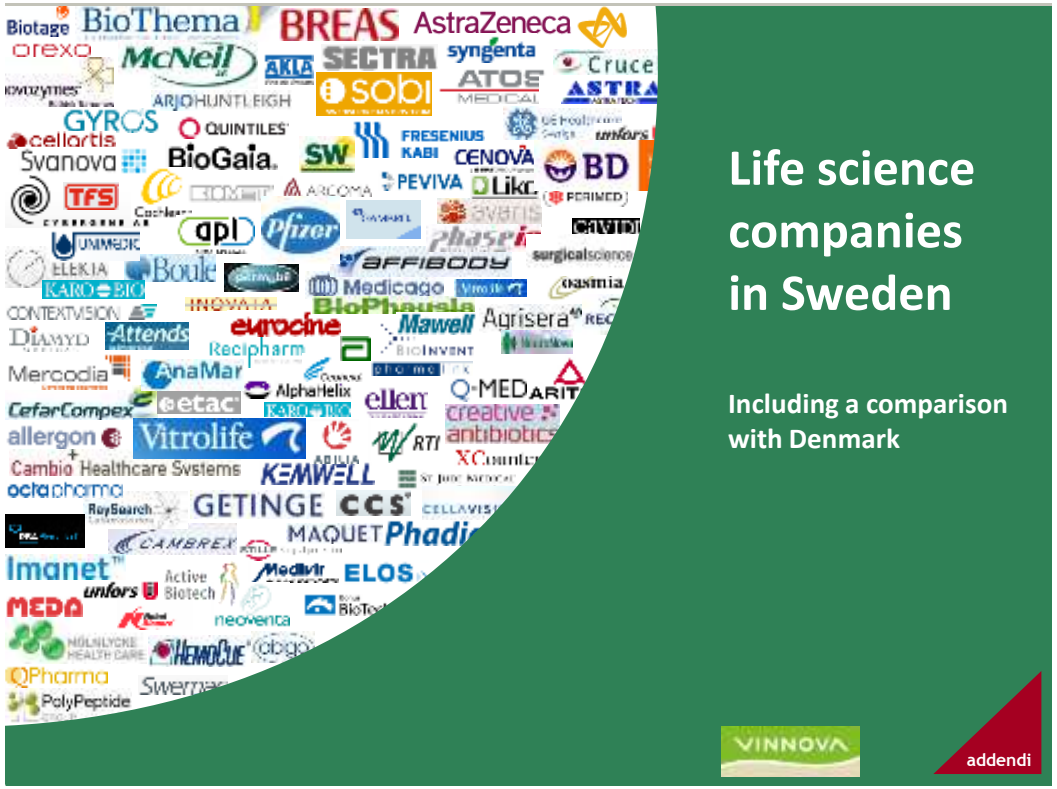
VINNOVA ANALYSIS
VA 2011:03

Life science companies in Sweden

Including a comparison with Denmark



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Today, life science is considered a critical foundation for long-term innovation and growth in many countries' industry and society. The life science industry is an important branch of industry, of economic and political significance to today's Swedish society. Accurate knowledge of the extent, structure and development of this industry is essential for sound policy decisions. Some of the technologies used by the life science industry are also used by such things as the forest, pulp and paper industry as well as the food industry but those companies are not included in the study.

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Life science companies in Sweden
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VINNOVA
in collaboration with

Stockholm-Uppsala Life Science / Uppsala BIO
Västra Götalandsregionen / GöteborgBIO
Region Skåne / Medicon Valley Alliance
Biotech Umeå
BioMedley / New Tools for Health

Initiator

Contents of the report

Summary

In Sweden the number of employees in the life science industry involved in manufacturing, consultancy, product development and/or research and development (R&D) in 2009 was about 32,000. The corresponding number of employees for 2006 was about 34,000 employees, i.e. a reduction with almost 2,000 employees. Overall, the present study covers about 700 companies, when individual companies within the same corporate group with similar activities and products are grouped. The study gives a snapshot of the companies' activities in Sweden in 2009, grouped by business segment, type of activity and region. Companies focusing on sales and marketing of life science products are not included in the cluster profile; they correspond to about 325 companies and over 8,600 employees. This gives a total of about 40,600 people employed in the industry.

The Swedish life science industry is dominated by AstraZeneca AB which has about 25% of the total number of employees. The industrial structure includes about 25 large companies, a limited number of medium-sized companies (about 50) and a large number of small and micro-sized firms. Since the acquisition of Pharmacia Corporation, Pfizer has divested most of the Swedish business segments; an exception is the Bioproduction facility in Strängnäs.

A snapshot of the corresponding corporate population in Denmark in 2009 is also included. In Denmark the number of employees in the life science industry involved in manufacturing, consultancy, product development and/or R&D in 2009 was almost 36,400 employees in 325 companies (37,400 employees in 2006). Novo Nordisk dominates the Danish life science industry with more than 25% of the employees. Several of the large Danish companies are controlled by foundations, such as Novo Nordisk, H Lundbeck and Leo Pharma.

Both Denmark and Sweden have seen a small downturn in the number of employees in the industry since 2006. For Sweden this is largely due to the reduced number of employees for AstraZeneca and Pfizer, whereas the reduction in the number of employees in Denmark is spread over several of the large companies who are jointly responsible for most of the Danish trend.

Over the period 1997-2009, the total employment in the Swedish life science industry increased by 38%. The dynamics exclude the development for the business segments Assistive products for disabled people and Healthcare facility products and adaptations since no full account of those business segments is available for previous years.

During the entire period studied (1997-2009), the biotech sector saw a 3.0% increase and the pharmaceutical sector increased by 1.2%. The medical technology sector increased by 8.6% in the years 2003-2009 (again excluding Assistive products for disabled people and Healthcare facility products and adaptations). The trend with an increasing number of companies has continued throughout the whole period 1997-2009. It is the number of micro-sized companies (1-10 employees) that has increased most dramatically, from about 130 in 1997 to about 430 in 2009.

There has been a decline in the number of employees since the peak year 2005. This is primarily because AstraZeneca AB, Pfizer Health AB and Pfizer AB have jointly reduced their number of employees by more than 4,400. On the other hand, the number of employees in other large companies and corporate groups has increased by more than 17% since 2005; an increase of almost 1,600 employees. The number of employees in SMEs (1-250 employees) has been almost constant since 2005.

The Swedish life science industry is largely concentrated on five life science regions with the Stockholm/Uppsala region as the largest followed by Malmö/Lund and Gothenburg. The other life science regions are Umeå and Linköping with far fewer employees. The region which has shown a clear increase in the number of employees from 2006-2009 is Malmö/Lund. The bi-national cluster Medicon Valley has more employees than any of the Swedish-only regions.

The vast majority of employees in the Swedish life science industry work in companies with positive relative results. The medium-sized companies (51-250 employees) show a higher share of positive results than the small (11-50 employees) and micro-sized companies.

Concerning trade in goods, only the paper and cardboard category scores higher than pharmaceuticals when it comes to net export. For medical technology products, net exports have been steady during 2005-2009 but lower than in 1998-2004. It is not possible to trace the trade in biotechnology products in the same manner as pharmaceuticals and medical technology, since these products are spread among many categories in the statistics.

1. Introduction

In many countries today, life science is considered a critical foundation of long-term innovation and growth in industry and society. The life science industry is an important segment with economic and political significance for today's Swedish society. Accurate knowledge of the extent, structure and development of this industry, combined with information about international industrial and scientific trends, is essential for sound policy decisions. Some of the technologies used by the life science industry are also used by other sectors such as the forest, pulp and paper industry and the food industry but these are not included in the study. Only companies focusing on the business segments described in the next section are analysed.

The present study focuses on companies but does not account for other parts of the innovation system such as the healthcare sector, public authorities, universities or other research organisations which are important players in the life science innovation system.

The overview presents different aspects of the Swedish life science industry and is based on the life science company database created and categorised by VINNOVA. Data has been compiled because the official NACE categories (statistical categories usually used to classify companies by industry) cannot easily be used for life science companies, as they are scattered among many NACE categories. Thus, NACE categories have been used to identify some of the relevant companies and in the present study have been combined with other sources of information to obtain the total company population. It should be noted that there is a delay between registering a new company and that company submitting its first annual report to the Swedish Companies Registration Office. Also, other changes due to mergers, acquisitions and liquidations appear with some delay in the statistics.

The companies have been classified into different sectors, business segments and core activities. The sectors are defined as the medical technology sector, the biotechnology sector and the pharmaceutical sector and the companies are also further divided into business segments. The companies' activities are categorised under the following headings: manufacturing, consultancy, product development and research and development (R&D). The way the companies have been categorised into business segments and activities will be described in the following section.

The analysis of the life science industry includes cluster profiles, development of employment and the development of relative results as well as the balance in trade in goods for pharmaceuticals and medical technology. The cluster profile is based on the distribution of individual companies in sectors, the size of the companies in terms of employees, business segments, geographical location and activities. This gives a snapshot of the life science industry as at 2009. In addition, R&D-intensive companies are classified based on whether they have a net turnover exceeding SEK 0.5 million or not. The firm development describes how the number of companies and employees has developed for the life science industry, included sectors and business segments over the period, 1997-2009. The development of relative results describes the results after financial items relative to the net turnover. Together, these aspects: the cluster profiles, geographical location, development of employment and relative results development, aim to give insights into the size, structure, development and performance of the Swedish life science industry between 1997 and 2009.

A Danish company database was constructed in the same fashion as the Swedish one in 2007 and was updated in 2010. The data on Denmark for 2009 was provided by Medicon Valley Alliance (Martin Andersson) as commissioned by Region Skåne. A bubble diagram has also been constructed for Denmark, allowing the Medicon Valley region to be described as well.

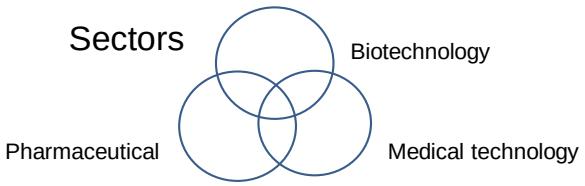
2. Variables

Sectors and business segments

Each company has been individually categorised into both a business segment and what sector or sectors the company belongs to according to each company's main business. Companies with their main activity in business segments other than those listed below are not included in the study, even if they have such activities to some extent. Due to the definitions of the three sectors, there are companies whose activity can be categorised as belonging to more than one sector. For instance, there are many companies within drug discovery that could be defined neither as exclusively pharmaceutical nor as exclusively biotechnology companies. Therefore, each company has been classified into one specific business segment, whereas an individual company can be found in more than one sector.

The characteristics of companies falling into the medical technology sector are that they develop medical products that are not drugs. The characteristics of companies falling into the pharmaceutical sector are that they develop drugs and various kinds of therapeutic products or methods. The biotechnology sector is characterised by companies developing the application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services. The OECD definition of biotechnology activities has been used to identify biotech companies and the definition is listed at the end of the report. In the sector categorisation of each individual company, the approach or method used to solve a problem or satisfy a customer or patient need was often crucial to this categorisation.

Together, these three sectors constitute what is known as the life science industry. The business segments included in this study are described below.



Business segments

Drug discovery and development

Companies can be found in *Pharmaceuticals* and *Biotechnology*.

- Research and development of new drugs and therapies. Very few pharmaceutical companies develop new drugs without using biotechnological tools. However, not all companies have the development of biopharmaceuticals, i.e. drugs based on large biological molecules such as proteins, as their goal. Rather, the large biological molecules are targets for the drugs developed. The drugs can be small molecules produced by organic chemical synthesis. In some cases, manufacturing, sales and marketing is also included in the individual company. The companies seek to develop new therapies to put on the market or licence to pharma companies generating up-front and milestone payments, royalties and possibly revenues from sales on divided markets, depending on the agreement. Biomarkers to help identify patient populations that benefit from a specific therapy are expected to become increasingly important.

Drug delivery

Companies can be found in *Pharmaceuticals* and *Biotechnology*.

- Companies in the drug delivery business segment are conducting research on how the active substances in medicines can be made to reach their target molecules in the body and how a satisfactory uptake of these substances can be ensured. Their clients are mainly companies involved in drug discovery and development. An increasing business area includes developing new formulations for existing drug substances, so that they can be better used for the same indications or for new ones. Using existing substances reduces development time, as they have already passed the regulatory process for another indication. The field of nanobiotechnology is expected to generate new solutions on how to administer drugs more specifically. Polymer chemistry, nanotechnology and surface chemistry are examples of possible required expertise.

Drug production (not biotech)

Companies can be found in *Pharmaceuticals.*

- Companies specialising in drug production which do not have their own research operations are included in this business segment. The use of biotechnology in the manufacturing of drugs is not included. Instead, those companies are found in the Bioproduction category. Important issues include development of cost-effective process and production technology as well as regulatory requirements.

In vitro diagnostics

Companies can be found in *Biotechnology* and/or *Medical technology.*

- The companies develop tools and techniques for diagnostics and most of their customers are the healthcare sector, clinical laboratory analysis companies and end consumers for home use. The biotechnology diagnostic companies often develop antibody-based tests. Medical technology diagnostic products can be technical appliances for measuring or visualising diagnostic results, or in vitro diagnostic tests. A difference compared to companies developing new drugs is that the process from idea to commercialisation of diagnostic products, processes and services is usually much shorter.

Biotech medical technology

Companies can be found in *Biotechnology* and *Medical technology.*

- Provides health services within that part of medical technology which has a biotech basis according to the OECD definition, including equipment and instruments for in vitro fertilisation, substitute plasma, blood management, cell therapy, plus the use of biodegradable biomaterials to replace or repair damaged tissue often referred to as tissue engineering and regenerative medicine.

CRO companies

Companies can be found in *Pharmaceuticals, Biotechnology* and/or *Medical technology.*

- CRO (Contract Research Organisation) companies include clinical research organisations dealing with products and services for assisting other companies in clinical trials and regulatory processes. The companies being assisted may be biotechnology, pharmaceutical or medical technology companies. Clinical research organisations need to be familiar with international regulations and regulatory bodies as well as having well-developed contacts in clinical research, hospitals and authorities. Some CROs have developed a technology platform or analysis system that is managed within the company and accessible to companies by contract research to help bring products through the regulatory system.

Bioproduction (healthcare related)

Companies can be found in *Biotechnology* and *Pharmaceuticals.*

- Biotech production of biomolecules, cells or microorganisms for use in healthcare-related products such as diagnostics and pharmaceuticals. These are specialised manufacturing companies whose clients include the pharmaceutical sector, other biotech companies or research groups. The biomolecules are often enzymes or antibodies. The companies' core expertise is development of cost-effective production solutions - adapting their activity to internationally stipulated regulatory requirements on quality and safety, plus an ability to adapt to customer requirements.

Biotech tools and supplies

Companies can be found in *Biotechnology.*

- Develop products and services for use in production, research and development. This includes products and services relating to bioseparation, biosensors, biomolecular analyses and bioinformatics. Their customers mainly consist of other biotechnology companies, the pharmaceutical and medical technology sector and university research teams but also other industries basing their products on biological raw materials, for instance in the food, forestry and agricultural sectors. Their expertise lies within application of interdisciplinary expertise combining technologies such as electronics, ICT, optics and materials engineering with life science to develop their products and services.

Agrobiotechnology

Companies can be found in *Biotechnology.*

- Develop plant-related products utilising biotech methods, for example as tools in the cultivation work for plant or tree breeding. However, few companies use gene technology as a method for obtaining specific properties in the end products (genetic modification). Also included is plant protection based on naturally occurring microorganisms or biomolecules as well as the processing of land-based raw materials with the aid of biotechnology.

Environmental biotechnology

Companies can be found in *Biotechnology*.

- Biotech solutions to environmental issues such as water purification, land decontamination (bioremediation) and waste management, as well as laboratory analysis. Their customers include municipalities, construction companies, and industries requiring such things as purification of water used in manufacturing processes. Companies within this field have very diverse focuses and it is therefore difficult to highlight a common core expertise. Some of these companies use non-pathogenic, naturally occurring microorganisms to treat waste, water or soil and the laboratory analysis companies develop specific testing methods and analytical measurement tools, to measure toxic substances for instance. However, biosensors are included in the Biotech Tools and Supplies business segment.

Food related biotechnology

Companies can be found in *Biotechnology*.

-The products of companies in the field of Food related biotechnology include biotechnically-produced components or ingredients for the development of foods with positive health benefits, such as probiotics. Food products in this field are sometimes referred to as functional food. This denotes a product with a documented, well-defined, product specific diet-health relationship. The aim of these products is to reduce the risk of developing diseases rather than cure them. Examples of other possible areas found in the segment include use of enzymes in food processes or as additives, or the development of quality control in the food sector by means of new biotechnological techniques. These companies are often intermediaries between academic research and the food industry. They need both expertise within their niche, (within, say, microbiology, nutrition and process technology) and knowledge of potential markets, public attitudes/demand and the needs of the food industry. The food industry, which uses biotech tools in its production processes for example, is not included in the population.

Industrial biotechnology

Companies can be found in *Biotechnology*.

- Biotechnology applied to industrial processes for large-scale biotechnological production, such as designing an organism to produce a useful chemical or using enzymes as industrial catalysts to produce valuable chemicals. Industrial biotechnology solutions tend to consume fewer resources than traditional processes used to produce industrial goods. The chemical, forest, pulp and paper industry and the food industry has not been included since the core competence in those companies is not biotechnology, even if the technology is used to some extent. However, most of the development of biotechnological processes in these industries does occur in large companies that do not have biotechnology as their core activity. There are few intermediary companies commercialising academic research in this field. Therefore, very few companies devoted to Industrial biotechnology are included in the present study.

Implantable devices - active and non-active

Companies can be found in *Medical technology*.

- Implantable dental, orthopaedic or other medical devices are included in this segment. They may be biologically active, like pacemakers and bone-anchored hearing aids, or non-active, like hip and knee joint replacement and cardiac stents. Specialist expertise is needed in various medical fields, materials science and tissue response to materials (risk of infection). Materials may include titanium, ceramics and steel. Implants are usually developed in close collaboration with the healthcare sector.

Anaesthetic and respiratory devices

Companies can be found in *Medical technology*.

- Development of anaesthetic equipment and solutions for supervision or control of respiration. The products are mainly used for critically ill patients i.e. intensive care (respiratory equipment) and in operating theatres (anaesthetic and/or respiratory equipment). Anaesthetics may be delivered to the patient intravenously or by inhalation. Products are developed in a combination of medical expertise, including anaesthetic properties of different gases, as well as expertise in a number of engineering fields such as mechanics and electronics for pneumatic systems, valves and sensor technology and computer programming for monitoring and control systems.

Electromechanical medical devices

Companies can be found in *Medical technology*.

- Technical equipment used for patient care and supervision or visualising of conditions. This business segment includes a broad range of products used in many medical fields such as critical care systems, perinatal monitoring and dialysis equipment. Many companies are large with diversified business and

may also develop products falling into other business segments. The companies identified require technical as well as medical expertise.

Radiation devices - diagnostic and therapeutic

Companies can be found in *Medical technology*.

- Develop products used in nuclear medicine such as devices for radiotherapy and radiology examinations, such as magnetic resonance imaging, computed tomography, positron emission tomography, X-ray and ultrasound devices. Laser therapy devices are also included in this business segment. The companies identified require technical as well as medical expertise.

Ophthalmic and optical products

Companies can be found in *Medical technology*.

- Companies dedicated to surgery or medical appliances within the field of ophthalmology. The required expertise may include ophthalmic surgical technology like cataract surgery. Products include laser vision products, eye surgery products and computer software for imaging the inside of the eye. The latter may be used for diagnosing eye conditions.

Dental devices

Companies can be found in *Medical technology*.

- Develop instruments and technical appliances used by dentists as well as disposables and supplies for use in dental clinics. Dental implants are found in the business segment "Implantable devices". On the other hand, dental laboratories and such things as toothbrushes and toothpaste are not included.

Reusable and single-use devices

Companies can be found in *Medical technology*.

- Disposable products used in patient care, such as dosage cups, hypodermic needles, sponges, contrast agents, incontinence and wound care products, syringes, gloves etc. are included as are reusable products such as surgical instruments. These companies are often manufacturing companies. Knowledge of industrial processes, sterilisation techniques and materials science is important. Characteristic of some companies is knowledge of the processes behind wound healing and the optimal conditions for wound care.

Information and communication tools

Companies can be found in *Medical technology*.

- Software and IT solutions for patient care or supervision etc. The segment includes training software for patients and personnel in the healthcare sector, ICT solutions for communication between patients and the health service regarding such things as scheduling appointments and information regarding specific conditions. ICT home care solutions are also included. The products also often facilitate the handling and integration of large volumes of information or provide analytical tools for clinicians that for example can function as diagnostic support.

Healthcare facility products and adaptations

In the bubble diagram but not in the dynamic diagram

Companies can be found in *Medical technology*.

- Companies producing machines, fittings and furniture for health services such as machines for disinfection and sterilisation, lighting, patient lifts (transfer aids), hygiene systems, examination couches and treatment tables. To be included, their major business must be products specifically for the healthcare sector. The companies are often manufacturing companies with an understanding of needs within the healthcare sector.

Assistive products for disabled people

In the bubble diagram but not in the dynamic diagram

Companies can be found in *Medical technology*.

- Develop products such as walking aids, wheelchairs, prosthesis, hearing aids which are not bone-anchored and orthopaedic devices. Providers of fittings and service concerning orthopaedic devices connected to the health service are not included.

Activity category

Research & development
Companies with exploratory research and development .
Within some companies there is also sales and marketing activity and manufacturing.

Net turnover more than 500 000 SEK / year

Net turnover up to 500 000 SEK / year

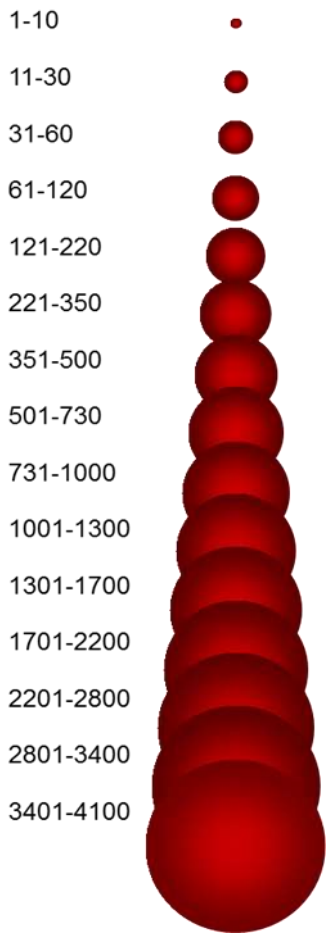
Incremental product and service development
Companies which principally develop their own products/services, i.e. incremental product development without elements of exploratory research.

Consultancy
Companies which principally carry out consultancy and commission activity. All CRO companies are included here.

Manufacturing
Manufacturing of products. Includes companies specialised in manufacturing but also the production units of integrated companies with more than 500 employees.

Number of employees

What is shown as “number of employees” in the report is the mean value of the number of full-time equivalent (FTE) employees each year included, i.e. the number reported by companies in their annual report to the Swedish Companies Registration Office. The actual number of people employed in companies may be 20-30% higher due to part-time posts, leave of absence etc.



The size of companies, measured by number of employees, is given as a bubble where the size of the company or operation is proportional to the volume of the bubble.

Following contact with the companies, those with more than 500 employees have been divided into different activity categories (rather than different business segments). The bubble highest on the vertical axis is downsized according to the number of employees in other activity categories and new bubbles are created for those units. Since an activity category for sales and marketing is not included, the employees of an integrated company with that activity are found in the bubble highest on the vertical axis.

Companies with operations in different regions are shown as bubbles, where the volume is proportional to the number of employees in each region.

Regions

SWEDEN

Stockholm/Uppsala
Comprising the counties of Stockholm, Uppsala and Södermanland. Ongoing initiatives are, “Stockholm-Uppsala Life Science”, “Uppsala BIO”, “BiotechValley” and “Stockholm Life”.

Malmö/Lund
Comprising Skåne county. The ongoing initiative is “Medicon Valley Alliance”, which also includes Zealand in Denmark.

Gothenburg
Comprising the counties of Västra Götaland and Halland. Ongoing initiatives are GöteborgBIO and MedCoast Scandinavia, which also includes the Oslo region (Oslo not shown in this study).

Linköping
Comprising the county of Östergötland. The initiatives in operation are “BioMedley” and “New Tools for Health”.

Umeå
Comprising the counties of Västerbotten, Norrbotten and Västernorrland. The initiative in operation is “Biotech Umeå”.

Rest of Sweden (Others)
Includes the identified companies which lie outside of the regions described above.

DENMARK

The Danish corporate population is divided into two regions:
Zealand and NCS (north, central and south) Denmark.

Comments

Companies included
Companies which have their major activity within the previously described selection of business segments with at least one employee in 2009 are included in the bubble diagram and listed later in the present report. Similarly included in the dynamic diagrams are companies with employees in any of the years 1997-2009 and whose major activity is in the previously described selection of business segments.

Companies not included
Companies devoted to sales and marketing of life science products are not included. Subcontractors to companies within the selection of business segments which do not have their core activity within these fields of expertise are not included. This may apply to such enterprises as design companies, companies within manufacturing (if the operation is not entirely concentrated on included business segments), ICT, mechanical, optics and electronics companies, PR agencies, venture capital companies and patent and business advisers. In recent years, a number of staffing companies providing personnel to the life science industry have also appeared. The scope of all these activities is difficult to estimate. Also excluded are companies in the chemical, pulp and paper and food industry which may have some biotech activities, but not as their core competence.

Companies conducting laboratory analysis services, often service laboratories to the healthcare sector, plus orthopaedic and dental laboratories and companies developing products sold by opticians have not been included at all in the present study.
Companies developing laboratory equipment which can be used in many sectors are not included in the bubble diagram. However, some such companies with manufacturing, product development or R&D in Sweden have been identified. They have approximately 300 employees in 13 companies and are not listed in the present report.

Division of companies into regions and different activity categories
For companies with operations in several regions, their activity in each region is shown. Companies with more than 500 employees are also divided into different activity categories shown as separate bubbles, showing such things as the number of employees within manufacturing.

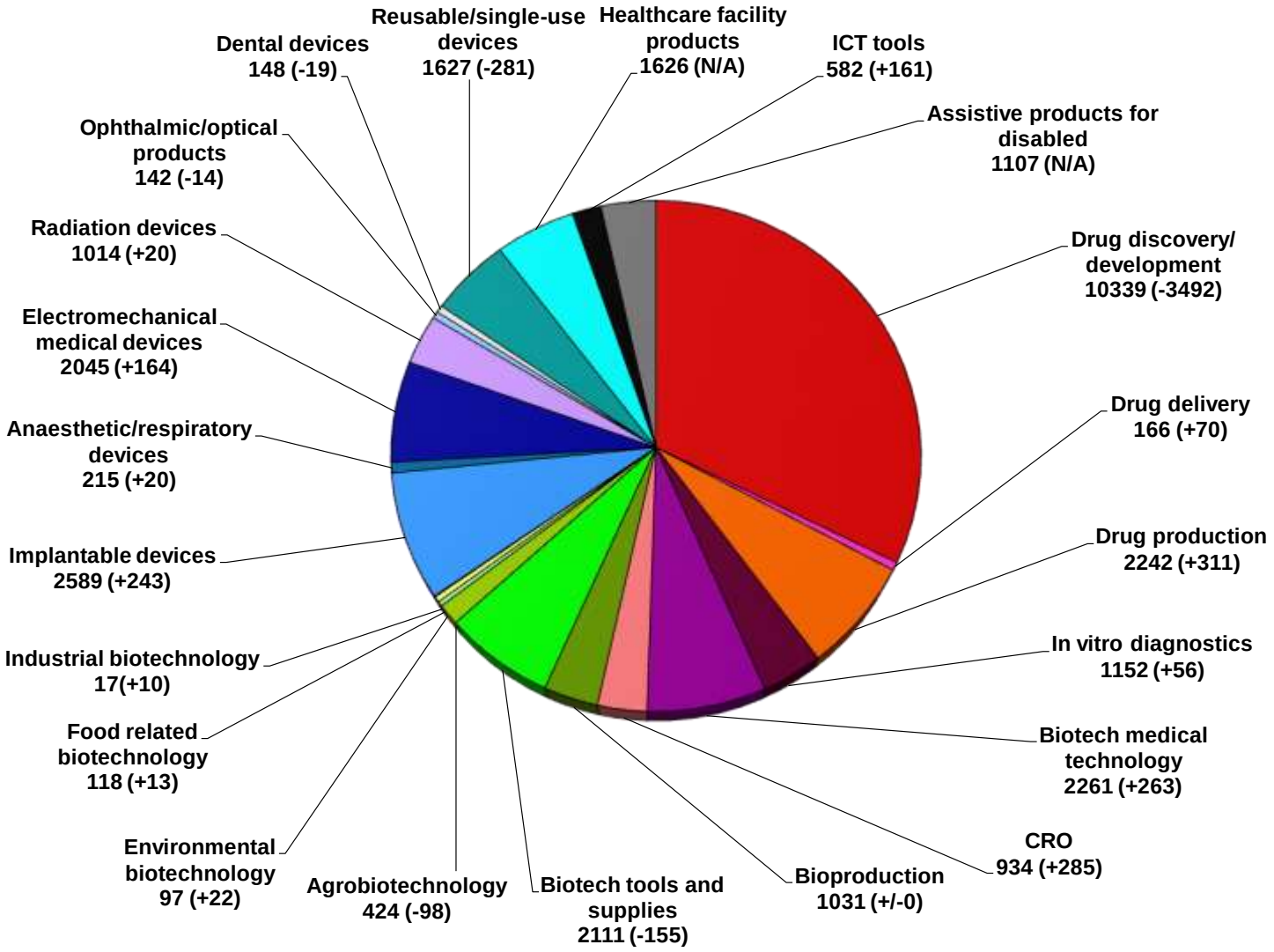
Assessment
Details of business segments, activity categories and markets are not available in general statistics, but require assessment based on information from different sources. The categorisation was made by VINNOVA.
Companies with fewer than 500 employees and several activity categories within the company have been placed in the activity category which is highest on the vertical axis. This means if the company has both product development and manufacturing activities, they appear under “Product development” on the vertical axis.

Bubble diagram
The bubble diagram used in this study shows four variables simultaneously:
• Geographical location (horizontal axis)
• Activity category (vertical axis)
• Business segment (colour)
• Company size in terms of the number of employees (bubble size)
Readers may thus draw their own conclusions based on different combinations of the variables.

Dynamic diagrams
The database for the biotechnology and most of the pharmaceutical industry dates back to 1997 including no longer existing companies as well as number of employees and financial data for the companies. Thus dynamic diagrams regarding such indicators can be obtained for the period 1997-2009. The number of companies is calculated for each year depending on the criteria selected for analysis, such as size class and business segment. The medical technology database was largely constructed in 2003. Thus, data for 1997-2003 is based on the 2003 company population. A limited number of old medical technology companies may therefore be missing in the dataset for 1997-2003, underestimating the size of the sector for those years.

Map
In the map visualisation (page 36), all bubbles in the diagram are distributed by county according to their geographic location. They have been randomly distributed within each county.

3. The Life Science Industry 2009



Number of employees (difference compared to 2006)

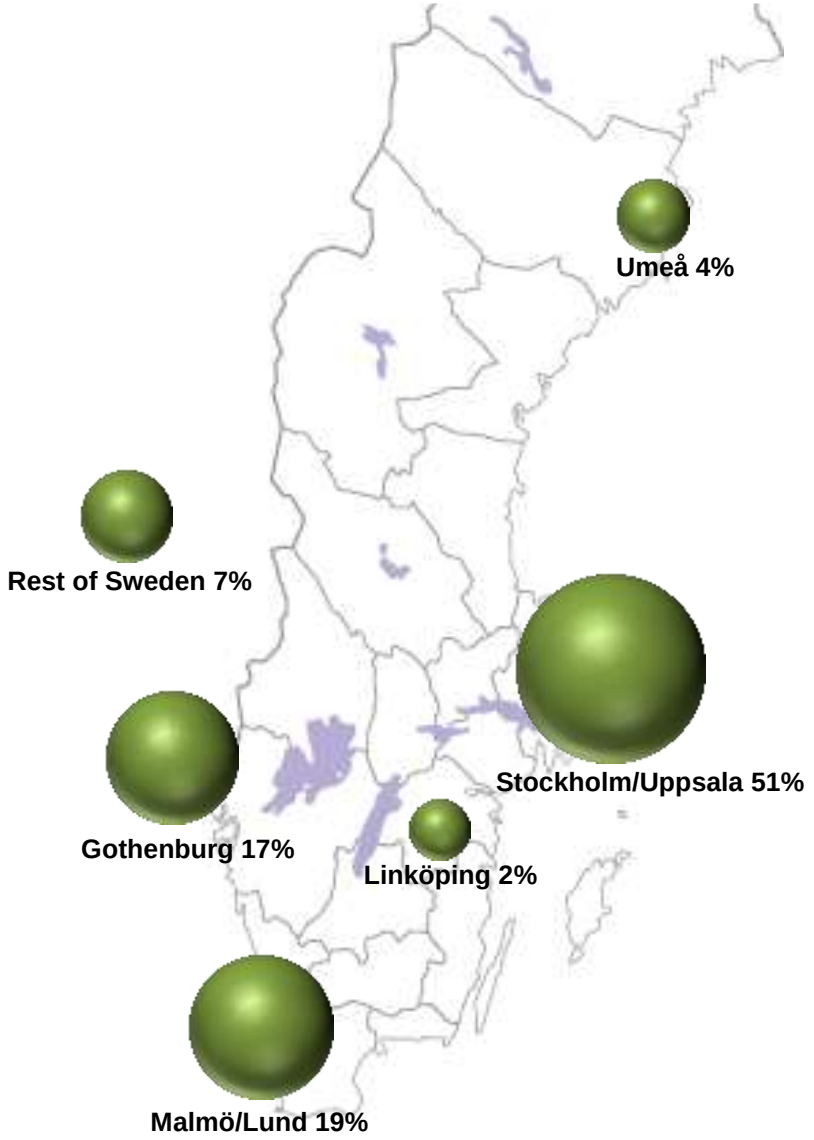
All companies

The total number of companies identified in the present study as active in research and development, product development, consulting or manufacturing within the included business segments of biotechnology, pharmaceuticals and medical technology in Sweden is about 700, with a total of 32,000 employees. This does not include companies focusing on sales and marketing. Those companies have over 8,600 employees distributed among some 325 companies and puts the total size of the industry at about 1,025 companies and 40,600 employees. There are also many companies with no employees still active according to Swedish Companies Registration Office; these are not included in the bubble diagram or figures mentioned above. Laboratory equipment not specifically designed for use in the biotechnology, pharmaceuticals or medical technology sectors is not included in the bubble diagram. This for example includes companies developing pH meters, magnetic stirrers, mass spectrometers or even those designing and building whole laboratories.However, some such companies with manufacturing, product development or R&D in Sweden have been identified; they have almost 300 employees in 13 companies, not listed in the present report.

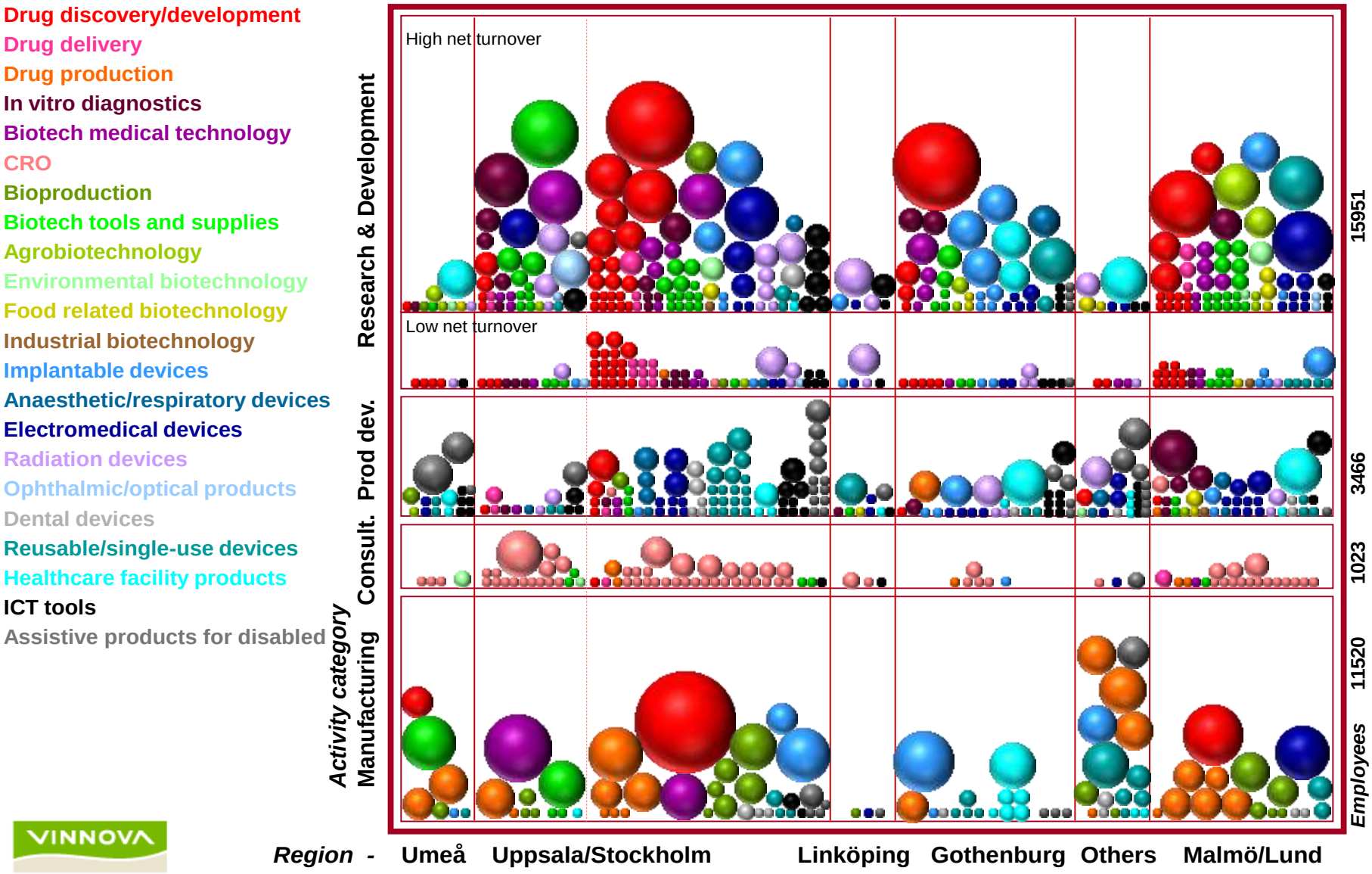
Research-intensive companies and manufacturing companies far outnumber those in other activities and jointly make up more than 80% of all included life science companies.

The companies are primarily located in the five Swedish life science regions. The regional distribution will be analysed later and the dominant large companies and corporate groups identified.

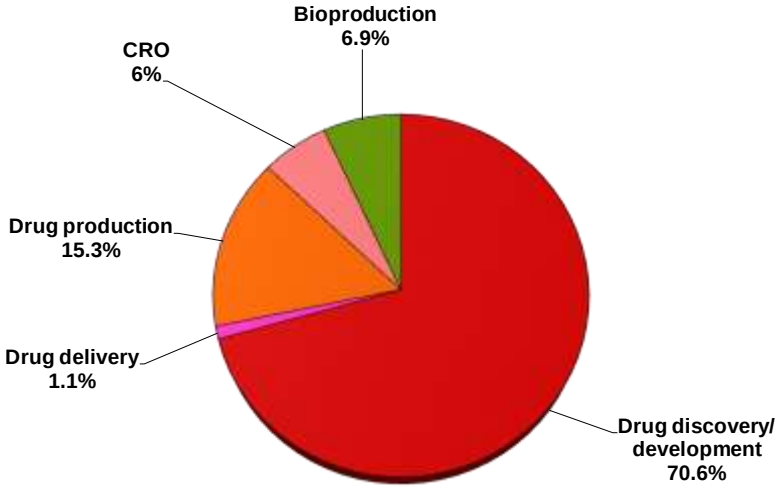
It should be kept in mind that the business segments add up to the total number of employees, whereas the three different sectors do not. This is because there is an overlap between sectors. A list of all companies included and their categorisation by business segment appears at the end of the report.



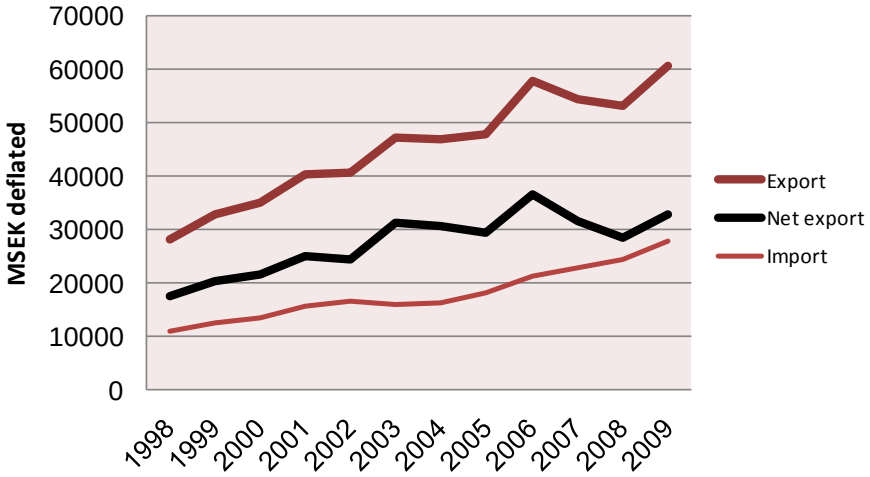
Cluster Profile Sweden



Pharmaceutical companies



Proportion of employees



Pharmaceuticals (SITC 541 and 542)

Comments

The pharmaceutical sector comprises more than 14,600 employees in more than 220 companies in 2009, not including sales and marketing companies. AstraZeneca constitutes more than half of the pharmaceutical sector in terms of number of employees. Drug discovery and drug development is by far the largest business segment, mainly due to the size of AstraZeneca. Since AstraZeneca is closing its R&D unit in Lund, the largest bubble in that region will disappear in future diagrams. Also Swedish Orphan Biovitrum and Pfizer contribute a significant number of employees in this business segment, followed by BioInvent, Medivir and Active Biotech. Pfizer has been divided into one bubble in Drug discovery and development and one bubble in Bioproduction. Other major companies in Bioproduction are Polypeptide Laboratories, Novozymes Biopharma and DSM Anti-Infectives, all with more than 100 employees each.

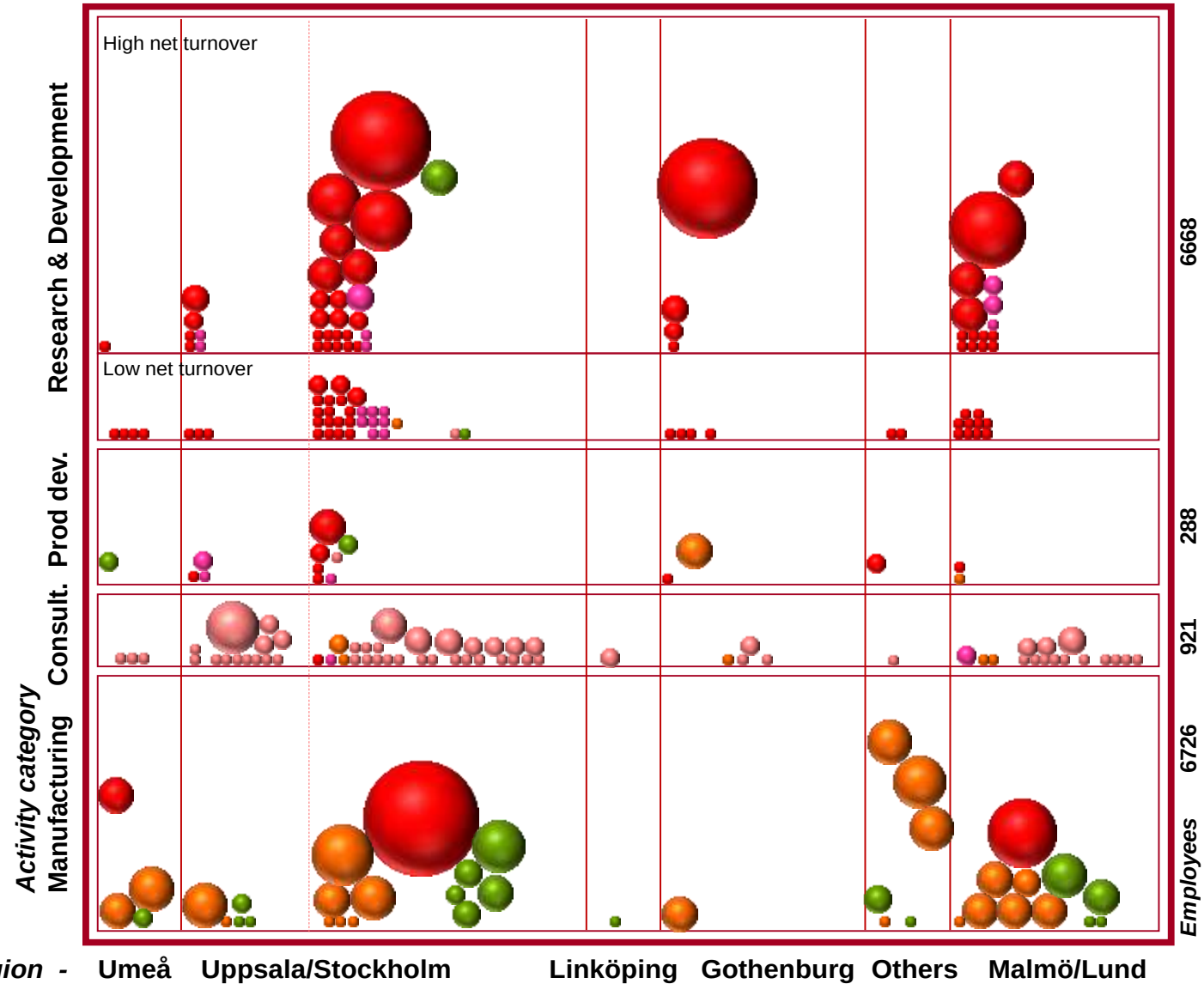
In Drug production, the dominant players are McNeil (part of Johnson & Johnson) with more than 800 employees and the Recipharm companies with more than 700 employees in total. Other large companies are Cambrex Karlskoga and Kemwell (headquartered in India). Drug delivery is the smallest Pharma business segment with 166 employees in total, with SHL Group, Camurus and Galenica as the largest companies with 20-40 employees each. The largest CRO companies are Quintiles, Trial Form Support and PPD Scandinavia.

Companies developing new drugs are predominately found in the categories that include exploratory research. The majority of those with low turnover, often start-up companies, are found in the Stockholm and Malmö/Lund regions. Many of the employees in the Pharma sector are found in the manufacturing activity category, largely due to the above mentioned large manufacturing units.

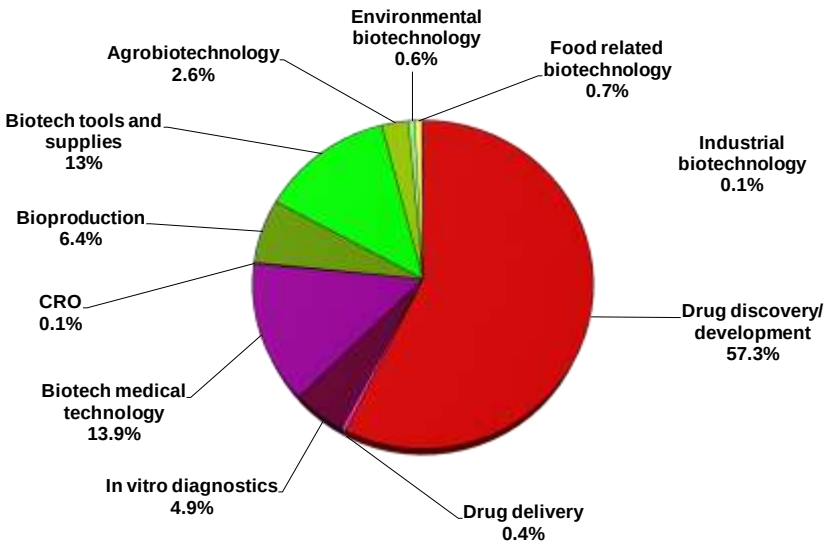
AstraZeneca is contributing the major part of Swedish export in pharmaceuticals (identified using Standard International Trade Classification codes or SITC). The pharmaceutical net exports is the second largest export category in the Swedish trade balance in 2009, after the category paper and cardboard. After a small downturn in 2007-2008, net exports increased again in 2009.

Cluster Profile Sweden - Pharmaceuticals

Drug discovery/development
Drug delivery
Drug production
CRO
Bioproduction



Biotechnology companies



Proportion of employees

Comments

The biotechnology sector includes more than 16,200 employees in 285 companies with the majority of employees active in Drug discovery and development, Biotech medical technology, Biotech tools and supplies or Bioproduction.

A business segment not already mentioned as included (at least to some extent) in the Pharmaceutical sector is Biotech tools and supplies; which employs over 2,100. The segment is dominated by GE Healthcare Bio-Sciences (e.g. bioseparation) with almost 1,600 employees, with R&D in Uppsala and manufacturing in Uppsala and Umeå.

In 2006 GE Healthcare Biosciences acquired Biacore (biomolecular interaction), a spin-off from Pharmacia in 1984. Large players also include Biotage (microwave synthesis), Gyros (miniaturised and automated immunoassays), Attana (biosensors) and Affibody (tools for protein analysis). Other major business segments include Biotech medical technology with the large companies Fresenius Kabi (nutrient solutions, almost 900 employees), Octapharma (plasma replacement, almost 600 employees) and Q-Med (hyaluronic acid, almost 400 employees) as well as Vitrolife (IVF-technology, almost 120 employees). Agrobiotechnology includes Syngenta Seeds and Lantmännen Sw Seed (previously Svalöf Weibull), with more than 250 and 120 employees respectively as well as the small forest biotechnology start-up, SweTree Technologies with more than 20 employees.

Smaller business segments are Food related biotechnology which includes Biogaia (probiotics), Ltp Lipid Technologies Provider (lipid-based food ingredients) and Probi (probiotics), and Environmental biotechnology with companies such as Anoxkaldnes (water treatment) and Ekologisk Technologi (soil treatment).

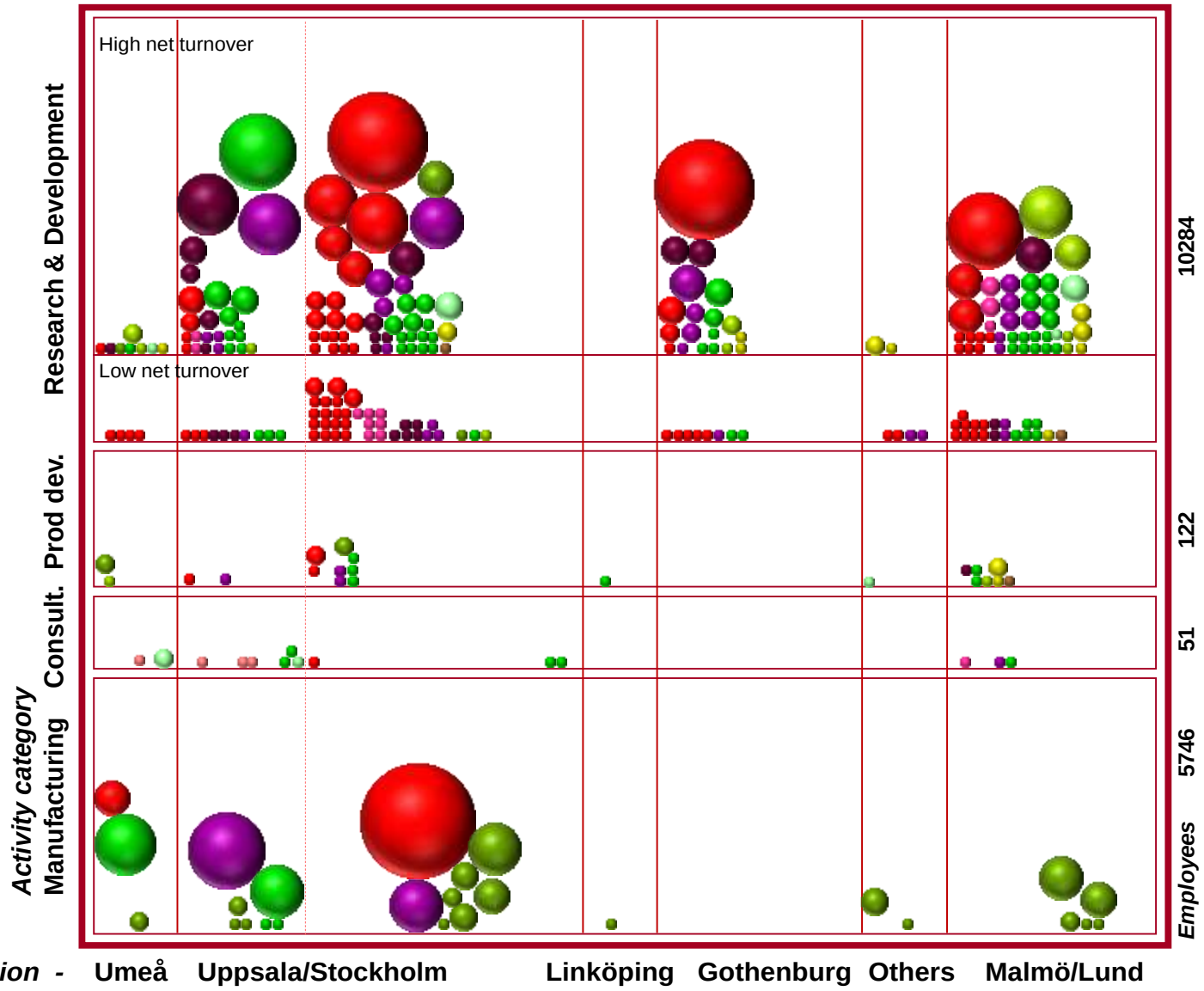
Industrial biotechnology only includes three small companies since efforts involving the use of biotechnology in major chemical, pulp and paper as well as food industries are not included in the database. This is because biotechnology is not their core activity. Large companies with industrial biotechnology as part of their competence but not core activity include the specialty chemical company Perstorp and the economic association Södra (processed forest products).

In terms of employees, the biotechnology sector is dominated by the activity categories of R&D and manufacturing. Geographically, very few employees are found in the Linköping region as well as outside the five life science regions and many of the employees are found in Uppsala.

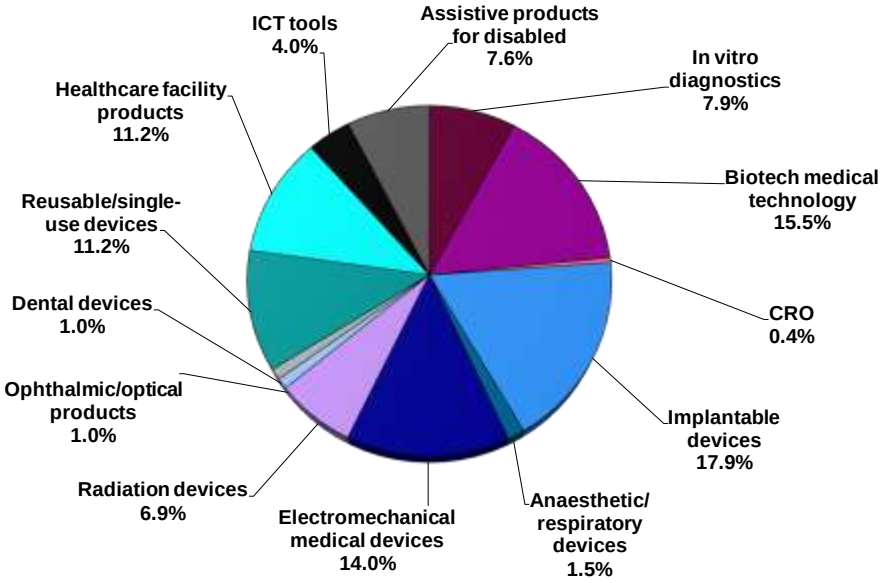
It is not possible to identify biotech products in the trade statistics since those products are scattered among several statistical categories.

Cluster Profile Sweden - Biotechnology

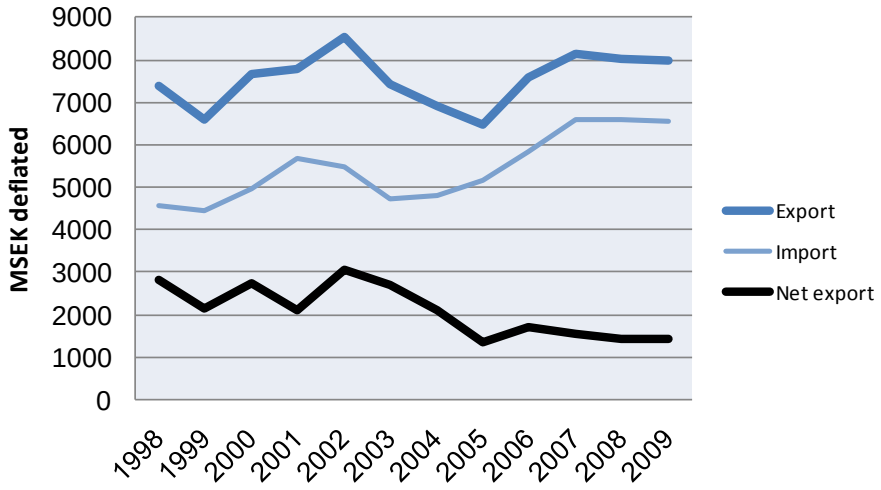
Drug discovery/development
Drug delivery
In vitro diagnostics
Biotech medical technology
CRO
Bioproduction
Biotech tools and supplies
Agrobiotechnology
Environmental biotechnology
Food related biotechnology
Industrial biotechnology



Medical technology companies



Proportion of employees



Medical technology (SITC 872 and 774)

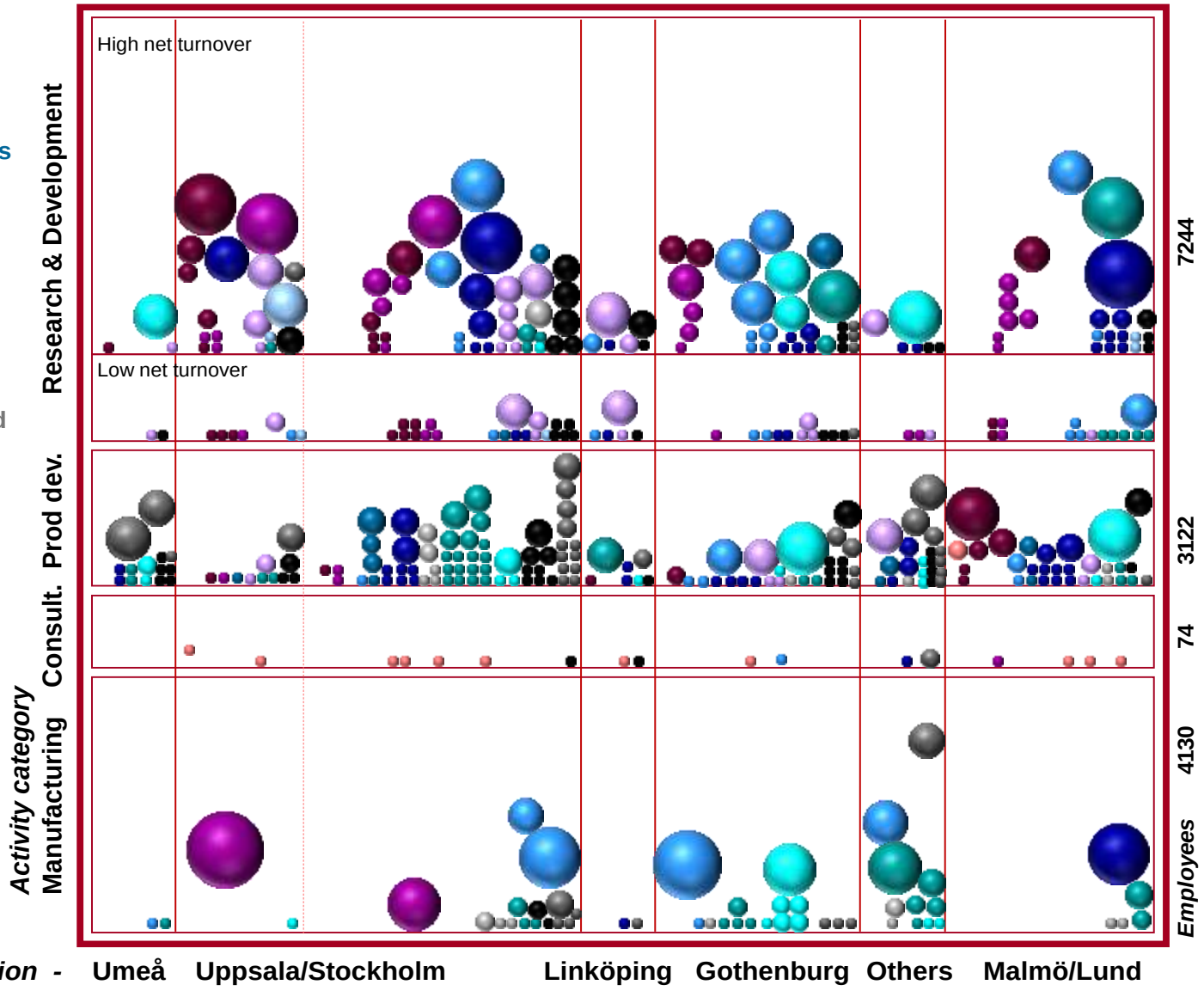
Comments

The medical technology sector employs almost 14,600 people in about 430 companies. It is dominated by the business segments of Implantable devices, Biotech medical technology and Electromechanical medical devices which jointly employ more than 47% of everyone in the sector. A larger share of medical technology companies are categorised as belonging to the "product development" activity than for the two other sectors in the present study. Developing these types of products usually takes less time than for drugs but like drugs, the products must undergo a regulatory process. Once a technical appliance is launched onto the market, the product is often subject to further development. Since few of the companies have more than 500 employees, they have not been divided across different activity categories. Thus, the number of employees in manufacturing in the medical technology sector is underestimated. A large number of the companies with 50-500 employees do have production units in Sweden.

Electromechanical devices are dominated by three companies, Gambro (dialysis), Maquet Critical Care (critical care systems, e.g. respiratory systems) and St. Jude Medical Systems (coronary diagnostics, interventional cardiology and haemostasis management). Many of the employees in the segment Reusable/single-use products are found in the three companies, Becton Dickinson (products for infusion therapy), Attends Healthcare (incontinence products) and Mölnlycke Health Care (includes products for wound care), each with between 300 and 400 employees. Ophthalmic/optical products is a small business segment with AMO Uppsala (eye surgery products) as the dominant company. Implantable devices include St. Jude Medical (pacemakers) and Nobel Biocare (dental implants). Radiation devices includes Elekta (laser surgery) and Sectra (e.g. mammography) as well as Gems PET Systems and Uppsala Imanet. Healthcare facility products include Getinge (sterilisation/disinfection/infection control), Arjo (e.g. hygiene systems) and Liko (patient transfer aids). All companies included in the Dental devices business segment are small. The largest company in Anaesthetic/respiratory devices is Breas Medical AB (e.g. home care ventilation). Cambio Healthcare Systems (software to administrate and document healthcare processes), Compugroup Medical (patient journal systems) and RaySearch (software for optimising radiation therapy) are among the companies devoted to developing ICT tools for the healthcare system. The largest company developing assistive products for people with disability is Permobil (electric wheelchairs).

Cluster Profile Sweden - Medical technology

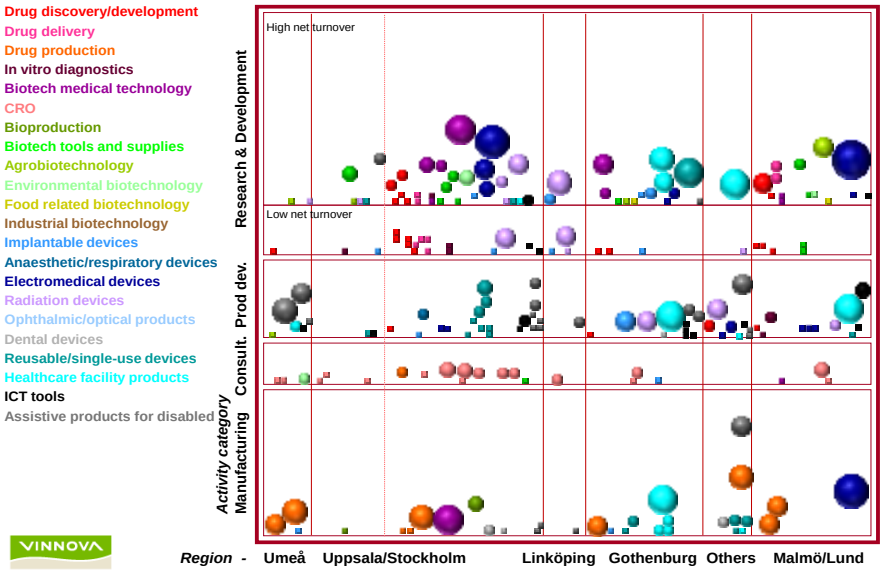
In vitro diagnostics
Biotech medical technology
CRO
Implantable devices
Anaesthetic/respiratory devices
Electromedical devices
Radiation devices
Ophthalmic/optical products
Dental devices
Reusable/single-use devices
Healthcare facility products
ICT tools
Assistive products for disabled



Parent company nationality

Swedish-owned companies

Cluster Profile Sweden



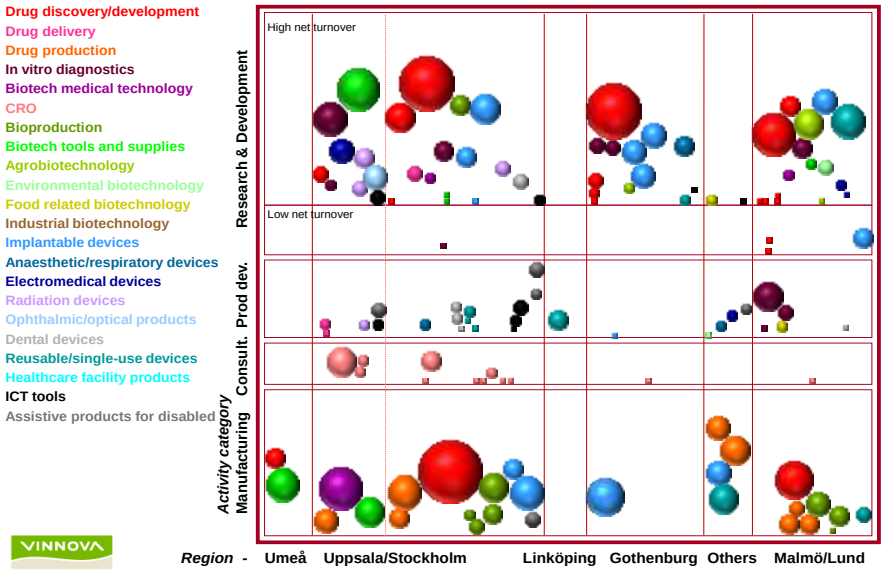
Foreign-owned (in terms of parent company nationality) life science companies are often large companies active in R&D and/or manufacturing. The consultancy sector is underrepresented among foreign-owned companies.

The foreign-owned pharmaceutical companies are often US-owned, Swiss or British. There are also several Dutch-owned companies, like Qpharma and Polypeptides laboratories, plus Danish-owned Novozymes Biopharma and NeuroSearch Sweden. In terms of number of employees, British ownership dominates due to AstraZeneca.

Among the foreign-owned biotech companies, parent companies from the US are well-represented and include GE Healthcare Biosciences and Pfizer. Parent companies in the Netherlands own DSM AntiInfectives Sweden, EuroDiagnostica and LTP Lipid Technologies Provider. A parent company in Switzerland owns Syngenta Seeds and Rechon Life Science (previously Ferring in Malmö) has a Chinese parent company.

Foreign-owned companies

Cluster Profile Sweden

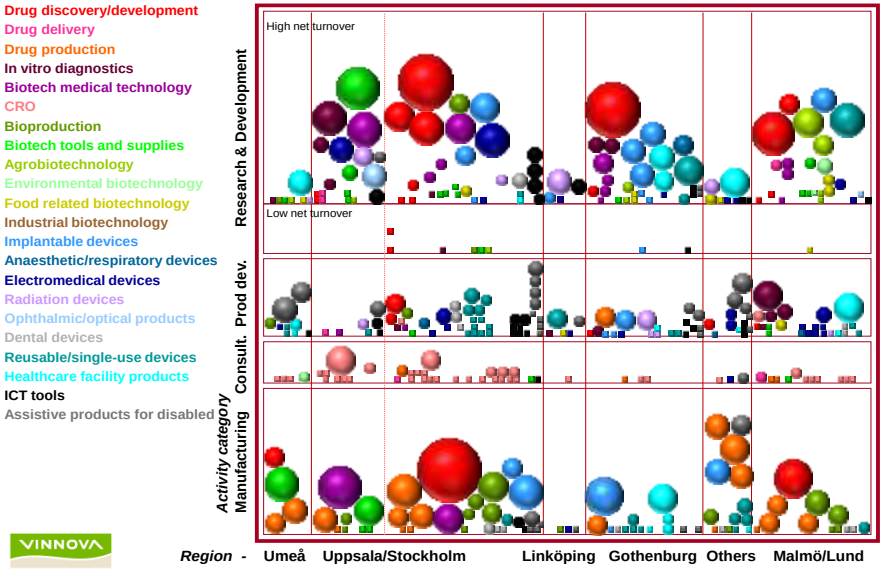


Most of the foreign-owned medical technology companies are owned by parent companies in the US. They are often medium-sized (51-250 employees) or large companies (>250), like Cederroth International, Becton Dickinson Infusion Therapy, St. Jude Medical, AMO Uppsala, GE Medical Systems Sverige. The largest British-owned companies are Astra Tech and Attends Healthcare Sweden. Luxemburg is also relatively well-represented, which is not the case for the other two sectors. The largest Luxemburg-owned companies are Phadia, Allergon and Ascendia MedTech.
A few recent changes include Sangtec changing ownership from German Altana to US Cepheid and being renamed as Cepheid AB, Swedish Biodisk becoming French Biomérieux AB and Bioglan becoming Spanish. Other changes include Swedish Magnetic Biosolutions becoming Norwegian Nordiag and that Radi Medical has been acquired and is now part of the American company, St. Jude Medical Systems AB. Also, SBL Vaccin is today part of Crucell from the Netherlands. Companies with non-majority foreign ownership are not included as foreign-owned companies and there are also a number of companies with no registered parent company nationality.

Positive or negative business results

Positive results

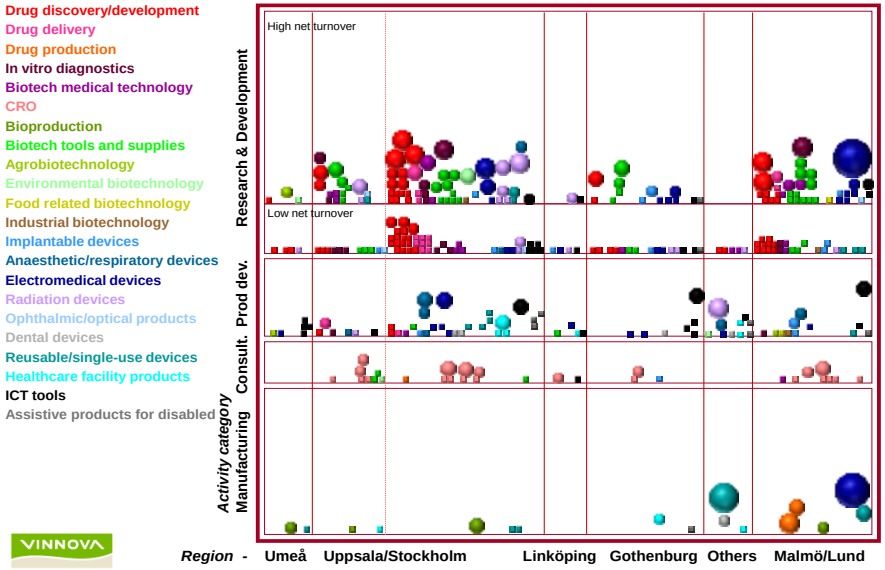
Cluster Profile Sweden



The companies with positive results after financial items in 2009 are shown above. Large companies are overrepresented among companies with positive results, as are the manufacturing companies. Concerning business segments, there is no striking difference in the distribution among those. Almost all of the foreign-owned companies are showing positive results. The distribution is slightly more even among the activity categories of Incremental product development and Consultancy. The vast majority of the employees are found in companies with positive relative results.

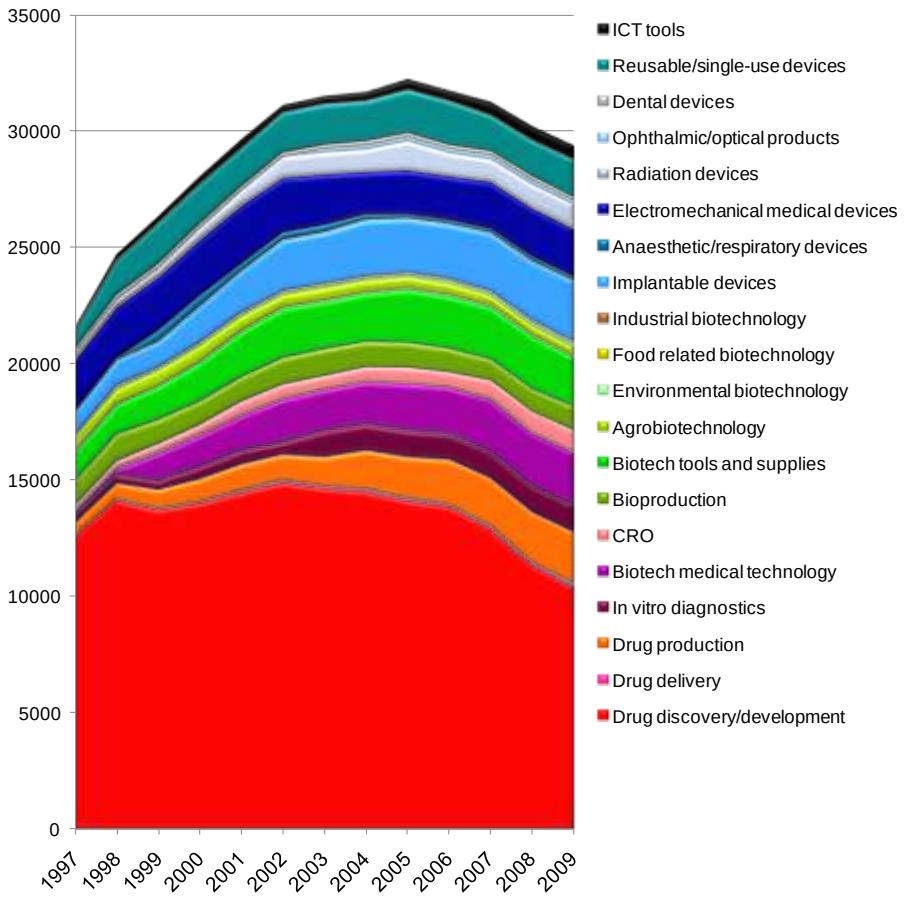
Negative results

Cluster Profile Sweden



The companies with negative results after financial items in 2009 are shown above. Small companies are overrepresented among those with negative results, including many drug discovery companies. As the location of many small drug discovery companies, Stockholm and Malmö/Lund is also home to many companies with negative results. Many of the consultancy companies also show negative results, as do many of the recent small start-ups. As would be expected, almost all companies with low net turnover have negative results.

4. Employment development 1997-2009



Total no. of employees per business segment

For the whole life science industry and the three sectors

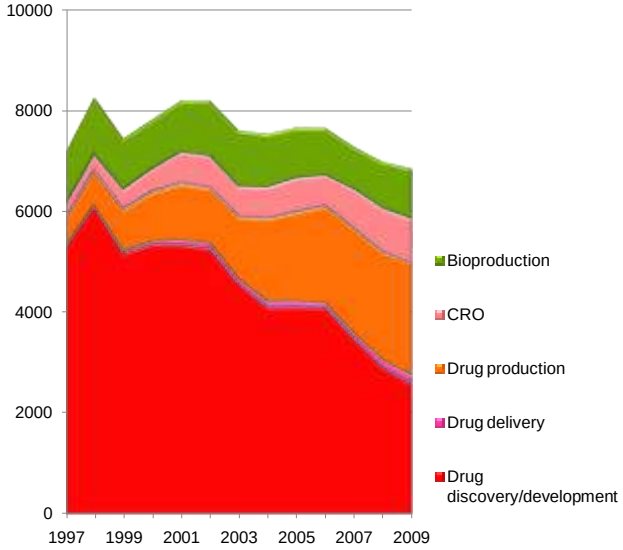
The collection of data to build the company database was initiated in 1997 for the biotechnology sector and in 2003 for the medical technology and pharmaceutical sectors. Thus, the 1997-2003 result of the two latter sectors, as well as the data from the total life science industry over the period 1997-2003 should be interpreted with some caution since one underlying factor of the growth is that the firm population for 1997-2003 may be incomplete. However, for the early years far fewer of the pharmaceutical companies are likely to be missing than for medical technology. This is because major players like Astra and Pharmacia and many of the smaller pharmaceutical companies were included in the 1997 biotechnology database. Even so, the life science industry in total grew by 38% in 1997-2009. Since the peak year of 2005, the number has declined by about 2,800 employees. The dynamics exclude the development for the business segments Assistive products for disabled people and Healthcare facility products and adaptations since no full account of those business segments is available for previous years.

Since 2006, most of the companies which ceased employing people (a total of 35), were firms with fewer than ten employees. Almost 20 were R&D companies and the rest were evenly distributed among the Manufacturing and Incremental product development categories. Almost 25 of the disappearing companies were in the medical technology sector. All medical technology business segments except Implantable devices and Anaesthetic and respiratory devices were represented. The business segments with the most companies that stopped employing are Reusable and single-use devices followed by In vitro diagnostics. The companies with more than ten employees that have stopped employing since 2006 have either been involved in mergers/acquisitions, or their employees are registered under another organisational identification number in the same corporate group. None of these are thus actually disappearing. For example Arexis and Swedish Orphan were acquired by what is now Swedish Orphan Biovitrum, Biacore by GE Healthcare Bio-Sciences and the Ferring manufacturing unit was acquired to form Rechon Life Science.

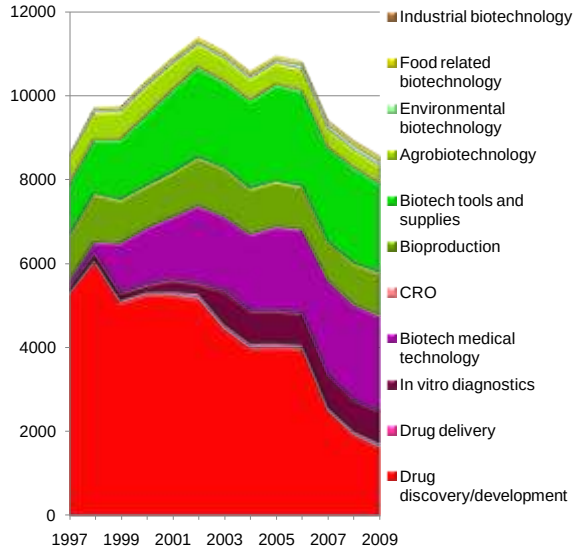
The Pharmaceutical industry excluding AstraZeneca had a peak year in 2002 which declined by 16% up until 2009 (more than 1,300 employees). This decline is primarily due to Pfizer's decreased number of employees. Drug production has increased but that is due in part to previous manufacturing units of Pharmacia and Astra being acquired by companies devoted to drug production. Therefore to some extent, employees have been moved from the Drug discovery and development business segment to Drug production. This is the case with companies like Kemwell AB and Recipharm Strängnäs AB, divested from Pfizer and AstraZeneca respectively. It is also the case that some previously divested Pharmacia business units are now categorised as Medical technology business segments. This is the case for AMO Uppsala, Octapharma and Fresenius Kabi.

Since most of the Drug discovery and development companies are also categorised under the Biotech sector and due to the dominant size of that segment, the decline of recent years can also be seen in the biotechnology sector. The Biotech tools and supplies business segment has always been a significant contributor to the number of employees in the Biotechnology sector and the number has been fairly constant since 2003, at around 2,200 employees. The peak year for the Biotechnology sector was also 2002; since then, the number of employees has been reduced by 2,800, or 25%.

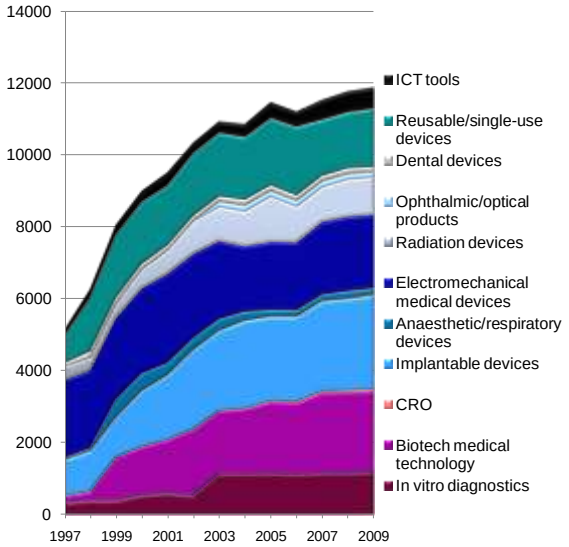
As has already been mentioned, the development of employment in Medical technology years 1997-2003 should be analysed with some caution since assembly of the Medical technology part of the database was initiated in 2003. Also, part of the dramatic increase in the number of medical technology employees is due to spin-outs of Pharmacia business segments being categorised under Medical technology business segments. Thus, the employees have been transferred from the Drug discovery and development business segment. The development during 2003-2009 is an 8.6% increase, or about 940 employees. As has previously been mentioned, Assistive products for disabled people and Healthcarefacility products and adaptations are excluded from this analysis. The increase during 2003-2009 years was primarily due to the growth of large companies in the business segments of Implantable devices and Biotech medical technology.



Pharmaceutical companies excl. AstraZeneca

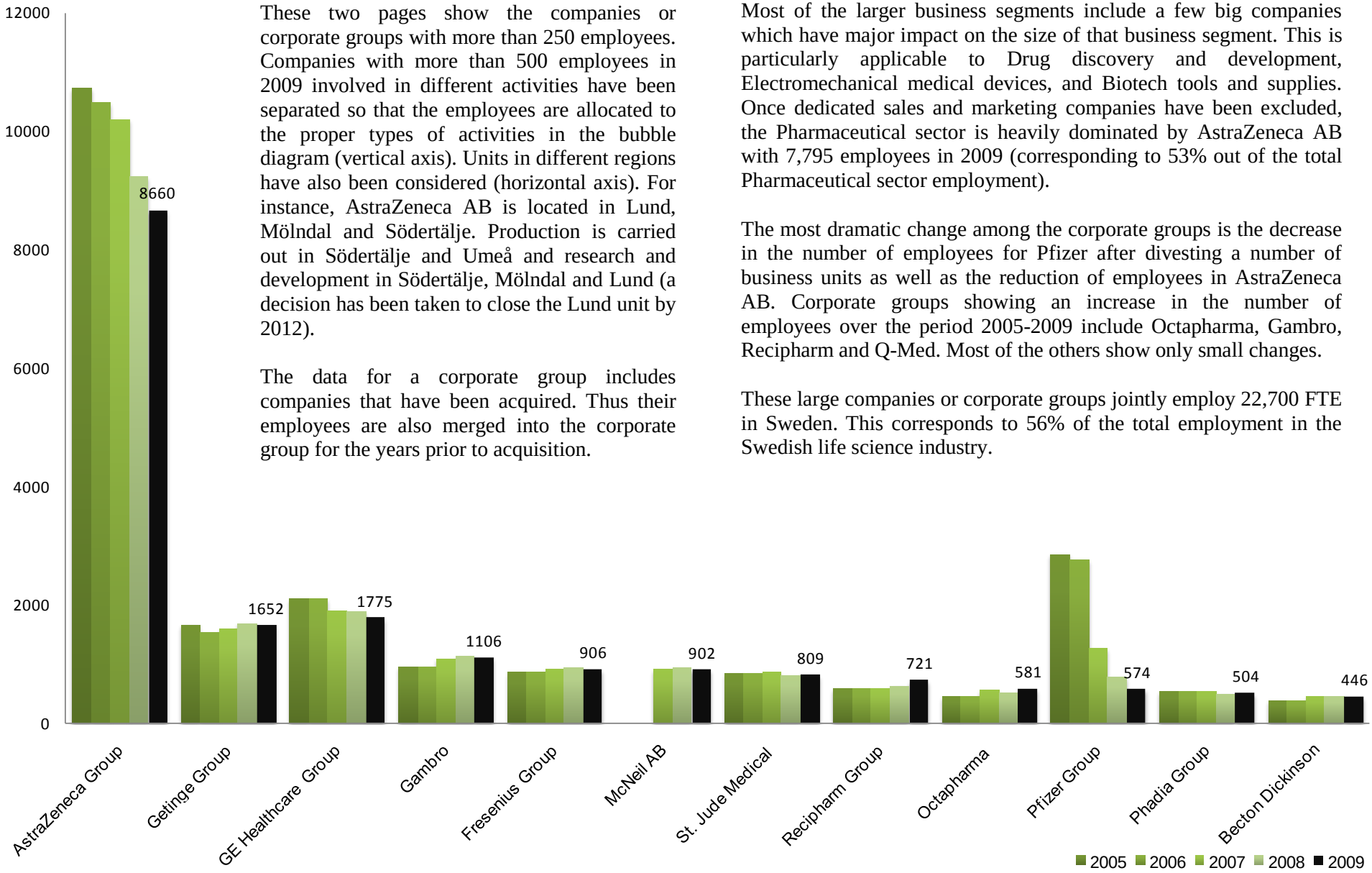


Biotechnology companies excl. AstraZeneca



Medical technology companies

Large companies and corporate groups



These two pages show the companies or corporate groups with more than 250 employees. Companies with more than 500 employees in 2009 involved in different activities have been separated so that the employees are allocated to the proper types of activities in the bubble diagram (vertical axis). Units in different regions have also been considered (horizontal axis). For instance, AstraZeneca AB is located in Lund, Mölndal and Södertälje. Production is carried out in Södertälje and Umeå and research and development in Södertälje, Mölndal and Lund (a decision has been taken to close the Lund unit by 2012).

The data for a corporate group includes companies that have been acquired. Thus their employees are also merged into the corporate group for the years prior to acquisition.

Most of the larger business segments include a few big companies which have major impact on the size of that business segment. This is particularly applicable to Drug discovery and development, Electromechanical medical devices, and Biotech tools and supplies. Once dedicated sales and marketing companies have been excluded, the Pharmaceutical sector is heavily dominated by AstraZeneca AB with 7,795 employees in 2009 (corresponding to 53% out of the total Pharmaceutical sector employment).

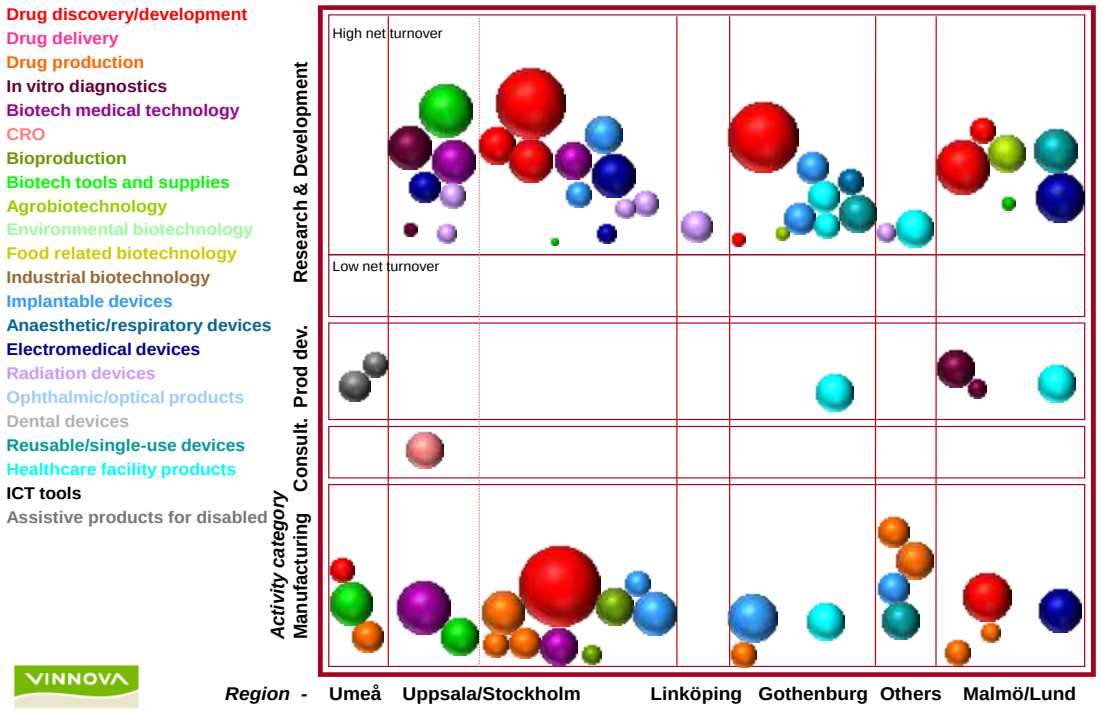
The most dramatic change among the corporate groups is the decrease in the number of employees for Pfizer after divesting a number of business units as well as the reduction of employees in AstraZeneca AB. Corporate groups showing an increase in the number of employees over the period 2005-2009 include Octapharma, Gambro, Recipharm and Q-Med. Most of the others show only small changes.

These large companies or corporate groups jointly employ 22,700 FTE in Sweden. This corresponds to 56% of the total employment in the Swedish life science industry.

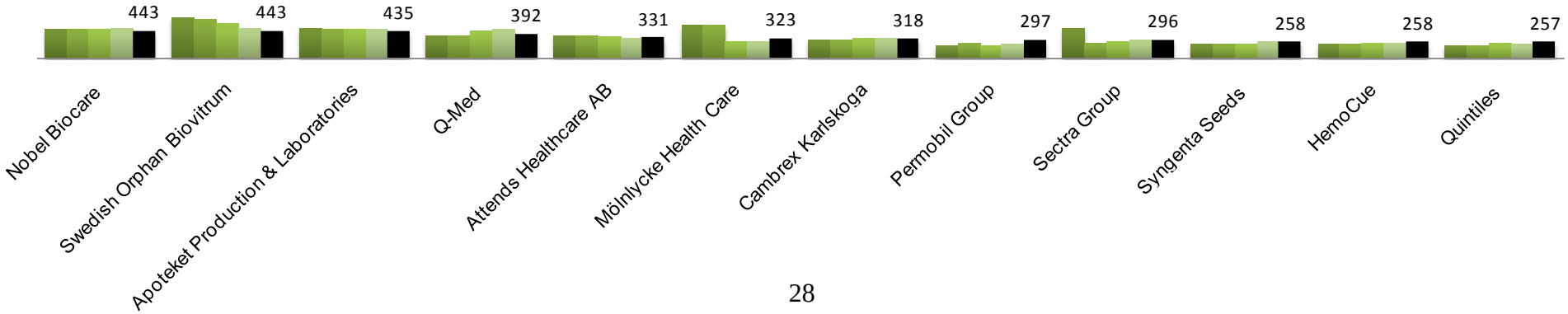
As seen in the bubble diagram, the large companies and corporate groups in 2009 have several business units across the country. Companies in the Getinge Group (e.g. Arjo, Maquet Critical Care, Getinge: Disinfection; Sterilization; Skärhamn; Infection Control) are primarily found in Halland but also have units in areas like Skåne, Stockholm and Västra Götaland. For the GE Healthcare Group (including GE Healthcare BioSciences, Uppsala Imanet, Biacore, GEMS PET Systems and Breas Medical), most of the employees are found in Uppsala but the group also has units in such cities as Umeå, Lund, Stockholm and Gothenburg. Research and development is conducted in Uppsala whilst production is in Uppsala, Umeå and Malmö/Lund. Pfizer has its production activity in Strängnäs and its sales and marketing activity in Stockholm.

A few companies also have activities outside the five regions in which the bulk of the life science industry is clustered. These include production units of Nobel Biocare, Recipharm and Cambrex in Karlskoga, Attends Healthcare in Aneby and Getinge Disinfection in Växjö.

Cluster Profile Sweden



Large companies and corporate groups



Development of relative result SME

The columns on the right show different aspects of the development of the business segments for each size of class (medium, small and micro): number of companies; number of employees 1997-2009 and share of the employees in 2009 in the circle diagram. For large companies/corporate groups the number of companies has remained almost constant throughout the period and is thus not shown. SMEs (1-250 employees) are divided into size classes by number of employees for each year from 1997-2009, whereas large companies are included according to the number of employees in 2009. Assistive products for the disabled and Healthcare facility products are not included in the dynamic diagrams and some of the companies in corporate groups on page 27-28 have been distributed here amongst the different size classes.

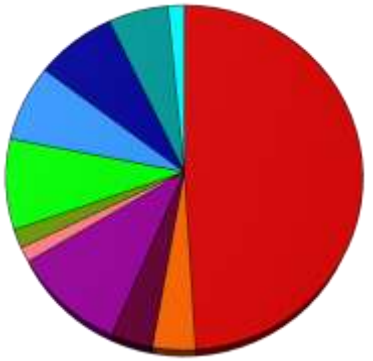
Comparing the columns illustrates the clear trend towards a dramatic increase in the number of micro-sized companies that leads to an increase, albeit limited, in the number of employees. This development is seen for the whole period. At the same time, the increased number of companies and employees has levelled off in the last five years for small companies, whereas medium-sized ones have actually seen a small decrease (following a significant increase in 2000-2002). Thus, although the total number of companies clearly increases over the whole period, the conclusion, especially in recent years, is that few of them reach beyond the micro-sized segment. Similarly, small and medium-sized companies have shown no average growth in recent years.

Drug discovery/development
Drug delivery
Drug production
In vitro diagnostics
Biotech medical technology
CRO
Bioproduction
Biotech tools and supplies
Agrobiotechnology
Environmental biotechnology
Food related biotechnology
Industrial biotechnology
Implantable devices
Anaesthetic/respiratory devices
Electromedical devices
Radiation devices
Ophthalmic/optical products
Dental devices
Reusable/single-use devices
Healthcare facility products
ICT tools
Assistive products for disabled

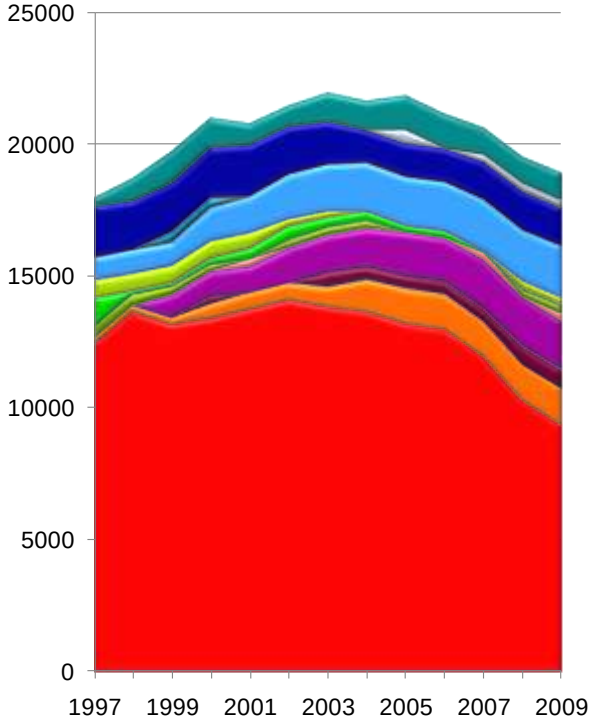
Looking at the specifics of different business segments, the largest increases in numbers of companies are seen for Drug discovery and development, Biotech tools and supplies, CROs and Electromechanical medical devices. By contrast, the business segments showing significant increases in the number of employees in the whole life science industry include Biotech medical technology, Biotech tools and supplies, Implantable devices and Drug production. The biggest contributors to the increased number of employees in those segments are large and medium-sized companies in Implantable devices, small and large-sized companies in Biotech tools and supplies, large-sized companies in Biotech medtech and large and medium-sized Drug production companies.

Large (>250 employees)

Number of employees (2009)



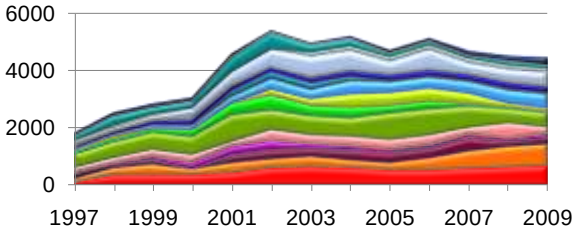
Number of employees



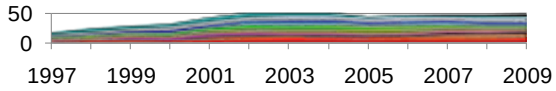
Medium (51–250)

Employment shares (2009)

Number of employees



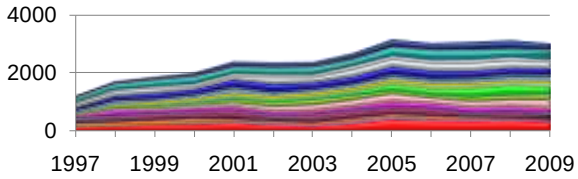
Number of companies



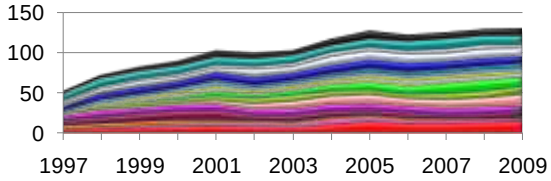
Small (11–50)

Employment shares (2009)

Number of employees

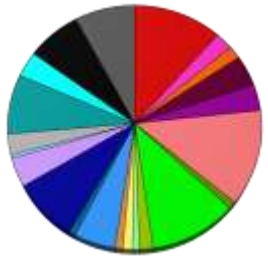


Number of companies

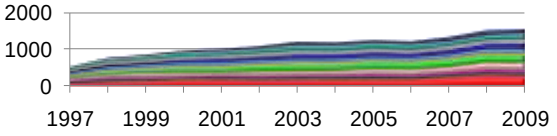


Micro (1–10)

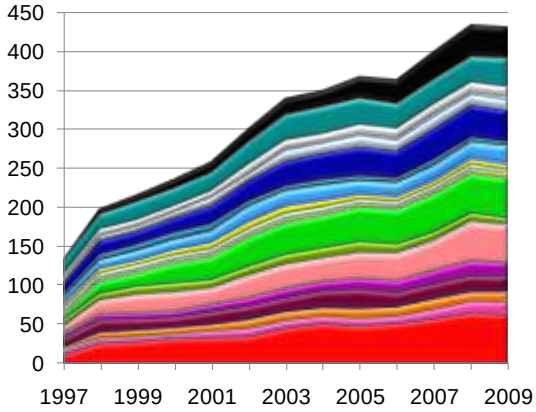
Employment shares (2009)



Number of employees



Number of companies



Astra-related companies in Sweden

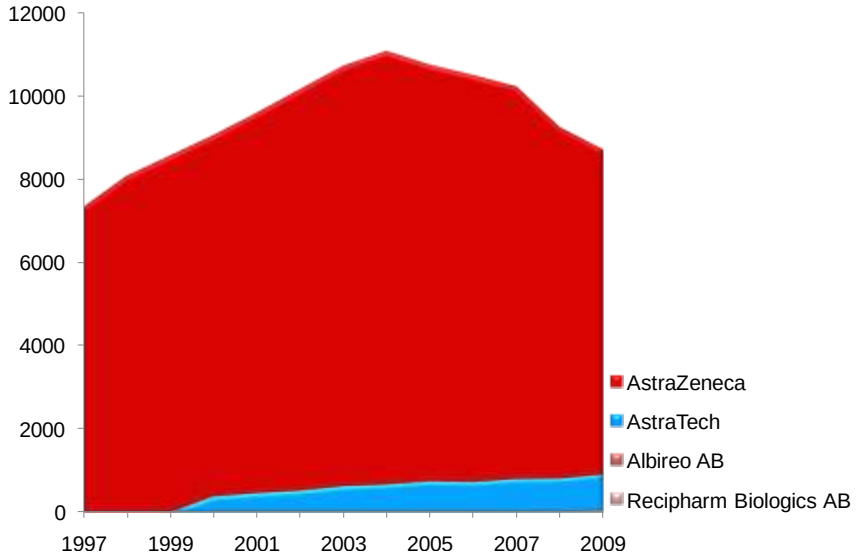
International events and Swedish growth development

The Astra-related companies include AstraZeneca (pharmaceuticals), AstraTech (medical technology: dental implants; urological and surgical products) in Gothenburg, the 2008 spin-out company Albireo, financed by a syndicate of venture capital firms, as well as Recipharm Biologics AB, the AstraZeneca biotech facility in Södertälje, which was acquired by Recipharm in 2007. In 2010, AstraZeneca announced the commencement of a review of its strategic options for Astra Tech, meaning that Astra Tech may be divested. The largest production unit in Sweden is located in Södertälje, but there is also production in Umeå. However, the functions at the Umeå site will be moved to Södertälje by 2012.
AstraZeneca is one of the world's leading pharmaceutical companies with products in six fields: oncology, cardiovascular, gastrointestinal, infection, neuroscience, respiratory and inflammation. The Astra group showed strong growth until 2004 when the number of employees started to decline.

Since the merger of Swedish Astra and British Zeneca in 1999, several hive-offs, investments, acquisitions and establishments have taken place. Many of the investments from 1999-2007 were made in UK and Sweden. Investments in different countries include opening and expanding several research, development and manufacturing facilities in the UK and opening research laboratories in Boston, USA, a manufacturing plant and a clinical research unit in China and new R&D facilities in India and Canada. There were also manufacturing facilities in France and Egypt, as well as acquisition of a controlling stake in Astra-IDL in India. AstraZeneca sold its penicillin factory in Strängnäs to Recip in 2001 but has invested in the production facility in Södertälje. From 2005-2007, AstraZeneca acquired KuDos Pharmaceuticals Ltd, Cambridge Antibody Technology group plc, Arrow Therapeutics (anti-viral therapies), the US-company MedImmune (biopharmaceuticals), a biologics manufacturing facility in Canada (from DSM Biologics Inc) and French Novexel (infection research). With these acquisitions, the AstraZeneca pipeline broadened into biopharmaceuticals and added bioproduction capabilities. AstraTech acquired Cresto Ti Systems in 2005.

In 2007, AstraZeneca opened a process and development laboratory next to its R&D centre in Bangalore, India and its first clinical pharmacology unit in China. The focus in China has been on knowledge about Chinese patients, biomarkers and genetics, initially with a specific focus on cancer. In the same year, AstraZeneca boosted investments in the R&D centre in Boston, US (infectious disease area and cancer) and the process research and development unit in Macclesfield, UK. In recent years, AstraZeneca has invested in collaboration with the PET-centre at Karolinska Institutet (SEK 80 million over five years) and has been collaborating with Region Skåne on chronic obstructive pulmonary disease and Columbia University Medical Center in New York on diabetes and obesity. AstraZeneca has also recently had strategic collaborations with big pharma companies such as Abbott and Merck on specific projects and has also announced collaboration with the commercialisation company for the UK's Medical Research Council to share access to their collections of compounds.

The most recent change heavily affecting AstraZeneca's activities in Sweden is the decision to close the R&D unit in Lund by 2012 and move some of its operations to Gothenburg. R&D sites in Charnwood and Cambridge in the UK are also to be closed and Arrow Therapeutics is likely to be sold. The pharmaceutical development at the Avlon site, UK, will cease and early-stage research in Wilmington, US, will be significantly reduced. However, Södertälje will keep its focus on pain and CNS and the Mölndal site will expand and become a global centre for the following therapeutic areas: cardiovascular, gastrointestinal, respiratory and inflammatory diseases.



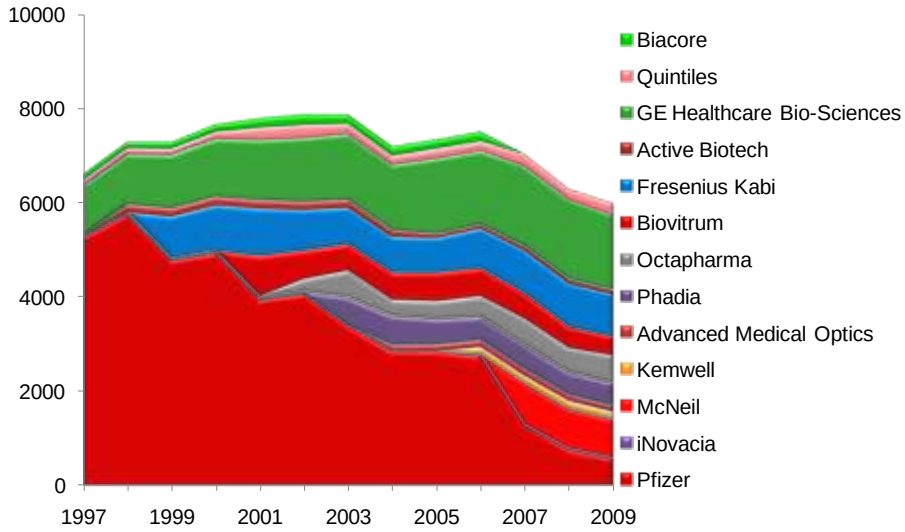
Pharmacia-related companies in Sweden

1911: Pharmacia formed.
1990: Pharmacia acquired by Procordia and merges with Kabi under the name Kabi Pharmacia. Subsequent name change to Pharmacia.
1995: Pharmacia merges with Upjohn to form *Pharmacia & Upjohn.* The company has approximately 7,000 employees in Sweden.
1996: Pharmacia Biosensor is sold and becomes *Biacore.*
1997: Pharmacia Biotech is merged with British company *Amersham* and in 2001 is named *Amersham Biosciences.*
1997 Pharmacia has 5,249 employees.
1998: Pharmacia closes its research unit in Lund and major sections are purchased by *Active Biotech.*
The same year, German company Fresenius takes over production of nutrient solutions and now operates under the name *Fresenius Kabi.*
1999: Pharmacia & Upjohn merges with Monsanto. The new group calls itself Pharmacia Corporation.
2001: Most of the remaining research within Pharmacia in Sweden is sold off and the new company *Biovitrum* is formed. Biovitrum subsequently sells the substitute plasma operation to Swiss company *Octapharma*. The same year, the clinical trials operation is acquired by US-company *Quintiles.* In 2006 *iNovacia,* was formed as a management buy-out from Biovitrum.
2002: *Pfizer* purchases Pharmacia.
2003: Pfizer sells *Pharmacia Diagnostics* to two venture capital companies (corporate group now called *Phadia*).
2004: *Amersham Biosciences* is sold to the American company General Electric Inc. and is now *GE Healthcare Bio-Sciences*.
2004-2007:
Pfizer invests to increase the production capacity in the bioproduction plant in Strängnäs. Bangalore-based pharmaceutical company *Kemwell* completes acquisition of Pfizer's Salazopyrin manufacturing plant in Uppsala. *Advanced Medical Optics* acquires the ophthalmic surgery operation and Pfizer moves its Uppsala operation to Stockholm.
In 2006, the Helsingborg production unit (Pfizer Consumer Healthcare) manufacturing the Nicorette product family is sold to the Johnson & Johnson group to form *McNeil Sweden AB*. Pfizer also closes its production unit in Stockholm.

2008-2010: GE Healthcare Bio-Sciences acquires Biacore.

Pfizer currently has no research facilities left in Sweden; only some development of aids for dosage and taking of drugs. However, there is collaboration on research with Karolinska Institutet amongst others and Sweden is one of three core countries in Europe for the companies' clinical research.

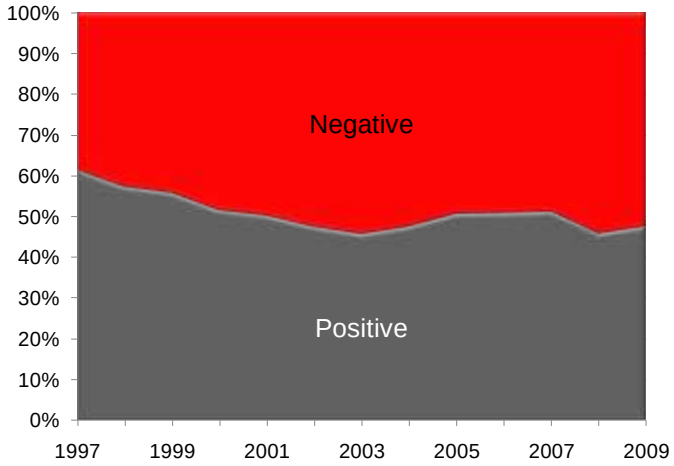
Since 1995, the former Pharmacia operation has been sold to various owners and now comprises 13 companies/corporate groups. From 1997-2009, these companies jointly decreased their number of employees by some 12%, to about 5,840 in total, corresponding to a decrease of about 770 employees.



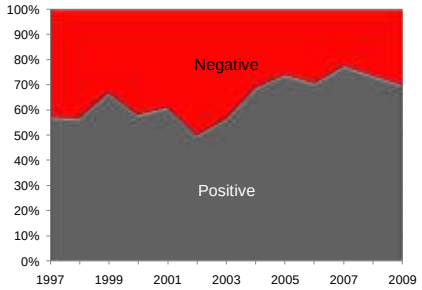
5. Development of relative results for SMEs 1997-2009

To understand the economic development of an industry, it is interesting to trace the development of relative results. This is defined as the results after financial items, divided by net turnover.

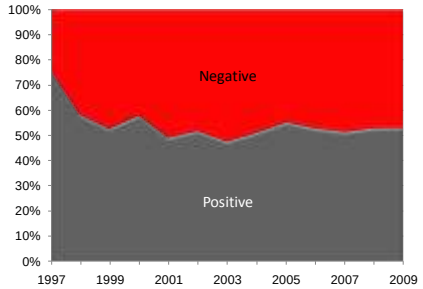
The graphs show how the share of the corporate population showing positive or negative relative results has changed over time in different size classes of the industry. As mentioned earlier, the vast majority of employees are found in companies showing positive relative results.
The results clearly show the difficulty that recently started micro-sized companies often have in showing positive relative results. They indicate that the largest share of those companies has negative relative results, 54% on average in the latest five years. This spills over into the whole SME population (1-250 employees), since the number of micro-sized companies is so great. For small-sized companies the share has been fairly constant, especially in recent years, with an average of 53% showing positive results years 2005-2009. For the medium-sized companies there is a greater variation over the years, but the development is positive and for the latest five years an average of 74% of the companies show positive results.



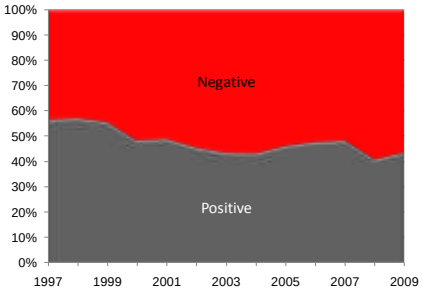
SME - companies (1 - 250 employees)



Medium-sized companies (51-250 employees)

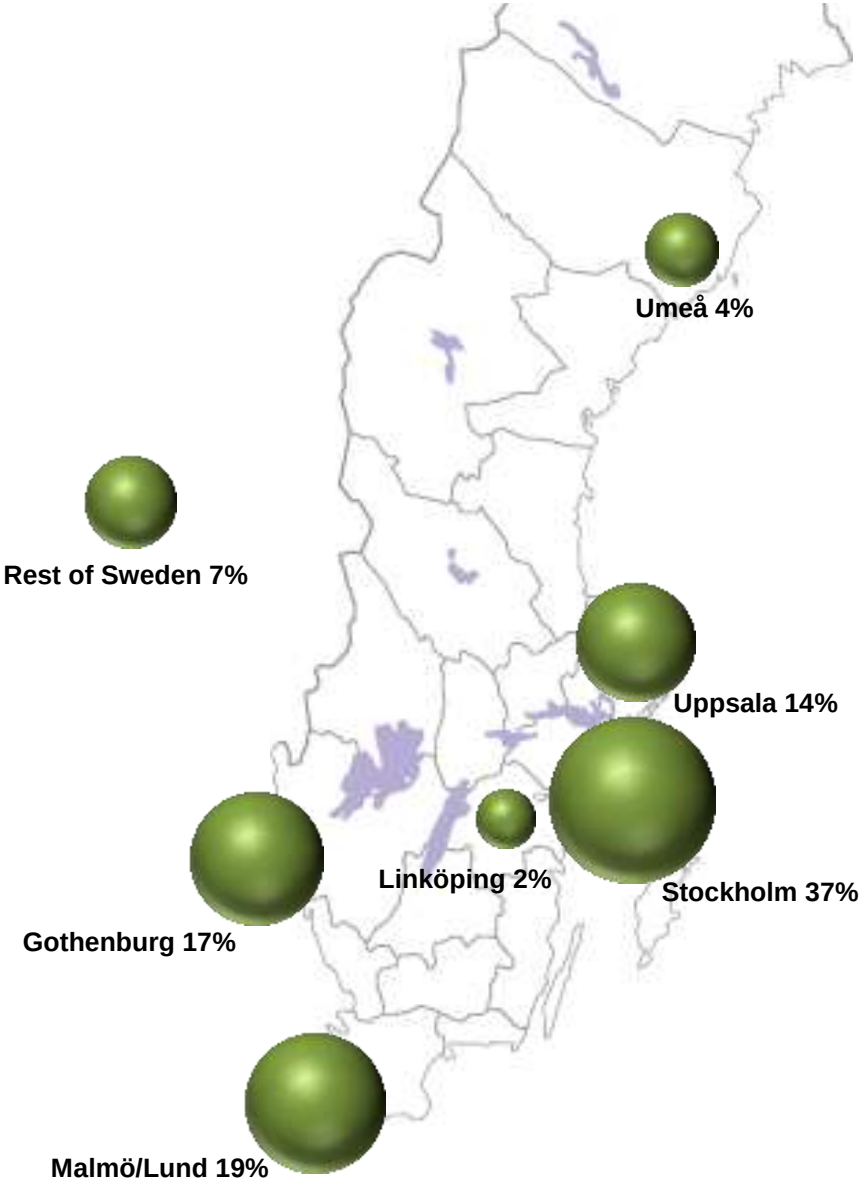


Small-sized companies (11-50 employees)

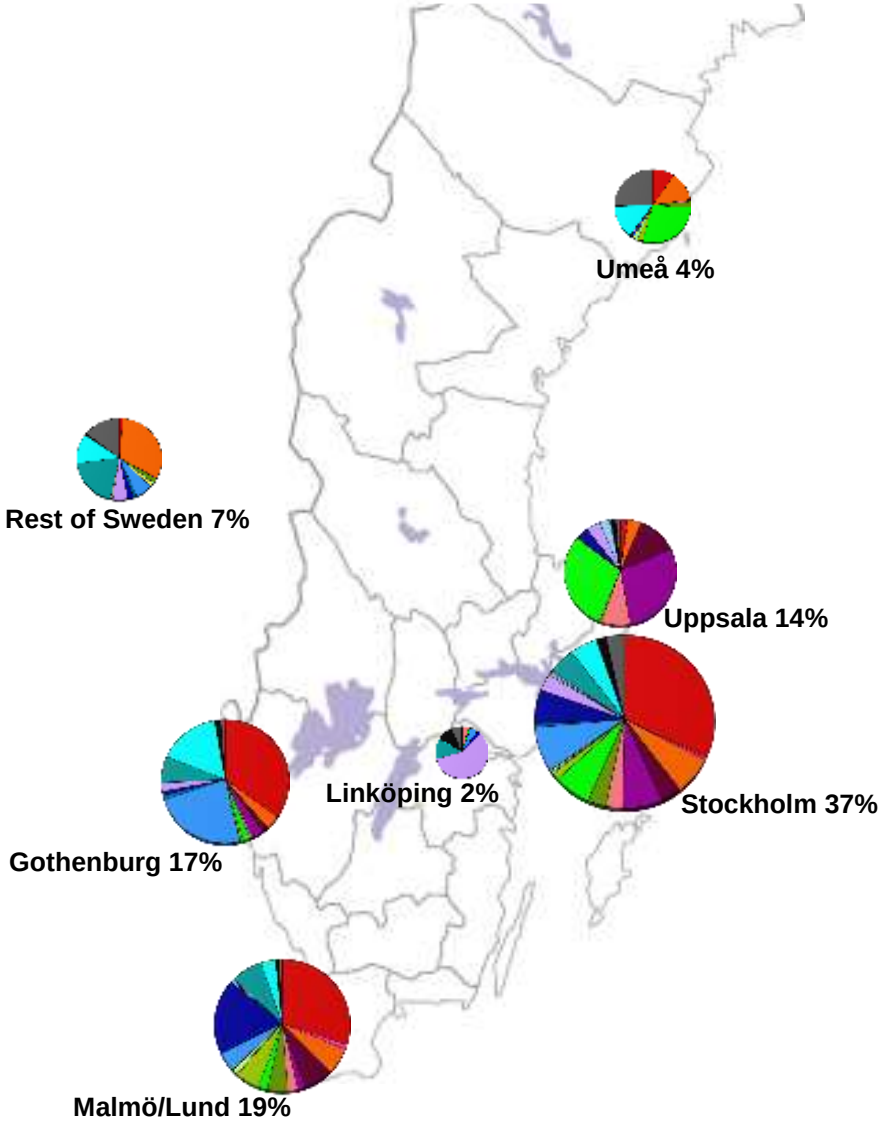


Micro-sized companies (1-10 employees)

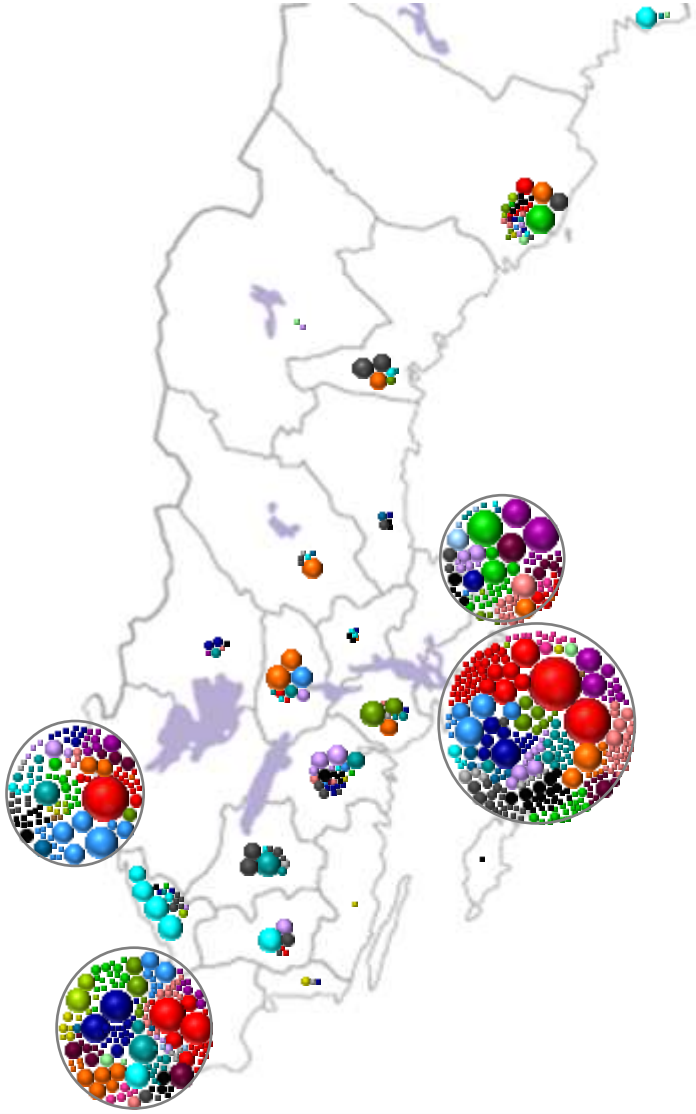
6. Regional profiles



Swedish Regions

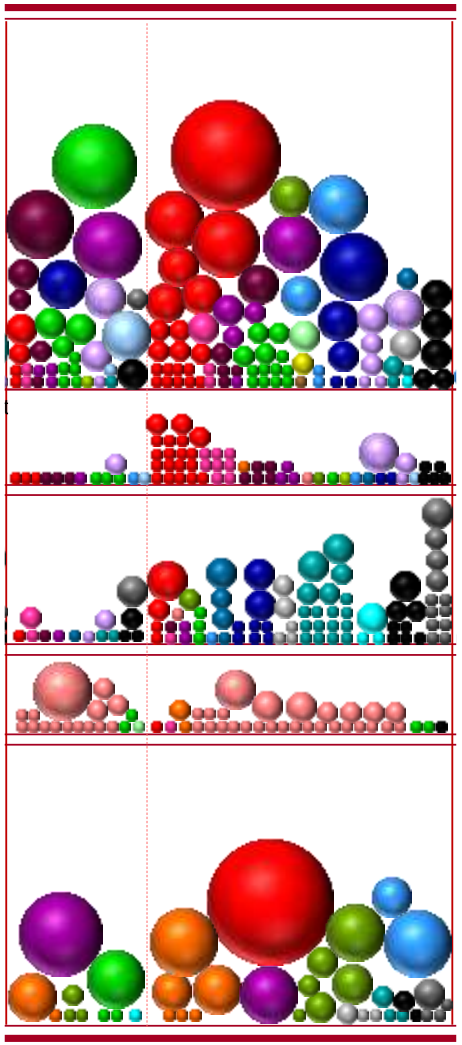


Proportion of employees - Sweden



Companies per county - Sweden

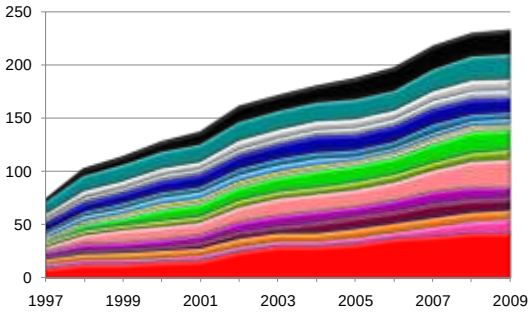
Region Stockholm/Uppsala



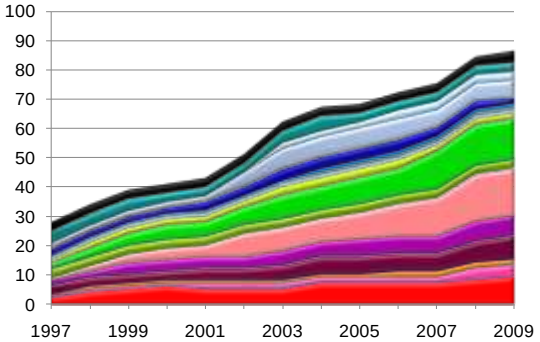
The number of employees in Stockholm in 2009 was about 11,800, a decrease of more than 3,000 employees since 2006. In Stockholm there is a clustering of companies in the Pharmaceutical sector. International pharmaceutical companies maintain a strong presence, localising much of their sales and marketing activities and clinical trial operations there (these are, however, not included in the analysis). Many other companies in the Drug discovery and development segment as well as CRO companies also chose Stockholm as their location. PPD Scandinavia AB is one CRO company which has grown in size. In Drug discovery and development, Meda and Medivir are two of the companies which have grown. In Medical technology, Mawell and Raysearch (both in ICT tools) are companies which have grown in Stockholm during the period studied. The number of companies with units located in Stockholm has increased from 74 to 231 with a steep increase seen for Drug discovery and development, CROs, ICT tools and Biotech tools and supplies. Strängnäs has some bio- and drug production plants and is shown in the diagrams as part of the Stockholm/Uppsala region.

The number of employees in Uppsala was almost 4,500 in 2009, which is about the same as in 2006. Uppsala has a number of the country's larger Biotech tools and supplies, Biotech medical technology and In vitro diagnostics companies, largely due to Pharmacia's previous activity in that region. Uppsala is also home to two significantly growing life science companies; Q-Med (Biotech medical technology) throughout the period studied and Orexo (Drug discovery and development) in more recent years. Both St. Jude Medical (pacemakers, Stockholm) and its recent acquisition Radi Medical (coronary diagnostics and interventional cardiology, Uppsala) have also been growing significantly, as has Quintiles (CRO). The number of companies with a presence in Uppsala has gone from 27 to 85, with the largest increase in Biotech tools and supplies and CROs.

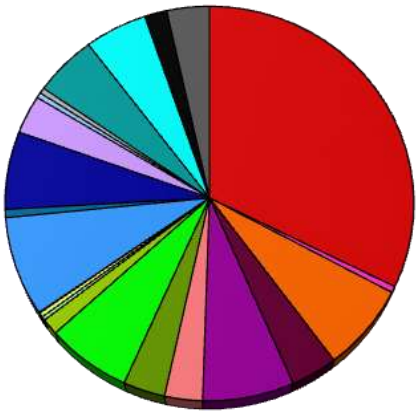
Thus the combined region of Uppsala, Stockholm, Södertälje and Strängnäs has decreased its number of employees by more than 3000 since 2006. Despite some growing companies in the region, this result is largely due to the reduction in employees at Pfizer and AstraZeneca AB.



Number of companies (Stockholm)

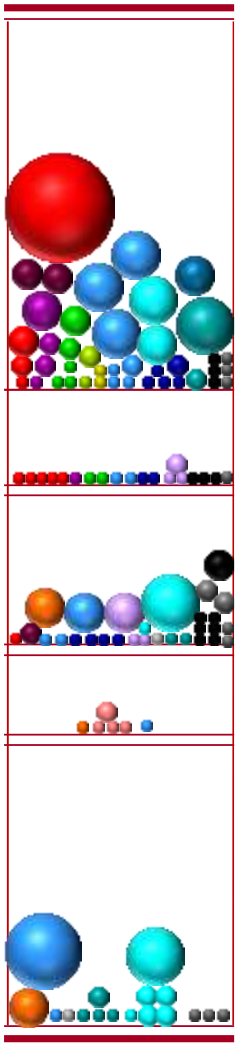


Number of companies (Uppsala)



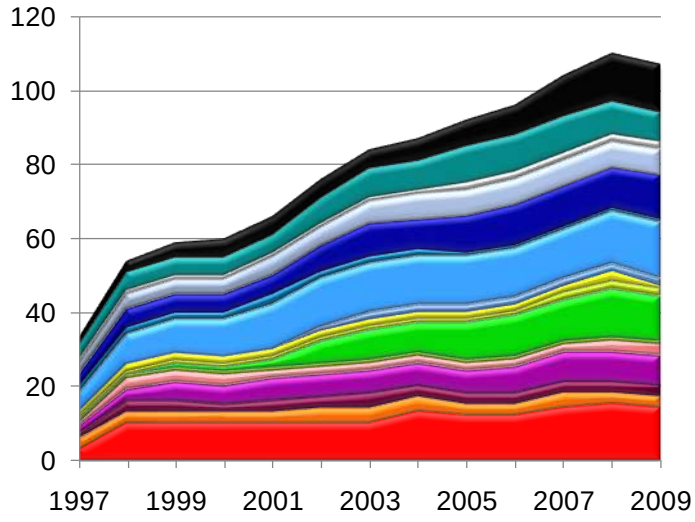
Proportion of employees 2009

Region Gothenburg



The number of employees in the Gothenburg region was about 5,600 in 2009 which was about the same number as in 2006. The Gothenburg area has AstraZeneca's largest research unit in Sweden, and several larger medical technology companies. These include several companies involved in the development of oral cavity titanium implants, limb prostheses and bone-anchored hearing aids. The Gothenburg region also has a large number of sales and marketing companies. Astra Tech (with operations in both dental implants and medical devices within urology and surgery) has both R&D and production in the Gothenburg region and has grown significantly in the region. Many of the Getinge Group companies are also located in this region. More than half of the employees in the life science industry in the region work in the medical technology sector, with its two major business segments of Implantable devices and Healthcare facility products and adaptations. One company in this region which has shown significant growth is Cochlear Bone Anchored Solutions (bone-anchored hearing aids); others include Vitrolife (in vitro fertilisation), Breas Medical (home care ventilation products), Cellartis (stem cells) and Mölnlycke Healthcare (single-use surgical and wound care products).

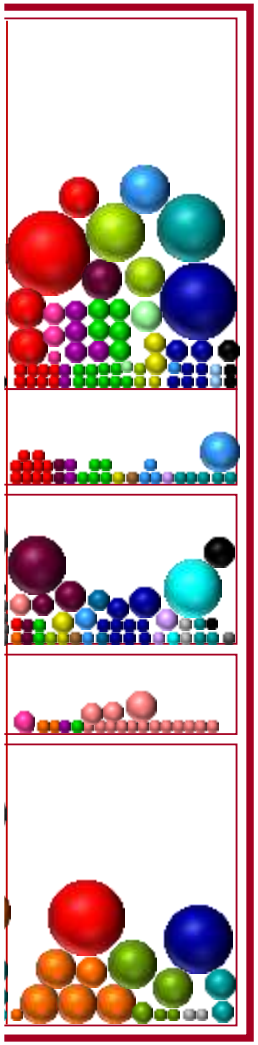
The number of life science companies with a presence in Gothenburg has increased from 33 to 107. There are five business segments that have grown to a similar extent: Electromechanical medical devices, ICT tools, Drug discovery and development, Biotech tools and supplies and Implantable devices.



Number of companies

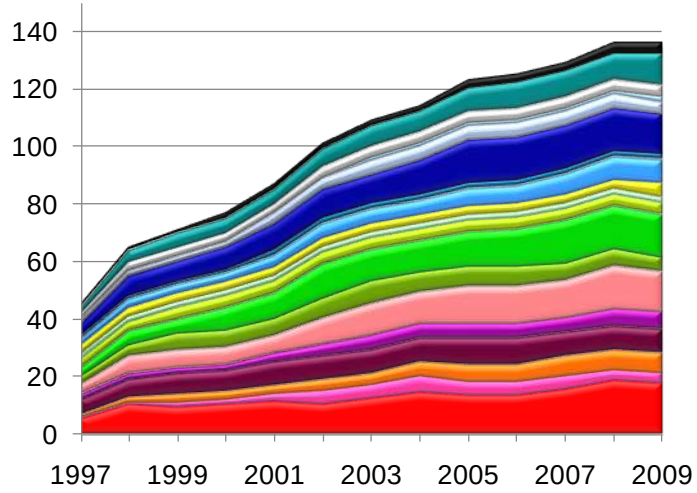
Proportion of employees 2009

Region Malmö/Lund

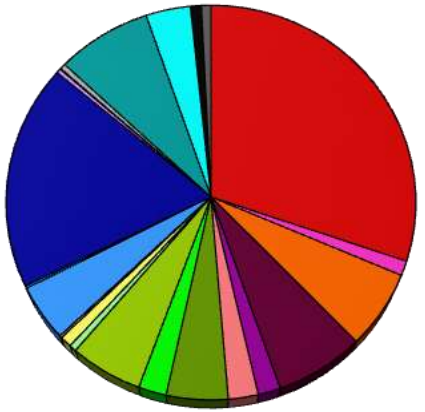


The total number of employees in the life science industry in the Malmö/Lund region was more than 6,000 in 2009, an increase of more than 700 since 2006. In the Malmö/Lund region, there are many people employed in Medical technology. Some of the business segments in other sectors which have many employees are Drug discovery and development, Drug production, Bioproduction and In-Vitro diagnostics. Agricultural biotechnology companies have a long tradition in the region. The small number of companies in Food biotechnology, Agricultural biotechnology and Environmental biotechnology are mainly situated in the Malmö/Lund region. In 2009, the largest life science employers in the region were Gambro, AstraZeneca and McNeil. Companies showing significant growth in employees in the region during 1997-2009 include Hemocue (blood glucose and haemoglobin diagnostics), Polypeptide Laboratories (peptide production), Biomet Cementing Technologies (bone cement) and Atos Medical (implants: ear/nose/throat, voice prostheses).

In the Malmö/Lund region the major increase in number of companies has been seen in Electromechanical medical devices, Biotech tools and supplies, Drug discovery and development and CROs. This has in total involved an increase from 44 to 135 companies in total.

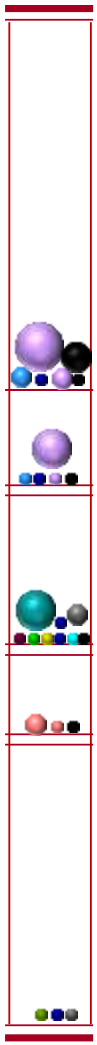


Number of companies

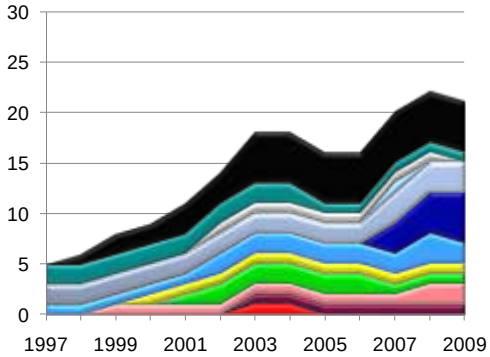


Proportion of employees 2009

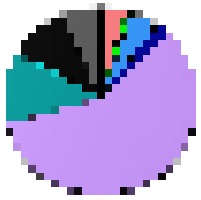
Region Linköping



The number of life science industry employees in the Linköping region was about 530 in 2009, a small increase since 2006. For Linköping the employees are mainly found in companies in Medical technology, Radiation devices. In Linköping the Sectra group (e.g. mammography equipment) and Elekta (radiation therapy and radiosurgery) have grown significantly 1997-2009, as has Cambio Healthcare Systems (ICT tools).
The number of companies has gone from five to 21, 1997-2009. ICT tools and Electromechanical medical devices have both gone from zero to five and are responsible for a large share of the increased number of companies.

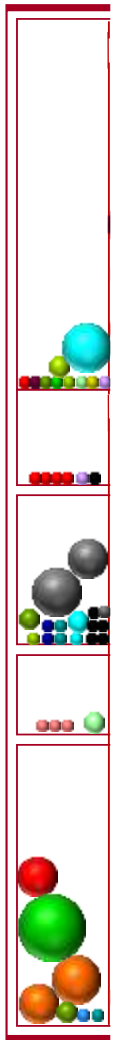


Number of companies



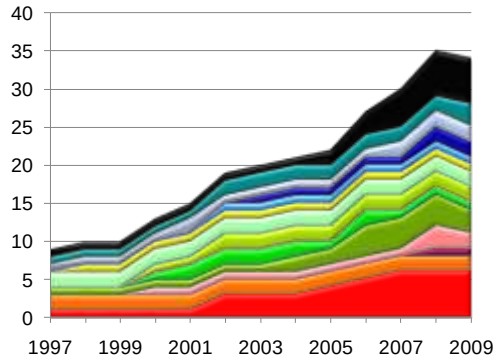
Proportion of employees 2009

Region Umeå

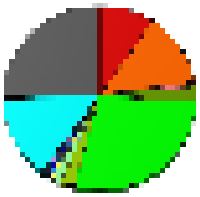


The number of life science industry employees in the Umeå region was almost 1,400 in 2009, a small increase since 2006. In Umeå the larger companies are mainly involved in manufacturing, but there is also a number of small, research-intensive companies. The Umeå region (Luleå) is home to Liko (patient transfer aids), showing a significant growth over the period studied.

The number of life science companies has gone from nine to 34 companies. Also in Umeå, ICT tools has seen an increase, from one to six firms. The same result is seen for the business segment of Drug discovery and development.

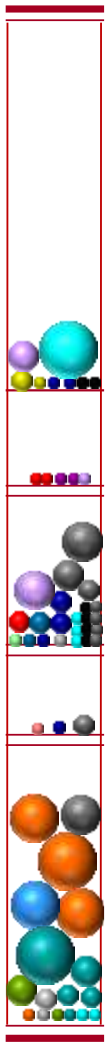


Number of companies



Proportion of employees 2009

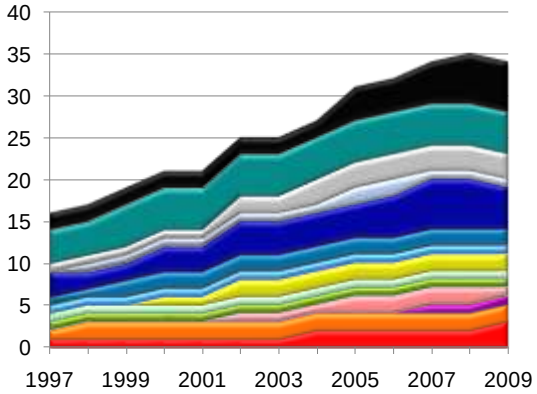
Rest of Sweden



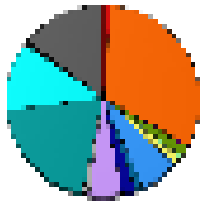
Others

Relatively few companies in the stated business segments are found outside the above regions and few are research-intensive companies. The total number of employees amounts to more than 2,100 which is about the same number of employees as in 2006. There are some companies involved in product development and manufacturing. Two of the growing companies during the studied period are Cambrex Karlskoga and Clean Chemical Sweden (CCS) in Borlänge. The major business segments are Drug production, Reusable and single-use devices, Assistive products for disabled people and Healthcare facility products and adaptations.

The increased number of companies is not as apparent as for the rest of Sweden and the number has gone from 16 to 34. ICT tools, Electromechanical medical devices and Reusable and single-use devices are responsible for much of this increase.

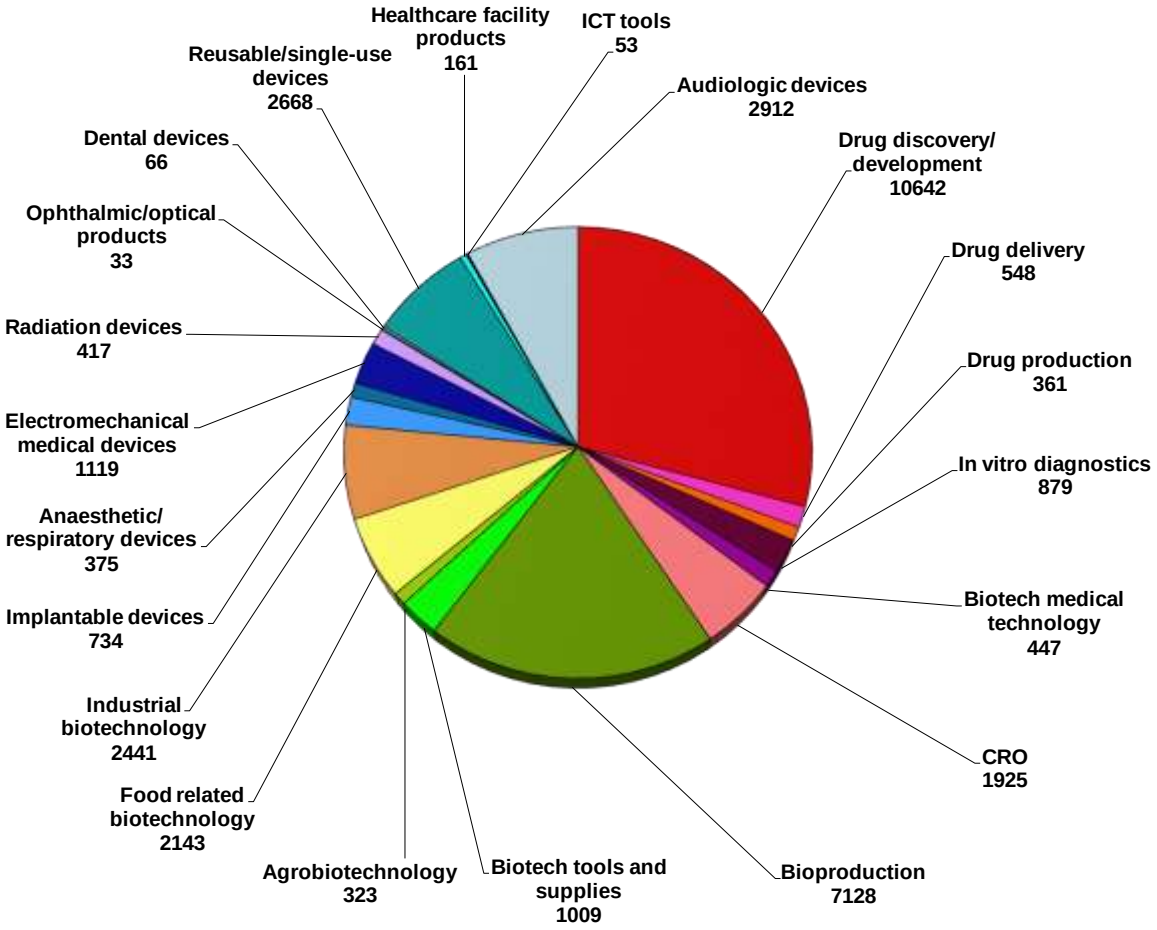


Number of companies



Proportion of employees

7. DENMARK



Number of employees

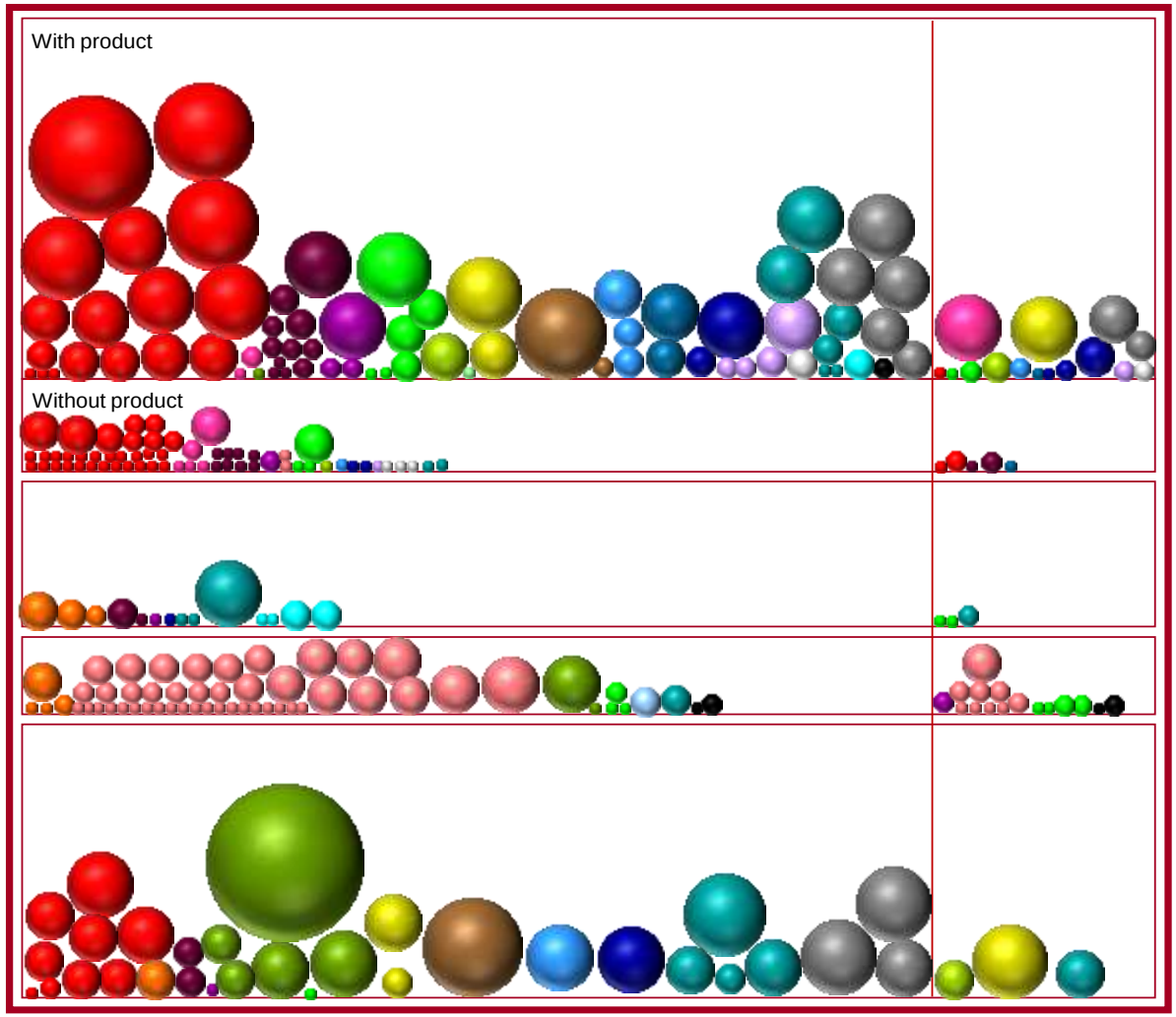
The Danish life science industry comprises 325 companies with a total of almost 36,400 employees (37,400 in 2006) involved in manufacturing, consultancy, product development and/or research and development in 2009. Companies focusing only on sales and marketing are not included for either Sweden or Denmark. Large companies or corporate groups with over 500 employees involved in different activities have been separated so that the employees are assigned to the proper types of activities (vertical axis). Units in different regions have also been considered (horizontal axis).

The Danish life science industry is dominated by Novo Nordisk, with more than 25% of the total number of employees. The industrial structure also includes another 33 companies with over 250 employees and 60 medium sized companies. The number of SMEs (1-250 employees) is about 240.

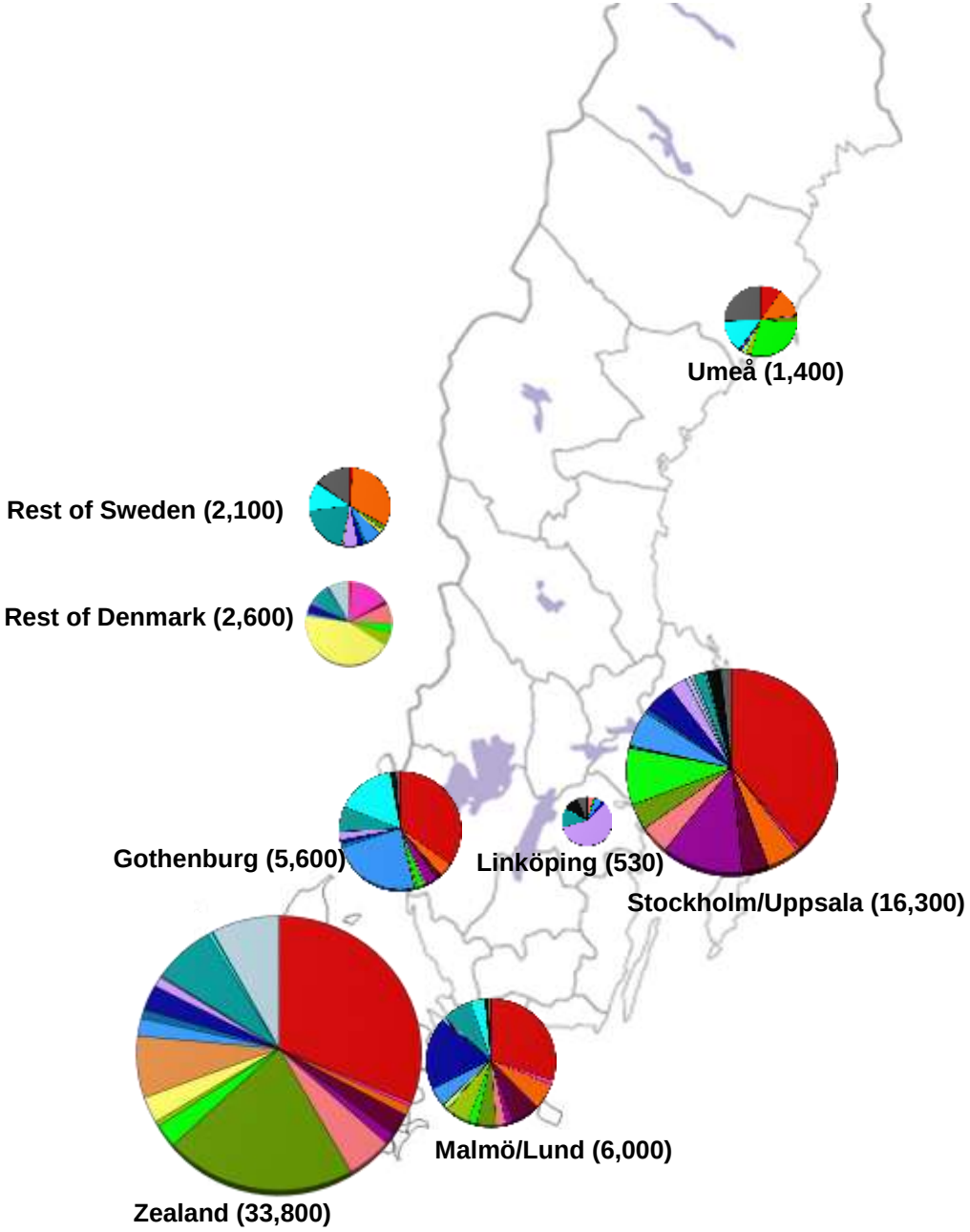
Over 90% of the employees are located in eastern Denmark. Most of the larger business segments include a few large companies which have major impact on segment size. This applies particularly to Drug discovery and development, which is dominated by Novo Nordisk. However, Leo Pharmaceuticals and H. Lundbeck, also have over 1,000 employees in the drug discovery and development segment. Novozymes dominates Industrial biotechnology. Coloplast is the largest medical technology company with more than 1,000 employees, but ten other medtech companies have over 250 employees, including three Audiological device firms (Oticon, Widex and GN Resound).

Cluster Profile Denmark

Drug discovery/development
Drug delivery
Drug production
In vitro diagnostics
Biotech medical technology
CRO
Bioproduction
Biotech tools and supplies
Agrobiotechnology
Environmental biotechnology
Food related biotechnology
Industrial biotechnology
Implantable devices
Anaesthetic/respiratory devices
Electromedical devices
Radiation devices
Ophthalmic/optical products
Dental devices
Reusable/single-use devices
Healthcare facility products
ICT tools
Audiologic devices



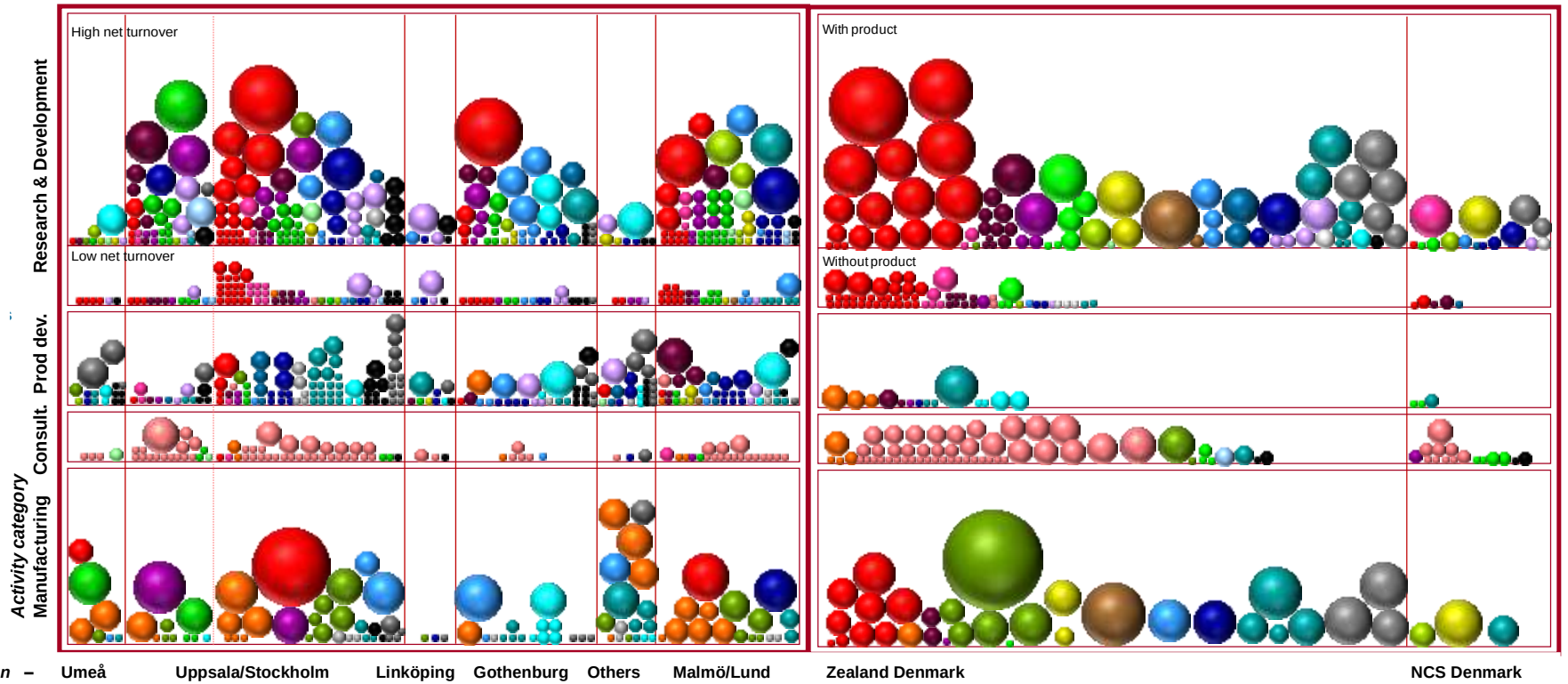
8. SWEDEN-DENMARK



Sweden has more than twice as many companies as Denmark, while the number of employees is slightly lower. The number of employees in Sweden and Denmark is over 32,000 (34,000 in 2006) and almost 36,400 (37,400 in 2006) in about 700 and 325 companies, respectively. Thus both countries have seen a reduction in the number of employees since 2006. The reduction in Denmark is spread among several companies which have reduced their staff by more than 200 employees each, whereas the bulk of the Swedish reduction can be attributed to AstraZeneca and Pfizer.

The Danish industrial structure includes more companies with more than 1,000 employees and far fewer SMEs. The industrial structure also differs when it comes to dividing the companies into business segments. Drug discovery and development have a similar, and dominant, share in the two countries but e.g. the Bioproduction, Food related and Industrial biotechnology segments are much larger in Denmark whilst the Biotech medical technology, Biotech tools and supplies, Healthcare facility products and adaptations and Implantable devices segments are much larger in Sweden. Also, in Denmark the field of Audiological devices is a narrow segment of significant size whereas Sweden has few such companies. Thus it is unnecessary to include such a segment for Sweden (for example, Cochlear Bone Anchored Solutions in Gothenburg is found in Implantable devices).

Cluster Profile Sweden - Denmark



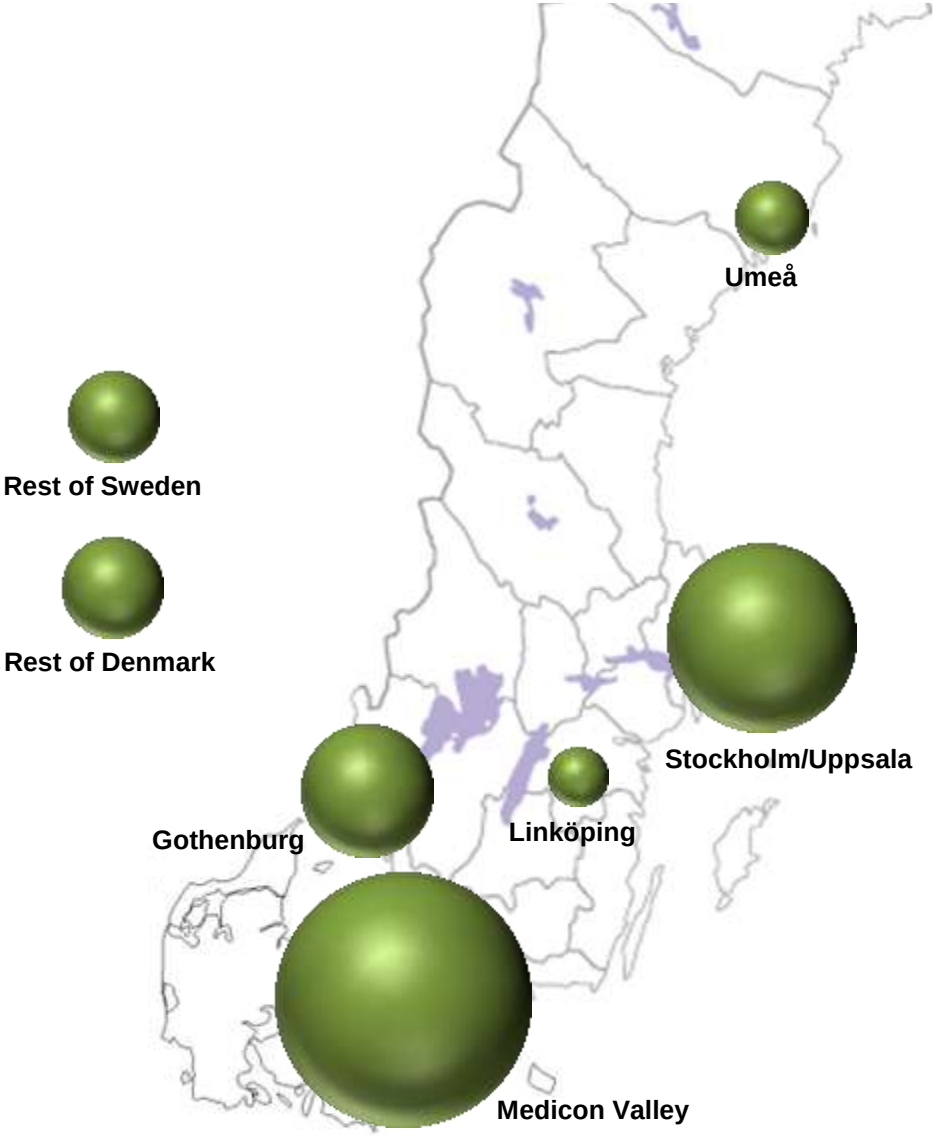
Drug discovery/development
Drug delivery
Drug production
In vitro diagnostics
Biotech medical technology
CRO

Bioproduction
Biotech tools and supplies
Agrobiotechnology
Environmental biotechnology
Food related biotechnology
Industrial biotechnology

Implantable devices
Anaesthetic/respiratory devices
Electromechanical medical devices
Radiation devices
Ophthalmic/optical products
Dental devices

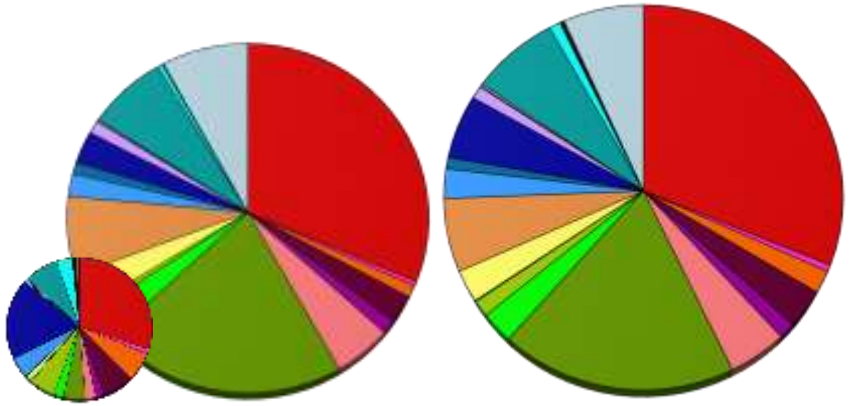
Reusable/single-use devices
Healthcare facility products
ICT tools
Assistive products for disabled
Audiologic devices

Medicon Valley



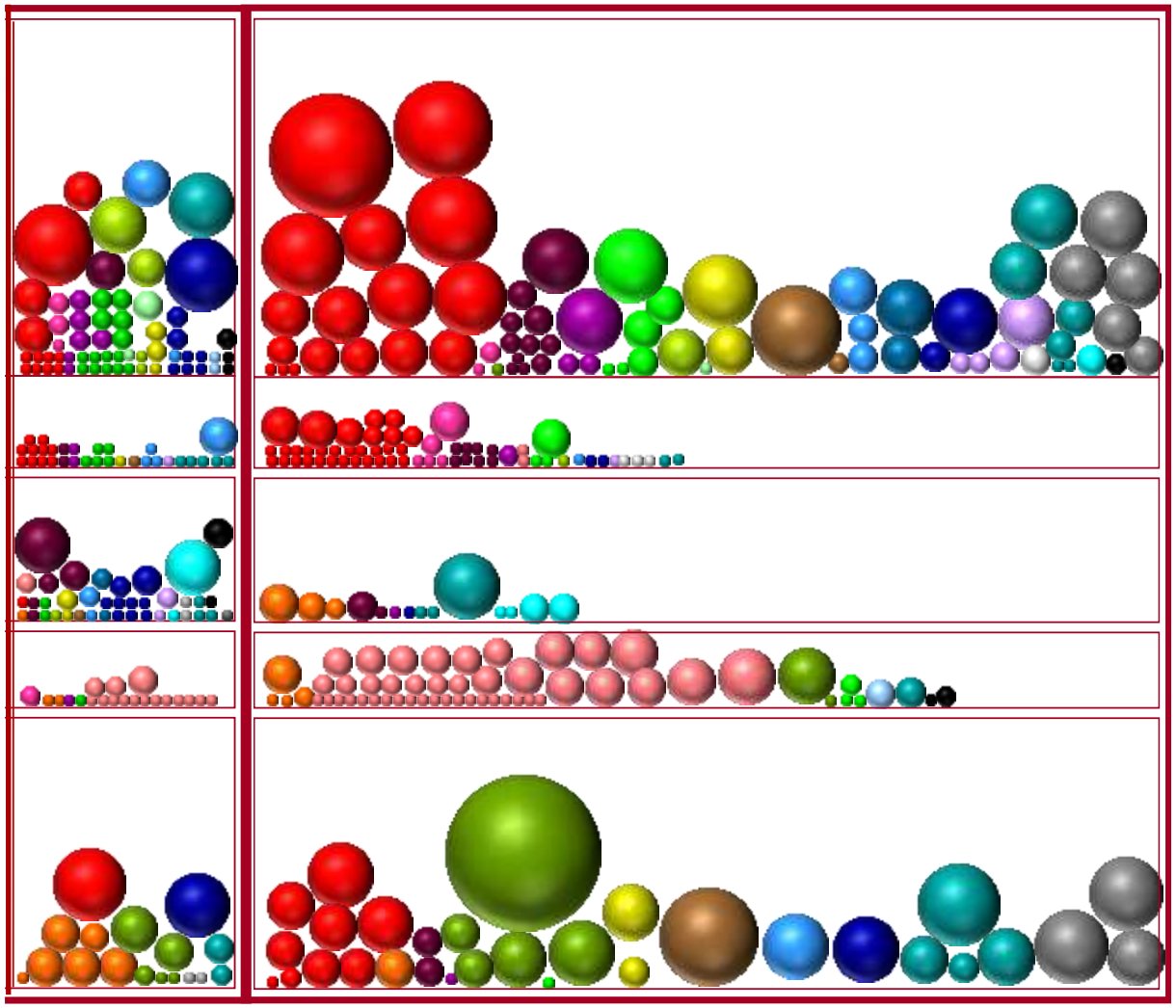
Medicon Valley is a bi-national cluster spanning the island of Zealand with the capital Copenhagen in eastern Denmark and the Skåne region of southern Sweden, including Malmö and Lund. The Medicon Valley region has about 40,000 employees in the life science industry. This is equal to 93% of all Danish plus 19% of all Swedish employees in companies with R&D and/or production and/or consultants, making the life science industry in this region larger than in either of the two countries.

In 2009, there were almost 33,800 employees on the Danish side (34,600 in 2006) and about 6,000 employees on the Swedish side (5,300 in 2006).



Medicon Valley Sweden Denmark *Medicon Valley Total*

Cluster Profile MediconValley



Drug discovery/development
Drug delivery
Drug production
In vitro diagnostics
Biotech medical technology
CRO
Bioproduction
Biotech tools and supplies
Agrobiotechnology
Environmental biotechnology
Food related biotechnology
Industrial biotechnology
Implantable devices
Anaesthetic/respiratory devices
Electromedical devices
Radiation devices
Ophthalmic/optical products
Dental devices
Reusable/single-use devices
Healthcare facility products
ICT tools
Assistive products for disabled
Audiologic devices

9. List of companies Sweden

Drug discovery and development

> 250 employees
AstraZeneca AB
Swedish Orphan Biovitrum AB (Publ)
Pfizer AB
McNeil AB

51 - 250 employees
Orexo AB
Bioinvent International AB
Medivir AB
Active Biotech Research AB, Active Biotech AB
Meda AB
Karo Bio AB
Oasmia Pharmaceutical AB

11 - 50 employees
Neurosearch Sweden AB
Abigo Medical AB
Sentoclone AB
Inovacia AB
Bioarctic Neuroscience AB
Isconova AB
Biophausia AB
Betagenon AB
Actar AB
Neuronova AB
Index Pharmaceuticals AB
Anamar AB
Diamyd Therapeutics AB

1 - 10 employees
Creative Antibiotics Sweden AB
Moberg Derma AB
Pharmasurgics In Sweden AB
Avaris AB
Nordsviten AB
Aprea AB
Dilafor AB
Tikomed AB
Hansa Medical AB
Niconovum AB
Axcentua Pharmaceuticals AB
Oxthera AB
Imed AB
Recopharma AB
Respiratorius AB (Publ)
Albireo AB
Redoxis AB
Omnio Healer AB
Umecrine AB
Got-A-Gene AB
Cardoz AB
Chrontech Pharma AB
Independent Pharmaceutica AB
Lipopeptide AB
Pharmalundensis AB
Helicure AB
Onco Targeting AB
Umecrine Mood AB
E Holme Utveckling AB
Oncopeptides AB
Allosergon AB
WP Development AB
Exthera AB
Dermagen AB
Akloma Bioscience AB
Pledpharma AB
Vicore AB
Vicore Pharma AB
Essentys AB
Glycovisc Biotech AB
Cortendo Invest AB
Cebix AB
Neurovive Pharmaceutical AB

Bacilltech AB
Everygene AB
Synphora AB
Nectin AB
Hyron Biomedical AB
Glucox Biotech AB
Swenora Biotech AB
Adenovir Pharma AB
Exicure AB
Mivac Development AB
Umandiagnostics AB
Neobiotics AB
Pharmalink AB
Dextech Medical AB
Oncoreg AB
Eribis Pharmaceuticals AB
Clanotech AB
Pep-Tonic Medical AB
Atomos Drug Discovery Services AB
Oxypharma AB

Drug delivery

11 - 50 employees
SHL Group AB
Camurus AB
Galenica AB
Magle AB
Renapharma-Vifor AB

1 - 10 employees
Novadex Pharmaceuticals AB
Xspray Microparticles AB
Inhalation Sciences Sweden AB
Viscogel AB
Zelmic AB
Eurocine Vaccines AB
Med Coat AB
Hans Lennernäs Biomedical AB
Quinnova Development AB
Pergamum AB
Jederstrom Pharmaceuticals AB
Latorius AB
Iscovent AB
Medinvent AB
Softcure Pharmaceuticals AB
Stratosphere Pharma AB
Akinion Pharmaceuticals AB

Drug production

> 250 employees
Apoteket Produktion & Laboratorier AB
Recipharm Stockholm AB, Recipharm AB
Cambrex Karlskoga AB

51 - 250 employees
Recipharm Karlskoga AB
Kemwell AB
CCS, Clean Chemical Sweden AB
QPharma AB
Carmel Pharma AB
Bioglan AB
Rechon Life Science AB
Recipharm Strängnäs AB
Unimedic AB

11 - 50 employees
Recipharm Höganäs AB
Syntagon AB

1 - 10 employees
Ramidus AB
Hebi Health Care AB
Gordic Sweden AB
Chemilia AB
Mglas Scandinavia AB
Isosep AB

Biotekpro AB
M&D Packaging AB
FPA Konsult AB
Biosafe AB
Approval Engineering AB
Metina AB

In vitro diagnostics

> 250 employees
Phadia AB
Hemocue AB

51 - 250 employees
Euro-Diagnostica AB
Cepheid AB
Allergon AB

11 - 50 employees
Mercodia AB
AB Biomérieux
Fujirebio Diagnostics AB
Svanova Biotech AB
Miab Mälarinvest AB
Chemotechnique MB Diagnostics AB
Histocenter-Skandinaviskt Centrum För Histotekni
IDL Biotech AB

1 - 10 employees
Lifeassays AB (Publ)
Bactus AB
Cavidi AB
Maiia AB
Wieslab AB
Zafena AB
Athera Biotechnologies AB
Boule Diagnostics International AB
Servotek AB
Nordic Biomarker AB
Devyser AB
Biovator AB
A1M Pharma AB
Celoxio AB
Biovica International AB
Aprovix AB
Arocell AB
Alimenta Medical AB
Cytogenomics Sverige AB
Findout Diagnostic AB

Biotech medical technology

> 250 employees
Fresenius Kabi AB
Octapharma AB
Q-Med AB

51 - 250 employees
Vitrolife Sweden AB, Vitrolife Sweden Instruments AB
CMA Microdialysis AB

11 - 50 employees
Bohus Biotech AB
Artimplant AB
Biora AB
Carmeda AB
Olerup Ssp AB
Glycorex Transplantation AB (Publ)
Nidacon International AB
Bone Support AB

1 - 10 employees
Glycoprobe AB
Corline Systems AB
Alteco Medical AB
Dental Therapeutics AB
Senzime AB (Publ.)
Ellen AB

Glycorex AB
Biopolymer Products Of Sweden AB
SSP Primers AB
3H Biomedical AB
Spiber Technologies AB
Arterion AB
Calmark Sweden AB
Celltrix AB
Novahep AB
Encecor AB
Cytacoat AB
Cellmatrix AB
Arcimboldo AB
Gothenburg IVFAB

CRO companies

> 250 employees
Quintiles AB

51 - 250 employees
TFS Trial Form Support AB
PPD Scandinavia AB

11 - 50 employees
A+ Science AB
IRW-Consulting AB
Parexel Sweden AB
Pharma Consulting Group in Uppsala AB
Kendle Sweden AB
NDA Regulatory Service AB
Sofus Stockholm Consulting AB
Statisticon AB
Jöns Jacob Berzelius Clinical Research Center AB
Stricent AB
Cross Technology Solutions AB
Smerud Medical Research Sweden AB
TFS Trial Form Support International AB
Commitum AB

1 - 10 employees
Scandinavian Regulatory Services AB
Synergus AB
Epiq Life Science AB
Encorium Sweden AB
Cyncron AB
A+ Science Umeå AB
Q Advance Compliance & Validation AB
Scandinavian CRO AB
Biocontactor AB
Imagnia AB
Pharmacontrol MQL AB
NDA Group AB
PRA International Sweden AB
Visionar Preclinical AB
Colloidal Resource AB
Center För Läkemedelsstudier i Malmö AB
Pharm Assist Sweden AB
Omnicare Clinical Research AB
Pygargus AB
Orphan Europe Nordic AB
Pharmtech AB
Habeco AB
Chiltern International AB
SEDOC Pharmaceutical Medicine AB
LBM Elektronik AB
ARA Life Science AB
Medos AB
Amellus AB
Umbilicus Nordica AB
Promech Lab Holding AB
Medcore AB
Hylae Clinical Research AB
Porten Pharmaceutical AB
Croel AB
Medpace Sweden AB
Pronexus Analytical AB
Methra Uppsala AB
Venaticus AB
Scandinavian Outcomes AB

Regman AB
Cardiocon AB
Fyzikon AB
Acureomics AB
Sanrui AB
Arandi Development AB
Pro Saludis AB
Life Science Management Laboratories i Uppsala A
Monitour AB

Bioproduction

> 250 employees
Pfizer Health AB

51 - 250 employees
Polypeptide Laboratories (Sweden) AB
Crucell Sweden AB
Novozymes Biopharma Sweden AB
DSM Anti-Infectives Sweden AB

11 - 50 employees
Scandinavian Gene Synthesis AB
Recipharm Biologics AB
Mabtech AB
Unitech Biopharma AB
Medicago AB
Protista International AB, Protista Biotechnology AB
Agrisera AB
Bioreal (Sweden) AB
Atlas Antibodies AB

1 - 10 employees
Ova Production AB
Innovagen AB
Immun System I.M.S. AB
TDB Consultancy AB
Medisera AB
Ferring AB
Inro Biomedtek AB
Xbrane Bioscience AB
Probac AB
Yo Proteins AB

Biotech tools and supplies

> 250 employees
GE Healthcare Bio-Sciences AB

51 - 250 employees
Biotage Sweden AB

11 - 50 employees
Cellartis AB
Gyros AB
Attana AB
Affibody AB
Olink AB
Olink Genomics AB
Cellectricon AB
MIP Technologies AB
Alligator Bioscience AB
Biosensor Applications Sweden AB
Mitrionics AB
Vironova AB (Publ)
Tataa Biocenter AB

1 - 10 employees
Biolin Scientific AB
Q-Sense AB
Absorber AB
Biothema AB
Denator AB
Peviva AB
Genovis AB
Beactica AB
GE Healthcare AB
Nordiag AB

Q-Linea AB
Ludesi AB
Scanbi Diagnostics AB
Dynamic Code AB
Nanoxis AB
Belach Bioteknik AB
Biochromix AB
Ridgeview Instruments AB
Chemel AB (Publ)
Cybergene AB
Acure Pharma AB
Modpro AB
Alphahelix Molecular Diagnostics AB (Publ)
Saromics AB
Symcel AB
Nipeg Invest AB
European Institute Of Science AB
Midorion AB
Clinical Gene Networks AB
Qlucore AB
Sigolis AB
Omnio AB
Multid Analyses AB
Sidec AB
Scandinavian Biotechnology Research (Scanbires)
John Curling Consulting AB
Immunicum AB
Medicwave AB (Publ)
Layerlab AB
Bio-Hyos AB
Percell Biolytica AB
Inovata AB
Quintessence Research AB Qrab
Ph Plate Microplate Techniques AB
BT Biomedical Technology AB
Biodev AB
Novaferm AB
Dynabyte Biolabs AB
Oligovation AB
Medcap AB (Publ)

Agrobiotechnology

> 250 employees
Syngenta Seeds AB

51 - 250 employees
Lantmännen Sw Seed AB

11 - 50 employees
Swetree Technologies AB

1 - 10 employees
Maselaboratorierna AB
Plant Science Sweden AB
Nya Bionema AB
Binab Bio-Innovation AB
Crop Tailor AB
In-Gene AB

Environmental biotechnology

11 - 50 employees
Scandinavian Biogas Fuels AB
Anoxkaldnes AB
Ekologisk Technologi i Skellefteå AB

1 - 10 employees
Invekta Green AB
Sysav Utveckling AB
Biobact AB
AB Thalassa

Food related biotechnology

11 - 50 employees
Biogaia AB
LTP Lipid Technologies Provider AB
Probi AB
Kemikalia AB

1 - 10 employees
Essum AB
Labrobot Products AB
Indevex AB (Publ)
Indevex Watertech AB
Concellae AB
Amicus Scandinavia AB
Celac Sweden AB
Proequo AB

Industrial biotechnology

1 - 10 employees
Xylophane AB
Organoclick AB
Appeartex AB

Implantable devices - active and non-active

> 250 employees
Astra Tech AB
St. Jude Medical AB
Nobel Biocare AB

51 - 250 employees
Cochlear Bone Anchored Solutions AB
Atos Medical AB
Elos Medtech Timmersdala AB
Biomet Cementing Technologies AB

11 - 50 employees
Biomain AB
Swemac Orthopaedics AB
Osstell AB

1 - 10 employees
Doxa AB
Surgical Inventions Jan Bertil Wieslander AB
Oticon Medical AB
Tigran Technologies AB (Publ)
Ospol AB
Denzir Production AB
Integrum AB
Promimic AB
Craniofacial Reconstruction Ta AB
Brånemark Center Göteborg AB
Limedic AB
Addbio AB
Carponovum AB
Swemac Medical Appliances AB
Hedelin & Co AB
Udesign Ögonkonsult AB
Iopharma Technologies AB
Rickard Brånemark Consulting AB
AB Immuno
P & B Research AB
Prozeo Vascular Implant AB

Anaesthetic and respiratory devices

51 - 250 employees
Breas Medical AB

11 - 50 employees
Phasein AB
Aerocrine AB
Artema Medical AB
Nonin Medical AB (Publ)
Anmedic AB
Airsonett AB

1 - 10 employees
Aspira Medical AB
Accelerator Nordic AB
Sedana Medical AB
Clinova Medical Innovation Dr Per Ljungvall AB
Aloro Medical AB

Electromechanical medical devices

> 250 employees
Gambro Lundia AB
Maquet Critical Care AB

51 - 250 employees
St. Jude Medical Systems AB
Boule Medical AB

11 - 50 employees
Gambro AB
Cellavision AB
Perimed AB
Ortivus AB
DJO Nordic AB
Neoventa Medical AB
Jolife AB
Dilab i Lund AB
Aurena Laboratories AB
Aiolos Medical AB

1 - 10 employees
Medirox AB
Spectro Analytic Irradia AB
Sapheneia Commercial Products AB
Qbtech AB
Cefar-Compex Medical AB
Hök Instrument AB
Ingenjörsfirman Björn Bergdahl AB
Everymed AB
Medical Vision AB
Sensodetect AB
Prostalund Operations AB
Somedic AB
Micus Sverige AB
Igelösa Life Science AB
Milmedtek AB
Entomed AB
Photonova Of Sweden AB
Biolight AB
Conroy Medical AB
Medivet Scandinavian AB
Demetech AB
Neodynamics AB
Obstecare AB
Medicpen AB (Publ)
Neoventor Medicinsk Innovation AB
Ceram AB
Pharmacell AB
Ljungberg & Kögel AB
Tl Elektromedicin AB
Likvor AB
Cardiolex AB
Curictus AB
Triomed AB
Comair Professor Hans Wiksell AB
Tilly Medical Products AB
PBM - Stress Medicine Systems AB
Syspiro Diagnostics AB
Medtentia AB
Biooptico AB
Novosense AB
Emotra AB

Radiation devices - diagnostic and therapeutic

51 - 250 employees
Elekta Instrument AB, Elekta AB
Sectra-Imtec AB
Gems Pet Systems AB
Sectra Mamea AB
Unfors Instruments AB
Arcoma AB
GE Healthcare Sverige AB

11 - 50 employees
Sectra AB
Uppsala Imanet AB
Contextvision AB
RTI Electronics AB
IBA Dosimetry AB
Xcounter AB
Hermes Medical Solutions AB
Triacon Scientific AB
Scandidos AB

1 - 10 employees
C-Rad AB
C-Rad Positioning AB
Oncolog Medical Qa AB
C-Rad Imaging AB
Krucom AB
Turon Medtech AB
RSA Biomedical AB
Breis & Co AB
Micropos Medical AB (Publ)
Synthetic Mr AB (Publ)
Spectracure AB
Bioresonator AB
Medfield Diagnostics AB
Scint-X AB
Hammercap AB
Beampoint AB

Ophthalmic and optical products

51 - 250 employees
AMO Uppsala AB

1 - 10 employees
Lyyn AB (Publ)
Premacure AB
Exomed AB
Retcorr AB
Phacotreat AB

Dental devices

11 - 50 employees
Dentatus AB
Belas AB
Directa AB
Amdent AB
AB Ardent

1 - 10 employees
Nordiska Dental AB
J.H. Orsing AB
Orasolv AB
Svenska Dentorama AB
AB Depro
Swedish Dental Supplies AB
Sendoline AB
Aristodent AB
Ceramatic Instrument AB
Dentosystem Scandinavia AB
Mirrodent AB
Dental In Sweden AB
Cleandent Sweden AB

Reusable and single-use devices

> 250 employees
Becton Dickinson Infusion Therapy AB
Attends Healthcare AB
Mölnlycke Health Care AB

51 - 250 employees
Cenova AB
Aritco Lift AB

11 - 50 employees
Akla AB

Stille AB
Orifice Medical AB
Flexmed AB
Convatec (Sweden) AB
Hammarplast Medical AB
Cellcomb AB
Bactiguard AB
Plasma Surgical AB
Inmedic AB
Conroy Production AB
Rolf Kullgren AB

1 - 10 employees
Trollhätteplast AB
Gridline AB
Scanflex Medical AB
Nolabs AB
K48 Konsult AB
Bio-Hospital AB
Apriomed AB
Item Development AB
Pharma Systems Ps AB
Sanicare AB
Spago Imaging AB
Microbiotech/Se AB
Dignitana AB
Vivoline Medical AB
Ascendia Medtech AB
Quickels Systems AB
Optima Scandinavia AB
Ursus Medical AB
Quickcool AB
Eskilstuna Instrumentverkstad AB
Calmed AB
Höjmed Medical AB
Mercan AB
Cathprint AB
Entpro AB
SF-Kirurgia AB
Antrad Medical AB
CMC Contrast AB
Inoris Medical AB
Victrix AB
AB Nordic Medifield Service
Corisco AB
Actimed Plast AB
T A Contrast AB
Wennbergs Finmek AB
Cimatex AB
Mellby Medical AB

Information and communication tools

51 - 250 employees
Cambio Healthcare Systems AB
Compugroup Medical Sweden AB
Mawell Scandinavia AB, Mawell Svenska AB
Raysearch Laboratories AB (Publ)

11 - 50 employees
Mentice AB
STT Condigi AB
Systeam Outsourcing Services Uppsala AB
Agfa Healthcare Sweden AB
Omnitor AB
Falck Igel AB
Health Solutions Svenska AB
Cogmed Systems AB, Cogmed Sverige AB
Exini Diagnostics AB

1 - 10 employees
Surgical Science Sweden AB
Diabetes Tools Sweden AB
Open In Sweden Care AB
Aidera AB
Dentaleye AB
Internetmedicin i Göteborg AB
Distributed Medical AB
Bergsjö Data AB

Redsense Medical AB
Zenicor Medical Systems AB
Action Caring Sweden AB
Sanocore AB
Omnitus AB
Box Play Alleato AB
Karlsson & Novak Medical AB
Melerit AB
Ceterum AB
Meditalk AB
Sencere Medical AB
Livanda-Internetkliniken AB
Medviso AB
Uptoit AB
Synaps Teknisk Utveckling AB
Telexmedica Kliniska Telemedicin AB
Inline Dss AB
Inovacor AB
G4 IT AB
Rätt Spår i Uppsala AB
Reachin Technologies AB
Sverker Jern Utbildning AB
Megra Studio AB
Graftcraft i Göteborg AB
Libego AB
Careit - Selfhelponline (Solutions) AB
Qbion AB
Comai AB
QP Quality Pharma Medtech AB
Kiwok Development AB
Bäwer & Nilsson AB

Healthcare facility products and adaptations

> 250 employees
Getinge Sterilization AB
Arjo Ltd Med. AB

51 - 250 employees
Arjo, Arjo Scandinavia, Arjo Hospital Equipment, Arjohuntleigh International
Getinge Disinfection AB
Liko, Liko Produktion, Liko Research & Development, Liko Textil
Getinge Infection Control AB
Getinge, Getinge Sverige, Getinge International

11 - 50 employees
Getinge Skärhamn AB
Handicare AB
Sjöbloms Sjukvårdsutrustning AB
Mercado Produktion AB
Oscar Instrument AB
Care Of Sweden AB
Remeda AB

1 - 10 employees
Rini Ergoteknik AB
Reison Medical AB
Proton Caretec AB
Medicvent AB
Vegoria Produktion AB
D-Tec AB
Toul Meditech AB
Molift AB
Caresia AB
ES Equipment AB
Jatab Care AB
Combimobil AB
Luki AB
AO Innovation AB

Assistive products for disabled people

> 250 employees
Permobil AB

51 - 250 employees
Etac Sverige AB

Etac Supply Center AB
Permobil Produktion AB

11 - 50 employees
Össur Nordic AB
Abilia AB
Lvi Low Vision International AB
Mercado Medic AB
Centri AB
Anatomic Sitt i Norrköping AB
Panthera Production AB
Hantverksdesign & Rehabiliteringsprodukter AB
Etac AB
Excal AB
Anatomic Sitt Produktion i Östergötland AB
Kom i Kapp - Rehatek AB
Gate Rehab Development AB
Decon Wheel AB

1 - 10 employees
Ortolab AB
Svan Care AB
Mabs Int AB
Kanmed AB
Handitek AB
B.I.M.A. Plastteknik AB
Synsupport Nordic Eye AB
Nyedal Utveckling AB
Swereco Rehab AB
Gewab AB
Handfast AB
Anatomica AB
Audiocare AB
Promedvi AB
Bioservo Technologies AB
Mastercare AB
Spina Medical AB
Elvings Otoplastik AB
Ago Innovator AB
Osseofon AB
Avanco AB
Exaudio AB
Gearwheel AB
Bestic AB
Cervrite AB
Jump & Joy AB

Tables

		Research & development	Product development	Consulting	Manufacturing	**TOTAL**
Total	Employees	15978	3466	1023	11520	31987
Pharmaceuticals	Employees	6756	288	921	6668	14633
Biotechnology	Employees	10311	123	51	5746	16231
Medical technology	Employees	7244	3122	74	4130	14570

Distribution of companies and employees by activity category

		Drug discovery and development	Drug delivery	Drug production (not biotech)	In vitro diagnostics	Biotech medical technology	CRO companies	Bioproduction (healthcare related)	Biotech tools and supplies	Agrobiotechnology	Environmental biotechnology	Food related biotechnology	Industrial biotechnology	Implantable devices - active and non-active	Anaesthetic and respiratory devices	Electromechanical medical devices	Radiation devices - diagnostic and therapeutic	Ophthalmic and optical products	Dental devices	Reusable and single-use devices	Information and communication tools	Healthcare facility products and adaptions	Assistive products for disabled people	Total
Total	Employees	10339	166	2242	1152	2261	934	1031	2111	424	97	118	17	2589	215	2045	1014	142	148	1627	582	1626	1107	31987
Pharmaceuticals	Employees	10339	166	2242	0	0	873	1013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14633
Biotechnology	Employees	9296	66	0	793	2261	17	1031	2111	424	97	117	17	0	0	0	0	0	0	0	0	0	0	16230
Medical technology	Employees	0	0	0	1152	2261	62	0	0	0	0	0	0	2589	215	2045	1014	142	148	1627	582	1626	1107	14570

Distribution of companies and employees by business segment

Sources

This study was based on the database built up within the framework of past Addendi AB reports as well as VINNOVA reports in this field (VINNOVA Analysis VA 2003:2, VINNOVA Report:VA 2005:2, VINNOVA Report:VA 2007:16, and VINNOVA Report:VA 2008:10), regional input and input from university holding companies, Innovationsbron AB, Venture Capital firms plus VINNOVA, NUTEK and the EU in regard to companies having received funding.

The data was supplemented by drawing on data lists for companies with NACE codes 244, 331, 73103 and 51460 from the Market Manager Partners database. Concerning companies identified by a NACE code, only those with at least one employee were categorised. In total, approximately 2,800 companies were categorised within the framework of this study. Companies were categorised on the basis of information from the companies' websites, other information on the Internet, patent applications, various studies and analyses on companies within the field and telephone conversations with many of the companies included. Information about the number of employees of each company, the year of establishment, the structure of groups of companies as well as the economic information was extracted from the consultancy firm Soliditet AB. Their database is based on information registered at the Swedish Companies Registration Office.

Biotech definition

OECD biotechnology definition:
The application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services

OECD list-based definition of biotechnology techniques:
DNA/RNA: Genomics, pharmacogenomics, gene probes, genetic engineering, DNA/RNA sequencing/synthesis/amplification, gene expression profiling, and use of antisense technology.

Proteins and other molecules: Sequencing/synthesis/engineering of proteins and peptides (including large molecule hormones); improved delivery methods for large molecule drugs; proteomics, protein isolation and purification, signalling, identification of cell receptors.

Cell and tissue culture and engineering: Cell/tissue culture, tissue engineering (including tissue scaffolds and biomedical engineering), cellular fusion, vaccine/immune stimulants, embryo manipulation.

Process biotechnology techniques: Fermentation using bioreactors, bioprocessing, bioleaching, biopulping, biobleaching, biodesulphurisation, bioremediation, biofiltration and phytoremediation.

Gene and RNA vectors: Gene therapy, viral vectors.

Bioinformatics: Construction of databases on genomes, protein sequences; modelling complex biological processes including systems biology.

Nanobiotechnology: Applies the tools and processes of nano/microfabrication to build devices for studying biosystems and applications in drug delivery, diagnostics etc.

VINNOVA´s publications

March 2011
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VINNOVA Analysis

VA 2011:

01 Smart ledning - Drivkrafter och förutsättningar för utveckling av avancerade elnät
02 Framtid med växtverk - Kan hållbara städer möta klimatutmaningarna?
03 Life science companies in Sweden including a comparison with Denmark
04 Sveriges deltagande I sjunde ramprogrammet för forskning och teknisk utveckling (FP7) – Lägesrapport 2007-2010, focus SMF. *Only available as PDF*

VA 2010:

01 Ladda för nya marknader – Elbilens konsekvenser för elnät, elproduktionen och servicestrukturer
02 En säker väg framåt? - Framtidens utveckling av fordonssäkerhet
03 Svenska deltagandet i EU:s sjunde ramprogram för forskning och teknisk utveckling - Lägesrapport 2007 - 2009. *Only available as PDF. For briefversion see VA 2010:04*
04 SAMMANFATTNING av Sveriges deltagande i FP7 - Lägesrapport 2007 -2009. Brief version of VA 2010:03
05 Effektanalys av stöd till strategiska utvecklingsområden för svensk tillverkningsindusytri. For brief version in Swedish and English see VA 2010:06 and VA 2010:07
06 Sammanfattning - Effektanalys av stöd till strategiska utvecklingsområden för svensk tillverkningsindusytri. Brief version of VA 2010:05, for brief version in English see VA 2010:07
07 Summary - Impact analysis of support for strategic development areas in the Swedish manufacturing industry. Brief version of VA 2010:05, for brief version in Swedish see VA 2010:06
08 Setting Priorities in Public Research Financing - context and synthesis of reports from China, the EU, Japan and the US
09 Effects of VINNOVA Programmes on Small and Medium-sized Enterprises - the cases of Forska&Växa and VINN NU. For brief version in Swedish see VA 2010:10
10 Sammanfattning - Effekter av VINNOVA-program hos Små och Medelstora Företag. Forska&Växa och VINN NU. Brief version of VA 2010:09
11 Trämanufaktur i ett uthålligt samhällsbyggande - Åtgärder för ett samverkande innovationssystem. *Only available as PDF*

VA 2009:

01 Svenska tekniker 1620 - 1920
02 Effekter av statligt stöd till fordonsforskning - Betydelsen av forskning och förnyelse för den svenska fordonsindustrins konkurrenskraft. For brief version in Swedish and English see VA 2009:11 and VA 2009:12
03 Evaluation of SIBED. Sweden - Israei test bed program for IT applications. *Only available as PDF*
04 Swedish possibilities within Tissue Engineering and Regenerative Medicine
05 Sverige och FP7 - Rapportering av det svenska deltagandet i EUs sjunde ramprogram för forskning och teknisk utveckling. *Only available as PDF*
06 Hetast på marknaden - Solenergi kan bli en av världens största industrier
07 Var ligger horisonten? - Stor potential men stora utmaningar för vågkraften
08 Vindkraften tar fart - En strukturell revolution?
09 Mer raffinerade produkter - Vedbaserade bioraffinaderier höjer kilovärdet på trädet
10 Förnybara energikällor - Hela elmarknaden i förändring
11 Sammanfattning - Effekter av statligt stöd till fordonsforskning. Brief version of VA 2009:02, for brief version in English see VA 2009:12
12 Summary - Impact of Government Support to Automotive Research. Brief version in English of VA 2009:02, for brief version in Swedish see VA 2009:11
13 Singapore - Aiming to create the Biopolis of Asia
14 Fight the Crisis with Research and Innovation? Additional public investment in research and innovation for sustainable recovery from the crisis.
15 Life Science Research and Development in the United States of America - An overview from the federal perspective. *Only available as PDF*
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17 Priority-setting in the European Research Framework Programme
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21 Research Priorities and Prioritysetting in China
22 Priority-Setting in U.S. Science Policies
23 Priority-Setting in Japanese Research and Innovation Policy

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02 Miljöinnovationer - Projektkatalog
03 Innovation & Gender
04 Årsredovisning 2010

VI 2010:

01 Transporter för hållbar utveckling
02 Fordonsstrategisk Forskning och Innovation FFI
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04 Årsredovisning 2009
05 Samverkan för innovation och tillväxt. For English version see VI 2010:06
06 Collaboration for innovation and growth. For Swedish version see VI 2010:05
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08 Vinnande tjänstearbete - Tio forsknings- & utvecklingsprojekt om ledning och organisering av tjänsteverksamhet. *Only available as PDF*
09 NO WRONG DOOR Alla ingångar leder dig rätt - Erbjudande från nationella aktörer till SMF - Små och Medelstora Företag.
10 Därför behöver Sverige en innovationspolitik
11 Omställningsförmåga & kompetensförsörjning - Projektkatalog. *Only available as PDF*
12 Smartare, snabbare, konvergerande lösningar - Projektkatalog. Adresserar området IT och data/ telekommunikation och ingår i IKT-programmet ”Framtidens kommunikation”
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VP 2010:

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02 Tjänsteinnovationer för tillväxt. Regeringsuppdrag - Tjänsteinnovationer. *Only available as PDF*

VINNOVA Report

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01 Hundra år av erfarenhet - Lärdomar från VINNVÄXT 2001 - 2010
02 Gender across the Board – Gender perspective on innovation and equality. *For Swedish version see VR 2009:20*

VR 2010:

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02 Innovations for sustainable health and social care - Value-creating health and social care processes based on patient need. For Swedish version see VR 2009:21
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05 VINNVÄXT i halvtid - Reflektioner och lärdomar. For English version see VR 2010:09
06 Sju års VINNOVA-forskning om kollektivtrafik - Syntes av avslutade och pågående projekt 2000 - 2006. *Only available as PDF. For brief version see VR 2010:07*
07 Översikt - Sju års VINNOVA-forskning om kollektivtrafik. For main version see VR 2010:06
08 Rörlighet, pendling och regionförstoring för bättre kompetensförsörjning, sysselsättning och hållbar tillväxt - Resultatredovisning från 15 FoU-projekt inom VINNOVAs DYNAMO-program
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10 The Matrix - Post cluster innovation policy
11 Creating links in the Baltic Sea Region by cluster cooperation - BSR Innonet. Follow-up report on cluster pilots
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21 VINNOVAs utlysningar inom e-tjänster i offentlig verksamhet 2004 och 2005 - Kartläggning av avslutade projekt
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VINNOVA develops Sweden´s innovation capacity
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