

The power of coaction

Healthcare challenges are being tackled through passionate collaboration
– and by companies with global impact



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FOREWORD

Life science – more important than ever

An aging population, the rapid increase in chronic diseases, antibiotic resistance and pandemics are putting pressure on the world's health authorities to manage increased healthcare costs. At the same time, a continuous flow of new innovations is changing the healthcare system and is contributing to increased quality of life for millions of people.

Sweden and West Sweden have a proud tradition of successful innovations and companies in life science. Many groundbreaking innovations have been developed here. Today, the region is full of promising projects aiming to develop pioneering solutions for improved healthcare now and for the future.

The interest in being part of this innovative environment has increased dramatically over the past three years. Researchers, investors, entrepreneurs and experts in different areas are attracted by opportunities that are hard to find elsewhere in the world.

This report highlights life science in West Sweden with its unique growth potential. The material has been developed by Sahlgrenska Science Park in collaboration with the Triathlon Group/ISEA within the framework of Catalyser - an initiative that Sahlgrenska Science Park runs together with Business Region Gothenburg, with funding from the EU and Region Västra Götaland.

It is based on previous reports describing the life science industry in Sweden and West Sweden, in combination with an in-depth analysis by Triathlon Group/ISEA.

The team at Sahlgrenska Science Park is working to strengthen life science in West Sweden by supporting entrepreneurs and innovators to develop their ideas into international companies. We hope you want to be involved and help create even better opportunities for entrepreneurs and startups to expand and improve the quality of life for people around the world.



Charlotta Gummesson
CEO Sahlgrenska Science Park



Åsa Lindström
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LIFE SCIENCE INDUSTRY

Two factors behind the Nordic region's strong position

Two factors give the Nordic region a particularly good position in global competition for life science investments. One is a proven ability and tradition to collaborate both within the region and between growing Nordic regional clusters. The other major advantage is the life science industry's new focus on digital health. Nordic, Swedish and West Swedish expertise in digital solutions provides the prerequisites for completely new answers to many of the major challenges facing healthcare.

This development will provide real benefit to people with healthcare needs. It also has potential as a preventative measure to prolong human life and increase people's quality of life. Moreover, it also has implications for staff needs in different areas of the healthcare sector, as well as for researchers, entrepreneurs, investors and business developers in life science.

The transformation of the life science industry in this perspective, the new possibilities that are opening up and the changes that can be expected in people's everyday lives can be compared to another dramatic industry change. What is now happening in life science is equally as big as cars becoming connected, electrified and self-driving. It can undoubtedly be described as a paradigm shift.

To a large extent, it is the same skills coming together in life science, as those behind the great developmental strides we have been witnessing in the Swedish automotive industry.

The pace of development is rapid and, in just a few years, a brand-new industry segment has emerged, under the name health tech.

The Nordic countries, Sweden and West Sweden currently have a unique opportunity to take a leading role in this transformation, thereby creating new products, services, companies and jobs.

These special conditions have already resulted in a rapidly growing interest in the knowledge and investment opportunities in life science in West Sweden. This report also points to the significant leverage effect in an even more developed cooperation and in prestigeless collaboration between different parts of Nordic society, research and business.

The business potential is high, but the greatest potential lies in the improvements that can be achieved on the individual level in terms of improved health and better working environments.

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Similar transformation as self-driving cars



Industry in total change

*Attracts investments and
establishments*

*Great opportunities for
entrepreneurs*



The industry's transformation
creates new solutions for
healthcare challenges

A changing world requires solutions to the great challenges of healthcare

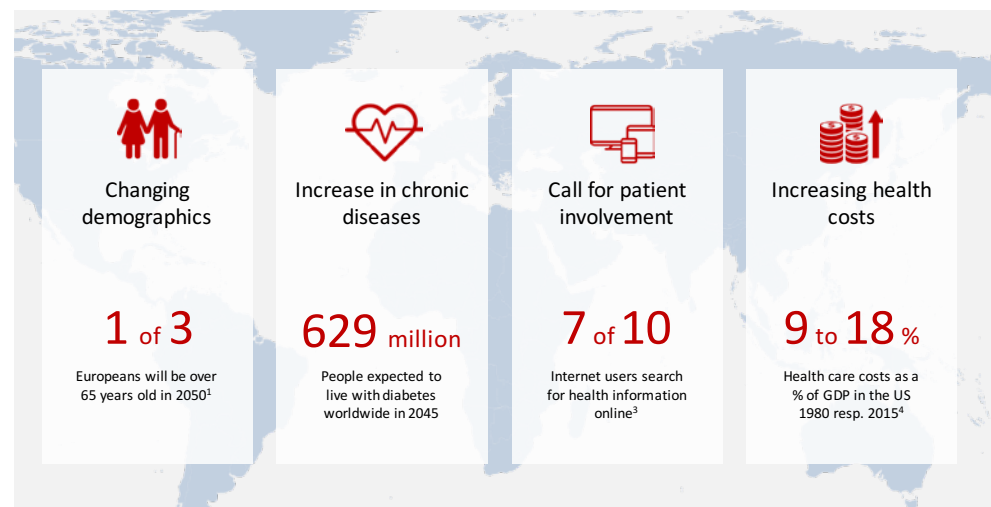
Life science is undergoing a shift characterised by the integration and collaboration of industries, technologies and expertise. We are seeing new constellations collaborating on innovations and development projects.

We are seeing new technologies providing the basis for innovative solutions based on a creative approach to digitalisation.

As in many other industries, the transformation involves challenges for the major players and established brands, but also exciting business opportunities for new entrepreneurs.

Interesting investment opportunities in completely new areas are opening up for financial backers. We can see how the capital market for startup companies in life science has undergone a major change over the past three years. Investment funds that previously only entered renowned tech companies are now showing great interest in life science companies. Interest even comes from large media groups who see synergies between digital communications and life science.

A changing world requires new solutions



Sources: 1Eurostars (2015) People in the EU: who are we and how do we live?, 2IDF Diabetes Atlas 8th edition, 3Pew Research Center Health Online 2013, 4CDC Health United States 2016

It has gone from being a very tough market, where it was difficult to raise capital, to a much better situation for Gothenburg and West Sweden. This change is based on strategic matchmaking between investors and entrepreneurs, with investors often in the US, China and other global financial centers.

It is primarily digital health and the development in medical technology that are attracting capital.

This means completely new prerequisites in the pursuit of capital. It requires much more of entrepreneurs and facilitators in publicly-funded initiatives that support the startup and scaleup phases.

The market for financing has gone from being local and specialised, based on close relationships with people who meet often, to being extremely competitive and global, where personal contacts are more difficult to establish.

At the same time, it provides many more opportunities and access to a completely different range of capital.

There is more money, with more stakeholders interested in the company's different development phases, larger contact networks and more entry points into the largest markets with distribution networks that a small company can never establish on its own.

It also requires more relationship building and understanding of what different investors are looking for. Much more specialist knowledge about how large financing solutions are built featuring many different stakeholders is also needed.

Several new forums and meeting places are being created to bring together entrepreneurs and investors. A clear example is the HealthTech Nordic Investor Forum held in Gothenburg in October 2018. Over 20 international investors are participating.

For the West Sweden life science industry, this brings new opportunities to scale up activities faster and to progress them all the way to global commercialisation.

At the same time, healthcare and the entire welfare society face major challenges. Global megatrends are influencing local conditions. We see a dramatic increase in "welfare diseases" and demographic challenges. More people are living longer with chronic diseases. Patients' expectations and demands are increasing. This creates a financing challenge for society. In addition, there is also an accelerating staff shortage in healthcare.

Part of the solution is in the development of the life science industry. New products and services, new ways of working and new organisational forms can increase the impact of public funds invested in healthcare.

For business, business models are changing in the same way as in other industries. New value chains are being created, new players enter as owners and there is a need to manage skyrocketing development costs.

Digitalisation also leads to privacy and political challenges. Managing the explosion of commercially valuable data that enables much of the attractive service and product development that is so interesting to the financial players is one example.

For the patient, this also means major changes. More self-care can both increase quality of life and reduce healthcare costs. The term “spetspatient” (empowered patient) was coined by Sara Riggare, herself a Parkinson’s Patient. Sara is also a PhD student at the Center for Health Informatics at Karolinska Institutet. She is one of the initiators of the Spetspatienter (empowered patients) project, funded by Vinnova. The project is a good example of how the Nordic countries, Sweden and West Sweden, through cross-sector collaboration, have the potential to take a leading position within a broad-based life science industry. The goal is to build a center of excellence for active patients. The center will work to educate patients and use their knowledge and requirements as a basis for the development of digital self-care tools.

With the aim of continuously gaining a patient perspective on current issues in Swedish healthcare, the Swedish government decided in the spring of 2018 to establish a patient council. This is intended as a forum for discussing long-term healthcare issues with patient representatives.

Source: LIFetime, LIF 2017.

In the “For safety’s sake” (För säkerhets skull) report, the Swedish Agency for Health and Care Services Analysis has analysed the Swedish population’s attitude towards sharing their health data digitally. The agency has asked about patients’ attitude towards different healthcare units having access to each other’s records, a collective drug list and that their medical data is included in digital registries for research purposes. The result is based on 1645 survey responses.

87 percent were positive to the collective drug list

84 percent were positive to different healthcare units having access to each other’s records

> 90 percent of patients were also positive to their data being included in digital research registries

Source: Dagens Medicin, 2018.



Rapidly increasing
interest in life science
in West Sweden

Advantages for regions that have all areas of expertise collaborating closely



Artificial Intelligence (AI) creates great opportunities

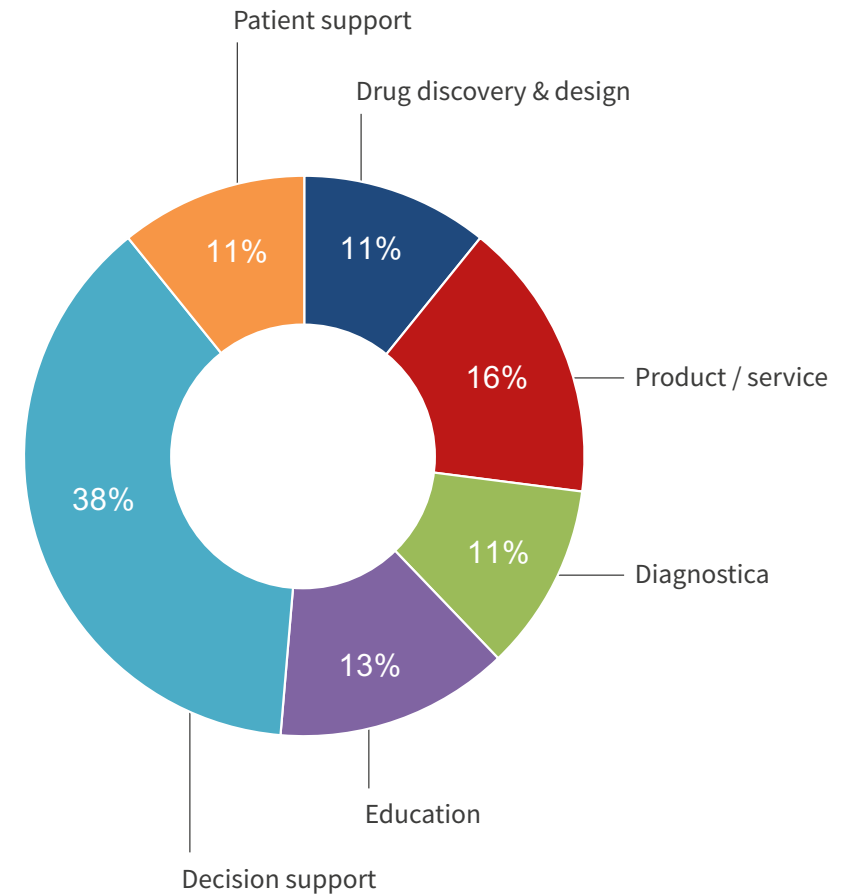
Investments in AI in Sweden during 2018 have been gaining real momentum. Several private, national and regional alternatives are being presented with the purpose of securing Sweden's competitiveness in an area that is undergoing rapid development, not least in the USA and China.

At the Lindholmen Science Park in Gothenburg, a national collaboration center for research in artificial intelligence is being established, partly funded by the Swedish state - AI INNOVATION of Sweden.

The privately-owned Knut and Alice Wallenberg Foundation is investing billions to strengthen Sweden as an AI nation. Chalmers University of Technology is participating in the initiative and is ramping up its capabilities in this area. AI, together with other parts of the rapid digital development and future quantum computers, can provide extraordinary opportunities in the future - benefiting individuals and society.

Chalmers is already investing in a new center of excellence aiming to benefit from and strengthen Sweden's expertise in digitalisation and healthcare. The Chalmers Center in Artificial Intelligence will also be located in Lindholmen and is expected to open in January 2019. Funding will mainly come from the Chalmers Foundation, which will invest more than SEK 300 million for the period 2019-2028. Other initiatives via Chalmers and industry are expected to double revenues in this area.

Chalmers has also been assigned the task by the Swedish government to coordinate the national initiative for a special university education within AI. This knowledge lift is being implemented to meet the labour market's need for transformation and in-depth knowledge in the area.



The development of digital services in West Sweden spans the entire value chain, although decision support solutions dominate strongly.

Decision support dominates digital services in West Sweden

The development of artificial intelligence (AI) creates opportunities throughout the entire life science value chain.

It affects, for example, research and development to design and develop new drugs, including clinical trials. AI supports the entire supply chain, for managing the product portfolio and education, as well as diagnostics, patient support and decision support.

The development of digital services in West Sweden spans the entire value chain, although decision support solutions dominate strongly.

This is evident from the report Sahlgrenska Science Park presented in 2018 to highlight how AI is used in the life science area. The report also aims to inspire more companies to develop their business by embracing the seemingly endless possibilities the technology offers.

The report can be downloaded at sahlgrenskasciencepark.se

Artificial intelligence in life science is limited to a cross-section of stakeholders who work with AI in some form. The report also highlights potential barriers to growing and developing the area of artificial intelligence even more.

Of the 24 companies included in the report, 71 percent work in medical technology, 21 percent in biotechnology and 8 percent in pharmaceuticals. The majority are small companies (<50 MSEK in turnover). Half of this category has implemented AI solutions or medical technology products on the market. It is not unusual for smaller companies to be established based on a particular application or proactive strategy for how the company will develop with AI.

Several medium-sized and large companies state that they are including AI in the company's strategy discussions or that they are experimenting and testing on a smaller scale to evaluate how to use AI.

Global pharmaceutical company, AstraZeneca, stands out among the companies surveyed, as they use AI in several application areas. Medium-sized and large companies have access to large amounts of customer or patient data that provides an excellent platform on which to develop applications and applications based on AI.

The companies that use AI to develop new drugs or clinical trials generally have a higher maturity rate (have come further with AI usage) than other companies in the report. One hypothesis for this is that these companies have more control over the required data - even though the lack of structural data sets is often considered to be one of the major challenges for most developers. AI has been used for several years in traditional drug development, for example in the design of new molecules.

Identified key findings



Rapid growth and extensive digitalisation ongoing across the region.



There is increased understanding of the possibilities for AI applications.



There is potential for increased collaboration between companies, regional academic centers and healthcare providers.

Explosion of data behind new methods and business



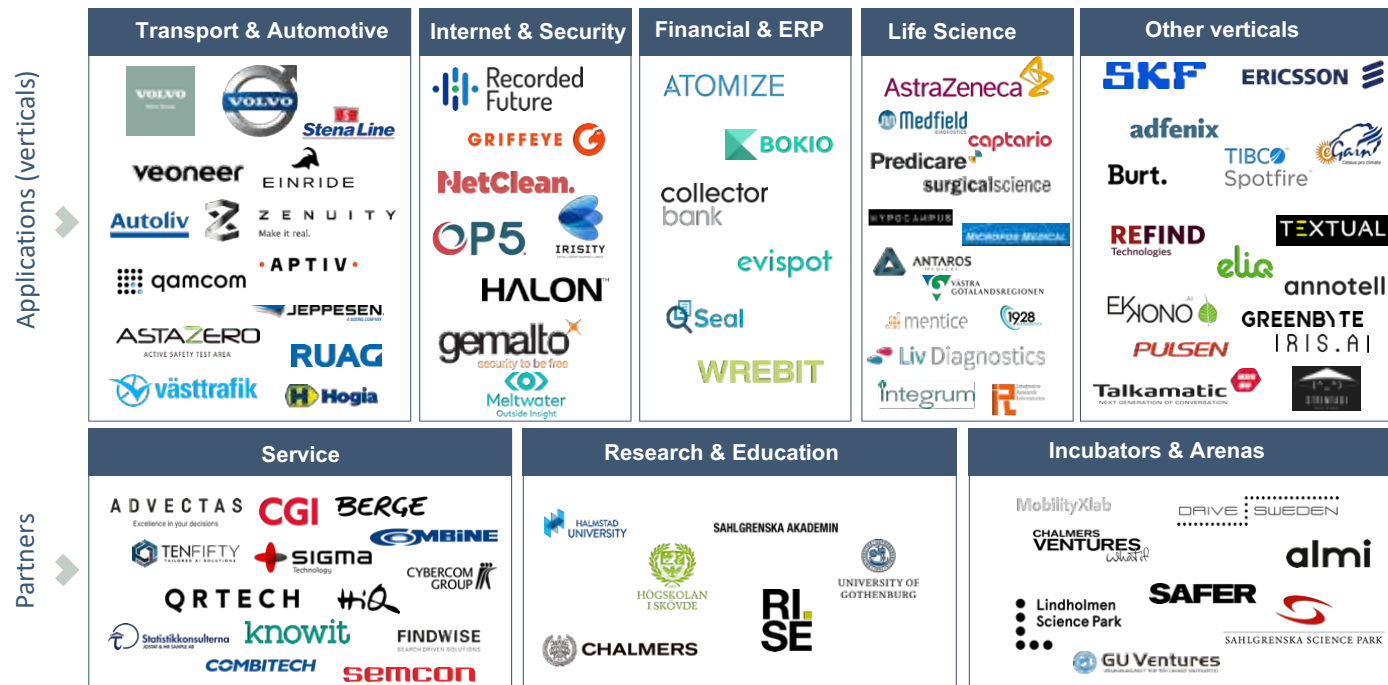
Six key trends

1. The patient's influence and power over his/her own situation is increasing - and will continue to increase. With access to personal data in an increasingly accessible way, it is a development that cannot be reversed.
2. Life science is spreading to completely different sectors of society, research and business than we have been used to. We see connections to the automotive industry, for example. Healthcare will be available in completely new environments and at other times with mobility solutions and media technology.
3. Specialist care with national principals is being concentrated to a few places with a high level of expertise. There are demands for equal provisions of care regardless of population demographics. Healthcare is organised from a national perspective rather than a regional one.
4. Self-care is becoming the norm - with the exception of hospital care, which is focused on high specialisation in a few places. The patient's preventive responsibility for his/her own health increases and creates a more personalised care.
5. Healthcare and pharmaceuticals are becoming more precise and adapted to the patient's individual needs.
6. Digital health and artificial intelligence (AI) are growing business segments. Information and Communication Technology (ICT) has had strong growth over the past decade. The intersection of ICT, healthcare and medical technology is attracting investments at an accelerated pace. The development is so fast that it is now possible to talk about a brand-new business segment; health tech.

Source: Sahlgrenska Science Parks environmental scanning

A position with many opportunities in health tech

BIG DATA, MACHINE LEARNING & AI INSPIRATIONAL MAP – WEST SWEDEN 2018



Source: West Sweden Artificial Intelligence – An inspirational map, April 2018.
Produced by Johan Hogsved, Hawco, for Business Region Gothenburg.

Four examples of innovations that are changing healthcare



Cellink

The world's first bioink company is booming. 3D printing human organs is no longer science fiction.



Sidekick Health

Mobile gaming makes it playfully easy to embrace healthier habits – and a lifestyle that doesn't make you sick.



Captario


A crystal ball that helps you look into the future. Powerful analysis tool for complex decision-making for drug development.



Medfield Diagnostics


Develop products for early diagnosis of brain injuries to facilitate faster treatment and improved quality of life.


One of the most attractive regions in Europe for life science investments

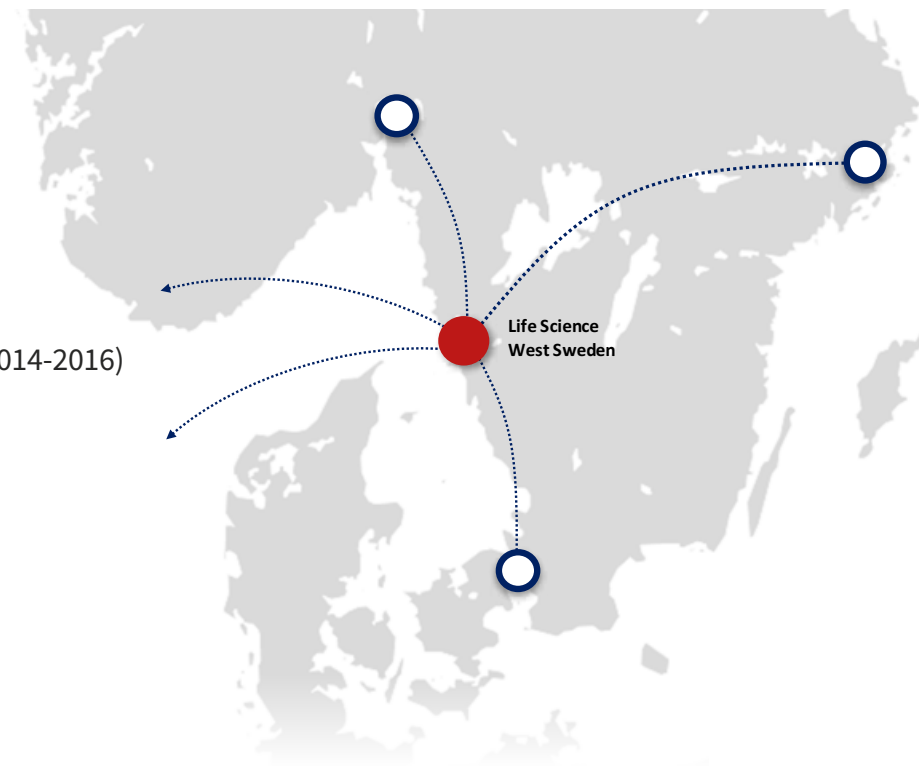
 **450** Life science companies

 **6 000** Employees

 **+10%** Highest increase in Sweden (in number of employees 2014-2016)

 **#1** One of the largest university hospitals in Europe

 **ICT** expertise to take the lead in digital health



Source: Growth Analysis (Tillväxtanalys) PM 2018:06. Development of the Swedish life science industry, Sahlgrenska University Hospital

Five factors attracting capital

Life science in West Sweden operates in an attractive and rapidly expanding metropolitan area with access to competitive skills.

1. Many viable projects in the pipeline

West Sweden has a growing number of developable companies in life science. The category that is now growing fastest is digital health - health tech. Globally renowned life science clusters in the region are a platform for new business opportunities. At AstraZeneca's global R&D Gothenburg site, unique opportunities are being created for spin-off companies. A strong focus on medical technology, combined with strong public healthcare, creates opportunities driven by real demand and limited financial risk.

The region's strengths in information and communication technology, with leading players such as Ericsson, Saab and the two Volvo groups, as well as the development environment at Lindholmen Science Park, are a major competitive advantage. New, open and prestigeless forms of collaboration such as mobilityXlab in the midst of the mobility cluster and AstraZeneca's BioVentureHub, as well as top-rated incubators, contribute to a dynamic start-up environment where new businesses can develop and thrive.

2. Passionate commitment to life science

In West Sweden there is a political commitment to life science that transcends party borders. This is reflected in the major public investment efforts and the unique opportunities for funding offered to companies in the start-up phase.

Involvement also lies in a long tradition of successful collaboration between public bodies, academia and industry.

Public and large private stakeholders are investing heavily in West Sweden. In 2018, planning and implementation is in progress for two major investments in life science environments in the region. According to estimates from Business Region Gothenburg, these two investments alone amount to about SEK 7 billion. In addition, SEK 1.8 billion was previously invested in Region Västra Götaland's new Imaging and Intervention Center (BoIC).

The attractiveness of the region is also evidenced by the fact that several large companies and organisations have chosen to locate their business in the region and expand here. West Sweden has also been designated as Sweden's National Center for Clinical Research.

Wallenberg's Center for Molecular and Translation Medicine (WCMTM) is a new center at the University of Gothenburg. The center is being developed in collaboration between the Region Västra Götaland and AstraZeneca. Patient benefit is in focus and the purpose is for basic research to lead to new treatments.

3. Industrial ability and knowledge required to get things done

West Sweden is one of northern Europe's strongest high-tech industrial regions. The business environment is characterised by a successful entrepreneurial tradition and a prestigious history of building knowledge-based industrial companies. In the region, there is also one of northern Europe's largest university hospitals, Sahlgrenska University Hospital, with opportunities to access world-class research, test beds and research environments.

The collaboration between industry and healthcare has led to the development of a strong life science cluster. The combination of extensive industrial and academic expertise, including an internationally recognised entrepreneurial school, creates a solid foundation for strong management teams and professional board work

4. Access to qualified employees

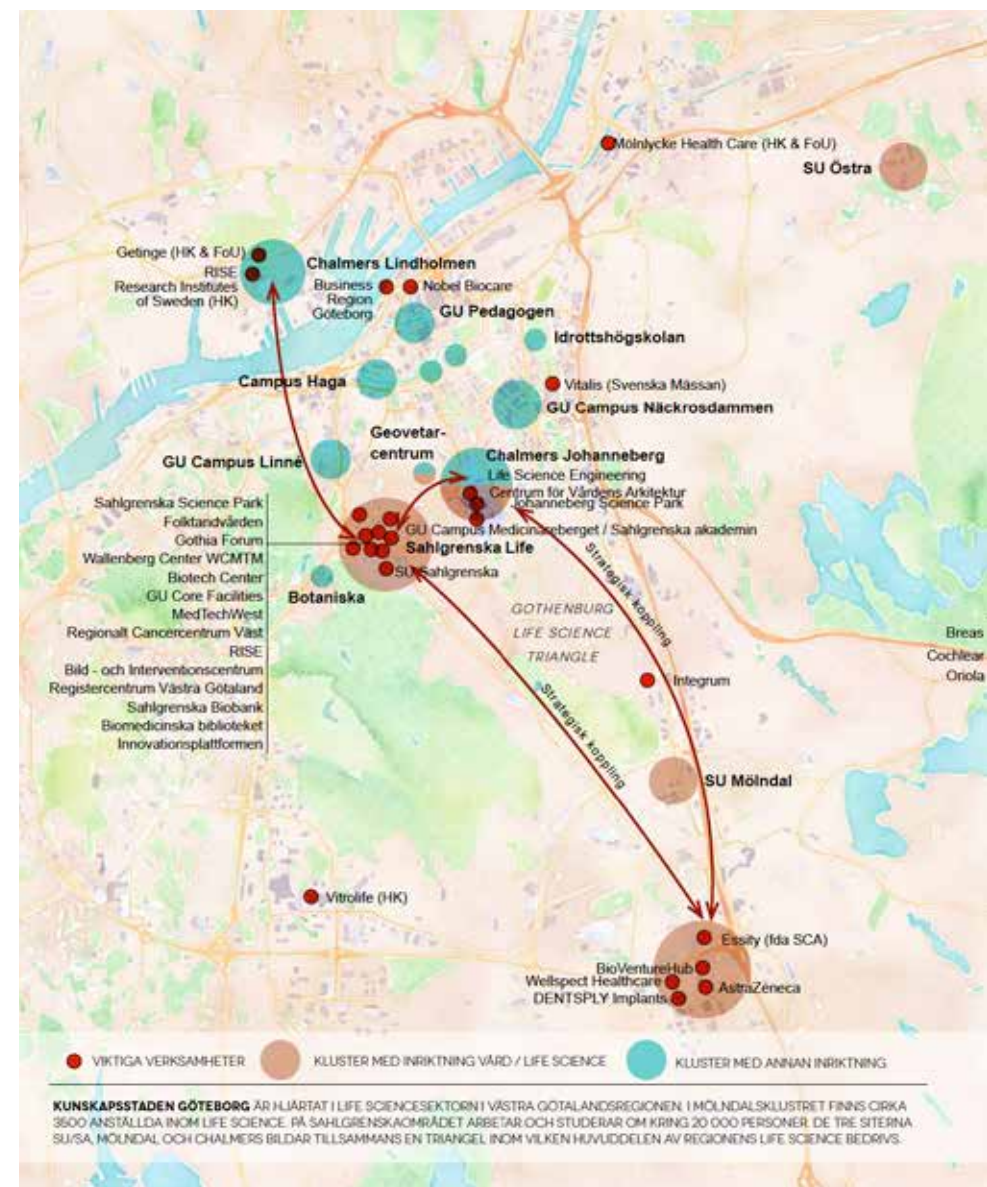
With five universities and more than 80,000 students in the region, there is a solid recruitment base for the life science industry. Within the Sahlgrenska Academy alone, there are 1,750 employees and 5,000 students.

Access to entrepreneurial programs in life science also creates good conditions. Sahlgrenska School of Innovation and Entrepreneurship (SSIE) and Chalmers School of Entrepreneurship are important for the future supply of expertise.

Through GU Ventures and Chalmers Venture, there is also access to funding for commercialisation of academic research results.

5. Short geographical distances

The physical proximity between areas of expertise is one of West Sweden's biggest assets. In a very small geographical area and in central locations in one of Sweden's largest metropolitan regions, there is an abundance of complementary skills. Proximity breeds collaboration and facilitates informal contact routes. The knowledge-based city of Gothenburg is in a strong growth phase.



More than SEK 7 billion invested in life science environments in West Sweden.

Next to AstraZeneca in Mölndal, Next Step Group and Investor's real estate company, Vectura, are progressing the major urban development project GoCo - Gothenburg CoValley.

The 100,000 square meter area will be a new innovation cluster focusing on life science. The area will also include housing, commerce and other services.

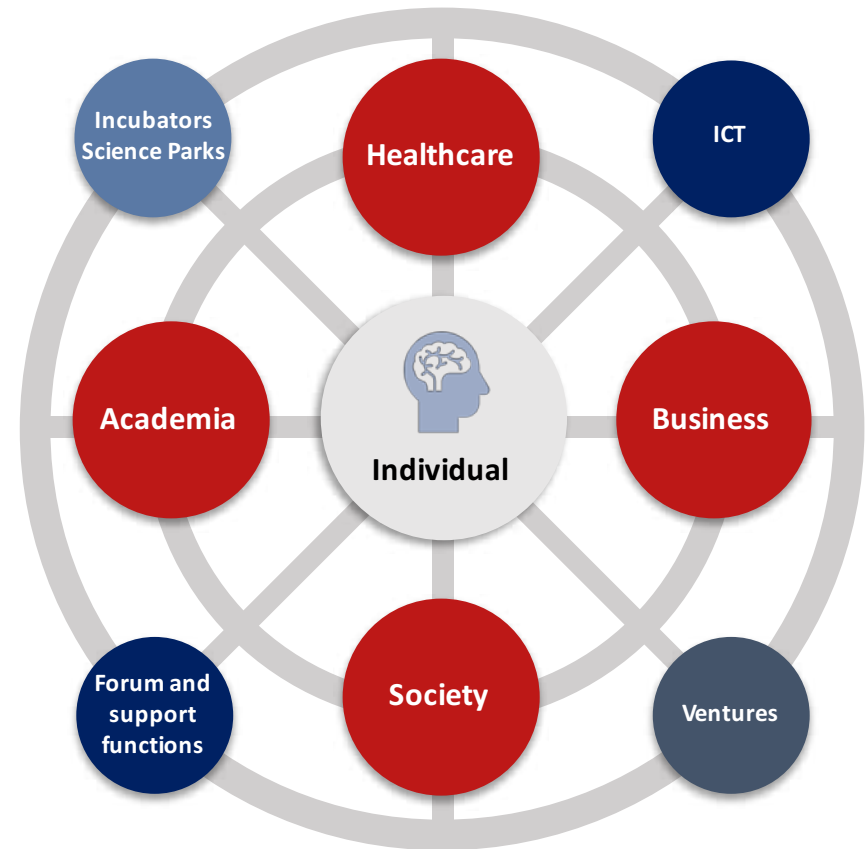
In parallel, work is progressing with Sahlgrenska Life - a major urban development project that physically connects Sahlgrenska University Hospital, the University of Gothenburg's medical research area (Medicinareberget) and the business development activities at Sahlgrenska Science Park. The plans include modern premises for healthcare, research and training, as well as attractive environments for companies in life science.

The two projects complement each other and represent a significant addition to West Sweden's competitiveness in the field of life science.



Source: GP 2016 and 2017.

Assets that make
West Sweden
attractive



A complete and well-integrated ecosystem for life science

For research and entrepreneurship to result in companies and commercially successful products and services, accessibility and interaction between the various components of the ecosystem are crucial.

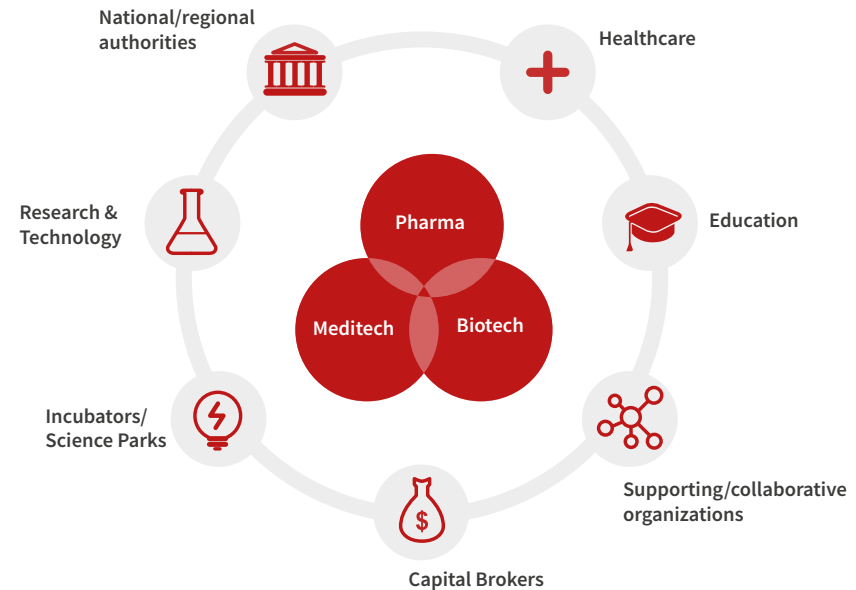
In the ecosystem, we include the patient-oriented healthcare sector, academic education and research, supportive and committed public organisations in different forms, national authorities and venture capital in different investment phases.

Another important part is networking and meeting places for international collaboration and the exchange of ideas and business opportunities. The international life science congresses that are planned in Gothenburg in the next few years are therefore of great importance.

International life science congresses in Gothenburg

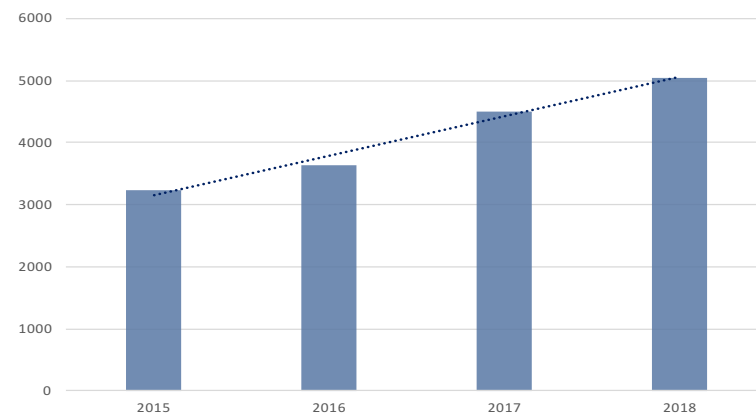
- IAGG-ER – International Association of Gerontology and Geriatrics European Region (May 2019) - 2 500 delegates
- EWMA – 29th conference of the European Wound Management Association (June 2019) – 3 000 delegates
- ESHG – the European Human Genetics Conference 2019 (June 2019) – 3 000 delegates
- ICS – International Continence Society (September 2019) – 3 000 delegates
- ECP – European Congress of Pathology (August 2021) – 2 000 delegates
- Eurospine 2021 (October, 2021) – 4 000 delegates
- Vitalis 2019, 2020, 2021 etc.

Source: The Swedish Exhibition and Congress Centre, 2018



Scandinavia's leading eHealth event

Number of Vitalis participants per year



Sweden leads the way in life science

The life science sector plays a major role in society and for economic growth. Sweden has, for several decades, led the way with successful entrepreneurship and company development in pharmaceuticals, medical equipment and biotechnology. There is a long tradition of successful market introductions. Some examples are the pacemaker, respirator, dialysis device, Losec and osseointegrated implants.

Behind this lies, among other things, a creative climate for the development-based innovation process in life science. It has been created by non-hierarchical organisations and qualitative healthcare with the possibility to conduct clinical trials.

Equally important have been an innovation-friendly healthcare system and a tradition of multidisciplinary collaboration between different sectors of society.

The life science sector is today a very important segment for society and economic growth. Life science is one of the Swedish government's strategic collaboration programs, and the government has launched several initiatives to further strengthen Sweden's position in this area.

Sweden is recognised as one of the world's most innovative countries and is ranked number one in the EU's European Innovation Scoreboard 2018.

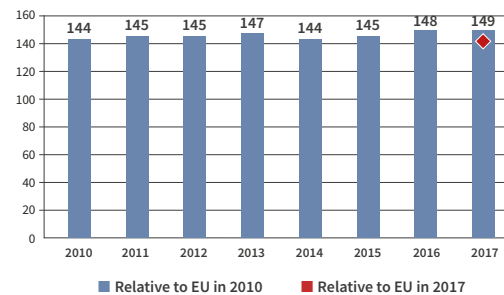
Sweden – The most innovative country in the EU

Sweden is, for 7 years in a row, recognized as an EU innovation leader in the European Innovation Scoreboard 2018

1. **Sweden**
2. **Denmark**
3. **Finland**
4. Netherlands
5. United Kingdom
6. Luxembourg
7. Germany
8. Belgium
9. Ireland
10. Austria



Sweden is an Innovative Leader. Over time, performance has increased relative to that of the EU in 2010.



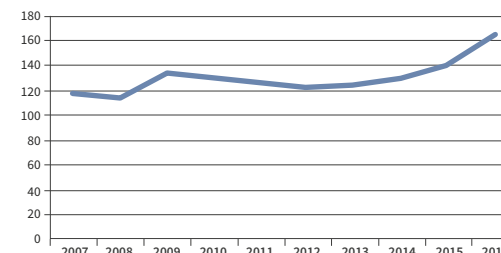
Innovation-friendly environment and Human resources are the strongest innovation dimensions.

Sales impact and Finance and support are the weakest innovation dimensions.

Average performance is measured using a composite indicator building on data for 27 indicators

Source: EU Commission – European Innovation Scoreboard 2018. Document date: 18/06/2018 – Created by GROW. DDF1.F.1. Publication date 18/06/2018

Trend: net turnover increase for life science companies



The Swedish life science companies had a net turnover of SEK 164 billion and exports amounted to SEK 88.9 billion in 2016. Between 2014 and 2016, the life science companies' net turnover increased by 27 percent, exports by 15 percent and the number of employees by 1.7 percent.

Source: Growth Analysis (Tillväxtanalys) PM 2018:06 Development of the Swedish life science industry

(Marketing and sales companies not included)

Sweden's life science industry

42,000 employees. 9.5 billion Euro (SEK 95 billion) in export value

15 percent of life science patent applications to EPO in 2017 (Sweden features regularly among the countries submitting the most past applications).

Well-developed collaboration between the trade associations Sweden BIO, the Swedish Association of the Pharmaceutical Industry (LIF) and Swedish MedTech.

Source: SwedenBIO/LIF/Swedish Medtech Handlingsplan för life science 2018

Three dominant clusters

The majority of Swedish life science companies are located in three metropolitan areas. The three dominant clusters are Stockholm, Uppsala and Södermanland (51 percent of employees), Västra Götaland and Halland (more than 19 percent) and Skåne (16 percent).

Of a total of around 3,000 companies, two thirds are active in research, development, production or consulting. One third is in marketing and sales.

The trend is that the number of employees is increasing most in small and medium-sized companies.

In 2016, the companies together had a net turnover of 160 million euros and exported for 900 million euros.

In two years, net sales increased 27 percent and exports 15 percent. The increase in the number of employees remained at 1.7 percent.

West Sweden has had a faster growth in employment, with an increase of ten percent.

Swedish Life Science Clusters

Share of total number of employees

West
Sweden

Source: Growth Analysis (Tillväxtanalys) PM 2018:06. Development of the Swedish life science industry

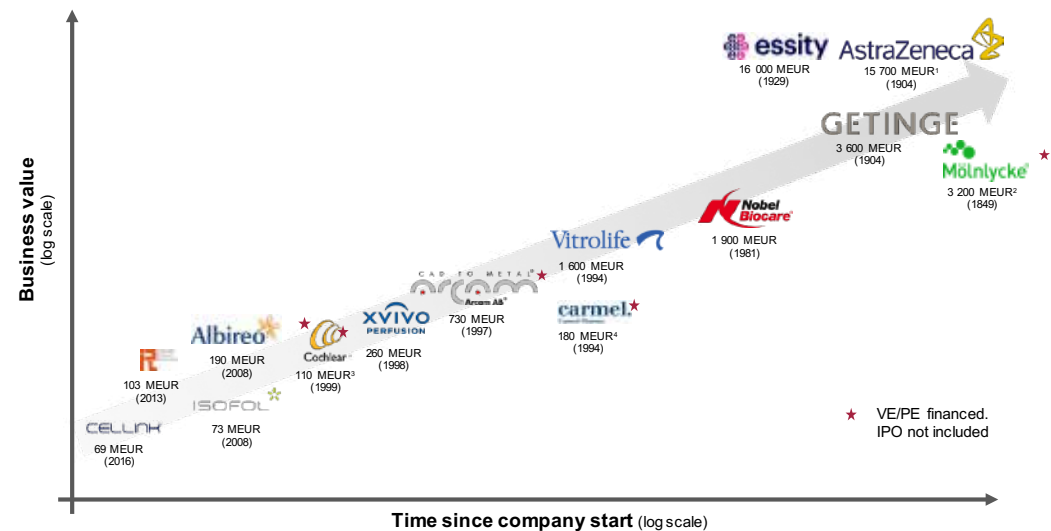
Substantial value has been created

AstraZeneca is the largest life science company in Sweden. A large part of its global sales comes from products that have been developed at the site in the Gothenburg region. Companies like Essity, Getinge, Mölnlycke, Nobel Biocare, Dentsply Sirona and Cochlear BAH are all local initiatives that have grown to become major international players. Later examples include Vitrolife, Arcam and Xvivo Perfusion.

Worth noting is that a large part of this value creation has so far been implemented with limited access to venture capital. Instead, the region's large life science companies have, in most cases, managed to grow organically with their own cash flows or through stock market introductions.

Substantial value creation over time

A selection of the many successful companies in West Sweden



Market cap based on last published financial report as of July 2018 if not otherwise specified.

1. Calculated as 25 % of market cap based on R&D spending for Gothenburg site.

2. Enterprise value as of 2010.

3. Amount paid by Cochlear in 2005 4Reported amount paid by BD in 2011.

Pharmaceuticals





Innovative products and services developed by life science companies in West Sweden have had a significant effect on how healthcare is being conducted.

Millions of people around the world have gained an increased quality of life.

This has also brought with it substantial value creation in the development of the companies. One example is the emergence of AstraZeneca's global research and development site in the Gothenburg region, which has been built on the local research that gave the world the proton-pump inhibitor, Losec, one of Sweden's greatest export successes of all time.

Losec was a very early result of well-functioning collaboration between business, academic research and healthcare. Today, AstraZeneca has more than 2,400 employees in the Gothenburg region. Their work represents a large part of the international group's market capitalisation.

A region with several leading life science businesses

	Examples of companies and brands	Cluster value (MEUR ¹)
 Pharmaceuticals	AstraZeneca ISOFL carlssonresearch IMMUNICUM Albireo	20,300
 Personal- and wound care	Mölnlycke essity abigo	18,800
 Biomaterials and anatomical reconstructions	Nobel Biocare oticon Dentply Cochlear EPOSURE Integrum ELOS	4,600
 Regenerative medicine	Vitrolife cellartis Takara XVIVO PERFUSION VERIGRAFT CELLINK Cline Scientific AB	1,900
 Medical technology business groups	GETINGE GETINGE GROUP AddLife ARJOHUNTLEIGH LIFCO TRIOLAB	5,800

1. Indicative estimation based on mkt cap / EV for business related to the western Swedish region
(Source: Triathlon Group 2018)

Personal hygiene and wound care

Mölnlycke is the cradle of medical technology in West Sweden, with origins in the early West Sweden textile tradition. In its modern structure, the business has grown into two global groups. Essity, with hygiene and health products, and Mölnlycke with products for surgery and wound care.

Biomaterials and anatomical reconstructions

Osseointegration is one of the region's strength areas. The area has enormous importance for many millions of people and is behind global companies such as Nobel Biocare, Dentsply Sirona, Cochlear BAHS and Integrum.

Several current startups are based on the knowledge relating to anatomical reconstructions that has been built up in the region. Two examples are Ortoma and Episurf Medical.

In vitro fertilisation and transplantations

When Vitrolife was founded in the mid-1990s, it was based on groundbreaking work at Sahlgrenska University Hospital. The company has taken a leading global position in the field of in vitro fertilisation.

Xvivo Perfusion is an example of business development based on transplantation expertise from Sahlgrenska University Hospital.

Medical technology groups

The emergence of medical technology groups is very important for Swedish startups to be able to take the next step in their development, in a broader context with professional ownership. The leading Swedish groups are linked to West Sweden. Getinge has evolved into a large multinational group, with a long history of successfully acquiring and integrating a large number of companies. Lifco and Addlife are other examples.

An industrial tradition of building successful companies

The figure to the right shows an example of how medical technology cluster around the implant has evolved from Professor Per-Ingvar Brånemark, Professor Bo Håkansson and Dr. Matts Andersson's discoveries. The example also shows how the cluster continues to create new business opportunities.

Growth and investment opportunities

The history of successful life science companies has created solid industrial capabilities and knowledge about how to get things done. More importantly, many strong, growing companies have ambitions to grow into global life science companies. Some of them are already there. The region is full of promising companies in pharmaceuticals, biotechnology, medical devices, digital health and imaging.

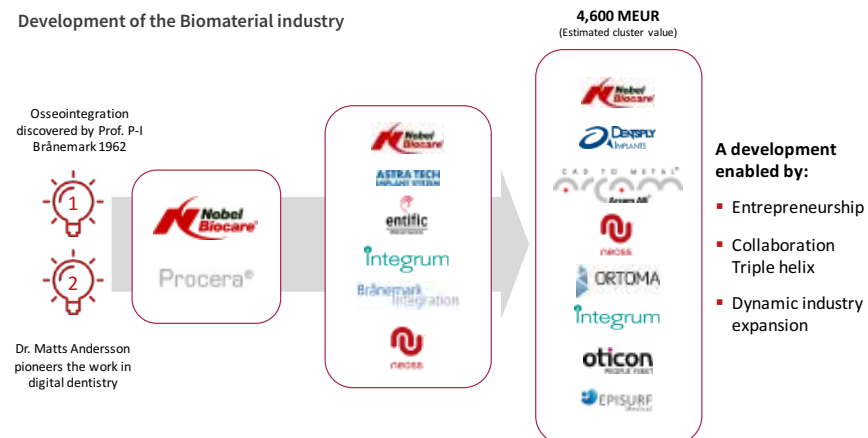
The area of digital health and imaging technology is a particularly vibrant environment that has grown strongly in recent years. The region's strong position in life science, in combination with the leading information and communication technology sector has created favourable conditions and growth opportunities for new innovations and companies. Today, we have companies that provide new, innovative solutions to society's biggest challenges. This applies to everything from new diagnosis methods to combat antibiotic resistance to social health games that have been developed to improve human health in an entertaining way.

Biotechnology is another fast-growing segment that has gained much attention lately. One of many interesting opportunities is Cellink, which develops a universal bioink that can be used on many different 3D printers.

The company has gained attention as one of Sweden's most interesting start-ups. Vitrolife and XVivo Perfusion are other examples of successful, growing biotechnology companies. Promising growth opportunities are also found in the region's traditionally strong areas of medical devices and pharmaceuticals. Here, companies are working with everything from next-generation cancer treatments to brain-controlled prosthetics.

An industrial tradition of building successful companies that generate new fast-growing spin-offs

Development of the Biomaterial industry



Long tradition of innovation and testing opportunities



Essity

- Global hygiene and health company with open innovation culture
- Significant medtech capabilities after the acquisition of BSN Medical in 2017

Getinge

- 10 000 employees in more than 40 countries
- HQ in Gothenburg – part of the skills cluster around Sahlgrenska and Chalmers



AstraZeneca

- 1 of the company's 3 strategic research centers with more than 2 400 employees
- Multinational innovation environment with global collaborations

Mölnlycke

- Innovation driven medtech organization with global market
- Focus: Develop trustful and more cost effective solutions for the healthcare challenges



Test beds and strength areas

In Region Västra Götaland, several innovation environments have been built up in the form of science parks. They have developed into important collaboration facilitators with strong brands and large contact networks capable of supporting research, development and entrepreneurship. Significant opportunities for collaboration are created as each of these science parks have their own areas of strength that complement the others. Expertise in various aspects of information and communication technology is valuable since the technologies cross-fertilise each other. Sahlgrenska Science Park in Gothenburg, with its emphasis on digital health, has an extensive degree of mutual exchange with Science Park Skövde with its specialisation in gaming, simulation and decision support, which are important factors in several areas of life science.

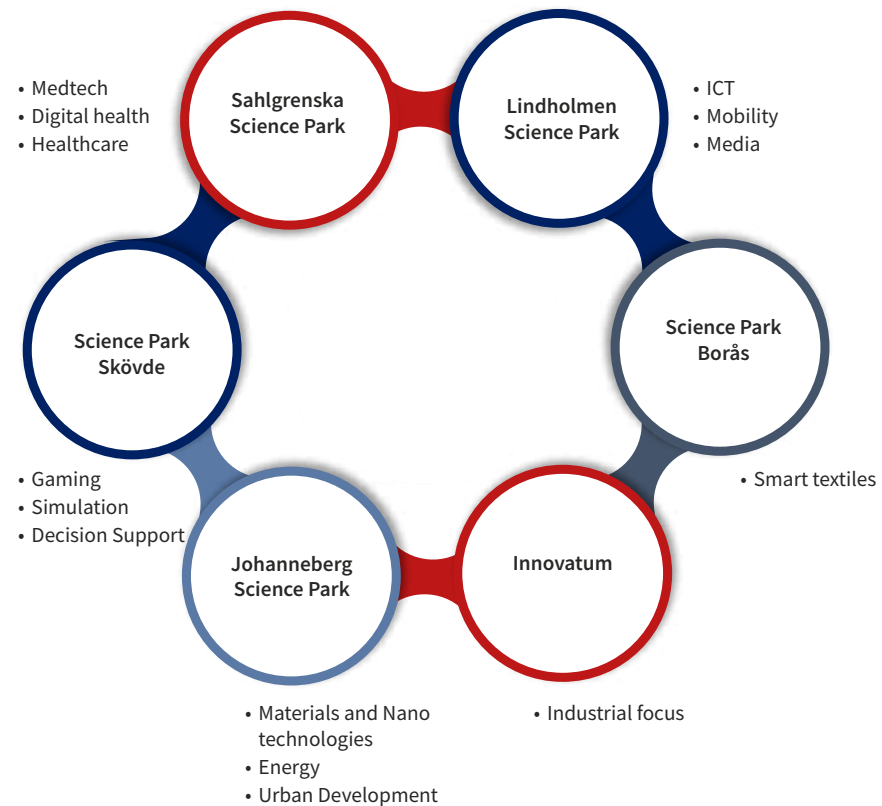
The same also applies to Science Park Borås, which focuses on smart textiles, Innovatum in Trollhättan with its industrial focus, and Johanneberg Science Park in Gothenburg which specialises in material science, nanotechnology, energy and urban development.

Interest in innovative test bed environments is growing

Test bed Göteborg is an initiative that will harness the innovative power of the city through collaboration on an entirely new level. The initiative includes the entire region, business, public bodies, academia, research institutes and science parks.

A physical or virtual test bed enables companies, academia and other organisations to collaborate in the development of new products, services or processes.

Collaborations with science parks in the region create growth opportunities for life science



New models for
closer collabora-
tion provide
greater impact



World-renowned research

West Sweden has been the site of many medical breakthroughs over the years and it has become the leading center for clinical trials in Sweden. Top-selling drugs have been developed in the region, including Losec, Nexium, Seloken, Dicumarol, Plendil, cholera vaccine, Brilinta and Abilify. The latter was developed in collaboration between the pharmaceutical industry and Professor Arvid Carlsson, who won the Nobel Prize in Medicine in 2000.

West Sweden is also at the forefront of biomaterials and implants. Gothenburg University was ranked in a bibliometric survey in 2012 as number 1 in the world in the field of osseointegration. Gothenburg is today a leading international center for R & D, design and manufacturing of the next-generation biomaterials, including smart textiles.

Transplantations and regenerative medicine form another strong area that has given rise to companies such as Vitrolife, Xvivo Perfusion and Collectis (now part of Takara). Many unique operations have been carried out in the region. In 2012, for example, the first uterus transplant from mother to daughter was performed by a Swedish doctor at Sahlgrenska University Hospital.

One of northern Europe's largest hospitals

Sahlgrenska University Hospital (SU), including the Sahlgrenska Academy (University of Gothenburg), has played an important role in the development of the life science industry in the region. There are several major hospitals in West Sweden, which is an advantage.

With approximately 17,000 employees and 2,300 care units, Sahlgrenska University Hospital is an important partner for research and development. Sahlgrenska is the only hospital in Scandinavia that has a complete transplant program for all organ transplants for both children and adults.

Region Västra Götaland has been selected to provide national healthcare coverage in:

- Lung transplants
- Liver transplants
- Heart transplants
- Cardiac surgery
- Craniofacial surgery
- Treatment of paediatric glaucoma and cataracts

Source: The National Board of Health and Welfare (Socialstyrelsen)

Open collaboration

West Sweden has a long tradition of transnational research. Many of the discoveries have been driven by defined clinical needs. Close collaboration with healthcare professionals has enabled successful commercialisation of new discoveries. To further facilitate the development of new ideas, the Innovation Platform has been established on the Sahlgrenska site. The platform serves as an arena where innovative solutions can be tested and displayed.

Clinical Studies Sweden

Public healthcare in West Sweden has organised a single point of contact for the implementation of clinical trials for all hospitals in the region. In 2009, Gothia Forum was established as a strategic resource affiliated with the healthcare authorities. Via Gothia Forum, companies and researchers are offered a quality-certified opportunity to access the region's patients and patient data on equal terms for all parties.

“When it works, we prefer to have a single point of contact for the clinical trials. Västra Götaland is a region that has managed well with this.”

Medical director at a global pharmaceutical company

The method has gained attention and was a decisive reason for Gothenburg being selected as the seat of the new Clinical Studies Sweden agency. Clinical Studies Sweden started its operations in 2016 and is a collaboration between the Swedish Research Council and Sweden's six healthcare regions.

The primary task is to strengthen and coordinate resources in six healthcare regions to conduct clinical studies

In 2018, 650 company-funded clinical trials were conducted in Sweden. Business-financed medical research amounted to more than ten billion SEK - in addition to the research conducted in medical technology and related research.

In 2017, the Ethics Committee approved approximately 2,400 new projects, of which approximately 10 percent were drug-based studies. The other 90% were studies relating to other therapies, observational studies, diagnostic studies and qualitative studies. (Source: SwedenBIO / LIF / Swedish Medtech Action Plan for Life Sciences 2018)

During 2017, the Ethics Examination Board in Gothenburg received 447 applications for clinical trials. (Source: Clinical Studies Sweden)

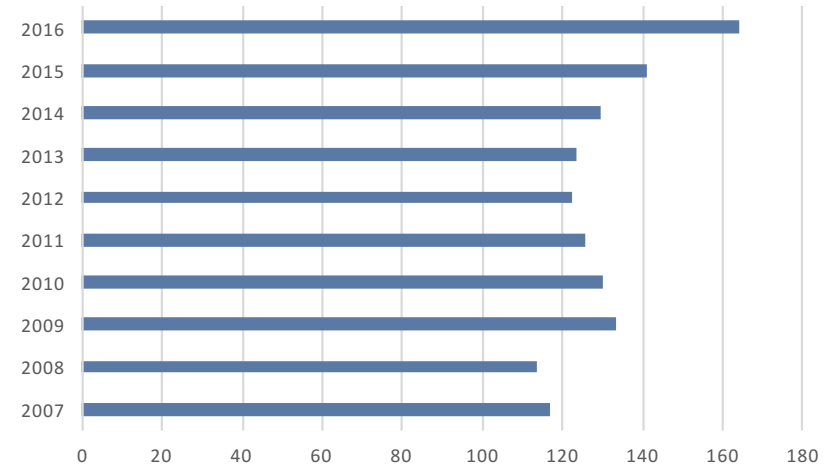


Increasing sales in most life science segments

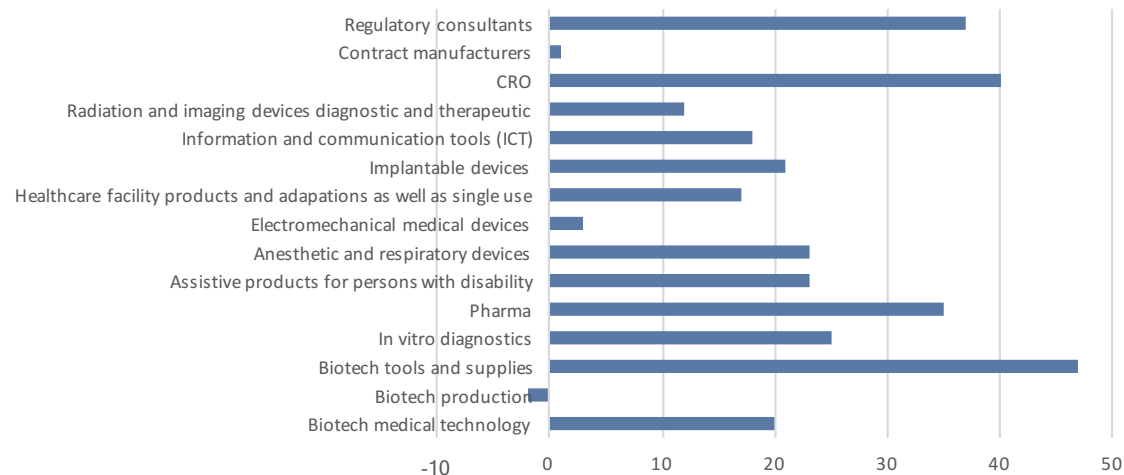
Sales increase in most segments of life science in Sweden

After a slump in the context of the international financial crisis, the Swedish life science industry has again shown a steady rise since 2013. The largest increase is noted between 2015 and 2016, according to the latest available statistics from Growth Analysis.

Net sales Mkr



Percentage change in net sales



Source: Growth Analysis (Tillväxtanalys) PM 2018:06

A large, light red outline of the number '3' is positioned on the right side of the slide, serving as a background element.

Nordic collaboration
climate is trump card
in global competition

Nordic innovation power is a global trump card

Megaregion creates important critical mass

A proactive alliance between the metropolitan regions in Norway, West Sweden and southern Sweden could facilitate the dissemination of knowledge between institutions and activities specialising in health and medical technology.

This is one of the conclusions of the OECD Territorial Reviews report: The Megaregion of Western Scandinavia 2018.

The area extends along the 500 km long coast that combines Norway's capital, the second and third largest cities in Sweden and their surrounding areas. Western Scandinavia comprises about one third of the population in Norway and Sweden. With a total gross domestic product (GDP) of USD 201 billion, the region generates a slightly lower GDP than Norway (USD 228 billion) and about half of Sweden's GDP (USD 400 billion).

Moreover, collaboration with the Copenhagen area also adds a critical mass within life science.

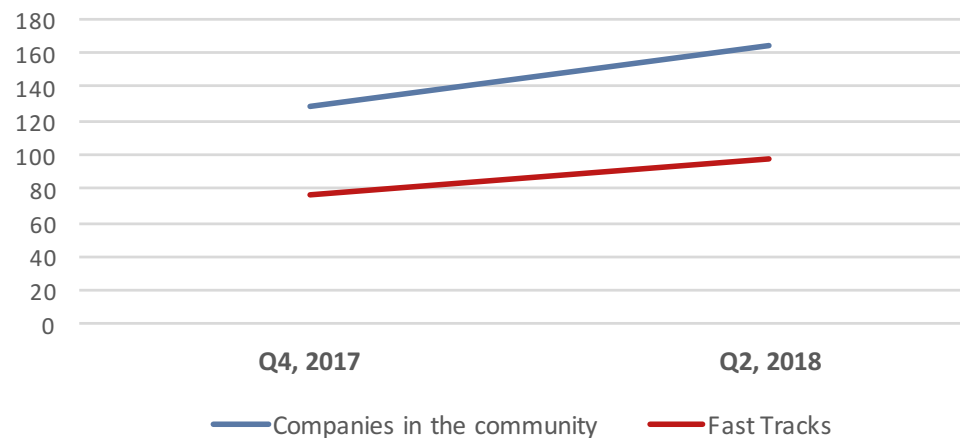
Source: EY, Nordic Life Sciences database

24 cluster across 20 geographical places



Openness to wide-ranging collaboration brings great competitive advantage

Increase of companies



HealthTech Nordic is a joint project aiming to accelerate the success and international scaling of startups.


HealthTech Nordic is one of the largest eHealth communities in the world.



Startups, entrepreneurs and enthusiasts in health tech are welcome to join the HealthTech Nordic Community. Startups and entrepreneurs based in the Öresund/Kattegatt-Skagerrack area can also qualify for the HealthTech Nordic Fast Tracks.

Photo from Vitalis 2018

Great potential in closer collaboration between Nordic region clusters



Competition is between the Nordic countries and other major regions

Strong clusters with specialties that complement each other

Prestigeless collaboration is important

Norway's Prime Minister, Erna Solberg, inaugurated ShareLab in Oslo Science Park. She's pictured above with Esben Nilssen.

Photo: Sigurd Klæva, Oslotech

AstraZeneca BioVentureHub



- Currently, 26 life science companies and 1 academic group co-locating with AZ at the heart of AZ Gothenburg's R&D site
- Offers unique access to world-class knowledge, capabilities and infrastructure – using existing resources in new ways
- Unique Public-Private-Partnership model

"The sharing economy applied to life science."

Stimulating a 4D life science reality

Drugs	Diagnostics
Devices	Digital health



Sahlgrenska Science Park – An independent arena dedicated to collaboration and growth

90 Companies
in our
environment



Park Annual

13 years since start
200+ speakers
500 participants
each year

Business development

Financing
Internationalisation
Digital health
Verification
Competence

Business report
**Life Science
West
Sweden**



eHealth Award
2019



HEALTHTECH NORDIC INVESTOR FORUM

Gothia Forum for clinical research

Point of contact

We facilitate collaboration between healthcare, academia and industry. Gothia Forum offers access to a wide network of physicians and clinics in Region Västra Götaland. We also act as a regional node in the nationwide scheme, Clinical Studies Sweden.



Clinical trial units

Gothia Forum has two clinical trial centers within the organization; Clinical Trial Center (CTC) and Primary Care Trial Center (PTC). They conduct clinical trials in all phases (First-in-Human to Phase IV). The trial centers act as a resource for all clinics within Region Västra Götaland.

Support in all phases of clinical studies

We can assist with individual elements as well as managing the research process from start to finish. This involves assistance with project management, feasibility, legal advice, quality support, analyses of health economics, medical counselling and support in regional development issues.

Gothia Forum
FOR CLINICAL RESEARCH



Innovation Platform in Region Västra Götaland

We Help You Identify Needs for Innovation

The Innovation Platform enables innovators and businesses to create competitive solutions to meet real healthcare needs. We help you gain user insights throughout the entire product and service lifecycle.



We Connect You with the Right People

As an official part of Region Västra Götaland, we act as a key link between healthcare and innovators or businesses. Based on your needs for clinical involvement, we connect you with suitable healthcare partners.

We Guide You Through the Process

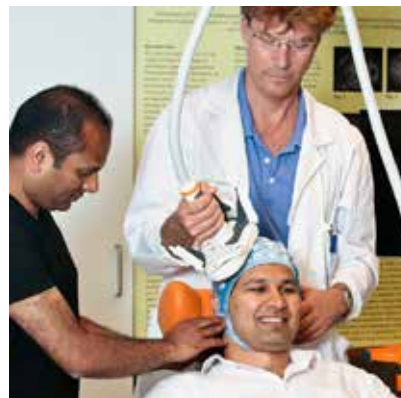
To facilitate in product and service development, we provide guidance on healthcare support processes, e.g. IT and procurement. As part of the region's healthcare sector, we ensure regulatory compliance during collaboration with healthcare partners.



MedTech West – Center for medtech research in West Sweden

We offer companies

- Access to new and frontline technologies and research competence from Chalmers Technical University, University of Borås and Gothenburg University
- Access to medical expertise from researchers at the Sahlgrenska Academy
- Research environments close to clinics and patients, and at universities
- Access to project funding and help when applying
- Work places on the Sahlgrenska University Hospital Campus for Adjunct Professors, Industrial PhDs and Master students
- Supervision of PhD and Master students' projects



Your gateway to competence, technologies and research partnerships

MedTech West is a collaborative platform, network and unique innovative triple-helix centre for biomedical engineering research, development and education in Western Sweden.

We will help you to initiate and facilitate multidisciplinary research collaborations between your company, relevant health care staff, and academic expertise in both the medical and technological field.

MedTech West

**SHIFTING CLINICAL FRONTIERS
WITH BIOMEDICAL ENGINEERING**

CHALMERS



UNIVERSITY OF GOTHENBURG



UNIVERSITY OF BORÅS



REGION
VÄSTRA GÖTALAND
SAHLGRENKA UNIVERSITY HOSPITAL

European Innovation Scoreboard 2018 ranking (1/2)

	EU28	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	IS	IL	MK	NO	RS	CH	TR	UA
FRAMEWORK CONDITIONS																			
Human resources																			
1.1.1 New doctorate graduates	2.0	2.4	1.9	0.6	1.9	0.8	3.5	2.2	2.9	2.7	3.1	0.9	1.5	0.8	2.0	1.1	3.4	0.4	1.8
1.1.2 Population completed tertiary education	39.0	46.6	40.3	43.6	34.0	25.6	44.5	35.1	40.3	47.4	47.3	47.6	n/a	33.0	48.3	n/a	50.1	30.5	n/a
1.1.3 Lifelong learning	10.9	19.1	15.8	4.0	9.8	1.1	12.0	3.4	27.4	30.4	14.3	23.6	n/a	2.3	19.9	n/a	31.2	5.8	n/a
Attractive research systems																			
1.2.1 International scientific co-publications	517	1628	1376	297	919	182	1135	439	1659	2019	1222	2799	908	151	1886	353	2946	492	61
1.2.2 Scientific publications among top 10% most cited	10.6	14.6	11.1	5.1	9.0	4.8	8.6	6.2	10.8	12.1	15.0	10.8	10.0	6.1	10.7	4.1	15.3	4.7	3.6
1.2.3 Foreign doctorate students	26.1	40.1	28.3	2.0	25.6	3.8	9.7	9.1	21.1	34.7	42.9	31.6	n/a	29.7	21.6	6.5	54.9	4.3	7.0
Innovation-friendly environment																			
1.3.1 Broadband penetration	16.0	27.0	13.0	13.0	32.0	17.0	16.0	12.0	32.0	39.0	13.0	n/a	n/a	11.0	21.0	3.0	n/a	17.0	0.7
1.3.2 Opportunity-driven entrepreneurship	3.3	5.9	3.0	3.7	2.1	1.2	2.4	1.3	6.9	7.8	3.5	10.0	2.6	0.6	6.3	n/a	5.5	1.9	n/a
INVESTMENTS																			
Finance and support																			
2.1.1 R&D expenditure in the public sector	0.70	0.87	0.87	0.32	0.64	0.21	0.49	0.39	0.91	0.98	0.52	0.77	0.57	0.32	0.95	0.55	0.93	0.44	0.23
2.1.2 Venture capital expenditures	0.116	0.150	0.060	0.036	0.048	0.037	0.006	0.014	0.095	0.083	0.173	n/a	0.009	n/a	0.148	0.003	0.107	n/a	0.019
Firm investments																			
2.2.1 R&D expenditure in the business sector	1.32	1.16	2.20	0.63	0.61	0.27	1.51	0.40	1.81	2.26	1.13	1.31	3.64	0.10	1.08	0.33	2.40	0.44	0.38
2.2.2 Non-R&D innovation expenditures	0.76	0.16	0.47	1.24	0.64	0.23	0.81	0.58	0.32	1.12	0.67	n/a	n/a	0.90	0.63	1.79	2.01	2.70	0.50
2.2.3 Enterprises providing ICT training	21.0	24.0	31.0	12.0	21.0	4.0	27.0	17.0	38.0	28.0	26.0	25.0	n/a	17.0	40.0	22.0	n/a	n/a	n/a
INNOVATION ACTIVITIES																			
Innovators																			
3.1.1 SMEs with product or process innovations	30.9	42.9	40.7	13.3	42.1	4.9	32.6	16.7	44.1	40.4	32.6	44.3	22.2	25.6	41.1	28.3	48.1	31.5	7.4
3.1.2 SMEs with marketing or organisational innovations	34.9	32.5	46.1	11.4	37.8	8.8	33.2	22.4	37.3	35.1	45.4	43.0	44.9	27.8	43.3	32.9	62.0	40.5	10.5
3.1.3 SMEs innovating in-house	28.8	35.0	35.0	8.3	25.6	4.5	26.1	13.9	38.3	35.1	19.0	n/a	21.6	18.7	35.2	23.8	42.5	22.5	18.7
Linkages																			
3.2.1 Innovative SMEs collaborating with others	11.2	17.5	20.5	3.5	7.8	1.8	13.2	8.4	16.8	13.5	24.7	20.6	12.9	7.1	19.0	4.9	8.7	6.3	1.5
3.2.2 Public-private co-publications	40.9	99.3	82.3	5.4	13.2	3.7	56.1	10.3	85.4	130.6	65.1	183.2	33.3	3.4	82.2	4.5	260.6	2.0	1.0
3.2.3 Private co-funding of public R&D expenditures	0.05	0.08	0.05	0.02	0.01	0.03	0.05	0.04	0.05	0.04	0.02	0.03	0.57	n/a	0.04	0.19	0.09	0.07	n/a
Intellectual assets																			
3.3.1 PCT patent applications	3.53	5.82	4.70	0.69	0.95	0.22	1.65	0.51	7.43	9.08	3.06	3.19	9.83	0.08	2.66	n/a	6.47	0.73	0.55
3.3.2 Trademark applications	7.86	9.78	13.09	5.33	8.10	2.64	11.09	4.49	12.30	11.44	6.95	6.26	3.52	3.24	3.79	3.68	17.87	1.34	1.85
3.3.3 Design applications	4.44	4.34	6.98	5.71	4.04	1.31	2.97	1.46	4.11	4.67	3.07	0.19	1.32	0.04	0.52	0.12	5.66	0.11	0.39
IMPACTS																			
Employment impacts																			
4.1.1 Employment in knowledge-intensive activities	14.2	17.1	15.0	10.3	10.6	7.7	13.7	10.6	16.2	18.5	18.5	19.3	26.9	6.3	15.4	14.4	21.4	6.7	12.9
4.1.2 Employment fast-growing firms innovative sectors	4.8	4.8	1.9	5.8	5.0	2.6	3.2	7.7	2.8	5.5	6.4	n/a	n/a	n/a	4.0	n/a	3.2	n/a	n/a
Sales impacts																			
4.2.1 Medium & high tech product exports	56.7	49.7	58.0	49.0	38.5	55.8	57.0	66.4	44.7	54.5	57.1	10.2	55.3	59.6	14.3	44.9	49.6	43.4	29.4
4.2.2 Knowledge-intensive services exports	69.2	77.7	43.1	40.2	41.1	46.2	36.0	33.2	70.3	73.2	71.7	57.1	65.7	25.5	78.3	47.6	68.0	31.9	49.2
4.2.3 Sales of new-to-market and new-to-firm innovations	13.37	10.81	11.98	6.45	6.27	6.51	12.44	19.12	9.27	6.89	20.81	6.07	11.90	3.30	6.16	7.94	19.62	10.51	3.30

Source: EU Commission – European Innovation Scoreboard 2018

European Innovation Scoreboard 2018 ranking (2/2)

	EU28	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT	LU	HU	MT
FRAMEWORK CONDITIONS																			
Human resources																			
1.1.1 New doctorate graduates	2.0	1.9	1.5	1.7	3.2	2.8	1.1	2.6	1.1	2.6	1.7	1.2	1.5	0.6	0.7	0.9	1.3	1.0	0.7
1.1.2 Population completed tertiary education	39.0	45.7	33.4	33.8	46.2	31.3	43.1	53.5	42.5	42.6	44.3	32.7	26.9	57.0	41.6	55.6	51.2	30.2	33.5
1.1.3 Lifelong learning	10.9	8.5	2.3	9.8	26.8	8.4	17.2	8.9	4.5	9.9	18.7	2.3	7.9	6.9	7.5	5.9	17.2	6.2	10.1
Attractive research systems																			
1.2.1 International scientific co-publications	517	1468	227	755	2346	812	1078	1249	608	732	726	492	632	1283	315	451	1715	456	597
1.2.2 Scientific publications among top 10% most cited	10.6	12.6	4.2	6.6	13.4	11.3	8.2	12.6	9.0	9.3	11.0	4.6	10.4	9.0	6.2	4.3	13.1	6.9	10.7
1.2.3 Foreign doctorate students	26.1	41.8	6.3	14.8	33.4	9.1	12.0	28.4	n/a	15.5	40.1	3.9	14.2	14.3	11.4	4.6	87.0	11.6	54.0
Innovation-friendly environment																			
1.3.1 Broadband penetration	16.0	26.0	12.0	12.0	42.0	14.0	17.0	18.0	5.0	25.0	12.0	7.0	7.0	5.0	19.0	28.0	25.0	16.0	20.0
1.3.2 Opportunity-driven entrepreneurship	3.3	1.6	1.0	2.7	11.1	4.0	3.4	2.6	1.5	1.8	4.6	1.2	2.6	1.8	3.0	2.2	4.8	2.4	n/a
INVESTMENTS																			
Finance and support																			
2.1.1 R&D expenditure in the public sector	0.70	0.74	0.21	0.64	0.97	0.94	0.61	0.35	0.57	0.55	0.78	0.46	0.50	0.27	0.33	0.55	0.60	0.29	0.23
2.1.2 Venture capital expenditures	0.116	0.107	0.037	0.006	0.064	0.069	0.111	0.135	0.001	0.102	0.240	0.021	0.055	0.075	0.285	0.054	0.352	0.079	0.000
Firm investments																			
2.2.1 R&D expenditure in the business sector	1.32	1.73	0.57	1.03	1.89	2.00	0.66	0.83	0.43	0.64	1.43	0.38	0.75	0.17	0.11	0.30	0.64	0.89	0.39
2.2.2 Non-R&D innovation expenditures	0.76	0.56	0.74	0.94	0.29	1.26	0.85	0.47	0.76	0.36	0.50	1.20	0.57	0.21	0.58	2.01	0.13	0.75	0.36
2.2.3 Enterprises providing ICT training	21.0	35.0	9.0	23.0	27.0	28.0	13.0	30.0	12.0	23.0	19.0	23.0	13.0	26.0	10.0	11.0	28.0	17.0	28.0
INNOVATION ACTIVITIES																			
Innovators																			
3.1.1 SMEs with product or process innovations	30.9	48.3	14.0	30.8	34.7	41.6	17.4	45.7	34.6	18.6	35.5	25.4	32.7	32.8	11.9	33.7	37.0	15.1	26.7
3.1.2 SMEs with marketing or organisational innovations	34.9	45.1	14.8	25.7	40.0	49.1	15.0	52.5	40.1	25.5	41.6	30.8	34.6	31.1	19.0	24.0	54.3	15.2	30.8
3.1.3 SMEs innovating in-house	28.8	39.8	11.2	28.0	28.2	37.9	15.8	41.3	31.4	14.5	31.5	21.1	30.5	30.5	10.2	30.4	32.2	11.7	23.9
Linkages																			
3.2.1 Innovative SMEs collaborating with others	11.2	28.6	3.1	10.0	13.2	10.1	10.8	13.9	14.8	6.7	13.2	6.8	6.7	11.7	2.8	15.2	9.2	6.2	4.2
3.2.2 Public-private co-publications	40.9	80.0	3.0	21.0	162.8	62.4	10.6	45.4	10.5	21.1	42.8	17.3	22.2	21.1	1.0	3.9	25.4	29.6	0.0
3.2.3 Private co-funding of public R&D expenditures	0.05	0.08	0.02	0.03	0.03	0.12	0.04	0.01	0.04	0.03	0.04	0.03	0.01	0.00	0.05	0.09	0.01	0.03	0.00
Intellectual assets																			
3.3.1 PCT patent applications	3.53	3.16	0.64	0.93	6.05	6.11	1.01	1.80	0.49	1.45	3.98	0.61	2.16	0.82	0.82	0.81	1.75	1.34	1.31
3.3.2 Trademark applications	7.86	8.11	9.10	5.09	12.79	9.51	16.55	5.08	4.92	8.99	6.04	4.00	8.46	43.15	7.77	7.39	37.70	4.15	40.88
3.3.3 Design applications	4.44	2.72	5.56	4.07	7.94	6.72	5.84	1.09	1.22	2.97	2.96	0.90	6.23	3.67	1.20	1.71	7.40	1.15	13.05
IMPACTS																			
Employment impacts																			
4.1.1 Employment in knowledge-intensive activities	14.2	15.6	10.2	12.9	15.1	14.8	13.5	20.6	12.1	12.5	14.5	11.6	13.7	17.0	12.1	9.7	22.0	11.6	18.4
4.1.2 Employment fast-growing firms innovative sectors	4.8	2.7	6.6	6.5	4.5	4.6	3.2	7.1	n/a	4.8	4.1	3.5	3.1	0.1	5.2	2.1	4.6	8.7	6.1
Sales impacts																			
4.2.1 Medium & high tech product exports	56.7	48.2	33.8	65.7	48.0	68.2	41.2	56.0	21.2	47.2	58.5	39.9	52.4	54.4	34.7	36.9	45.4	68.5	61.6
4.2.2 Knowledge-intensive services exports	69.2	68.9	39.0	43.8	71.7	74.6	48.6	94.2	42.2	33.1	67.6	19.1	50.9	70.0	52.4	22.0	92.6	49.0	33.9
4.2.3 Sales of new-to-market and new-to-firm innovations	13.37	7.60	4.80	14.57	6.96	13.34	10.49	18.07	12.75	15.94	15.02	4.91	10.06	4.49	5.31	8.57	6.54	12.47	4.12

Source: EU Commission – European Innovation Scoreboard 2018

Sahlgrenska Science Park aims to strengthen life science business in West Sweden. While supporting new companies to emerge, we also create the right conditions for established companies to develop and grow more rapidly. Our mission in West Sweden is to actively contribute to: the establishment of new and development of existing companies, innovation and competitiveness in the life science industry and collaboration between academia, healthcare and business.

Sahlgrenska Science Park is assigned by Business Region Göteborg, the Region Västra Götaland, the University of Gothenburg, Chalmers University of Technology and the city of Mölndal.

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