Partnering for Impact
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The University of Copenhagen</td>
<td>3</td>
</tr>
<tr>
<td>Management</td>
<td>3</td>
</tr>
<tr>
<td>The Research &amp; Innovation Council</td>
<td>4</td>
</tr>
<tr>
<td>Facts and Figures</td>
<td>4</td>
</tr>
<tr>
<td>Research Strengths</td>
<td>7</td>
</tr>
<tr>
<td>Copenhagen Science City</td>
<td>8</td>
</tr>
<tr>
<td>Commercialisation</td>
<td>10</td>
</tr>
<tr>
<td>TTO Budget</td>
<td>11</td>
</tr>
<tr>
<td>Income Stream</td>
<td>11</td>
</tr>
<tr>
<td>Invention Disclosures</td>
<td>12</td>
</tr>
<tr>
<td>Turning Inventions into Deals</td>
<td>12</td>
</tr>
<tr>
<td>Proof-of-Concept</td>
<td>16</td>
</tr>
<tr>
<td>Copenhagen Spin-outs</td>
<td>18</td>
</tr>
<tr>
<td>Student Entrepreneurship</td>
<td>20</td>
</tr>
<tr>
<td>Appendix 1: The Technology Transfer Team</td>
<td>21</td>
</tr>
<tr>
<td>Appendix 2: Invention Disclosures per department 2011-15</td>
<td>25</td>
</tr>
</tbody>
</table>
The University of Copenhagen

As the largest university in Denmark\(^1\), the University of Copenhagen is recognised as one of Europe's leading universities with a strong core in basic research and research-based education covering a wide range of subject areas.

As the result of the university mergers in 2007, the then Royal Veterinary and Agricultural University as well as the Danish University of Pharmaceutical Sciences became faculties of the University of Copenhagen. In 2012 these two faculties merged again with the Faculties of Science and Health Science resulting in the six-faculty university that we know today.

Management

The University Board is the highest authority at the University of Copenhagen. The Board consists of six external members and five internal members. Rector and two pro-rectors (pro-rector for Research & Innovation and pro-rector for Education) are appointed/approved by the Board to head the daily management of the University. Deans are nominated by Rector and appointed by the Board to head the six faculties.

The University of Copenhagen is a self-governing unit under

\(^1\) As a measure of turnover and the number of employees and students
the state. The University reports to the Ministry of Education with which the Board of the University has entered into a Development Contract. This contract formulates the University’s objective and intended progress for a fixed period of time.

The Research and Innovation Council

The University’s Research and Innovation Council was established by Pro-rector Thomas Bjørnholm in 2011. The Council is responsible for the University’s strategic development within research, innovation and business collaboration and to determine how this development is best supported by the organisation. The Council’s objective is to secure increased external funding, prioritise how the university profiles its activities externally and to initiate a greater number of collaborative relationships with private and public partners. The Council consists of Pro-rector (Chair), the director of Research & Innovation as well as the associate deans for research and/or industry relations from the six faculties.

A number of initiatives have been taken in recent years to underpin and boost the University’s activities within innovation and entrepreneurship:

- Strategy for collaboration with private enterprise, produced in close dialogue with internal and external stakeholders, focuses on:
  - Matchmaking
  - Increased focus on innovation and entrepreneurship in education
  - Seamless commercialisation and technology transfer processes
  - Enhanced strategic dialogue with industry
- Strategy for closer collaboration with companies with limited research and development resources
- Description of the University’s leading-edge research areas ([www.forskning.ku.dk](http://www.forskning.ku.dk))
- An annual Innovation Prize has been part of the University’s Commemoration ceremony since 2011 celebrating a particularly innovation researcher/research group
- Allocation of an internal, annual proof-of-concept fund of DKK 5 mio for promising inventions
- Establishment of Copenhagen Spin-outs, an ERDF-funded project with a budget of approx. EUR 5.3 million in total. During the project period (2011-Spring 2015), the three academic institutions (the Copenhagen University, the Technical University of Denmark and the Capital Region’s hospitals) established 23 research-based spin-outs
- Strengthened collaboration with the Technical University of Denmark and Copenhagen Business School on Copenhagen Science Region (see below), Next Generation (entrepreneurship education) and formalised research collaboration (within for example foods)
- Strategic alliances with industry (national and international companies)

Facts and Figures

Dating back from 1479, the University of Copenhagen today produces knowledge of the highest quality, it is ranked 37 in the world (Leiden Ranking 2013), and is a major national and international player thanks to its networks, engagements and collaborations.
The University of Copenhagen is member of IARU, the International Alliance of Research Universities, bringing together ten of the World’s leading research-intensive universities:

- Australian National University
- ETH Zurich
- National University of Singapore
- Peking University
- University of California – Berkeley
- University of Cambridge
- University of Oxford
- The University of Tokyo
- Yale University

For more information, please visit the IARU web-site: www.iaruni.org

Researchers and Nobel Prizes

- Ludvig Holberg (1684-1754), meta physics, rhetoric and history
- H. C. Ørsted (1777-1851), physics
- Niels Finsen (1860-1904), Nobel Prize in medicine 1903
- August Krogh (1874-1949), Nobel Prize in medicine 1920
- Johannes Fibiger (1867-1928), Nobel Prize in medicine 1926
- Niels Bohr (1885-1962), Nobel Prize in Physics 1922
- Henrik Dam, Nobel Prize in medicine 1943
- Aage Bohr, Nobel Prize in Physics 1975
- Ben R Mottelson, Nobel Prize in Physics 1975
- Niels K. Jerne, Nobel Prize in Medicine 1984

With over 40,000 students and more than 10,000 employees, the University of Copenhagen is the largest institution of research and education in Denmark. Academic staff (FTEs) amount to approx 5,500 employees. The University’s annual income of EUR 1.1 billion places it in the same league as other world-renowned universities.
A total of 959 PhD students enrolled at the University of Copenhagen and 833 PhD degrees were conferred. The University’s PhD action plan outlines various potential career paths and development opportunities for PhDs. The Graduate Talent Programme consists of a five-year PhD programme allowing students to start their PhD programmes after completing a bachelor degree.

The University has as one of its declared goals to increase both national and international research funding. To this end, the University published its Strategy for Collaboration with Private Enterprise 2012-2016 which specifically focuses on R&D intensive national and international companies as well as creation of opportunities for new spin-out companies.

<table>
<thead>
<tr>
<th>2014: Number of co-financed research projects</th>
<th>SCIENCE</th>
<th>HEALTH SCIENCE</th>
<th>BRIC</th>
<th>TOTAL KU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of co-finances research projects</td>
<td>1,966</td>
<td>1,772</td>
<td>126</td>
<td>3,864</td>
</tr>
<tr>
<td>Danish public sources</td>
<td>950</td>
<td>680</td>
<td>34</td>
<td>1,664</td>
</tr>
<tr>
<td>Danish private sources</td>
<td>611</td>
<td>903</td>
<td>74</td>
<td>1,588</td>
</tr>
<tr>
<td>EU</td>
<td>237</td>
<td>87</td>
<td>10</td>
<td>334</td>
</tr>
<tr>
<td>Other non-Danish sources</td>
<td>168</td>
<td>102</td>
<td>8</td>
<td>278</td>
</tr>
</tbody>
</table>

The University of Copenhagen is a core partner in InnoLIFE, a Knowledge and Innovation Community (KIC) partnership and the EU’s largest-ever public-private partnership. The partnership promotes active lifestyles and healthy living and will receive EU funding in the region of 4-5 billion. Other partners include Imperial College, Karolinska Institute, KU Leuven, Roche Diagnostics GmbH, Novo Nordisk A/S together with other leading European universities and companies.
Research Strengths

The University’s focus on excellence was further strengthened by the University of Copenhagen’s Excellence Programme for Interdisciplinary Research awarding grants to 18 projects. This programme has to date spent almost half a billion Danish kroner (EUR 67 million) in order to promote closer interdisciplinary research collaboration amongst the University’s scientists.

The University has identified a number of areas of interdisciplinary strengths such as:

- Biological production
- Food
- Globalisation
- Climate & sustainability
- New medicines
- Health and lifestyle
- Water

Centres of Excellence

The University of Copenhagen has 26 centres of excellence funded by the Danish National Research Foundation. A total of 23 centres are based at the Science and the Health Science faculties. Currently, the following centres are active in the Science and Health Science areas:

<table>
<thead>
<tr>
<th>Name of Centre</th>
<th>Centre leader</th>
<th>Grant Period</th>
<th>Grant Mio DKK</th>
<th>Grant Mio EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center for Dynamic Molecular Interactions (DynaMo)</td>
<td>Professor Barbara Halkier</td>
<td>2012-2017</td>
<td>49</td>
<td>6.6</td>
</tr>
<tr>
<td>Copenhagen Center for Clycomics</td>
<td>Professor Henrik Clausen</td>
<td>2012-2017</td>
<td>62</td>
<td>8.31</td>
</tr>
<tr>
<td>Center for Quantum Devices</td>
<td>Professor Charles Marcus</td>
<td>2012-2018</td>
<td>64</td>
<td>8.6</td>
</tr>
<tr>
<td>Center for Permafrost (CENPERM)</td>
<td>Professor Bo Elberbing</td>
<td>2012-2018</td>
<td>60</td>
<td>8.0</td>
</tr>
<tr>
<td>Centre for Macroecology, Evolution and Climate (CMEG)</td>
<td>Professor Carsten Rahbek</td>
<td>2010-2015</td>
<td>59,9</td>
<td>8.0</td>
</tr>
<tr>
<td>Center for Symmetry og Deformation (SYM)</td>
<td>Professor Jesper Grodal</td>
<td>2010-2015</td>
<td>50</td>
<td>6.7</td>
</tr>
<tr>
<td>Center for Particle Physics (Discovery)</td>
<td>Assoc. Professor Peter Hansen</td>
<td>2010-2015</td>
<td>40</td>
<td>5.4</td>
</tr>
<tr>
<td>Center for Star and Planet Formation(STARPLAN)</td>
<td>Martin Bizzarro</td>
<td>2009-2014</td>
<td>34</td>
<td>4.5</td>
</tr>
<tr>
<td>Center for GeoGenetics</td>
<td>Professor Eske Willerslev</td>
<td>2009-2014</td>
<td>50</td>
<td>6.7</td>
</tr>
<tr>
<td>Center for Ice and Climate</td>
<td>Professor Dorthe Dahl-Jensen</td>
<td>2007-2017</td>
<td>115,8</td>
<td>15.5</td>
</tr>
<tr>
<td>Center for Epigenetics</td>
<td>Professor Kristian Helin</td>
<td>2007-2017</td>
<td>110,9</td>
<td>14.9</td>
</tr>
<tr>
<td>Danish Arrhythmia Research Center (DARC)</td>
<td>Professor Søren-Peter Olesen</td>
<td>2005-2015</td>
<td>69,7</td>
<td>9.3</td>
</tr>
<tr>
<td>Center for Models of Life (CMOL)</td>
<td>Professor Kim Sneppen</td>
<td>2005-2015</td>
<td>52,1</td>
<td>7.0</td>
</tr>
<tr>
<td>Dark Cosmology Centre (DARK)</td>
<td>Professor Jens Hjort</td>
<td>2005-2015</td>
<td>114,2</td>
<td>15.3</td>
</tr>
</tbody>
</table>

2 http://research.ku.dk/strengths/basic_research_centres/
Copenhagen Science City: Hub for Research & Innovation

Copenhagen has been voted the Nordic Region’s best city in which to run a business (Pricewaterhouse Coopers, 2012) and the easiest place in Europe to run a business (World Bank 2013).

Copenhagen Science City comprises the area around the University of Copenhagen, the Metropolitan University College and Copenhagen University Hospital. The area is one of the largest areas of education, research and applied sciences within the fields of pharmacology, health sciences and natural sciences in Europe. More than 30,000 students and staff study and work in the area every day.

A number of the internationally leading research institutes under the University of Copenhagen are gathered at Copenhagen Science City. Research into diabetes, genetics, stem cells, healthy ageing, cancer, datalogy, nanoscience and biology will take place at the Science City centres and institutes such as the Biotech Research and innovation Centre (BRIC), the Novo Nordisk Foundation Centre for Protein Research (CPR), the Novo Nordisk Foundation Centre for Basic Metabolic Research, the Finsen Institute, the Department of Computer Science and the ESS Data Management and Software Centre.

The massive investments in Copenhagen Science City are currently materialising through a number of large infrastructure projects:

Copenhagen Science City is an attractive location for businesses and knowledge institutions within the health and life sciences, cleantech and ICT.

The Science City includes 200,000 m² which have been designed for businesses, with office hotels, various sizes of self-contained rental premises and sites ready for development. There is space for growth companies, small entrepreneurs and established businesses. There is also 40,000 m² designed for housing.

More than 35,000 people work at the Science City and about 55,000 people live in the area.

The Science City brings together research and innovation created around the University of Copenhagen, the Metropolitan University College and Copenhagen University Hospital. This creates strong synergies between, knowledge, business and the City.

3 www.copenhagensciencecity.dk
**Pharma Science Centre**
The construction of new buildings for the Pharma School under the Faculty of Health Sciences will provide more laboratories in the fields of chemistry, biology and technical pharmacology. Scientists from different departments will be able to interact and undertake collaborative work in these shared facilities thus strengthening interdisciplinary academic research.

Size: 5,100 m²  
Budget: EUR 24 million (DKK 179 million)

**Mærsk Building**
The Panum Building houses the University's Faculty of Health Sciences whose international biomedical research environment will be further strengthened by the addition of the Mærsk Building. From 2015, the Mærsk Building will be the home of front line research in the fields related to the treatment of cancer, dementia, diabetes, heart disease and allergies.

Size: 37,200 m²  
Budget: EUR 190 million (DKK 1,422 billion)

**Extension of Copenhagen University Hospital**
Through an extension and renovation of its grounds, Copenhagen University Hospital intends to consolidate its position as an academic spearhead institution as well as a highly specialised hospital. Additions will include a treatment centre with new private rooms, state-of-the art operating theatre, an intensive care department and outpatient departments and facilities for image diagnostics.

Size: 76,100 m²  
Budget: EUR 248 million (DKK 1,85 billion)

**The Niels Bohr Building**
The Niels Bohr Building for the Faculty of Science will provide a new setting for communication, education and the research within the fields of physics, chemistry, computing sciences, mathematics and science didactics.

Size: 45,000 m²  
Budget: EUR 219 million (DKK 1,631 billion)

**COBIS 2**
COBIS, a science park and incubator specialising in biotech, opened its doors in 2009. The recent extension of COBIS (2) will provide additional square meters for a combination of office and lab facilities. The extension will be able to accommodate another 25-30 business and business developments in life science, biomed and biotech in 2014. After the completion of COBIS 2, the total area will amount to 19,000 m².

Size: 7,000 m²  
Budget: EUR 15 million (DKK 115 million)
Commercialisation

The University of Copenhagen was the first Danish university to establish a Technology Transfer Office in 2003, moving away from the purely administrative patent offices established at Danish universities as a result of the introduction of the Danish “Bayh-Dole Act” in 2000.

Today, the University’s TTO is manned with 14 highly skilled professionals who scout, evaluate invention disclosures, turn inventions into deals (licenses and spin-outs) and negotiate a large number of research collaboration agreements and the present and/or future intellectual property resulting from these agreements. Please see Appendix 1 for further details on the team.

The University of Copenhagen’s TTO model is set up to be as lean and efficient as possible. All commercial agreements are negotiated and signed within the office and the University has, from day one, delegated all decision-making to the TTO in order to ensure swift and professional processes.

---

4 Danish Act on Inventions at Public Research Institutions, 2000
TTO Budget

The TTO’s total annual budget amounts to EUR 2,478,828 (DKK 18,492,000):

<table>
<thead>
<tr>
<th>Budget Posts</th>
<th>Amount in DKK</th>
<th>Amount in EUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>7,202,000</td>
<td>965,415</td>
</tr>
<tr>
<td>Travel + representation</td>
<td>250,000</td>
<td>33,521</td>
</tr>
<tr>
<td>Patenting and commercialisation expenses</td>
<td>5,900,000</td>
<td>790,885</td>
</tr>
<tr>
<td>Proof-of-Concept fund</td>
<td>5,000,000</td>
<td>670,241</td>
</tr>
<tr>
<td>Staff courses, IT, furniture, other office expenses</td>
<td>140,000</td>
<td>18,766</td>
</tr>
<tr>
<td>Total DKK + EUR</td>
<td>18,492,000</td>
<td>2,478,828</td>
</tr>
</tbody>
</table>

The overall aim for the University in relation to the Tech Transfer Office is to make as many agreements and deals with external parties as possible. Income on licensing agreements is still relatively modest. Most agreements are made with biotech companies on technologies that require years of development as well as substantial investments.

Income Stream

The University of Copenhagen TTO income stream is similar to many other TTOs internationally who have been active for a decade or so. Currently, the TTO’s portfolio of licensing agreements contains more than 150 agreements of which +40 generated income in 2015 (income being both royalties, licensing fees and reimbursement of patent expenses).
Invention Disclosures

Since 2000 employees at the Danish research institutions are required to disclose inventions to their employer. At the University of Copenhagen it is the Tech Transfer Office who receives, evaluates and protects inventions from the academic community.

The number of disclosures has varied over the past 10 years. The fluctuations seem to coincide with major restructuring activities within the University of Copenhagen. Two universities (the Danish University of Pharmaceutical Sciences and the Royal Veterinary and Agricultural University) merged into the University of Copenhagen in 2007/8 and obtained status of universities. In 2011 these two faculties (of Pharmaceutical Sciences and LIFE) merged with the faculties of Health Sciences and Sciences.

After a few years with modest numbers, the trend was turned in 2013 with a big increase in invention disclosures (from 49 in 2012 to 77 in 2013). This development has been underpinned by a number of university initiatives both by the Tech Transfer Office (increased scouting, workshops, teaching, information campaigns) and by the University and faculty managements. Going forward, the University Management Team has decided that innovation activities and performance will be included in all research managers’ annual performance contracts.

Disclosures from departments vary greatly with some department standing out year after year as major contributors to the annual invention disclosure production. Though these departments also vary from year to year it is evident that Plant and Environmental Sciences and International Health, Immunology and Microbiology are two very active departments. Other departments perform cutting-edge research and are expected to produce an increasing amount of commercially interesting invention disclosures in the years to come.

Appendix 2 offers an overview of invention disclosures per department 2011-2015.

Turning Invention Disclosures into Deals

The TTO has been very successful in securing an important number of licensing deals for the University of Copenhagen.
Disclosures, patents, deals 2004-2015

Year after year, the University of Copenhagen enters by far most of all licensing deals on patented inventions amongst the Danish research institutions:

National licensing activities

In average, approximately 25% of all inventions are turned into a deal and the rate of success when it comes to choosing which ideas to protect with a view to commercialisation is almost 1:1!

Turning Inventions into Deals: 2004 – 2015

---

5 includes data from the Danish University Pharmaceutical Sciences and the Royal Agricultural and Veterinary School  
6 Data from 2004, 2005, 2006 includes the Royal Agricultural and Veterinary School and the Danish University of Pharmaceutical Sciences
The University’s deal flow has been increasing over the years. Licensing to existing companies has been the preferred route of commercialisation. In recent years, more focus has been directed towards entrepreneurial researchers and assistance to those wishing to create spin-outs on the basis of their inventions (see more about spin-outs below).

**Deal-flow 2004 – 2015**

The year 2015 proved to be a particular good year where the Tech Transfer Office entered 23 licensing agreements and spun out 5 new spin-out companies. Some University of Copenhagen inventions are licensed to several international partners as has been the case with the “Brachyspina” invention:

---

**The Brachyspina Genetic Test – one invention: 8 license agreements**

The genetic disease Brachyspina found in cattle leads to calves born with an abnormally short spine and other life-threatening deformities.

**The Invention**

Genetic test method developed by researchers at the University of Copenhagen in collaboration with colleagues from the University of Liège, Belgium.

The test determines whether cattle are carriers of a particular mutation resulting in calves with the Brachyspina syndrome.

**Collaboration and Market**

Danish company, Genoskan A/S, purchased a license to the test in 2009. The invention has been licensed to 7 other companies from France, Spain, Germany, the Netherlands, USA and Japan.

---

7 Figures include the Royal Veterinary School and the Danish University of Pharmaceutical Sciences
The Faculty of Health Science accounts for the majority of license deals though the Faculty of Science is on the rise.

License agreements per faculty 2008-2015

Professor Barbara Halkier and the group around refined beans are good examples of projects from Science (the former LIFE) that incorporate both research collaboration agreements and commercial agreements with external partners. Both these groups have been recipients of the University's Innovation Prize (2012 and 2013) which was awarded for the first time in 2011.

Eliminating Plant Toxins

Plants produce toxins to defend themselves against potential enemies - from herbivorous pests to diseases
Oilseed rape plants produce glucosinolates as toxin
Only limited amounts of the protein-rich seeds can be used for animal fodder

The invention
Method to prevent undesirable toxins from entering the edible parts of the plant Developed by researchers at UCPH and Bayer CropScience

Collaboration
UCPH and Bayer CropScience
Working together to install new technology and produce a canola plant with glucosinolate-free seeds

Inventor:
Barbara Ann Halkier

---

*Please note that the faculties of LIFE and PHARMA merged with HEALTH and SCIENCE in 2011*
Proof-of-Concept

In 2007, the Danish Government allocated funding for Proof-of-Concept for two Danish consortia (East and West). The East Consortium (University of Copenhagen, the Technical University of Denmark, the Capital Region of Denmark, The Danish Serum Institute) was allocated a fund of a total of EUR 9.3 mio (DKK 69.5) over the period of 2008-2012.

Over the 5 year period, the University of Copenhagen submitted 33 applications of which 23 were successful. These 23 projects were allocated at total of EUR 1.9 mio (DKK 14.233.369) from 2008-2012.

Refined Beans: Efficient use of plant products

The Invention
3 researchers at the University of Copenhagen have developed a smart and very efficient method of extracting protein from pulses - from lupins to soybeans.
The residual products can be used for food for humans as well as for animal fodder.

Collaboration and market
- UCPH, Agro Korn A/S and Hornslyd Kobmandsgaard A/S
- Collaboration based on patented inventions and license agreement
- New factory worth DKK 100 Mio is built for up-scaling of bioprocesses using soya beans
- Estimated factory annual turnover: DKK 350 Mio

The researchers won the University of Copenhagen Innovation Award 2012.

Inventors:
Jens Chr. Sørensen
Keld Ejdrup Markedal
Hilmer Sørensen
Science, Univ. of Copenhagen
From those 23 proof-of-concept projects, 7 spin-outs have been formed. Some of these projects have later been adopted and established under the umbrella of Copenhagen Spin-outs (see table below). Copenhagen Spin-out projects benefit from mini-proof-of-concept grants, mentoring and advice from industry mentors, access to training and workshops, etc.

**Timpco Aps**  
Area: diagnostic cancer research  
University researcher: Nils Brunner  
www.timpco.com

**VAR2 Pharmaceuticals**  
Area: design and development of proprietary therapeutic proteins targeting cancer-specific carbohydrate structures for multiple cancer indications  
University researcher: Ali Salanti  
www.var2pharmaceuticals.com

**FIDA-TECH Aps**  
Area: monitoring glycemic control in type 2 diabetes  
University researcher: Henrik Jensen  
www.fida-tech.com

**Neoloch Aps**  
Area: developing drugs for the treatment of degenerative and inflammatory diseases of the brain University researchers: Elisabeth Boch, Vladimir Berezin  
www.neoloch.dk

**InProTher**  
Area: development of a novel therapeutic vaccine against Human Papilloma Virus (HPV)  
University research: Peter Johannes Holst  
www.novo.dk/seeds/

**Bojesen & Petersen Biotech Aps**  
Area: production of the product, Bactivate, aimed at infertile mares caused by a chronic infection  
University researchers: Anders Miki Bojesen, Morten Ronn Petersen  
news.ku.dk/all_news/2013/2013.2/scientists_make_racehorses_fertile/

**Avilex Pharma Aps**  
Area: development of novel inhibitors of PDZ domains to target a range of unmet needs  
University researchers: Kristian Stromgaard, Anders Bach  
www.avilexpharma.com
The University of Copenhagen’s TTO has managed Copenhagen Spin-outs since 2011. This is a partnership between the University of Copenhagen, the Technical University of Denmark and the Capital Region of Denmark (12 hospitals) together with a number of central stakeholders such as the Association of Danish Biotech and the Association of the Danish Pharmaceutical Industries.

The project was funded through a EUR 5.3 million ERDF grant from 2011-Spring 2015. During this period, the academic institutions produced 23 research-based spin-outs thus exceeding the overall aim of the project of 21 spin-outs. The partners signed an MoU in May 2015 in which they agree to continue the collaboration in Copenhagen Spin-outs without external funding.

The University of Copenhagen Tech Transfer Office is currently working on a number of spin-out projects as illustrated below. This list only contains the projects that are currently in the University portfolio. More projects will be added as they are taken on board by the University.

### Avilex Pharma:

Medicines for treatment of Neuropathic pain and Ischemic stroke
- Founded by inventors in 2012
- 2 license agreements with the University of Copenhagen

The inventions
- New drug candidates that target a system linked to the NMDA receptor inside the brain cell
- The target is responsible for triggering cell death in case of disease
- The NMDA receptor retains normal function but the brain cell is protected against cell death
- Priority patent applications filed in 2008 and 2011

Collaboration
- 2 rounds of Proof-of-concept funding
- Novo Seeds A/S is investor in Avilex Pharma
- Ongoing collaboration between Avilex Pharma and Dept of Chemical Biology, Faculty of Health Sciences

Capital (June 2015)
- DKK 10 million from Seed Capital, Denmark
- DKK 18 million translation award, Welcome Trust, UK

Inventors
Professor Kristian Strømgaard
PostDoc Anders Bach
<table>
<thead>
<tr>
<th>Name of project</th>
<th>Department</th>
<th>Area</th>
<th>PoC and other grants (in DKK)</th>
<th>Spinout year</th>
</tr>
</thead>
<tbody>
<tr>
<td>InProther Aps</td>
<td>Intl. Health, Immunology …</td>
<td>Development of a novel therapeutic vaccine against Human Papilloma Virus</td>
<td>Various</td>
<td>2012</td>
</tr>
<tr>
<td>FIDA-Tech Aps</td>
<td>Pharmacy</td>
<td>Monitoring glycemic control in type 2 diabetes</td>
<td>Various</td>
<td>2012</td>
</tr>
<tr>
<td>Bojesen &amp; Petersen Biotech Aps</td>
<td>Veterinary Disease Biology</td>
<td>Bactivate, product aimed at infertile mares carrying a chronic infection</td>
<td>Various</td>
<td>2012</td>
</tr>
<tr>
<td>Dep-Xplora Aps</td>
<td>Pharmacy</td>
<td>Prodrugs for pain relief</td>
<td>Various</td>
<td>2012</td>
</tr>
<tr>
<td>AviLex Pharma Aps</td>
<td>Drug Design &amp; Pharmacology</td>
<td>Development of novel inhibitors of PDZ domains</td>
<td>Various</td>
<td>2013</td>
</tr>
<tr>
<td>Gel</td>
<td>Drug Design &amp; Pharmacology</td>
<td>New gel various applications</td>
<td>SCO: 150K</td>
<td>2014</td>
</tr>
<tr>
<td>Immunitrack</td>
<td>Biology</td>
<td>Drug for treatment of autoimmune diseases</td>
<td>Novo:2.300K SCO: 125K</td>
<td>2014</td>
</tr>
<tr>
<td>Glycospot</td>
<td>Plant and Env. Sciences</td>
<td>Kit for screening active enzymes within plant polysaccharides</td>
<td>SCO: 125K</td>
<td>2015</td>
</tr>
<tr>
<td>Bioprinter</td>
<td>Food Science</td>
<td>Novel production of food grade proteins and fibers from plants</td>
<td>External partner: 750K SCO: 184K</td>
<td>2015</td>
</tr>
<tr>
<td>RetiCare</td>
<td>Neuroscience &amp; Pharmacology</td>
<td>NPY-derived peptides for treatment of eye diseases</td>
<td>CSO 175K</td>
<td>2015</td>
</tr>
<tr>
<td>Potentiostat</td>
<td>Chemistry</td>
<td>Electrochemistry – New Potentiostat</td>
<td>CleanTech 250K</td>
<td>2015</td>
</tr>
<tr>
<td>Flax Slim</td>
<td>Nutrition, Exercise and Sports</td>
<td>Flaxseed as food supplement and ingredient</td>
<td>SCO: 210K</td>
<td>2015</td>
</tr>
<tr>
<td>Dual Syringe</td>
<td>Pharmacy</td>
<td>Pre-filled syringes</td>
<td>CSO: 50K</td>
<td>2016</td>
</tr>
<tr>
<td>PH Sensor</td>
<td>Chemistry</td>
<td>New optic sensor for measurement of pH</td>
<td>PoC: 300K Lundbeck: 250K SeedCapital: 500K SCO: 195K</td>
<td>2016?</td>
</tr>
<tr>
<td>Phosfor</td>
<td>Plant and Env. Sciences</td>
<td>New method for measuring fertiliser condition in plants</td>
<td>Various SCO 150K</td>
<td>2016?</td>
</tr>
<tr>
<td>PC Programme</td>
<td>BRIC</td>
<td>Software for sequence data</td>
<td>SCO: 100K</td>
<td>2016?</td>
</tr>
<tr>
<td>Prostate Cancer</td>
<td>Veterinary Disease Biology</td>
<td>Diagnosis of prostate cancer</td>
<td>POC 280K</td>
<td>2017</td>
</tr>
<tr>
<td>Antag</td>
<td>Neurovidenskab og Farmakologi/Biomedicinsk Institut</td>
<td>Endogenous glucose-dependent insulinotropic polypeptide receptor antagonist</td>
<td>CSO PoC 254K NNF 500K</td>
<td>2017</td>
</tr>
<tr>
<td>DiaCure</td>
<td>Danish Stem Cell Center</td>
<td>Novel cell surface markers for isolation of human ES-cell derived PDX1+ beta cell progenitors</td>
<td>KU PoC 500K Novo Seeds: 2.4000K</td>
<td>2017</td>
</tr>
</tbody>
</table>

According to these projections, the University of Copenhagen will thus have spun out at least 18 companies from 2012 till then 2017. These projections are only based on the current projects in the pipeline and have not taken new potential spin-out projects into consideration.
Student Entrepreneurship

Students at the University of Copenhagen have ample opportunities to explore their business genes and to live out their entrepreneurial dreams. The University has catered for the more innovative students for many years and the efforts were particularly intensified and integrated through the projects, Next Generation and Copenhagen Innovation and Entrepreneurship Lab (CIEL), both funded by the European Social Fund and the Capital Denmark Growth Forum. Next Generation was initiated in 2010 with a project period of 4 years. In 2011 CIEL was initiated as an extension of these activities with a two-year-funding period.

**Next Generation**’s overall aim was to integrate innovation and entrepreneurship in teaching activities, to strengthen the students’ knowledge and innovative competencies, to integrate innovation and entrepreneurship into the scientific disciplines and to strengthen the collaboration across the participating universities. At the University of Copenhagen, the two entrepreneurial Greenhouses, Katapult and Katalyst, have been the operational partners. During the course of the initiative more than 9,000 students have been exposed to innovation and entrepreneurship through various events, competitions and courses. University teaching staff have participated in workshops and other events where they have been taught how to integrate innovative pedagogic skills in their day-to-day teaching (be it in medicine, physics or plant biology). A total of 98 students have received proof-of-concept funding for their ideas leading to 60% establishing their own company (of which 54% have a positive turn-over).

**Copenhagen Innovation and Entrepreneurship Lab (CIEL)** is an alliance between the University of Copenhagen, the Technical University of Denmark and Copenhagen Business School. The three partners join their efforts in order to develop and support initiatives within innovation and entrepreneurship (I&E) for the benefit of students, industry, research and education within the region. CIEL activities are centred round research, education and student activities:

- In research, the Entrepreneurship Research Accelerator (ERA) creates new research alliances and seed-finance for about 20 new I&E research projects. A novel entrepreneurial database will create the basis for unique longitude studies on the impact of I&E university education.
- In education, CIEL supports and facilitate the development of I&E courses (Entrepreneurial Excellence Programmes, Digital Services Innovation in Health Care, Food Entrepreneurs, Green Innovation in Cities, Bio Innovation)
- For students, CIEL supports the development of co-curricular activities and seeks to develop and improve the support provided by the entrepreneurial eco-system. Startup Spirits is a novel inspirational game for students to become entrepreneurs.

Activities in both Next Generation and CIEL have now been embedded within the University of Copenhagen to ensure continuation of experiences, best practise and development of innovation and entrepreneurship within education. The University has allocated a significant amount for these activities under the auspices of the University’s own “**2016-Fund**”, a fund with the specific aim of underpinning particularly important strategic initiatives.

**T57 – Office space for students** provides a creative and professional environment for students who would like to develop or work on their ideas and students who have already started a business. Students have access to counselling, mentoring, events and workshops and will be able to network with like-minded entrepreneurs or entrepreneurs-to-be. Students can get work space on a first-come-first-served basis – the space is free but “tenants” are expected to give 2 hours a month to the development or the running of the space.
Appendix 1

The Technology Transfer Team

Karen Laigaard

Karen Laigaard established the University's Tech Transfer Office in 2003. Before joining the University of Copenhagen, Karen was employed with the Danish Ministry of Science, Technology and Innovation. From 1996-2001 Karen worked as International Marketing Manager at the University of Glasgow’s commercialisation office, Research & Enterprise. She was the president of ASTP (Association of European Science & Technology Transfer Professionals) from 2009-11, a member of ASTP's board from 2007-2011 and is now Chair of ASTP's Programming Committee. Over the years Karen has been part of numerous national and international working groups on technology transfer and frequently speaks at conferences and seminars around the world. She is a board member of NTNU TTO AS, the technology transfer organisation of the Norwegian University of Science and Technology in Trondheim. Karen is a Registered Technology Transfer Professional (RTTP). She holds an MA and recently completed the Executive Healthcare Innovation Management Program from Stanford University/Technical University of Denmark.

Niels Engelhard

Niels Engelhard holds a Master in Agronomy from the University of Copenhagen (1995). He joined the University of Copenhagen in 2008 and works with all aspects of out-licensing of early stage technologies; scouting, assessment of commercial value of inventions, licensee strategy, marketing of early stage technologies, valuation of IPR and negotiation of license agreements. Niels worked 13 years at the Danish Technological Institute (DTI) as a business consultant specialising in licensing and commercialisation of early stage technologies from private inventors, public-sector research institutions and startups. Alongside the licensing activities, Niels worked as a DTI consultant as a part-time Investment manager in 1998-2000 for two seed incubators and has been a board member of several high-tech start-up companies. From 2000 to 2006 Niels worked mainly with private inventors, and small companies advising clients on different aspects of licensing and technology transfer. Niels is currently a non-executive member of the Board of the biotech company, Virogates A/S.

Maj Hilligsøe

Maj is a biologist by background graduating with a M.Sc. from the University of Copenhagen (including studies in neuroscience at the University of British Columbia). Maj joined the Tech Transfer Office in 2012 following several years of working as an IPR counsel in private practice as well as in the pharmaceutical and biotech industries, e.g. Takeda Pharma and Zealand Pharma. Maj has obtained experience in all aspects of product development, from the conception of an idea to launch of a product, life cycle management and licensing. As Commercial Officer at the Tech Transfer Office, Maj is responsible for evaluating inventions, identifying companies for out-licensing opportunities and negotiating licensing agreements.
Bo Stenhuus

Bo is a European Patent Attorney and has extensive experience with innovation and startup companies. Bo joined the University of Copenhagen TTO in December 2012 as a Technology Scout with a focus on business planning and execution of spin-outs from the University. Previously Bo has been part of the management team of a small biotech company and he has worked in private practice as a patent attorney. Bo is skilled in bridging the research from Universities with the commercial needs of small and medium sized companies. Bo holds a Ph.D. in chemistry from the Technical University of Denmark, a degree in finance from Copenhagen Business School and a CBA from IDA Business & Leadership. Bo is responsible for invention disclosures related to spin outs, assisting researchers in forming their own companies, negotiating license terms and connecting researchers with suitable external advisors.

Peter Stein Nielsen

Peter Stein Nielsen holds a M.Sc. in Biology and a Ph.D. in Natural Science (1991) from Aarhus University. Peter joined the University of Copenhagen TTO in July 2014 as a Technology Scout with a focus on business planning and execution of spin-outs from the University. Previously Peter worked in academic positions at the Norwegian University of Life Sciences, Risø National Laboratory and the Technical University of Denmark before joining Carlsberg Laboratory in 1999. In 2001 Peter joined Exiqon and the following 10 years held various positions, predominantly in R&D but also as head of production and part of the management team in Exiqon. Most recently Peter worked as department manager for Chr. Hansen, Human Health and Nutrition Innovation. Peter has a broad background from Biotech/Life Science ranging from venture financed biotech to a Nasdaq-OMX C20 company. Peter is responsible for invention disclosures related to spin outs, assisting researchers in forming their own companies, negotiating license terms and connecting researchers with suitable external advisors.

Steffen Haurum

Steffen Haurum is a special adviser and has since January 2015 been the Project Manager for Copenhagen Spin-outs. The aim of Copenhagen Spin-outs is to create biotech spin-outs based on public research results from University of Copenhagen, the Technical University of Denmark and the Capital Region Hospitals. Before joining the University of Copenhagen in 2015 Steffen worked at Roskilde University with knowledge dissemination, innovation and regional development. Previously Steffen worked with regional development and EU structural funds at the Danish Business Authority. Steffen holds a master’s degree in public administration.
**Mette Andrup**

Mette Andrup works at the University of Copenhagen as a senior legal advisor primarily in the field of research related contracts, such as collaboration agreement, license agreements and other IP related issues. Before joining the University of Copenhagen in 2006 she worked at Statens Serum Institute (1995-2001) and the Technical University of Denmark (2001-2005). Mette’s educational background is a M.Sc. in Business Administration and Commercial Law from the Copenhagen Business School, Denmark. Altogether she has 19 years of experience in handling research related contracts with industry and universities. Mette has given lectures a several ASTP events and was on AUTM’s annual meeting committee 2010 – 2012.

**Luisa Nygaard**

Having started her career as an attorney-at-law with the top-tier Danish law firm Gorrissen Federspiel, Luisa spent nearly 10 years advising Danish as well as international companies within IPR and medico. In 2008 Luisa was seconded to Novo Nordisk within the licensing and litigation department. Luisa joined the Technology Transfer Office in January 2012 as special legal adviser and has since then negotiated at large amount of projects incorporating complex IP and licensing structures.

**Eva Lessel**

Eva has worked with legal matters related to public research institutions for more than 20 years with special emphasis on IP related matters and technology transfer the last 7 years. Eva has served as a legal adviser in the Danish National Research Foundation and since 2007 as a legal adviser at the University of Copenhagen. Eva holds an LLM from University of Copenhagen. During her 14 years with the Danish National Research Foundation, Eva has gained broad knowledge of research and research administration nationally and internationally and she served for a period at the National Science Foundation, US. Eva is a member of the Danish Society for Intellectual Property Rights and of ASTP-PROTON (Association of European Science and Technology Professionals).

**Henriette Grønfeldt**

Henriette joined the University of Copenhagen in 2006 and is a special legal advisor in the Tech Transfer Office. She graduated with a Master of Laws from the University of Aarhus. Her first job was as Head of section, Directorate of Health, Nuuk, Greenland Home Rule, where she undertook ministerial servicing, legislative work and handling of appeals in the health care area. Henriette made a short stop as a legal consultant for the Danish Association of Pharmaceutical Industries with focus on legislative work of relevance to the pharmacies and informing members on relevant legislation. She then returned to Greenland to a job as a project consultant working on the Greenland pharmaceutical legislation. Henriette returned to Denmark to a job as an in-house lawyer with focus on copyright and negotiating license agreements for the Danish National Library Authority.
Marie Hyllested

Marie is attorney-at-law and has broad legal and commercial knowledge of contract law with focus on IP matters, hereunder 10 years of legal counseling within the Danish film and entertainment industry. Since 2009 Marie has been specialising in IP-related activities of public universities in terms of technology transfer (research collaborations and commercial agreements). After four years at the Technical University of Denmark, Marie joined the Tech Transfer Office of the University of Copenhagen in 2013. Marie has comprehensive experience drafting, negotiating and counseling on matters specifically related intellectual property rights.

Søren Østergaard

Søren joined the Tech Transfer Office at the University of Copenhagen in 2014. Previously he worked at the Technical University of Denmark (2012-2014) and the Danish Commerce and Companies Agency (2010-2012). As a legal advisor, Søren is primarily working in the field of drafting and negotiating a variety of research collaboration agreements, licensing agreements and dealing IP-related issues in general. Søren holds an LLM from the University of Copenhagen and a BA from the University of Southern Denmark and Aarhus University.
Appendix 2: Invention Disclosures per department 2011-2015

Disclosures per department 2015 (total of 70) – one joint disclosure between two depts

Disclosures per department 2014 (total of 74)
Disclosures per department 2013 (total of 77)

Disclosures per department 2012 (total of 49)
Disclosures per department 2011 (total of 58)