

OVERVIEW OF EXHIBITION

LIFE SCIENCES - ENABLING TOMORROW'S HEALTHCARE SOLUTIONS

MOUNTING OF PRINTS, TYPE A

TIMELINE 1
700 x 1,000 mm x 3



TIMELINE 2
700 x 1,400 mm x 1



TIMELINE 3
700 x 1,000 mm x 3



TIMELINE 4
700 x 1,000 mm x 3



TIMELINE 5
700 x 1,000 mm x 3



OPTIONAL ARRANGEMENT
depending on the character of the room you can place the module where you think it is suitable.

THE SWEDISH HEALTHCARE SYSTEM GUARANTEES EQUIVALENT HEALTH AND MEDICAL CARE

'According to the Swedish Health and Medical Services Act, care must be given with respect for the equal value of all people and for the dignity of the individual person.'

- Sweden is divided into 21 regions with responsibility for financing and providing healthcare. Funding consists primarily of regional and local taxes
- Healthcare is heavily subsidised, with low patient fees and a high-cost ceiling
- The entire population has access to care
- Sweden has free healthcare for children and young people under the age of 20
- Most hospitals are public, but in primary care there are many private actors
- Sweden has more doctors and nurses per capita than most EU countries
- The free choice of care and quick access to care are statutory
- Sweden is one of the EU countries spending the most per capita on healthcare



LIFE SCIENCES ENABLING TOMORROW'S HEALTHCARE SOLUTIONS

In recent decades there has been a fantastic development in healthcare around the world. More people than ever now survive cancer, heart attacks or strokes. Newly born babies with rare genetic diseases can now receive diagnosis and treatment so quickly that life-threatening conditions can be successfully averted. Developments in image diagnostics and genetic analysis, the understanding of how a cell works, the possibility of developing human proteins for treatment in cells, and gene therapies are some examples.

Sweden's dedication to the health of its citizens is evident, as the country has long focused on frontline medical research and innovation, while simultaneously giving all citizens affordable access to high-quality healthcare. But what makes Sweden's life sciences story so successful, both historically and as we look towards the future?

Several factors deserve credit, such as a strong level of collaboration (a quadruple helix of industry, academia, government and civil society) high-quality research, a substantial clinical infrastructure, efficient innovation hubs, an extensive system of bio-data resources, as well as a society-wide focus on prevention and health.



HEALTHY NORMS BEHIND PUBLIC HEALTH

Vision E-health 2025 is a national goal set for Sweden to become the leader in utilising digitisation and e-health opportunities by the year 2025. This vision is one of many that signal Sweden's commitment to issues of health and the life sciences, as the nation proactively develops a healthcare system that is already ranked high internationally.

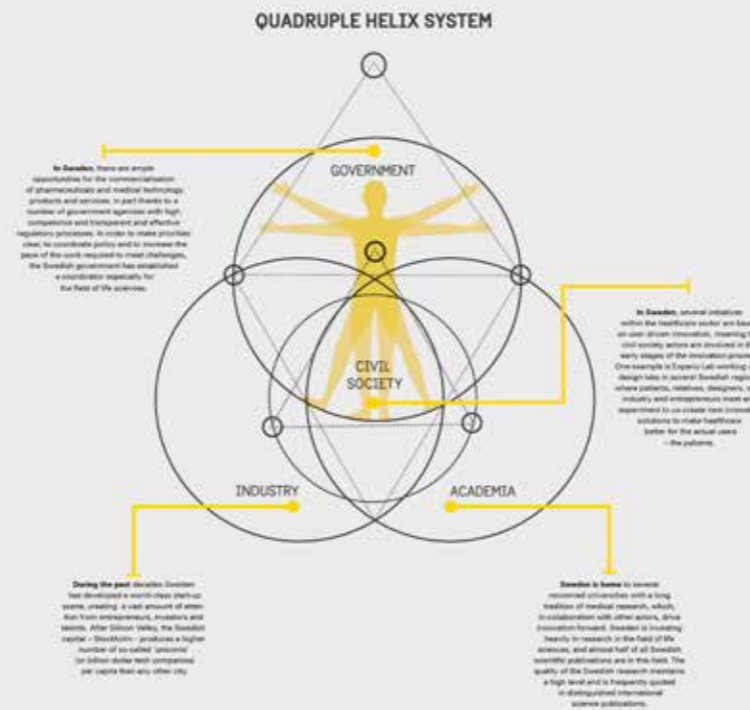
Swedes have a basically healthy attitude towards diet and exercise. Government food recommendations, sports activities and outdoor days at school, and a widespread membership in amateur sports associations have long been part of the typical Swedish everyday life. School nurses, childhood vaccination

programmes, subsidised eyewear and free dental care up to the age of 23 are examples of preventive societal efforts. Many Swedish workplaces have both wellness and exercise periods during working hours. All to increase the prospect of a healthy population.



COLLABORATION IS KEY

One of the main underlying factors for Sweden's success as a life sciences nation is collaboration. There is a strong drive for and a long tradition of collaboration among healthcare providers, researchers, business interests and academia.



Collaboration appears in many forms, including at national specialist research centres, science parks and hubs, start-up companies and large corporations. Another example is the development of living labs where civil society, often users, is collaborating with other actors in the innovation process, creating a quadruple helix system, together with the traditional actors in triple helix collaborations – government, industry and academia.

THE HUGE POTENTIAL OF BIOBANK SWEDEN AND AIDA

Ensuring the use of the biological samples in biobanks for the purpose of research, screening and treatment is of utmost importance for developing the healthcare sector.

Biobank Sweden is a unique resource that includes more than 150 million tissue samples and associated healthcare data. The dominant part (95%) consists of samples taken for diagnosis. The healthcare centres and hospitals also collect thousands of tests for research in registry analyses, academic studies, clinical trials and the like.



Another potential use of Swedish data is to take advantage of new technologies based on analysis of large amounts of structured, high-quality data such as machine learning and AI.



AIDA is a national arena for research and innovation into the use of AI for medical image analysis. Modern AI fits perfectly into the healthcare objective of tailoring treatment for each patient. Not least in image diagnostics, such as radiology and pathology, many research studies have shown that AI has enormous potential to contribute to higher quality and efficiency in healthcare. Academia, healthcare and industry come together under the AIDA project to translate technological advances in AI to benefit patients.

A SWEDISH TREASURE CHEST OF STRUCTURED DATA AND BIOLOGICAL SAMPLES

Another feature of Swedish society that aids the life sciences is the system of national personal registration. Since 1947 each and every Swede has been assigned a unique personal identification number that allows data for a specific individual to be linked between different archives and records. The number is used for contacts with authorities and for all healthcare documentation.



SWEDEHEART – THE MORTALITY RATE AFTER A HEART ATTACK HAS MORE THAN HALVED

Healthcare centres throughout Sweden every day register problems, measurements and results based on each individual patient. In 2015, the national quality registries released data for approximately 580 research projects and published more than 400 scientific articles.

An example of Swedish quality registries is Swedeheart. For 20 years, Swedeheart has been working to improve care for patients suffering from myocardial infarction, commonly known as heart attacks. During this period, the number of deaths due to heart attacks has halved, from just over 18,000 to about 7,000 per year. The decrease is seen in both women and men, and in all age groups.

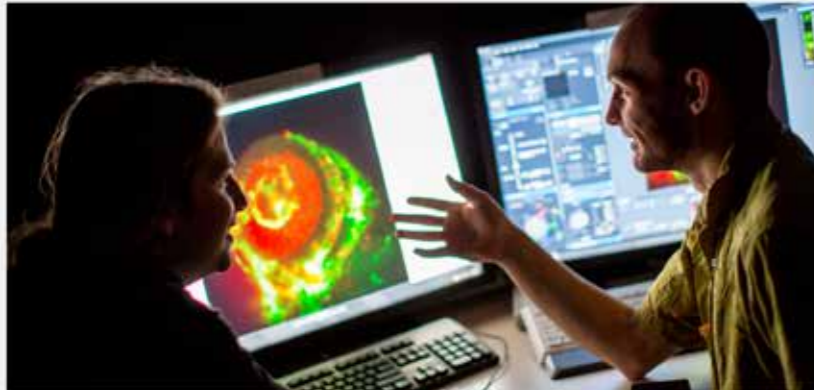
Heart research is estimated to have saved more than 150,000 lives and EUR 76 billion in costs over the past 30 years. Swedish heart research has also resulted in scientific articles in some of the most renowned medical journals. Thus, Swedeheart has influenced the care of heart disease worldwide.



EXAMPLES OF RESEARCH FACILITIES THAT CONDUCT WORLD-LEADING RESEARCH

SciLifeLab is a national centre for the molecular biosciences with a focus on health and the environment, to which more than 150 research groups are affiliated. The centre provides national access to advanced technologies and information. SciLifeLab collaborates with health and medical services,

authorities and the business community in order to apply re-search results directly in society in the form of new clinical methodologies, new drugs and an improved environment. Many successful projects are based on one or more of the technology platforms from SciLifeLab.



MAX IV Laboratory, which today has the world's brightest synchrotron, has been around for 30 years. The new facility was inaugurated 2016. Close to MAX IV, the European Spallation Source (ESS) is being built as a joint European research facility, which will be an important resource for researchers from all over Europe. Both of these facilities give researchers from academia and industry the opportunity to study not only the structure and function of proteins and biofilms, but also other types of material research with applications in areas such as energy and the environment.



SWEDEN IS INVESTING HEAVILY IN INFRASTRUCTURE FOR RESEARCH IN LIFE SCIENCE

Sweden is actively working to improve infrastructure for clinical studies where healthcare, researchers and the business community work together for the patient's best interests. All of these are available to researchers across the country and are open to collaboration between researchers and industry, both nationally and internationally. Swedish law gives researchers the right to the research they carry out; they can themselves apply for patents and can choose when and where their research results should be reported.



FROM IDEAS TO RESULTS

The Swedish life sciences industry comprises more than 40,000 employees in about 3,000 companies. A strong contributing factor in the increasing number of start-ups is the current trend of global companies to open their processes for innovation to collaboration with smaller companies, academia and the healthcare sector to exploit the opportunities with digitalisation in health and life sciences. Together, these environments give an entrepreneur or researcher the opportunity to transform research results or new technology into marketable innovations.



the development and production of biological drugs. TestaCenter offers infrastructure for the verification and validation of large-scale production processes.

Sahlgrenska Science Park in Gothenburg brings together life sciences participants and a large network within the business sector to deliver expert knowledge and experience based on commercial viability.

Medicon Village is a life sciences-oriented research village in south of Sweden. Medicon Village is home to both private enterprise, innovative support and academic research, primarily Lund University's cancer unit. Researchers, innovators, business people and other experts are able to work together and exchange ideas. The entire health chain is represented – prevention, diagnostics, treatment and care.



The Stockholm-Uppsala region is Sweden's largest life science cluster. It includes half the business community in life sciences, five universities and health and medical care for almost three million people.

BioVentureHub located in the heart of Astra Zeneca's research facility outside Gothenburg, acts as a nursery for research companies within the pharmaceuticals and medical technology sectors. Companies gain access to research resources, knowledge and an international research environment.

The ambition for TestaCenter is to contribute to developing Sweden as a global leader in

COMBATTING ANTIBIOTIC RESISTANCE

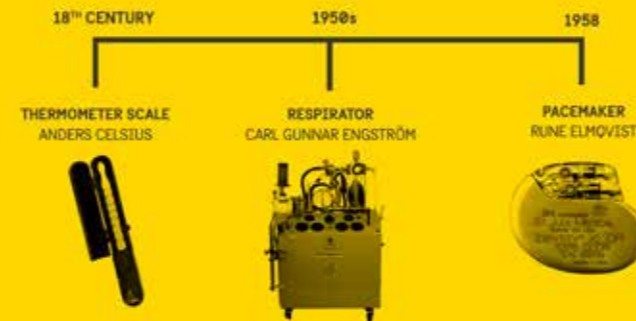
A different aspect of preventive care is how to face the threat of antibiotic resistance. Antibiotics save lives, a situation people have long taken for granted. The increase in antibiotic resistance is a major global health risk, and there is broad political consensus in Sweden to prioritise efforts to combat the trend. In 1986 Sweden was the first country to stop using antibiotics in feed for growth-promoting purposes in healthy animals, which has since become law throughout the EU. Sweden has initiated and hosted the international research collaboration Joint Programming Initiative on Antimicrobial Resistance, which now includes 27 countries.



A LOOK AT SWEDISH LIFE SCIENCE INNOVATIONS

Historically, Sweden has shown innovative power in terms of biological drugs, that is drugs whose active substance has been produced in, or purified from, living cells or tissue. Swedish-based Pharmacia developed one of the first protein drugs, a coagulation factor that replaces the deficiency of haemophiliacs.

Sweden also has a history filled with inventions, including Anders Celsius' thermometer scale from the 18th century, and Carl Gunnar Engström's respirator from the early 1950s. The implantable pacemaker is another Swedish invention, which allows millions of people with heart disease to live a normal life.



SWEDISH INNOVATION OF TODAY

PRECISION RADIATION MEDICINE

Elekta is a global medical technology company that is committed to ensuring that everyone with cancer has access to – and benefits from – precise and personalised radiotherapy treatments. Every year, more than 15 million people globally are diagnosed with cancer. Radiotherapy remains an important component of cancer treatment with approximately 50 per cent of all cancer patients receiving radiotherapy, and every year around 1.5 million patients around the world are treated with Elekta's clinical solutions.



BIO-INKS AND BIOLOGICAL TISSUE

Cellink, a Swedish-American company founded in 2016, produces bio-inks and 3D bioprinters developed in-house that make it possible to print biological tissues. The bio-ink consists of nano-cellulose and it is mixed with the cells that are to be examined. Testing of medicines and cosmetics can be done on the printed tissue, rather than on experimental animals. A long-term goal is to be able to print human spare parts. Today, the company's technology platform is being used to print tissues such as liver, cartilage, skin and even fully functional cancer tumours.

EXPERIENCE BIKING

BikeAround is an experience bicycle for elderly people, sufferers of dementia or Alzheimer's, or people with cognitive disabilities. It combines physical, social and cognitive activation. The bike is placed in front of a curved screen where images from Google Street View are projected. As the user pedals, the images move, and allows the user to cycle to places they have a personal relationship to and can bring memories to life, or even allow them to visit new places virtually.

