to the shortage of skilled labourer in Denmark, Lundbeck recruits continuously from around the world as well as from Skåne; many other life science companies in Zealand, such as Ferring Pharmaceuticals and Novo Nordisk, do the same.

– There are a lot of Swedish-speakers at the site, so many people cross the Øresund Bridge from Sweden to Denmark every morning, says Elise Hauge. She sees that as an indication that the transborder exchange of expertise works well and is important in Medicon Valley.

Something else that works well is the Danish government's plan to make the tax deduction on R&D permanent from 2022, as well as public-private collaboration in the region, according to Elise Hauge.

– We're good at entering partnerships and working with universities and hospitals. As an example, Lundbeck collaborates with Rigshospitalet on how molecules are transported into the brain, says Elise Hauge, adding that politicians must never take for granted the life science sector's growth and its increasing exports.

– We do a good job, and the politicians can easily say "Well, that's going great", and then go focus on something else, but if the politicians were

to nurse it more, I think this golden egg could grow even bigger and benefit everyone in Denmark and Sweden, says Elise Hauge. ■




PHOTO: LUNDBECK

LUNDBECK

- **Founded:** 1915
- **Branches in life sciences:** Pharma
- **Focus area:** Brain medicine
- **Ownership:** Foundation-owned, listed
- **CEO:** Deborah Dunsire
- **Headquarters:** Valby
- **Turnover 2020:** 17.7bn DKK
- **Gross year-end result 2020:** 1.9bn. DKK
- **Total number of employees in Medicon Valley:** around 1 750
- **Total number of employees globally:** around 5 750



PHOTO: LUNDBECK

Lundbeck bought a former dairy in Lumsås for pharmaceutical production in 1961.



ILLUSTRATION: NICC

Genmab's new headquarters in Valby, Copenhagen, is due to be completed in the first quarter of 2023.

INTERVIEW:

GENMAB IS CONSOLIDATING ITS COPENHAGEN ACTIVITIES AND BUILDING A NEW GLOBAL HEAD-QUARTERS WITH ROOM FOR 700 EMPLOYEES

The biotech company Genmab is one of the life science companies in Medicon Valley whose staff has grown most over the past five years. For that very reason, the company needs more space and is currently building new global headquarters in Copenhagen that will be nearly four times larger than their current headquarters. The new headquarters are a milestone for the company, says Birgitte Stephensen, Senior Vice President IPR & Legal at Genmab. The large number of employees is partially due to the biotech company's goal to take over more of the marketing of their own cancer drugs, and partially due to a large number of new research projects.

The listed Danish biotech company Genmab expects to inaugurate its new global headquarters in Valby, Copenhagen in the first quarter of 2023. The move will give the company space for its growing staff. Founded in Copenhagen in 1999, Genmab now has international operations and commercial activities in Princeton, USA; Utrecht, Holland, and Tokyo, Japan.

– We're running out of space. We have three different locations in Copenhagen, and we expect to expand even more in the coming years, so we'd like to have all our staff in Denmark under the same roof, says Birgitte Stephensen, Senior Vice

President IPR & Legal at Genmab.

The new headquarters in Copenhagen thus has space for around 700 employees, which will ensure the company enough office space to grow robustly in the coming years, and this is something the biotech company expects to continue doing, says Birgitte Stephensen.

She adds that when it comes to recruitment, Genmab benefits from the dense concentration of life science companies in Medicon Valley; because there are many professionals in the region, they generally don't have difficulty recruiting employees.

The 12 500m² new headquarters will be nearly four times larger than its current headquarters at Kalvebod Brygge in Copenhagen, where the company's base has been 3 500m² in a building owned by the Swedish real estate company Castellum.

Prior to that, Genmab was in other locations in the Copenhagen area; the biotech company is currently building its new domicile from the ground up, and this is an important consolidation.

– This is a very important milestone for Genmab. I've been with the company since 2002 and we've had many different addresses, and over the years it has been hard to predict how many people we would be. We had a few tough years during the financial crisis and we had to cut our staff and downsize our offices, so I see this as a really significant milestone, and it shows that we have become a very well consolidated company, says Birgitte Stephensen.

Genmab quadrupled its labour force in Medicon Valley

Genmab hit another milestone in July 2021 when its number of employees around the globe rounded 1 000; of these, 300 are in Copenhagen – that's nearly five times what the Danish staff number was five years ago, when around 60 people were employed in Copenhagen.

Genmab is thus one of the life science companies in Medicon Valley whose staff has grown most since 2017, according to figures compiled by Øresundsinstittutet and data available from the company register Bisnode.

The steep employee growth curve that the company has followed over the past three or four years according to Birgitte Stephensen is in part a manifestation of Genmab's vision to market its products on its own by 2025; doing this requires additional competences.

Genmab currently has five products on the market. Four of them are currently sold by the international life science companies Janssen, Novartis and Horizon Therapeutics, and Genmab receives milestone- and royalty payments. One of the products, Darzalex, for a type of cancer called myelomatosis, is marketed by Janssen and is responsible for around 73% of turnover.

The ambition to be involved in the marketing of a pharmaceutical of which Genmab has 50% ownership or more was already fulfilled earlier this year with the drug Tivdak, for recurring, metastatic cervical cancer. The biotech company will market Tivdak in the USA with its American collaborator Seagen following the



Birgitte Stephensen,
Senior Vice President
IPR & Legal Genmab.

PHOTO: TUALA HUARNØ - GENMAB

American drug authorities' approval this September; this may be seen as yet another in a series of milestones for the biotech company.

More clinical projects increase staff growth

The other reason Genmab's staff is growing is that the company's pipeline is growing and there are more clinical projects, explains Birgitte Stephensen. The more comprehensive development work is partially due to a new collaboration agreement for new cancer drugs with the American biotech company AbbVie, which has already brought Genmab more than 40mn USD in milestone payments from the American company.

– We have a very broad range of different functions and different expertise represented on our Danish site, but the areas where growth has been especially strong are clinical operations and our CMC-area, which is in charge of production, says Birgitte Stephensen

The new location in Copenhagen will not include labs, which the company's seats in Holland and the USA do, she adds. The building will exclusively contain offices, and its placement was largely influenced by where employees live and the short distance to Copenhagen Airport. ■

GENMAB

- **Founded:** 1999
- **Branches in life sciences:** Biotech
- **Focus area:** Cancer
- **Ownership:** Listed
- **CEO:** Jan van de Winkel
- **Headquarters:** Copenhagen
- **Turnover 2020:** 10.1bn DKK
- **Gross year-end result 2020:** 4.8bn DKK
- **Total number of employees in Medicon Valley:** around 315
- **Total number of employees globally:** around 1 000



PolyPeptide, located in Limhamn, Malmö, is one of the city's largest CDMOs with 300 employees.

PHOTO: INEWS ØRESUND

INTERVIEW:

AUGMENTED PRODUCTION AND A LISTING – ONE OF MALMÖ'S LARGEST LIFE SCIENCE COMPANY PRESSING FORWARD

One of Malmö's largest life science companies, PolyPeptide, is in an expansion phase. This spring, the company received permission to almost triple its peptide production in Malmö, and its parent company went public in Switzerland. The company's manufacturing capacity is already being scaled up at the facility in Limhamn, and production is set to increase substantially in 2022. While the company's current staff of 300 won't be multiplying as quickly as the kilos of peptides, PolyPeptide Group's site director in Malmö Jens Fricke does expect the personnel to grow in the coming years. One challenge to the continued expansion is brought up: nowadays it's hard to find the right expertise in automatization, chemistry, and process technology.

A lot has happened over the past year for one of Malmö's largest life science actors, the CDMO PolyPeptide, whose global facilities make peptides for 16 of the world's largest pharmaceutical manufacturers today. Around half of those clients work directly with PolyPeptide in Malmö. When Jens Fricke receives us at the company's Limhamn plant, on the very same site where Frederik Paulsen Sr founded Ferring back in 1952, he shows us the addition currently being built for the increased

production volume to come. PolyPeptide was part of Ferring until PolyPeptide Group was created in 1996. Today, the listed company is owned largely by Draupnir Holding BV.

The walls of the meeting room where we take a seat are covered with whiteboards filled with jotted notes about current projects and clients. As a company that delivers peptides, also known as amino acid chains, to some of the world's biggest big pharma companies and biotech players,

PolyPeptide has its hands full trying to meet the enormous demand.

This spring, after a process that took five years, the company received permission from the Land and Environment Court of Appeal to increase their production volume in Malmö to 1 000 kilos a year – from the estimated 400 kilos per year.

– The news was a relief for us, because now we can go further with an incredibly successful

operation that is growing more with each year. It also makes it possible for us to take on bigger projects, which helps our clients take their next step. If we hadn't gotten approval, there would have been a risk that our clients turned to other players instead, says Jens Fricke, site director of PolyPeptide Group Malmö.

The approval is also the reason that PolyPeptide has already started working on expanding its facility, so it can create a larger-scale and more flexible production moving forward. A sizeable new project will be implemented in 2022 in which the treatment line in the production process will be extended with automated systems, which will also mean increased flexibility.

– Being able to meet clients' needs is an important factor for us. When they contact us, they'd ideally like to have the products the next day and not in two years, because their clinical projects will be delayed otherwise, says Jens Fricke, adding that the addition also includes an improvement to isolation, which is the final part of the production process.

Besides building new production components, PolyPeptide works ceaselessly to maintain and improve the production processes in place today.

– It's a question of how we can exploit our existing resources better. How can we use less energy per kilo we produce, for example? That agenda is something we follow ourselves, but our clients also encourage it, says Jens Fricke.

Determining exactly when PolyPeptide will reach its production volume of 1 000 kilos in Malmö is difficult, Jens Fricke says. As an CDMO with no products or brands of its own, the company's environment is continually changing, and it largely depends on good relationships with clients, as well as the clients' results.

– Two factors dictate how quickly we can scale

up. One of them has to do with our own capacity, and the other is whether we have clients lined up. Sometimes clients' demands increase steadily, and sometimes we suddenly get multiple large orders all at once, so it's difficult to say exactly how the development will take shape in the long term. And clients may have rapid developments in either direction, and their needs may be more or less than what was originally planned, he says.

"The demand for good labour in the region has grown over the past years. A lot of companies, both in Malmö-Lund and in Copenhagen, are growing and largely seeking the same expertise."

Today, PolyPeptide employs around 300 people in Malmö, which is an increase of nearly 100 individuals in five years. Jens Fricke expects the number of employees to continue to grow in the years to come. Since a large part of the expanded capacity will be reliant on the automatization and digitalisation of processes however, the company's staff is not expected to grow as substantially as the financial results and the production volume.

There are also challenges when it comes to recruitment – the expertise necessary for the automatization and

digitalisation of a chemical production process is difficult to locate in the region today.

– The demand for good labour in the region has grown over the past years. A lot of companies, both in Malmö-Lund and in Copenhagen, are growing and largely seeking the same expertise. Because of that, along with bringing in people from outside, we're also putting efforts into internal training and career paths, says Jens Fricke.

In April 2021, the parent company PolyPeptide Group started trading in Switzerland. The IPO raised 172mn Euro and entails that the global headquarters is established in Zug, Switzerland. Today there are four people there, one of whom is the company's CEO Raymond de Vré, as well as others in investor relations. Many global functions are still based in Malmö however, for example IT, marketing, and product development. The IPO has meant greater transparency toward the public for the operations in Malmö, and Jens Fricke finds that the public is now more interested in the company and its operations.

In addition to the facility in Malmö, the company has manufacturing and research in the USA, France, India, and Belgium. In 2020 PolyPeptide Group had a turnover of 223mn Euro, of which PolyPeptide Laboratories in Malmö turned over 732mn SEK. ■

POLYPEPTIDE GROUP

- **Founded:** 1952 under the name Nordiska Hormonlaboratoriet by Fredrik Paulsen, changed its name to PolyPeptide in 1996 and became independent from Ferring Pharmaceuticals
- **Branches in life sciences:** CDMO (Contract Development Manufacturing Organization)
- **Focus area:** Peptides
- **Ownership:** Listed in Switzerland
- **CEO:** Raymond De Vré
- **Headquarters:** Zug, Switzerland
- **Turnover 2020:** 223mn EUR
- **Gross year-end result 2020:** 38mn EUR
- **Total number of employees in Medicin Valley:** around 300
- **Total number of employees globally:** around 1 000



Polypeptide Group's director in Malmö, Jens Fricke.

PHOTO: POLYPEPTIDE

A survey of the companies in Skåne's life science sector was published last November by Øresundsinstitutet and Medicin Valley Alliance as part of the Interreg-project Greater Copenhagen Life Science Analysis Initiative. The life science sector in Zealand is currently being mapped out, and the results are expected to be presented in 2022.

SKÅNE'S LIFE SCIENCE SECTOR COMPRISES 426 COMPANIES. Around half of them can be classified as micro-companies with nine employees or fewer. There are around 100 small companies with 10-49 employees and ca 25 medium-sized companies with 50-249 employees. Six life science companies with more than 250 employees were identified. While most of the enterprises are micro-companies, two-thirds of employees work in medium-sized or large companies.

HALF OF THE COMPANIES ARE LOCATED IN SCIENCE PARKS. Of the 426 life science companies identified, around half are located in the parks Medeon, Ideon, Medicin Village and the incubator SmiLe. With its 225 registered companies, Lund is the municipality in Skåne with the greatest number of life science companies.

7 500

The life science industry employs 7 500 people in Skåne. The sector has grown in recent years – in 2015 there were just under 6 000 people working at Skåne's life science companies.

92 new companies

92 new life science enterprises have seen the light of day since 2015. Together, they employ around 220 people. 64 of the newly-founded companies are in Lund Municipality.

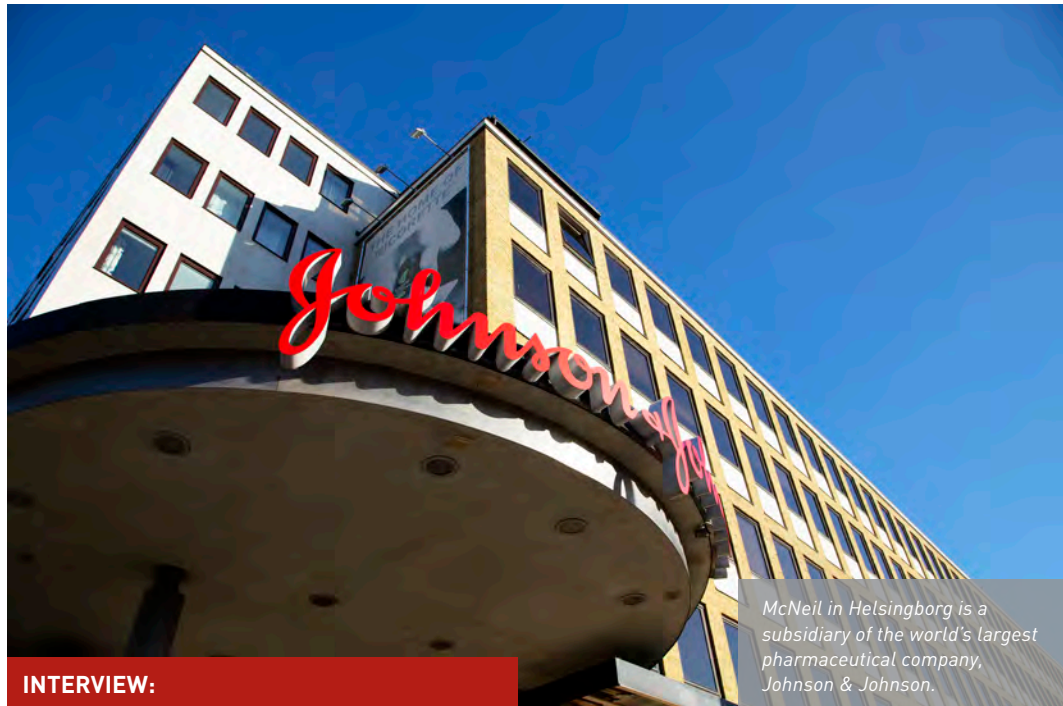


PHOTO: INEWS ØRESUND

McNeil in Helsingborg is a subsidiary of the world's largest pharmaceutical company, Johnson & Johnson.

INTERVIEW:

SKÅNE'S LARGEST LIFE SCIENCE COMPANY MCNEIL IS BOOSTING ITS CAPACITY IN HELSINGBORG

With around 665 employees, McNeil in Helsingborg is Skåne's largest life science company, best known for its stop-smoking products, Nicorette. Major investments have been made in recent years to increase production in Helsingborg, and a new product – the nasal spray Rhinocort – has been implemented in production. The demand for Nicorette products is expected to grow in the years to come, and the capacity will also continue to increase, says McNeil's CEO Jody Lodge.

In 2019, the company invested around 20mn Euro in the Helsingborg facility.

– We've increased our capacity, and we're working on implementing new products fully. Part of why we're expanding our capacity is an increased market demand for Nicorette products, says Jody Lodge, CEO of McNeil. The new products to which he refers are primarily the nasal spray Rhinocort, which is currently manufactured and was partially developed in Helsingborg.

The increased demand for McNeil's over-the-counter stop smoking products Nicorette increased more still during the pandemic, as many people took action against their smoking addictions.

– McNeil has fared well during the pandemic. Working from home went very well, and it seems many people decided to stop smoking during the pandemic, so we've seen an effect on our Nicorette products, he says, adding that production has been able to continue without interruption, and there has been a drastic decrease in travel in McNeil and in the American company.

Awarded for environmental work

In the past year, McNeil was designated a 'Lighthouse' by the World Economic Forum (WEF). McNeil thus became part of a global

network of manufacturing industries that contribute to what is called what is called Industry 4.0. Around 60 companies around the globe are classified as Lighthouses, and previously Sandvik was the only Lighthouse in Sweden.

– We're proud of the designation. It was a long process, and it means that we are a guiding light in the industrial revolution of digitalisation, sustainability and more. We're also Johnson & Johnson's very first CO2-neutral production site, says Jody Lodge, adding that the company's focus on sustainability also resulted in it being awarded Helsingborg's environmental award in 2020.

More expansion and automatization in the future

McNeil will continue to increase its capacity as the demand, primarily for Nicorette, continues to grow – but it is still too early to say how that increase will take form, says Jody Lodge.

– Looking toward the future, we see more technology involving more robots and automatization than what we use today. The need for employees who can support that technology will still exist in the future. That's not to say we don't have that technology now; it means that we'll be putting more focus on it.

According to Jody Lodge, generally speaking, technical expertise is what McNeil will need in the years to come. There will be a particular demand for people who understand and can implement technical solutions for problems. While McNeil has no trouble recruiting, he says, he has the impression that the supply of technical expertise in the future won't be able to meet the demand from the companies in the region.

–There's a high concentration of life science companies in this region, and I think that the demand will surpass the supply. That's just my impression, says Jody Lodge. For the moment he isn't worried however, because McNeil has good networks and links to the student environment, as Jody Lodge points out – and on top of that, the Helsingborg company works actively to develop employees' competences further so they can handle new tasks, he explains.

McNeil's predecessor started in Copenhagen in 1908

The McNeil story started back in 1908 in Copenhagen when two pharmacists bought the pharmacy

Løveapoteket. The business became Københavns Løveapoteks Kemiske Fabrik, now known as LEO Pharma. In 1914 the business branched out to Sweden with the subsidiary AB LEO in Helsingborg, where the first product was stool-softening pills. Over the course of the 20th century changes were made to the company name, ownership and product portfolio, but Nicorette has been the company's primary product since 1978, and in 2006 Johnson & Johnson acquired the Helsingborg company from Pfizer.

Today the company's facilities include manufacturing- and administrative buildings with 550 employees and a distribution centre with around 30 employees ten kilometres away. On top of that, there are R&D facilities with 85 employees who are responsible for supporting global product development in the category consumer health at Johnson & Johnson of which McNeil is a part. The category has three subareas: cough and cold, smoking cessation, and digestive health. ■



Jody Lodge, CEO McNeil.

PHOTO: INEWS ØRESUND

MCNEIL

- **Founded:** 1914 under the name AB LEO, which was a subsidiary of the Danish LEO Pharma, changed its name to McNeil in 2006 after it was acquired by Johnson & Johnson. Prior to the acquisition McNeil was owned by e.g. Pfizer
- **Branches in life sciences:** Pharma
- **Focus area:** Over-the-counter medicines (OTC)
- **Ownership:** Private (Johnson & Johnson corporation)
- **CEO:** Jody Lodge
- **Headquarters:** Helsingborg
- **Turnover 2020:** 1.7bn SEK
- **Gross year-end result 2020:** 0.9bn SEK
- **Total number of employees in Medicon Valley:** 830
- **Total number of employees globally:** around 130 000 in Johnson & Johnson

RESEARCH: Coronavirus pandemic impacts research and education



Compared to last year, the number of life science researchers has increased from 14 500 to 14 700 individuals. At the same time, the number of university students rose in Denmark as well as Sweden during the pandemic. Certain measures on the Danish side of the strait may lead to a decrease in the number of life science students in Medicon Valley in the future, however. This is partially due to plans to move educational programmes away from the country's urban centres, and in part because fewer vocational programmes will be offered in English.

- 14 681 people research in the life sciences in Medicon Valley, at universities, regions and research institutions. 74% of them are in eastern Denmark, and 26% are in Skåne, according to information compiled from these research actors.
- Researchers at the universities, research institutions and regional councils of Medicon Valley are conducting or have completed more than 200 research projects related to covid-19 over the past two years. The projects range from vaccine development to understanding the virus and contagion and how to improve the care of afflicted patients.
- All of Copenhagen's educational institutions are affected by a broad political agreement in Denmark entailing that admissions to educational programmes in the metropolitan areas will gradually be reduced up to ten per cent. Research may also be impacted. The ambition is to move the study places from the cities and elsewhere in the country.
- The number of exchange students to universities in Medicon Valley has decreased during the coronavirus pandemic, while degree students have continued to arrive, say universities in the region. Danish statistics for 2020 confirm this.
- Swedish and Danish universities slip slightly on the most renowned ranking lists, where American and British universities fill the top slots as usual. The learning institution in Medicon Valley to rank highest is the University of Copenhagen, but from a Scandinavian perspective, it usually – though not always – comes in after Stockholm-based Karolinska Institute.

MORE STUDENTS AT UNI AND 200 RESEARCH PROJECTS ON COVID-19 IN MEDICON VALLEY

More than 200 research projects related to SARS-CoV-2 have been started in Medicon Valley since the spring of 2020, as a concrete consequence of the pandemic. Studies have shown however that various restrictions and closures due to covid-19 have affected research and education in many ways, a few examples being that university employees have had to put more time into teaching at the expense of their research and that more students have applied to and completed educational training programmes, but also that fewer exchange students have come to the region.

University researchers in all fields have found it more difficult to gather data, and teaching has required more time, at the expense of research. It is not uncommon that researchers experienced diminished creativity and motivation when it came to research during the pandemic. One-fourth of researcher respondents reported that they had to make many or very many changes to their research. At the same time, some researchers reported little

difference compared to before the pandemic, as shown in a study conducted by the Swedish Higher Education Authority of seven learning institutions in Sweden, including Kristianstad University.

The number of students at universities and colleges increased in Denmark as well as Sweden during the pandemic, as did the number of students who completed their studies, according to statistics from Statistics Denmark and Swedish Higher Education

Authority. Swedish figures revealed however that socially uneven recruitment to universities became more prevalent than before the pandemic.

Studies of learning environments during the coronavirus era have revealed that students have not felt the same joy or motivation related to their studies as before. Certain aspects of digital teaching worked well, such as planned contact between teachers and students, as shown in a study by and of the ten Danish seats including Roskilde University, Aalborg University and University College of Northern Denmark. Funding came from Denmark's Ministry of Higher Education and Science. At the same time, there have been fewer discussions and dialogues between students and directly with instructors.

Denmark and Sweden have both implemented strategies to counter the possible negative effects of the pandemic on students. In Sweden for example, extra resources have been allocated for study-social activities at universities and colleges, and Denmark has done the same in order to allow graduating students to participate in practical features of their educational programmes that they missed.

EXAMPLES OF COMPANIES WITH CORONAVIRUS RESEARCH

Adaptvac, Hørsholm (vaccine development)
AGC Biologics, Søborg (vaccine development)
Bavarian Nordic, Hellerup (vaccine development)
Elplatek, Espergærde (antibacterial surfaces on e.g. door handles)
Evaxion Biotech, Copenhagen (vaccine development)
Expres2ion Biotechnologies, Hørsholm (vaccine development)
Falck, Copenhagen
Immunitrack, Copenhagen (contribution to vaccines and tests)
JVS, Greve (shields to protect healthcare workers)
Konduto, Taastrup (contagion tracing via algorithms)
Oncology Venture, Hørsholm (drug development)
Qlife Holding, Helsingborg (development of antibody test)
Synact Pharma, Lund (drug development)
UNION Therapeutics, Copenhagen (drug development)
Xintela, Lund (development of stem cell treatment)

Millions to research

Both countries have also allocated resources for research on covid-19. Early in the pandemic, the Danish government allocated 150mn DKK for covid-19 research, and the Swedish government pledged 100mn SEK. In addition, the Swedish government later also allocated 100mn SEK for follow-up studies on covid-19 vaccines and 50mn SEK for research on long covid.

Furthermore, numerous Danish foundations designated resources for covid-19 research, and Danish and Swedish researchers have been able to seek funding for research projects about the illness from the countries' "regular" grant funds.

200 coronavirus projects in Medicon Valley

As in last year's report, at least 200 research projects related to SARS-CoV-2 have been counted in Medicon Valley since the start of the pandemic. This year's figures are even more certain however, as they are based entirely on information from the regions, universities, and research institutions on the number of projects. Nonetheless, there is still no comprehensive overview available, as many learning institutions and regions do not know themselves exactly how many research projects related to covid-19 their researchers are involved in. In addition, there is a great deal of research related to the coronavirus at companies in Medicon Valley, and this is not included in the 200 projects.

The vast majority of academic research is conducted by the regional councils, which are heading more than half of the projects counted.

Fewer exchange students

Since the start of the pandemic, the number of international students coming to Medicon Valley on exchange programmes from other universities around the world has decreased. However, the number of students who have come for full degree programmes has increased somewhat, report some of the region's universities. The development is also evident in Danish statistics on the number of international students in 2020. Swedish statistics for 2020 have not yet been released.

Fewer international students are expected in Denmark in the future however, due to a political agreement entailing that fewer business academies and vocational bachelor programmes will be able to offer courses in English in the future. The reason is a political desire to cut back the number of EU citizens who study and work in Denmark and thus have a right to Danish student grants.

200 SARS-COV-2-RELATED RESEARCH PROJECTS IN MEDICON VALLEY

Researchers at the universities, research institutions and regional councils of Medicon Valley are conducting or have completed more than 200 research projects related to covid-19 over the past two years. The projects range from vaccine development to understanding the virus and contagion and how to improve the care of afflicted patients.

One of the most widely discussed projects related to covid-19 is the vaccine that researchers at the University of Copenhagen are working to develop with the companies Expres2ion Biotech, Adaptvac and Bavarian Nordic, as well as universities in Aarhus, Leiden, Tübingen and Wageningen, and others. The first human trials showed good results, according to reports from the University of Copenhagen.

Other research projects in Medicon Valley range from covid-19 immunity in the overall population to analysis of antibodies that target the so-called spike protein, which is important for neutralising the virus, to scientific documentation and comparison of the effects that different restrictions and recommendations have had in Denmark and Sweden.

Difficult overview

There is no comprehensive overview over the various research projects related to the coronavirus in Medicon Valley; for that reason, some university departments that conduct extensive research have chosen not to supply information for this analysis. Other institutions reported that there are probably more projects than those they have listed. Based on the information supplied by universities, research institutions and regions in Medicon Valley however, there have been more than 200 projects since the start of the pandemic.

In addition, it is highly probable that there are many more research projects related to the coronavirus

pandemic and its effects, for example in social sciences, economics, and the humanities; in the scope of this analysis, only seats of learning, research institutions and departments that conduct research in the life sciences were surveyed.

Furthermore, there has been a great deal of covid research in the industry – both internally, within companies, and in collaboration with academia. For example, in addition to the above example of vaccine development, Copenhagen-based Union Therapeutics is working on developing a drug to treat covid-19 that can be inhaled or taken as a nasal spray, and Qlife from Skåne developed a covid-19-test.

It is also important to remember that many research projects are conducted collaboratively, sometimes with other actors from Medicon Valley, but just as often with researchers or industry players elsewhere in Denmark or Sweden or in other parts of the world.

Most covid-19 research projects in the regions

In terms of the sheer number of research projects related to the coronavirus, the largest players by far are the regions. They were responsible for a clear majority of the approximately 200 projects in this survey. According to Region Skåne, their researchers carried out at least 36 related research projects by June 2021, and Region Zealand reports 46 research projects in which the region's researchers have been the primary partner. No information is available on how many other research projects Region Zealand's researchers have participated in.

It is even more difficult to determine the exact number of research projects in which researchers working for the Capital Region of Denmark have been involved. The Capital Region itself has not compiled the information, but has supplied the number of research projects registered with the region's scientific committee, as well as the number that have requested access to data from patient journals, i.e., a total of 114 projects. This figure includes researchers who are employed by the Capital Region as well as researchers who requested permission to conduct studies in the Capital Region. For the sake of clarity, only half of that figure – i.e., 57 projects – have been included in the total sum.

ABOUT THE FIGURES:

Many universities, research institutions, and regions submitted information for this analysis on the research projects that their researchers are heading and those in which they are participating with others. However, some only supplied aggregate information on both types of projects, whilst still others simply provided the names of projects headed by their researchers. It is thus not possible to assert that exactly 200 research projects are being or have been conducted, but the figure plausibly represents the minimum number.

81.5mn for KU's manure research

Researchers at the University of Copenhagen have received 60mn DKK from the Novo Nordisk Foundation and 21.5mn DKK from the Innovation Fund to research how manure in the form of fatty acids can be given to plants via their leaves rather than their roots.

Numerous research projects at the Faculty of Science have been granted large sums this year. As another example, the Novo Nordisk Foundation granted 48.6mn DKK for research that aims to develop algorithmic strategies for the quantum simulation of biomolecules, which can, in extension, generate more knowledge important for biochemical processes in pharmaceutical design.

Closing

On 30 June 2022, Sustainable Biotechnology at the University of Aalborg in Copenhagen will close its doors. Some of the employees will move to Aalborg, where research will continue, whilst others will retire or change jobs. So, in the future, life science research at Aalborg University in Copenhagen will only be conducted at the Centre for RNA Medicine.

TOP MARKS FOR BIOFILM RESEARCH . The research centre Biofilms Research Center for Biointerfaces at Malmö University was deemed "excellent" or "very good" in all criteria in the review by external experts conducted every fifth year. Now, the research centre will receive funding from the university for another five years.



NEW CENTRE, LAB AND MEMBERSHIP AT LUND UNIVERSITY:
The Faculty of Medicine at Lund University is extending its existing premises to include a Movement and Reality lab in Lund and a



PHOTO: LINXS

British biophysics researcher to head LINXS

On 1 December, Trevor Forsyth will become the new head of LINXS, Lund Institute of Advanced Neutron and X-ray Science, as well as a professor of biophysics at Lund University. He was most recently at the Institut Laue-Langevin (ILL) in Grenoble, France, where he is also head of the Life Sciences Group. In addition, he is a biophysics professor at Keele University in Great Britain. LINXS' aim is to create a strong research environment built around MAX IV and ESS and to promote collaboration, both internationally and with other societal areas.

Virology Centre in Malmö.
Lund University has also become a full member of the national infrastructure SciLifeLab Drug Discovery and Development Platform.



PHOTO: REGION Hovedstaden

Regions invest in research centre for gene-based pharmaceuticals and a better overview of Danish health data

- Region Skåne has decided to co-finance a new platform for pharmaceutical trials for Alzheimer's disease. The region has also started a clinical research centre for ATMP, or pharmaceuticals based on genes, cells or tissues, with a special focus on clinical practice and trials in academia as well as in the industry.
- Together with the Region of Southern Denmark and others, the Capital Region of Denmark is developing the national metadata map "Det landsdækkende Datalandkort", which will provide an overview of Danish health data to benefit research and development. The region is also part of another project on guiding researchers in how they can gain access to health data.
- Throughout the year, Region Zealand has conducted a special research initiative on personalised cancer care at the Center for Surgical Science at Zealand University Hospital.

100 million DKK

The Faculty of Health and Medical Sciences at the University of Copenhagen has received a 100 million DKK grant from the Novo Nordisk Foundation for establishing a Biosafety class III facility at the Maersk Research Tower at the Panum Institute.

OVERWEIGHT IN SMALL CHILDREN BECOMES A BIGGER ISSUE.

Denmark's National Institute of Public Health in Copenhagen is officially part of the University of Southern Denmark, and its focus has now broadened to include the mental health and weight of small children.

UNIVERSITY OF COPENHAGEN CONSOLIDATES INNOVATION.

Around 300 companies a year are created based on innovations at the University of Copenhagen. Starting this year, the university will consolidate its innovation in a new centre headed by Marius Sylvestersen. The aim is to gather the knowledge spread out in different departments in a single place, and to support translational thinking between different subject areas. The centre will be physically consolidated in one building.

30% of KU's science admissions to be cut

As a result of Denmark's broad political decision to move student places from metropolitan areas to other parts of the country, the University of Copenhagen plans to slash student places at the Faculty of Science by 30%. Research environments related to the faculty may also be closed. Admissions to the Faculty of Health and Medical Sciences will be cut by 16%. 200 student places in medical training will be relocated to Køge, where the university already has a medical training collaboration with Region Zealand. This relocation excepted however, the university has deemed moving student places too costly and difficult, so they will simply be slashed instead.

All of the seats of learning in and around Copenhagen are affected by the agreement, including e.g. DTU and Roskilde University, and admissions to educational programmes in the metropolitan areas will gradually decrease up to ten per cent.

UNIVERSITIES, REGIONS AND RESEARCH INSTITUTIONS



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



2. ROSKILDE UNIVERSITY
Life science researchers: 55
of which professors: 6
of which doctoral students: 19
Life science students: 459



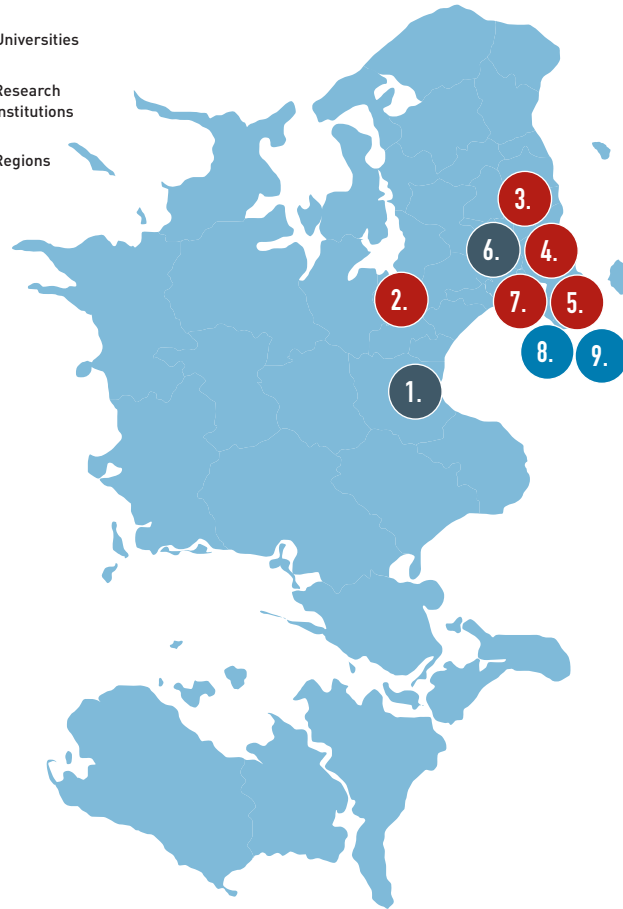
3. TECHNICAL UNIVERSITY OF DENMARK (DTU)
Life science researchers: 1 254
of which professors: 91
of which doctoral students: 478
Life science students: 4 293



4. UNIVERSITY OF COPENHAGEN
Life science researchers: 4 597
of which professors: 668
of which doctoral students: 2 451
Life science students: 14 411

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.
* Researchers at the hospitals in the region often conduct research part-time. Some of the researchers at the hospitals and at the Danish Cancer Society also have part-time positions at the universities in the region.

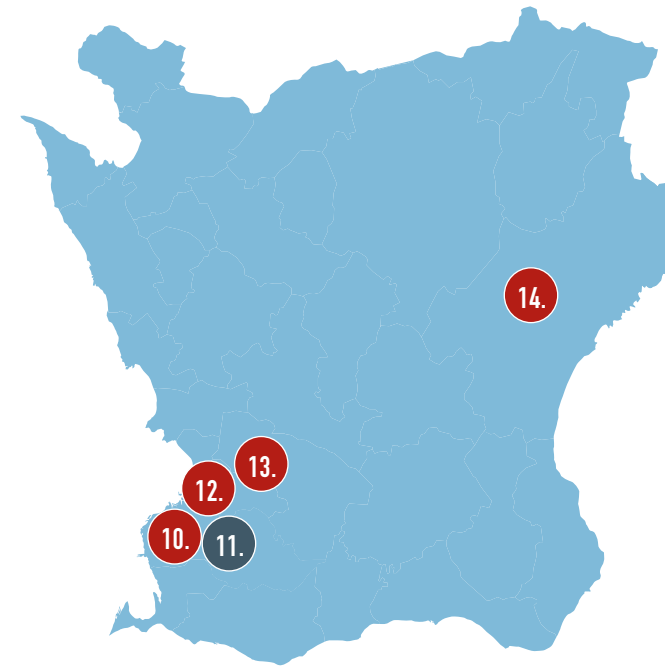
- Universities
- Research institutions
- Regions



5. 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: -



6. REGION HOVEDSTADEN*
Life science researchers: 4 049
of which professors: 254
of which doctoral students: 894
Life science students: -



7. AALBORG UNIVERSITY IN COPENHAGEN
Life science researchers: 14
of which professors: 3
of which doctoral students: 3
Life science students: 41

Other learning institutions:
Copenhagen Business School (CBS) does not conduct life science research in the traditional sense, but it is touched upon, for example through research in organisation and public management.



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



9. DANISH CANCER SOCIETY*
Life science researchers: 113
of which professors: 6
of which doctoral students: 28
Life science students: -



10. MALMÖ UNIVERSITY
Life science researchers: 226
of which professors: 33
of which doctoral students: 99
Life science students: 2 031



11. REGION SKÅNE*
Life science researchers: ca 1 800
of which professors: 108
of which doctoral students: 776
Life science students: -



12. THE SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCE IN ALNARP
Life science researchers: 210
of which professors: 20
of which doctoral students: 74
Life science students: 746



13. LUND UNIVERSITY
Life science researchers: 1 546
of which professors: 243
of which doctoral students: 466
Life science students: 3024



14. KRISTIANSTAD UNIVERSITY
Life science researchers: 70
of which professors: 20
of which doctoral students: 14
Life science students: ca 1 600

INTERNATIONAL DEGREE PROGRAMME STUDENTS CONTINUE TO ARRIVE, DESPITE THE PANDEMIC

The number of exchange students in Medicon Valley decreased during the coronavirus pandemic, but degree programme students have continued to come, according to reports from numerous universities in the region. Danish statistics for 2020 also confirm this.

Various types of international students arrive in Medicon Valley every year: some are on exchange from another university, others have been admitted to an international programme, and others are post-graduate students. Figures from Statistics Denmark show that the number of international degree- and postgrads in the life sciences in eastern Denmark rose between October 2019 and October 2020 by four and five per cent, respectively, despite the pandemic in the second half of the period.

Admissions and Recruitment Manager at DTU Vanita Singh confirms this development and also commented on the university's degree programme students in all fields, not only in the life sciences.

– It has been a good year for DTU. We have had an increase in the number of international students, a general increase in all our programmes, she said.

Swedish statistics are currently only available for the period until 2019, and there are thus no official Swedish figures for the corona period. However, the experiences reported from the universities in Malmö and Lund are the same as in Denmark.

– Generally speaking, we haven't seen any decline in the number of registered international

students during the pandemic; the figures have remained more or less the same since before the 2020 autumn term. We offered the majority of our international programmes online, which may be one explanation for the figures staying stable. As far as the autumn term 2021 is concerned, we've seen more of an increase in the number of students registered in international programmes, says Rebecca Arklöf, international coordinator at Malmö University.

The number of students to begin master's and graduate programmes at Lund University's Department of Medicine increased slightly during the pandemic, according to Elisabeth Axell, who heads the department's international division. However, she believes that the increase might have been greater if it hadn't been for the pandemic, as the graduate programme was offered in English for the first time in the 2020 autumn term, and there were a small number of international students at the time.

When it comes to postgrads, the numbers have declined, she says.

– The number of students in postgraduate programmes with undergraduate training from other countries decreased a bit, particularly in the 2021

NUMBER OF INTERNATIONAL STUDENTS IN THE STUDY YEAR 2019/20

	Number of students	of whom in research programmes	Change 2009/10 - 2019/20
Skåne	1 191	314	6%
Stockholm-Uppsala region	4 366	1 498	31%
Västra Götaland	1 244	262	29%
Sweden, rest of	1 668	216	-7%
Sweden	8 469	2 290	17%
Eastern Denmark	2 561	986	86%
Denmark, rest of	1 487	435	27%
Denmark	4 048	1 148	59%
Medicon Valley	3 752	1 027	50%

Source: Statistics Sweden and Statistics Denmark

spring term. This is probably not exclusively due to the pandemic; other factors may also have had an effect, for example changes in funding and a new research school introduced at the Department of Medicine.

Significantly fewer exchange students

Even if the number of degree programme students and postgrads in the region has remained rather stable in spite of the pandemic, the number of international students participating in exchange programmes has fallen, according to the universities. At Malmö University for example, the number of exchange students dropped by half in 2020.

– When covid-19 and the pandemic took hold, a lot of students chose to cancel their exchange studies. Malmö University offered digital exchanges, but they didn't attract students to the same extent, and instead of participating digitally, many students

chose to cancel, says Rebecca Arklöf.

Denmark cuts back number of places for international students

Pandemic or not, the number of international students in the Danish part of Medicon Valley might decrease in the future. In late spring this year, six Danish political parties, including the Government, decided to decrease the number of courses taught in English in Denmark, particularly at business academies and vocational bachelor programmes. The reason is that increasingly more EU-citizens are entitled to Danish study grants, as they both study and work part-time in Denmark. Politicians decided to target courses at business academies and vocational bachelor programmes as statistics show that few of the English-speaking graduates subsequently find work in Denmark.

FEWER INTERNATIONAL RESEARCHERS IN SWEDEN

In 2020, the number of applications to and approvals for the tax relief scheme in Sweden dropped after rising for three consecutive years. In Denmark, where statistics are currently only available until 2019, the number of individuals who took advantage of the tax relief scheme for researchers and key workers rose in 2019.

758 people were approved for tax relief in Sweden in 2020; this was 20% less than in 2019. In 2019, 7 699 people took advantage of the Danish tax relief scheme; this was a four per cent increase from 2018. Denmark has seen an increase every year since 2012. The statistics apply to both countries on the whole

and all fields – not only the life sciences. As the figures for Denmark and Sweden represent different things, they cannot be compared directly. Furthermore, both countries have chosen different tax relief systems, with the Danish system offering significantly more benefits than the Swedish (see the fact box below).

FACTS: TAX RELIEF SCHEMES IN DENMARK AND SWEDEN

- Both Denmark and Sweden offer special tax schemes for foreign employees to make it easier for companies and universities to attract talent from other countries.
- The Danish system is distinctly more advantageous. While a key employee in the Danish scheme needs to earn a minimum of 65 100 DKK per month including employee benefits, a foreign expert in Sweden needs a monthly salary of 94 601 SEK to be approved.
- When comparing the minimum level for the salary

in Denmark and Sweden, it is important to note that the salary on a Swedish payslip is generally lower than its Danish counterpart due to differences in the way the social security systems are financed. In Sweden, employers have to pay employer contributions for the employee in addition to their salary, whilst in Denmark, the social security system is financed via income taxes.

- In Sweden, tax relief can be received for a period of maximum three years, and in Denmark, for seven years.

THE UNIVERSITY OF COPENHAGEN RANKS HIGHEST OUT OF MEDICON VALLEY'S SEATS OF LEARNING

Swedish and Danish universities slip slightly on the most renowned ranking lists, where American and British universities fill the top slots as usual. The learning institution in Medicon Valley to rank highest is the University of Copenhagen, but from a Scandinavian perspective, it usually – though not always – comes in after Stockholm-based Karolinska Institute. The ranking is research-based, but depending on the list in question, teacher density and international reputation may also have an impact.

QS WORLD UNIVERSITY RANKINGS

WORLD UNIVERSITY RANKINGS (2022)

(Total of 1 300 on the list)

1 Massachusetts Institute of Technology (MIT), USA (1)
2 University of Oxford, UK (5)
3 Stanford University, USA (2)
79 University of Copenhagen (76)
87 Lund University (97)
89 KTH Royal Institute of Technology (98)
99 Technical University of Denmark (DTU) (103)
121 Chalmers University of Technology (139)
124 Uppsala University (124)
148 Stockholm University (181)
155 Aarhus University** (147)
180 University of Gothenburg (202)
309 University of Southern Denmark* (353)
326 Aalborg University* (305)
329 Linköping University (262)
365 Umeå University (333)

By Faculty - Life Sciences and Medicine (2021)

(Total of 502 on the list)

1 Harvard University (USA)
2 University of Oxford (UK)
3 Stanford University (USA)
8 Karolinska Institute (10)
19 University of Copenhagen (18)
58 Uppsala University (54)
80 Lund University (77)
85 Aarhus University** (86)
95 University of Gothenburg (105)
191 Umeå University (201)
196 University of Southern Denmark* (231)
238 Stockholm University (231)
248 Swedish University of Agricultural Sciences (SLU)* (255)
292 Technical University of Denmark (DTU) (305)
284 Linköping University (320)
348 Aalborg University* (371)

By Faculty - Natural Sciences (2021)

(Total of 501 on the list)

1 Massachusetts Institute of Technology (MIT), USA (1)
2 Stanford University, USA (3)
3 Harvard University, USA (2)
82 University of Copenhagen (80)
85 KTH Royal Institute of Technology (84)
98 Stockholm University (104)
117 Lund University (96)
140 Uppsala University (139)
165 Technical University of Denmark (DTU) (167)
184 Chalmers University of Technology (181)
201 Aarhus University** (197)
373 University of Gothenburg (377)
396 Linköping University (399)



PHOTO: NEWS ØRESUND

SHANGHAI RANKING

OVERALL RANKING LIST (2021)

(Total of 1 000 on the list)

1 Harvard University, USA (1)
2 Stanford University, USA (2)
3 University of Cambridge, UK (3)
30 University of Copenhagen (33)
42 Karolinska Institute (45)
71 Aarhus University** (69)
74 Stockholm University (69)
78 Uppsala University (77)
101-150 University of Gothenburg (101-150)
151-200 Technical University of Denmark (DTU) (151-200)
151-200 Lund University (151-200)
201-300 KTH (201-300)
201-300 SLU* (301-400)
301-400 Aalborg University* (301-400)
301-400 Linköping University (301-400)
301-400 University of Southern Denmark (301-400)*
401-500 Chalmers (301-400)

401-500 Stockholm School of Economics (401-500)
401-500 Umeå University (401-500)
601-700 Copenhagen Business School (801-900)
601-700 Örebro University (601-700)
801-900 Linneaus University (801-900)

TIMES HIGHER EDUCATION

WORLD UNIVERSITY RANKINGS (2022)

(Total of 1 662 on the list)

1 University of Oxford, UK (1)
2 California Institute of Technology, USA (4)
3 Harvard University, USA (3)
39 Karolinska Institute (36)
96 University of Copenhagen (84)
104 Aarhus University** (106)
116 Lund University (103)
131 Uppsala University (111)
176 Stockholm University (183)
185 Technical University of Denmark (DTU) (187)
185 University of Gothenburg (191)
201-250 Aalborg University* (201-250)
201-250 Copenhagen Business School (CBS)** (201-250)
201-250 KTH Royal Institute of Technology (201-250)
251-300 Chalmers University of Technology (201-250)
251-300 Linköping University (401-500)
251-300 University of Southern Denmark* (251-300)
301-350 Swedish University of Agricultural Sciences (SLU)* (351-400)
351-400 Umeå University (351-400)
401-500 Örebro University (351-400)
601-800 Roskilde University (601-800)
801-1000 Karlstad University (801-1000)

By subject: Clinical and Health (2022)

(Total of 925 on the list)

1 University of Oxford, UK (1)
2 Harvard University, USA (2)
3 Imperial College London, UK (4)
13 Karolinska Institute (10)
72 University of Copenhagen (76)
96 Uppsala University (101-125)
101-125 Lund University (101-125)
101-125 Aarhus University** (101-125)
126-150 University of Gothenburg (126-150)
251-300 Aalborg University* (251-300)
251-300 Umeå University (251-300)
251-300 University of Southern Denmark* (251-300)
301-400 Linköping University (301-400)
301-400 Technical University of Denmark (DTU) (251-300)
301-400 Örebro University (301-400)

By subject: Life Sciences (2022)

(Total of 972 on the list)

1 Harvard University, UK (1)
2 University of Cambridge, USA (2)
3 Massachusetts Institute of Technology (MIT), USA (4)
28 Karolinska Institute (24)
56 Uppsala University (49)
75 Lund University (70)
85 Stockholm University (87)
100 Aarhus University (126-150)
101-125 Swedish University of Agricultural Sciences (SLU)* (101-125)
101-125 Technical University of Denmark (DTU) (69)
201-250 Chalmers University of Technology (not on the list)
201-250 University of Gothenburg (176-200)
251-300 Umeå University (201-250)
251-300 University of Southern Denmark* (251-300)
301-400 Aalborg University* (201-250)
301-400 Linköping University (301-400)
301-400 Örebro University (301-400)

Footnote: Shanghai Ranking is published by the independent organisation Shanghai Ranking Consultancy. Times Higher Education is published by the eponymous journal and reviewed by PricewaterhouseCoopers (PwC). QS World University Rankings is published by the British student guidance company Quacquarelli Symonds (QS).

Red: performs life sciences research in Medicon Valley
(Last year's ranking.)
* Has a branch in the region.
** Located or has a branch in the region, but does not perform life science research in the region.

FUJIFILM

Di synth
biotechnologies

Building for the Future

Project:
Expansion of FUJIFILM Diosynth Biotechnologies'
manufacturing site in Hillerød, Denmark

Bygherre/Client: FUJIFILM Diosynth Biotechnologies ApS, CVR 29960702

Se byggepladens info tavle i portvagt for CVR liste

Please see the construction site's informational board at the guard house for CVR listing

ANALYSIS: Medicon Valley invests for increased growth

When Medicon Valley's life science companies invest in new plants, offices, research facilities and acquisitions, the foundation is laid for continued growth.

- New and expanded plants are a prerequisite for the R&D of new pharmaceuticals and medical products reaching new patients and generating new revenue.
- More than half of Medicon Valley's 32 beacon companies with over 250 employees in the region are expanding with company acquisitions or investments in new or expanded offices, research facilities and plants.
- Since 2000 Novo Nordisk has invested more than 30bn DKK in new and expanded facilities in Denmark and the USA. Since 2019 Fujifilm Diosynth Biotechnologies has invested 12bn DKK in the acquisition and expansion of a pharmaceutical plant in Hillerød.
- Other life science companies that plan investments or have invested in new plants, offices or research facilities since 2019 include Novozymes, LEO Pharma, AGC Biologics, Chr Hansen, Genmab and Ferring in Zealand and McNeil, Tepe, Sever Pharma Solutions and Polypeptide in Skåne. Furthermore, substantial acquisitions have been made by Novo Nordisk, Lundbeck, Coloplast, and others.
- Investments are also being made on national and European levels in the material research facilities MAX IV and European Spallation Source (ESS) in Lund. ESS' data centre is in Copenhagen. Among other things, the facilities may be used for the development of new pharmaceuticals.
- Additional investments are being made by the industrial foundation owners of Denmark's large pharma companies, which grant billions annually to e.g. research and new business.
- The region's nine universities and higher learning institutions specialising in the life sciences combined with the six thriving science parks are an important foundation for research and innovation.
- Together, the structures and new initiatives above give Medicon Valley robust potential for continued healthy growth.

BILLIONS INVESTED ARE A SIGN OF STRENGTH

The Danish-Swedish life science cluster in Medicon Valley is about to climb a rung on the development ladder. One sign of strength in the region are the thriving beacon companies with their growing numbers of employees, and more than half of these companies are scaling up through acquisitions or investments in new or expanded offices, research facilities and plants. The region's six flourishing science parks are the foundation on which new businesses form from university research. The synchrotron radiation facility MAX IV in Lund and the European Spallation Source, which is also in Lund but has its data centre in Copenhagen, are expected to offer new opportunities for developing pharmaceuticals. Nationally, more patent applications have been noted, and there have been new export records in both Denmark and Sweden, where life science has been prioritised highly on political agendas for several years now and new national strategies have been formulated for the sector.

For Medicon Valley, development means more than just new research and new products. A world-class industrial structure is essential for new pharmaceuticals and medical products to reach patients around the globe. Production in Medicon Valley is in a wide-reaching expansion phase, and above all else that will contribute to

an increase in Danish pharmaceutical exports.

Headquartered near Copenhagen in Bagsværd, Danish Novo Nordisk is Scandinavia's largest pharmaceutical company today, after 20 years of very rapid growth. Between 2001 (the first year after it separated from the biotech company Novozymes) and 2020, Novo Nordisk's turnover

grew from 21bn to 127bn DKK, and its employees around the globe went from 16 100 to 45 300. Expectations are high that the company will continue to grow thanks to research successes with the GLP-1 analogue semaglutide. Semaglutide has already resulted in long-acting injections and tablets for treating Type-2 diabetes, as well as pharmaceuticals for treating obesity and possibly even Alzheimer's disease.

Novo Nordisk puts over 30bn DKK into scaling up production

Since 1969, Novo Nordisk has built up the region's largest pharmaceutical manufacturing facility in the port city of Kalundborg in western Zealand. After investments of over 18bn DKK since 2000, more than half of the world's insulin is produced there, as are a series of other pharmaceuticals.

However, the investments in Kalundborg won't satisfy demands now that the new GLP-1 pharmaceuticals are being launched. Already in 2015, Novo Nordisk decided to invest the equivalent of 13.6bn DKK in new plants in the USA and in Måløv, northwest of Copenhagen. In 2021, an additional 500mn DKK investment in the Måløv plant was initiated.

Fujifilm invests 12bn DKK in Hillerød

The second-largest investment in a plant in Medicon Valley was made in a facility for biopharmaceuticals that American Biogen started building



MEDICON VALLEY is the bi-national life science cluster spanning the island of Zealand in 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 four million residents. In Sweden, the same geographical area is often called the 'Øresund Region'.

up after purchasing a site in Hillerød in 2001. Eighteen years later, the completed facility was sold to Japanese Fujifilm Diosynth Biotechnologies, which is now doubling the size of the plant. Fujifilm will have invested a total of 12bn DKK in the purchase and expansion of its Danish plant.

A number of other larger companies in the region have already or are planning to add on to their manufacturing capacity: LEO Pharma is building a new facility for 1.5bn DKK in Ballerup. By 2023, American AGC Biologics will have doubled the size of its plant in Søborg. In 2020, Chr Hansen took over a factory in Kalundborg in western Zealand. This year, Xellia Pharmaceuticals started up a new plant in the USA.

On the Swedish shores of the Øresund, McNeil in Helsingborg scaled up production in 2019. In Malmö, the oral health company TePe and the CDMOs Sever Pharma Solutions and Polypeptide expanded or are planning to expand their manufacturing facilities.

Large investments are being made in headquarters and research as well. Novozymes inaugurated a large new research campus in Kgs Lyngby, close to DTU Science Park, in 2019. The Biotech company Genmab recently decided to build new headquarters in Copenhagen, and next year Ferring Pharmaceuticals will move into Soundport, its new Danish headquarters and R&D facility near Copenhagen Airport.

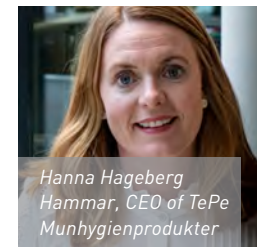
Three Danish companies have also made company acquisitions worth billions in the USA in recent years: Novo Nordisk, Lundbeck and Coloplast.

A major structural change has also been made in the globally leading cluster of Danish hearing aid manufacturers: GN Hearing, Demant and WS Audiology; the latter was created by the merging of Danish Widex and the Singaporean company Sivantos in 2019.

Investments are a sign of Medicon Valley's strength

The above investments are evidence of Medicon Valley's strength – and they are merely a selection. There is a strong confidence in the future among companies and investors active in the region alike.

Even on a national level however, an understanding of the life science cluster's importance for growth and employment has emerged in recent years. Denmark and Sweden now both have national life science strategies and life science offices. Denmark has gone a step further and created a



Hanna Hageberg Hammar, CEO of TePe Munhygienprodukter

PHOTO: NEWS ØRESUND



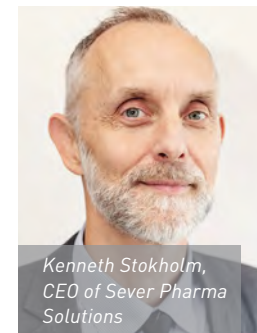
Lars Rebién Sørensen, chairperson of the Novo Nordisk Foundation and Ferring Pharmaceuticals

PHOTO: NEWS ØRESUND



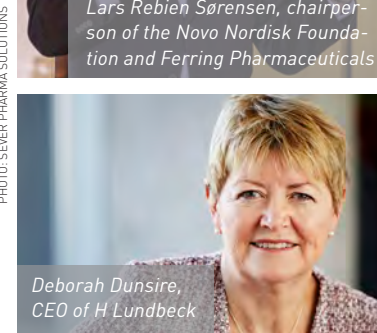
The former financial director of Novo Nordisk Jesper Brandgaard is chairperson of LEO Pharma

PHOTO: LEO PHARMA



Kenneth Stokholm, CEO of Sever Pharma Solutions

PHOTO: SEVER PHARMA SOLUTIONS



Deborah Dunsire, CEO of H Lundbeck

PHOTO: HLUNDBECK



Catherine Mazzacco, CEO of LEO Pharma

PHOTO: LEO PHARMA

Six people heading companies in change as CEO or chairperson. TePe Munhygienprodukter and Sever Pharma Solutions in Malmö and Ferring Pharmaceuticals, LEO Pharma and H Lundbeck in Zealand are some of the companies in Medicon Valley that are transforming through investments in new facilities, offices, acquisitions, or strategic reconstructions. Several months ago, Ferring and LEO Pharma both appointed new chairpersons of the board with a background at Novo Nordisk.

national cluster. That understanding came after the 2008 financial crisis, when the life science sector went against the tide and continued to grow. The growth has also continued throughout the coronavirus pandemic, and the sector made global contributions with new and rapidly developed vaccines.

Investments in the material research facilities MAX IV in Lund and European Spallation Source, ESS, which is also Lund but has its data centre in Copenhagen, is yet another sign of national and European investments that strengthen life science research. While MAX IV is formally a Swedish, national investment, Denmark is one of the countries that has contributed with direct investments. ESS is a European investment, and Denmark and Sweden are its host countries.

2020, a record year

Denmark and Sweden had already noted broad successes in life science in 2019-2020. Tax revenue from life science companies and their employees is on the rise, according to statistics from 2019. In 2020 an upward trend could once again be noted in the number of Danish and Swedish life science patents granted. Danish and Swedish pharmaceu-

tical exports set new records in 2020, and Danish pharmaceutical exports have more than doubled since 2010, while their Swedish counterparts have increased 66%.

Today there are more than 32 beacon companies in Medicon Valley, with over 250 employees in the region. 25 of them are in Zealand, and seven are in Skåne. Since 2016/2017, the number of regional employees at Medicon Valley's beacon companies has increased by 4 000 people, equivalent to 86% of employment in the life sciences in Medicon Valley.

Today's investments make future successes possible

The examples of major investments in production and research in Medicon Valley are a sign of the good potential for another record year, even if there is naturally a risk of setbacks. International competition is stiff, not to mention Stockholm, which intends to surpass Medicon Valley in growth. Companies such as Lundbeck and LEO Pharma are undergoing major processes of transformation- and renewal, which means a higher level of risk. Lundbeck's share price is currently under pressure because of lacking research strides.

LARGER MEETINGS AND CONFERENCES

Below are some of the larger meetings and conferences being arranged in the Greater Copenhagen Region in the coming year, as well as a selection of international meeting places where representatives from organizations and companies from the region's life science cluster will be participating. Due to the coronavirus pandemic, most of the events scheduled for the near future have been relocated to digital platforms and will be held virtually.

- 15-17 November 2021, Malmö
Techconnect Europe Innovation Conference & Expo
- 17 November 2021, Malmö
HealthTech @Medicon Valley
- 22 November 2021, Ghent
Translational Immunology
- 30 November-1 December 2021, London
Giant Health 2021
- 7 December 2021, virtual
MedFIT 2021
- 7-9 December 2021, virtual
BioFIT 2021
- 9 December 2021, London
Genesis 2021
- 9-10 December 2021, virtual
SmiLe Innovation Days
- January 2022, Copenhagen
Medicon Valley Alliance New Year's Reception
- 24-27 January 2022, Dubai
Arab Health
- 25 January 2022, Zürich
Swiss Nordic Bio 2021
- 31 January 2022, Copenhagen
HALOS symposium
- 18-21 March 2022, Amsterdam
EAU22
- 1 April 2022, Lund
The Future of Swedish and Danish Life Science
- 4-6 April 2022, Basel
BIO-Europe Spring
- 20-21 April 2022, Malmö
Nordic Life Science Days
- 21 April 2022, Rotterdam
Innovation for Health
- 4 -5 May 2022, London
Anglonordic Life Science Conference
- November 2022, Copenhagen
Medicon Valley Alliance Annual Meeting

RECORD NUMBER OF PARTICIPANTS IN LIFE SCIENCE EVENT IN LUND

In early September, the science park **Medicon Village in Lund** hosted the annual conference **The Future of Swedish and Danish Life Science**, where people from the sector in the Øresund Region and beyond could meet once again at a large regional event for the first time since the coronavirus pandemic. With 250 participants on site and just as many joining digitally, there conference had a record-high number of participants, according to its organiser, the journal **Life Science Sweden**.

Swedish, Danish, and international speakers took the stage at Lund's Medicon Village in early Sep-

tember to talk about exchange and collaboration opportunities for the life science sector in Sweden and Denmark. Among the Danish players present in Lund were the private equity company Sunstone Life Science Ventures, which has investments in a number of biotech companies in Lund and Malmö, the consultant firm Knowledge Gate Group, and the biotech companies Galecto and ExpreS2ion Biotechnologies from Copenhagen. The conference could be followed digitally or on site, and there were a record number of participants.

In April, SwedenBio plans to hold Nordic Life Science Days as a physical event in Malmö again.

APPENDIX: Facts and definitions

REPORTS AND FACTS

The following is a selection of recent reports from the life sciences in Sweden, Denmark, and Greater Copenhagen.

This April, the Danish government launched a new [life science strategy](#) that included 270mn DKK to fund 38 different initiatives in seven areas over the next three years. Among the initiatives is the establishment of a shared platform for data overview, guidance and requesting access to health data. The strategy was put into effect in May via a decision by the Danish Parliament.

In February the Danish Ministry of Industry published the report ["Tiltrækning af kliniske forsøg – analyse af danske rammevilkår i et internationalt perspektiv"](#) [Attracting Clinical Trials – Analysis of Danish framework in an international perspective]. The report, which later became part of the new life science strategy, offers suggestions for how Denmark can become a more attractive host country for clinical trials. Clinical research is at a high level, and healthcare personnel has a strong reputation, whilst improvements could be made to framework in areas such as time for conducting clinical trials at Danish hospitals, recruiting patients and pricing.

As part of efforts to market Sweden as a life science country and attract more investments from abroad, the Swedish government has determined that a broad [mapping of Sweden's life science sector](#) is needed. In late August, the government appointed Sweden's innovation agency Vinnova to conduct the analytical work in collaboration with trade associations and regions. Reports on the progress will be annual, and a more thorough survey of a specific area in the sector will be prepared every third year.

The Swedish government appointed Vinnova to establish an [innovation hub](#) that will help companies further develop their products and the production of advanced pharmaceuticals and vaccines in Sweden. The final review of the assignment will be in March 2023.

Stockholm Chamber of Commerce published the report ["Livsviktigt för huvudstaden"](#) [Vital for the Capital City], presenting seven actions for strengthening the sector. Region Stockholm's goal is for Stockholm to become one of the world's leading life science regions by 2025.

In its [Annual report](#) for 2020, Invest in Denmark confirms that the life science industry is among the sectors that have been affected least by covid-19. The

crisis has affected sectors differently to date, and tech-heavy companies with focus on tech and life science have done well, the annual summary confirms.

In its report ["Tilbage på sporet efter Covid-19: Life science-industriens syv bud på hvordan vi lykkes"](#) [- Back on Track after Covid-19: Seven recommendations for succeeding], the Confederation of Danish Industry proposes that the life science industry can make an important contribution to getting Denmark back on track after covid-19, both in terms of health and economy. Among the suggestions is a national strategy for improved use of health data and increased capacity for effective approval of medical equipment.

In its [business report](#) for 2021, the trade organisation the Danish Association of the Pharmaceutical Industry, LIF, states that Denmark's pharmaceutical industry contributes 28% of all private research and 19.5% of export goods. In 2020, Denmark exported pharmaceuticals for 136bn DKK.

According to a [synthesis](#) in LIF's journal *Magasin med.*, there are 2 679 full-time employees in biotech in Denmark. That is a 37% increase over the past ten years. The figures from Statistics Denmark are the most recent figures available, and they are from 2019. In 2020, there were 79 newly registered biotech companies.

The Danish Patent and Trademark Office's analysis ["Life Science"](#) shows that the Danish life science industry is stable when it comes to patent application, and that life science is an indisputably strong area for Denmark. Novozymes and Novo Nordisk are the two Danish companies with the most patent activity in the life science industry.

The Capital Region of Denmark should become a globally leading "health capital", according to the growth team Vækstteam Hovedstaden, which submitted its [recommendations](#) to the government this June. A new pool to promote public-private collaboration in the area of health will help achieve the goals set. The growth group also recommends that the Capital Region of Denmark establish a European Digital Innovation Hub for life science.

A report from NY Consulting on [Scandinavian Investor Climate](#) shows that Sweden had significant transactions and interesting deals in 2019-2020 when it came to investments in life science companies, whilst the transactions in Denmark and Norway were larger.



The Danish government presented a new life science strategy in April 2021. From left: Denmark's former minister of Higher Education and Science Ane Halsboe-Jørgensen (S), Minister of Health Magnus Heunicke (S), Minister of Economic and Business Affairs Simon Kollerup (S) and Minister of Foreign Affairs Jeppe Kofod (S).

Working on behalf of Region Skåne, the consulting firm WSP conducted an [ecosystem analysis](#) of the innovation system in the life sciences. One recommendation made in the report is to pursue the notion of the Øresund Region as "Scandinavia's life science centre".

The Research and Innovation Council of Skåne, FIRS, prepared an [agenda](#) for the area of Life science & Health to achieve the goals set in Skåne's innovation strategy. Among the priorities that the working group deemed particularly important are clinical research and innovation and access to test beds, as well as maintaining competence for the future.

Forska Sverige! [Research Sweden!] compiles an [annual report](#) on the medical research situation in Sweden and other countries every year. According to the latest report, the total investment in R&D decreased from 3.9% to

3.4% of the BNP between 2001 and 2019. During the same period, companies' investments in their own R&D in Sweden decreased from 3.0% of the BNP to 2.4%.

A [study](#) by SwedenBio shows that 80% of Sweden's life science companies plan to expand by recruiting more employees or consultants over the next year. More companies have a more positive view of the future now than before the start of the coronavirus pandemic.

According to the annual compilation of ["The Pharmaceuticals Industry"](#) in figures from the European Federation of Pharmaceutical Industries and Associations, EFPIA, the pharmaceutical industry is a key asset to the European economy. The industry employs 830 000 people; for comparison, this figure was around 550 000 in 2000.

LIFE SCIENCE ACROSS THE ØRESUND

This June, Øresundsinstittet conducted an analysis of life science across the Øresund within the framework of the Interreg-project Greater Copenhagen Life Science Analysis Initiative, which is being carried out jointly by Øresundsinstittet and Medicon Valley Alliance. Among other things, it reveals that contact across the Øresund is wide-reaching, with commuters, researchers, the establishment of companies, and investments. However, 21 years after the inauguration of the Øresund Bridge, a great deal of collaborations still depend on personal contacts and EU-projects, whilst e.g. national structures encumber collaboration between universities in Denmark and Sweden.

The report in hand, ["State of Medicon Valley 2021"](#), is an annual report, published for the first time in November 2016. The report has been prepared by the Danish-Swedish knowledge centre Øresundsinstittet and commissioned by the network organisation Medicon Valley Alliance.

ORGANISATIONS

TRADE AND NETWORKING ORGANISATIONS:

- **ASCRO** – Swedish association focused on clinical research and clinical trials
- **Cluster Excellence Denmark** – a support function for clusters and innovative networks in Denmark co-funded by the Danish Agency for Institutions and Educational Grants and the regions
- **CHI**, Copenhagen Health Innovation – Danish organisation focused on developing new educational and development activities within healthcare
- **Danish Life Science Cluster** – one of 14 new cluster organisations in Denmark that was highlighted by the Ministry of Science Innovation and Higher Education and received funding from the Danish Executive Board for Business and Growth
- **Dansk Biotek** – Danish trade organisation for companies in biotechnology
- **EuropaBio**, the European Association for Bioindustries – European trade organisation for the biotechnology industry
- **EFPIA**, European Federation of Pharmaceuticals Industries and Associations – European trade association for the pharmaceutical industry in Europe
- **FOIN**, the Association of Innovative Settings in Denmark – Danish trade association for science parks and innovative settings, formerly Forskerparkforeningen/The Science Park Organisation
- **Healthcare Denmark** – Danish organisation with political mandate to market the Danish health care sector
- **IFPMA**, International Federation of Pharmaceutical Manufacturers & Associations – international trade association for pharmaceutical companies and associations
- **Kemi & Life Science** – Danish trade community and network for distributors and manufacturers of chemicals
- **Lif Danmark** – Trade association for the pharmaceutical industry
- **Lif Sverige** (researching pharmaceutical companies) – Trade association for manufacturers of pharmaceuticals
- **Life Science Law DK** – an independent society that aims to improve legal conditions for the Danish life science industry
- **Medicoindustrien** – Danish trade association for companies that produce, sell, or have an interest in medical equipment
- **MVA**, Medicon Valley Alliance – Networking and member organisation in the Danish-Swedish life science cluster Medicon Valley in Greater Copenhagen
- **Pharma Danmark** – trade union for academics employed in the Danish life science industry
- **Swecare** – Swedish member organisation that works for broad collaboration with the health and healthcare

sectors

- **SwedenBIO** – Swedish trade association for the life science sector
- **Swedish Labtech** – Swedish trade association for companies working in diagnostics, laboratory equipment, analysis and biotechnology
- **Swedish Medtech** – Swedish trade association for medical technology
- **SISP**, Swedish Incubators & Science Parks – Swedish trade association for incubators and science parks
- **Synapse Life Science Connect** – a student-driven, non-profit organisation that strives to link the academic bioscience community and the life science industries
- In addition, there are the broader trade organisations Dansk Industri (Confederation of Danish Industry) and Dansk Erhverv (Danish Chamber of Commerce) and Handelskammaren (Sweden's Chamber of Commerce) and Svenskt Näringsliv (Confederation of Swedish Enterprise).

PUBLIC ACTORS:

- **Clinical Studies Sweden** – Swedish collaboration between six healthcare regions that aims to simplify and develop the work of clinical studies
- **Copenhagen Capacity** – A public initiative to promote investments and economic development in Greater Copenhagen
- **Erhvervsfremmebestyrelse** (The Danish Executive Board for Business Development and Growth) – a part of the Danish Business Authority that promotes and funds decentralized business approaches
- **Erhvervsstyrelsen** – Danish business authority that works to improve companies' competitive strength
- **Greater Copenhagen** – Political partnership organisation between 46 Danish and 39 Swedish municipalities and

INTERREG ÖRESUND-KATTEGAT-SKAGERRAK

EU's programme for transregional collaboration. Funds for the Interreg-projects come from the EU's European Regional Development Fund, and half of the project's budget goes to financial support. Since 2015, the EU-programme Interreg Öresund-Kattegat-Skagerrak has granted around €47mn to joint Danish-Swedish development projects in the life sciences. A total of 18 life science projects received funding between 2015-2022; ten of these are still active.



Around 20 players from the life science sector met Anna Hallberg (S), Sweden's Minister for Foreign Trade and Nordic Affairs, for a round table discussion at the Swedish embassy in Copenhagen this September.

the Capital Region of Denmark, Region Zealand, Region Skåne and Region Halland

- **Innovationsfonden** – Fund from the Danish Ministry of Higher Education and Science that invests in new knowledge initiatives
- **Invest in Skåne** – A public initiative to attract foreign investments to the region, promote exports and internationalisation for companies in the Skåne region
- **Läkemedelsverket/Medical Products Agency** – Swedish authority that tests and approves pharmaceuticals
- **Lægemedelstyrelsen /Danish Medicines Agency** – Danish authority that tests and approves pharmaceuticals
- **Patent- och registreringsverket/Swedish Patent and Registration Office** – Swedish authority for intellectual property rights
- **Danish Patent and Trademark Office/Patent- og Varemærkestyrelsen** – Danish authority for intellectual property rights
- **Styrelsen for Forskning og Innovation** – Danish authority that works to strengthen research and innovation
- **The Government Offices of Sweden's coordinating Office for Life Science** – was established in 2018 and is working among other things with a new life science strategy.
- **The Life Science Office at Denmark's Ministry of Industry, Business and Financial Affairs** – the government office responsible for the implementation of the Danish national strategy for life science.
- **Tillväxtverket/ Swedish Agency for Economic and Regional Growth** – Swedish authority to promote companies' competitive strength
- **Tillväxtanalys/Growth Analysis** – Swedish authority with tasks such as analysing and evaluating Swedish growth policies
- **Trial Nation** – Danish organisation that offers a single,

national entry point for actors wishing to conduct clinical trials in Denmark.

- **Vetenskapsrådet/Swedish Research Council** – Swedish authority that works to promote Swedish research
- **Vinnova** – Swedish authority that works to improve opportunities for innovation and research
- **Wonderful Copenhagen** – Danish organization working to attract e.g. life science conferences to the Medicon Valley region

MEDIA:

- **Altinget** – News site with a website and newsletter on research, health and more.
- **Biostock** – News- and analysis service with a focus on companies in the life science sector and an editorial board in Lund's Medicon Village
- **Dagens Medicin** – Swedish journal about the healthcare sector
- **Dagens Medicin, Dagens Pharma, Kommunal Sundhed and Praktisk medicin** – Danish journals about the healthcare sector
- **European Biotechnology News** – European journal about life science
- **Greater Copenhagen Life Science Magazine** – Scandinavian life science magazine published by the Danish marketing and advertising agency Nem Media
- **Kemivärlden Biotech** – Scandinavian journal for chemistry, chemical engineering and biotechnology
- **Labiotech.eu** – European news site on the biotechnology industry
- **Life Science Sweden** – Journal on the Swedish biotechnology, medical technology and pharmaceutical industries

- **MedWatch** – Danish news site on the medical and pharmaceutical industries
- **Nordic Life Science News** – journal and news site on the Nordic life science industry
- **Pharma Industry** – Swedish trade journal for the pharmaceutical industry

SCIENCE PARKS IN MEDICON VILLAGE THAT COMPLETELY OR SIGNIFICANTLY FOCUS ON THE LIFE SCIENCES:

- **DTU Science Park** – focus on deep tech. Located in Hørsholm and Lyngby. Formerly known as Scion DTU. Incubator: **Futurebox**.
- **Copenhagen Bio Science Park, COBIS** – Located in Copenhagen. Owned by Symbion. Incubator established at COBIS on initiative of the Novo Nordisk Foundation: **BioInnovation Institute**.
- **Symbion** – Coworking space and network organisation focused on life science, foodtech, hardware/makerspace and SaaS. Seven different locations in Copenhagen from the end of 2022/beginning of 2023. Symbion owns COBIS. Located in Copenhagen.
- **Ideon** – focus on future transportations, smart cities, smart materials and health tech. Located in Lund. Incubator: **Ideon Open/Beyond**.
- **Krinova** – focus on food, the environment and health. Located in Kristianstad. Incubator and science park.
- **Medeon** – focus on life science. Located in Malmö. Incubator: **Medeons inkubator**.
- **Medicon Village** – focus on life science. Located in Lund. Incubator: **SmiLe**.

LEARNING AND RESEARCH INSTITUTIONS IN MEDICON VALLEY WITH ACTIVITY IN THE LIFE SCIENCES:

- **University of Copenhagen** – A large university with departments for health and medical sciences, science, humanities, law, social sciences and theology.
- **Technical University of Denmark (DTU)** – A technical university in Kongens Lyngby, just north of Copenhagen.
- **Roskilde University** – A university in the middle of Zealand with emphasis on transdisciplinarity.
- **Aalborg University in Copenhagen** – A campus of Aalborg University in Jutland with a broad range of departments.
- **The National Institute of Public Health (NIPH), University of Southern Denmark** – A research institution that is part of the University of Southern Denmark, but also serves the Danish authorities, supporting them with research and counsel on public health.
- **Copenhagen Business School, CBS** – A university in Copenhagen with focus on economics, as well as educational training in Business Administration and Bioentrepreneurship
- **Copenhagen School of Design and Technology** – An

institute of higher education in Copenhagen with some research in optometry.

- **Capital Region of Denmark** – The region encompasses a large number of hospitals, predominantly in Copenhagen and northern Zealand. The largest of them is Rigshospitalet.
- **Region Zealand** – The region encompasses a number of hospitals, primarily in Zealand and Lolland. The most important of them is Zealand University Hospital in Roskilde and Køge.
- **The State Serum Institute, Copenhagen** – A research institution of the Danish Ministry of Health. Its focus is on diagnostics, epidemiological monitoring and vaccination research.
- **Steno Diabetes Center Copenhagen** – a hospital specialised in diabetes that offers some education and is part of the Capital Region today.
- **The Danish Cancer Society, Copenhagen** – A patient organisation to fight cancer. With a research centre in Copenhagen.
- **Lund University** – A large university with departments for medicine, science, technology, the humanities, law, economics, theology, art, music and theatre.
- **Malmö University** – A university with a transdisciplinary focus.
- **The Swedish University of Agricultural Sciences in Alnarp** – One of the largest campuses of the Swedish University of Agricultural Sciences, which has campuses throughout Sweden. Its main areas are landscape architecture, horticulture and plant production.
- **Kristianstad University** – A college in north-eastern Skåne with a strong focus on education.
- **Region Skåne** – The region encompasses a number of hospitals in Skåne, the largest of which is Skåne University Hospital in Lund and Malmö.
- **University College Absalon** – Educational institution that offers programmes in the life sciences such as biotech engineering, machine engineering, and bioanalysis at Campus Kalundborg.

NEW RESEARCH FACILITIES

European Spallation Source, ESS, is a multidisciplinary neutron facility currently under construction in Lund; expected completion in 2023. ESS' data centre, located at COBIS in Copenhagen, opened in 2019. The ESS facility will be the world's largest and most advanced neutron source. In the future, the ESS facility will furnish new knowledge in e.g. materials research and biotech, which can be used to develop new drugs, materials, fuels and more. Not far from the ESS facility is Sweden's national MAX IV Laboratory, which is part of Lund University.

STATISTICS AND METHOD

Describing the life science sector with statistics is a challenge. The sector is far from homogenous, and it shifts over time. There are only five sub-areas designated in the national statistics as exclusively life science sectors; the remainder are spread out over a long string of sector codes. The same is true for universities where life science is not a clearly defined research area. Therefore, the exclusive use of statistics from the national statistics offices cannot provide a sufficiently complete and comprehensive representation. We have thus also chosen to complement the statistics with facts from the Nordic Business Key, as well as information provided by the companies and universities themselves.

The macro-level numbers in this report and certain special figures, such as for example domestic and international students, have been specially requested from Statistics Denmark and Statistics Sweden. We have used the following statistic divisions to define the life science sector and export of life science products:

SNI and DB07-sector codes are exclusive to life science sectors, used for figures regarding employment:

21 Manufacture of basic pharmaceutical products and pharmaceutical preparations
 26.60.10 Manufacture of hearing aids and supplies
 26.60.90 Manufacture of irradiation, electromedical and electrotherapeutic equipment
 32.5 Manufacture of medical and dental instruments and supplies
 46.46.10 Wholesale trade of medical goods and nursing supplies.

The following codes are used for the description of scientific research and employment:

72.11 Research and experimental development in biotechnology
 72.19 Other research and experimental development in natural sciences and engineering.
 These two industries encompass companies whose primary purpose is research in natural sciences and not life science production companies.

Some of these are life science companies; however, since the sectors also contain research within other areas than life science, the sectors are not included in the figures for employment in the life sciences, but are instead presented separately.

The commodity groupings (SITC) in trade statistics utilised to describe exports:

54 – Medical and pharmaceutical products
 872 – Medical Instruments and appliances and similar

ABOUT THE FIGURES

TAXATION, PAGES 8-17

Corporation tax

Corporation tax for Danish life science companies is defined as the corporation tax paid by all workplaces in

the sectors (DB07): CF, 266, 32.5 og 46.46.10.

The source for corporation tax in Denmark is Statistics Denmark. The population and the calculation method for corporation tax in the life science sector have been adjusted with respect to the methods used in previous reports. This is due to a change in Statistics Denmark's method of linking financial units to concerns that made it impossible to recreate figures using the criteria utilised in the past. The entire period 2008-2019 has been updated with figures for this population. It is however important to note that corporation tax is paid on the company/concern level, and the main sector of a workplace does not necessarily correspond to the company's main sector.

For Sweden corporation tax is the company's final tax, which consists of state tax (corporation tax) on the year's result (22% of reported surplus) plus other taxes that may be applicable, e.g. yield tax. The source for corporation tax in Sweden is Statistics Sweden (SCB), and all companies in the sectors 21, 26.6, 32.5 and 46.46 are included.

Income tax

In Denmark income tax for people employed in the life science sector is defined for people employed in the companies/concerns in the sectors (DB07): CF, 266, 32.5 and 46.46.10. Income tax is determined geographically according to where the income is earned, and not where the employee resides. The source for Danish income tax is Statistics Denmark. Commuters are not included in the statistics of Danish income tax. Residents of Denmark who work abroad are not included in the statistics for Danish income tax.

Income tax is calculated from the total personal income; i.e. it includes income from salary and self-employment, as well as any transfers of income that are subject to taxation.

In Denmark, income tax is equivalent to the total personal final tax on income, including labour market contributions. The total personal final tax includes state tax, health care tax, municipal tax, preliminary corporation tax, tax on stock dividends and stock profit, and labour market contributions. Final tax is determined after the deductions have been made and various tax additions have been included.

The amount of labour market contributions paid for employees in the life science sector is calculated by in-

ferring that the labour market contributions comprise the same share of the total income tax, including labour market contributions, for the life science sector in its entirety as for the economy as a whole. The income tax, excluding labour market contributions, for employees in the life science sector is divided by the share of the total income tax including labour market contributions, comprised by the labour market contributions for the economy as a whole, to calculate the income tax including labour market contributions for employees in the life science sector.

In Sweden, income tax is equal to the total income tax on gainful employment. The source for this data is the Swedish income register for the period 2008-2019. Income from gainful employment includes income from a position of staff employment including benefits, surplus from business operations, sickness benefits, unemployment benefits and pension income after general deductions. These may be social security duties to another country, alimony or social contributions. The source for Swedish income tax is SCB. The statistics utilised are retrieved from tax on earned income in the industrial branches 21, 26.6, 32.5 and 46.46. Commuters are not included in the statistics for Swedish income tax.

Income and corporation tax comprise only part of the amount contributed to the treasury through taxes and duties; of which value-added tax is the absolute largest in both countries. In Sweden, duties and other taxes include e.g. a municipal property tax, burial tax, duties to religious communities, vehicle tax and a series of excise duties on e.g. alcohol and tobacco. In Denmark there are a large number of taxes and duties in addition to corporation tax and income tax, for example municipal property tax, which is calculated based on value, registration duties on cars and a number of excise duties on other products such as tobacco, wine, spirits, chocolate and sugar.

EXPORT, PAGES 8-17

The figures for the global pharmaceuticals market are the amounts invoiced to pharmacies and hospitals by distributors. Those amounts are not equivalent to the amounts that manufacturers of pharmaceuticals receive for their products; discounts and other price agreements are not included.

The source for the information on the global market is IQVIA. The source for the global market export is the

UN Comtrade database and figures for the Danish and Swedish life science export are retrieved from Statistics Denmark and Statistics Sweden, respectively.

The Danish and Swedish life science sectors' exports are calculated as the export of Medicinal and pharmaceutical products (SITC 54), as well as Instruments and appliances, n.e.s., for medical, surgical, dental or veterinary purposes (SITC 87.2). The SITC classification is the UN's classification system for goods (Standard International Trade Classification). The sources are the foreign trade statistics from Statistics Denmark and Statistics Sweden, respectively.

EMPLOYMENT, PAGES 8-17

The employment figures cover the manufacturing sectors: 21 Pharmaceuticals, 26.60.10 Manufacture of hearing aids and supplies, 26.60.90 Manufacture of irradiation, electromedical and electrotherapeutic equipment, 32.50.00 Manufacture of medical and dental instruments and supplies and 46.46.10 Wholesale of pharmaceutical and nursing goods. The sources are the register-based Labour Force Statistics in Denmark (RAS) and in Sweden (RAMS). Statistics Denmark and Statistics Sweden utilise national industry classification (DB07) and (SNI2007), both of which are based on and correspond to the European industry classification NACE. A company can perform business that is within more than one sector classification. In such cases, the company has a main sector and one or more additional sectors. In the register-based Labour Force Statistics, all of a company's employees are registered under the company's primary sector.

Note that it is also possible that branch codes are assigned to companies differently in Denmark and Sweden.

Other industry subdivisions of the life science sector cannot be extracted, as they are placed within service sectors such as business services, which covers a significantly broader area than life science. The advantage of using the narrow definition of the sector is that it becomes possible to trace the industry's development over time, as well as to draw European and international comparisons. The disadvantage is that the life science industry is not shown in its entirety. Therefore, the figures are supplemented by figures for employees at life science companies not covered by the national statistical figures from Statistics Denmark and Statistics Sweden; an example of a company that we have supplemented with employee figures is Novozymes. The supplementary information has been collected from the relevant companies either via email, telephone or via the company website; from Nordic Business Key; www.allabolag.se; or from news articles.

SCB's register-based labour markets statistics, RAMS, has changed its method and source, and comparisons with earlier statistics are thus no longer possible. The number of employees picked up statistically, by sector codes, may be considered a tentative estimate, as many businesses with some or all of their activities in the life

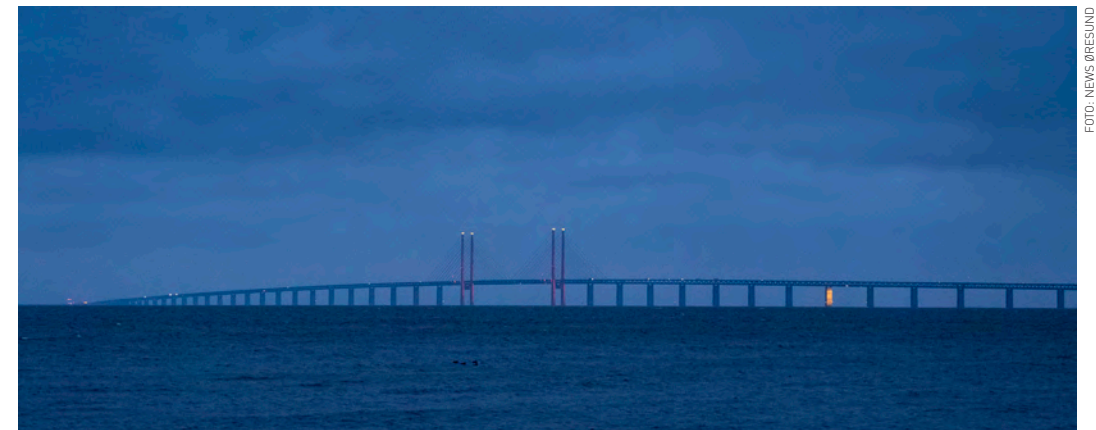


FOTO: NEWS ØRESUND

sciences are registered with an incorrect sector code.

The number of Øresund commuters was retrieved from the report "Life Science Across the Øresund" from the Interreg-project Greater Copenhagen Life Science Analysis Initiative.

PATENTS, PAGES 8-17

For patent applications figures from the European Patent Office (EPO) are used. Normally, a patent application to EPO is preceded by an application to the national patent office. The filing date for the application to the national patent office is the priority date for the subsequent application to EPO. The publishing date for a patent application to EPO is usually 18 months after the priority date. Patent information from United States Patent and Trademark Office (USPTO) is rather old at the time of publishing, and for that reason it has been chosen primarily to present data for EPO, even though the interest in patent applications at USPTO has grown as a consequence of the growth of the American medical market.

UNIVERSITIES, RESEARCH INSTITUTIONS AND REGIONS, PAGES 60-71

Figures for the number of researchers and students have been provided by the universities, regions and research institutions themselves. All figures are headcounts and from 2020 unless otherwise noted.

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.

Lund University. The numbers apply to the total number of researchers at the Faculty of Medicine, and a selected number of researchers at the Faculty of Science and researchers who primarily work in the life sciences at the following departments at Lund University's Faculty of Engineering (LTH): Immunotechnology, Automatic Control, Food Technology, and Chemical Engineering. There are also researchers in the life sciences at the Department

of Biomedical Engineering, the Department of Computer Science, the Department of Transport & Roads and the Department of Technology and Society at LTH. Of the doctoral students, those who are employed elsewhere have not been counted this year. The number of students refers only to those who study at the Faculty of Medicine and thesis students at relevant departments at LTH. There are also life science students at the science department and other who study at LTH.

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, and a selection of students in programmes in the life sciences or with electives in the life sciences for the academic year 2019/20. Research in the life sciences was also performed at DTU Chemistry, DTU Electrical Engineering, DTU Nanotech, DTU Mechanical Engineering, and DTU Compute.

The Swedish University of Agricultural Sciences in Alnarp. The number of students includes those from Agroecology, Horticultural Science, Agriculture and Rural Management, Outdoor Environments for Health and Well-being, Horticultural Management: Garden Design, Horticultural Management: Gardening and Production, Plant Biology for Sustainable Production, Sustainable Food Systems, Euroforester and Forest Science, for the academic year 2020/21.

Malmö University. Life science students: full-time equivalents. Includes students of Dentistry, Oral hygiene, Dental technician studies, Welfare work, Social work and related, Nursing – Care, Specialist nursing, Biomedical analysis and related, and independent courses.

Kristianstad University. Number of students for autumn 2019. Other data is from 2019.

Roskilde University. Figures from the turn of the year 2016/17.

Aalborg University in Copenhagen. Figures from 2021.

SECTOR CLASSIFICATION

The definition of life science often includes:

- BIOTECHNOLOGY COMPANIES
- PHARMACEUTICAL COMPANIES
- MEDICAL TECHNOLOGY COMPANIES

All students study Sustainable Biotechnology.

The Capital Region of Denmark. Figures from 2019. The number of researchers indicates people who dedicate at least 10% of their working hours to research – often, but not always – in the life sciences. A number of researchers also have part-time positions at the University of Copenhagen.

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

Region Zealand. Head count for researchers – many conduct research part-time.

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

INTERNATIONAL RESEARCHERS AND STUDENTS, PAGE 68-69

International students

The figures for the number of students and their connection to the job market are retrieved from customised analyses by Statistics Denmark and Statistics Sweden. The selection of educational programmes was made from the programme classifications in Denmark and Sweden, and programmes have been chosen within which work in the sector is usually found after education is completed.

The figures for Denmark and Sweden are not directly comparable due to differences in the educational systems and the available data material.

The Danish and Swedish educational systems are structured differently. In Denmark, students – apart from exchange students – register for an entire programme at the bachelor or graduate level. In Sweden, it is possible to register for individual courses, and it is also possible to complete a master's degree by combining individual courses from different programmes. The criterion is that one must earn 120 ECTS points to complete a master's

degree. A student who has registered for two courses in the same semester will thus be accounted for two times in the statistics. An attempt has been made to account for this in the extracts from the Swedish data. Students registered for more than one course at the same institution are only counted as one student; however, if that student is registered for courses at two separate institutions, s/he will be accounted for twice in the data material. The figures for the number of students are thus not directly comparable between Denmark and Sweden.

The definition of an international student depends on national definitions and the possibilities offered in the dataset at hand. Therefore, the definition differs in Danish and Swedish data extractions. In Sweden, an international student is defined as 1) a person from a country outside of the EU/EEA, who upon moving to Sweden reported that the move was motivated by studies, and where a residency permit has been issued for less than two years before the commencement of studies; 2) students who have moved to Sweden less than six months prior to the commencement of studies; and 3) other individuals lacking a Swedish personal identification number in the educational institutions' study administration systems. In Danish data, an international student is defined as such if s/he came to Denmark within a period from one year prior and three months after commencement of studies, and does not have a Danish secondary education.

International researchers

Data for foreigners who have not completed their education in the country are incomplete in the national statistics office's register of the population's education. Because of the poor data quality on the education of workers who have come to Denmark from abroad it has been necessary to use additional sources such as the utilisation of the tax relief schemes, and the Danish Agency for Labour Market and Recruitment's database Jobindsats.dk.

It is not possible to extract specific data material for

THE EFFECT OF SECTOR DRIFT AND SECTOR CHANGE

Statistics for the number of employees in the life science sector are based on figures from the register-based Labour Force Statistics in Denmark (RAS) and in Sweden (RAMS). The employment figures cover the manufacturing sectors: 21 Pharmaceuticals, 26.60.10 Manufacture of hearing aids and supplies, 26.60.90 Manufacture of irradiation, electromedical and electrotherapeutic equipment, 32.50.00 Manufacture of medical and dental instruments and supplies and 46.46.10 Wholesale of pharmaceutical and nursing goods. Sector drift and sector changes for individual companies can affect

the figures to a greater or lesser degree. The more detailed statistics are for individual sectors and smaller geographic areas, the more visible sector drift and change of sector become. A sector drift is a slow change in a company's product portfolio that eventually leads to it belonging to a different sector than it did originally. A change of sector is the switch to another sector code without changes to the company's product portfolio.

State of Medicon Valley 2017 contains an example (Coloplast) of how sector code can change over time.

ABOUT THE EMPLOYMENT STATISTICS

The figures in the introductory macro section are based on the most recent statistics available from Statistics Sweden (SCB) and Statistics Denmark. Due to a change in method in SCB's register-based labour market statistics, the figures are not comparable with figures from previous years. The figures may also be seen as a tentative estimate, as many businesses with some or all activities of their in the life sciences are registered with other sector codes than those used in the statistics. The figures presented in the 'Beacons' chapter of this report and in the Greater Copenhagen Life Science Analysis Initiative project, GCLSAI, in which a manual survey of the regions companies is conducted, is thus higher.

the life science sectors in Medicon Valley from the data sources used here; however, by the use of the available complementary Danish sources, the Danish life science sector's need for highly qualified workers from abroad becomes clearly visible. The Danish Ministry of Taxation and the Forskarskattenämnden websites offer statistics about the utilisation of the tax relief scheme.

ABOUT THE FIGURES - RESEARCH ABOUT THE CORONAVIRUS, PAGES 63

Information about the number of research projects on the novel coronavirus is based on information on the number of projects supplied by the universities, regions, and other research institutions themselves. Multiple actors emphasise however that the figures are approximate.

The higher learning institutions, regions and other research actors in Medicon Valley that have reported conducting research projects on the novel coronavirus are the Capital Region of Denmark, Region Zealand, Region Skåne, DTU, the University of Copenhagen, Lund University, Malmö University, Aalborg University in Copenhagen, the Danish Cancer Society, Roskilde University and the National Institute of Public Health (Denmark), which is part of the University of Southern Denmark.

Many universities, research institutions, and regions submitted information for this analysis on the research projects that their researchers are heading and those in which they are participating with others. However, some only supplied aggregate information on both types of projects, whilst still others simply provided the names of projects headed by their researchers. It is thus not possible to assert that exactly 200 research projects are being or have been conducted, but the figure plausibly represents the minimum number.



FOTO: NEWS BRESUND

MISCELLANEOUS

We have also collected information from personal interviews, telephone interviews and in e-mail contact with experts and companies. This applies, among others, to the chapter on beacons. Data for the reviews of companies has been retrieved from Bisnode, through contact with the companies and from their websites, as well as from media reports. We have also utilised the public investigations from within life science, as well as other reports from public actors and trade and networking organisations.

INTERVIEW LIST

- **Michael Hallgren**, Senior Vice President, Novo Nordisk Manufacturing Kalundborg, e-mail, 2021-10-12
- **Dennis Schmidt Pedersen**, Executive Vice President Global People & Communications, LEO Pharma, e-mail, 2021-10-05
- **Elise Hauge**, Executive Vice President People and Communication, Lundbeck, meeting, 2021-09-27
- **Birgitte Stephensen**, Senior Vice President Head of IPR & Legal, Genmab, digital meeting, 2021-10-08
- **Jens Fricke**, Site Director, PolyPeptide Group Malmö, meeting, 2021-10-15
- **Jonas Nordström**, Communication Specialist, McNeil, telephone, 2021-09-29
- **Rebecca Arklöf**, International Coordinator, Malmö University, e-mail, 2021-10-19
- **Elisabeth Axell**, International Director, Faculty of Medicine, Lund University, e-mail, 2021-10-19
- **Vanita Singh**, Admissions and Recruitment Manager, DTU, e-mail, 2021-10-13

REFERENCE LIST

The exact sources are provided with the statistics in the respective chapters and on pages 83-87.

PRIMARY STATISTICAL SOURCES:

- Greater Copenhagen Life Science Analysis Initiative
- SCB/Statistics Sweden, including customised analyses
- Statistics Denmark, including customised analyses
- UN Comtrade
- World Ban
- Bisnode, Nordic Business Key, business database

OTHER SOURCES:

- Aalborg University, Aarhus University, University College Absalon, Danish School of Media and Journalism, Roskilde University, University of Southern Denmark, UCL University College, University College South Denmark, University College of Northern Denmark and VIA University College: Experiences with Online Teaching in 9 Further Education Institutions in Spring 2020, January 2021
- Bisnode, Nordic Business Key, business database
- Børsen, leading Danish business newspaper that also reports on the life science sector
- Carlsberg Foundation
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- University of Copenhagen: Udflytningsplan fjerner 1.600 studiepladser i København (Plan to Move Eliminates 1 600 Study Places from Copenhagen), 14 October 2021
- VIA University College: Corona-hjælp fra Folketinget på 100 millioner (100 Million in Corona Aid from Danish Parliament), 3 April 2021
- Press releases and annual reports from respective companies
- We also received additional data via email and telephone from companies

Behind the report:

MEDICON VALLEY ALLIANCE AND ØRESUNDSINSTITUTTET

Øresunds instituttet and Medicon Valley Alliance have a long-term analysis collaboration. State of the Region is an annual analysis of the developments in Medicon Valley. Medicon Valley Alliance and Øresunds instituttet are both member-based, and a selection of the member-actors are represented in the board of directors.

Board of directors:



Board of directors:



MEDICON VALLEY ALLIANCE (MVA) is a non-profit membership organization in the Danish-Swedish life science cluster Medicon Valley, which is a part of Greater Copenhagen. Our 300 members represents the region's triple-helix and include universities, hospitals, human life science businesses, regional governments and service providers.

ØRESUNDSINSTITUTTET 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 Øresunds instituttet, 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.



The analysis "State of Medicon Valley" is prepared by Øresunds instituttet and commissioned by Medicon Valley Alliance.



The analysis "State of Medicon Valley" is prepared by ØresundsInstitutet and commissioned by Medicon Valley Alliance.

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www.oresundsinstitutet.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.

