

# ANNUAL REPORT 2014



## KEY FIGURES 2010-2014

	2014	2013	2012	2011	2010
<b>Grants and distributions</b>					
Total grants at year-end, centers, and Niels Bohr professors	57	59	64	58	61
Annual distribution, MDKK	435.9	423.0	391.0	358.8	387.3
<b>Return on investment</b>					
Bonds, MDKK	182.7	-38.1	182.4	261.4	164.5
Equities, MDKK	153.8	256.1	207.7	-71.3	169.7
Total return, MDKK	336.5	218.0	390.1	190.1	334.2
<b>Government grants (MDKK)</b>					
Transferred from previous years	0.0	0.0	5.3	26.8	53.8
Government grants received	0.0	0.0	0.0	0.0	0.0
Distributions	0.0	0.0	5.3	21.5	27.0
Carried forward to following years	0.0	0.0	0.0	5.3	26.8
<b>Administrative costs (MDDK)</b>					
Administrative costs, depreciation included	12.1	12.7	11.6	12.2	11.1
Costs compared to distributions, %	2.8	3.0	3.0	3.4	2.9
Costs per grant, MDKK	0.2	0.2	0.2	0.2	0.2
<b>Total assets</b>					
Total assets at year-end, MDKK	3,535.4	3,650.6	3,871.5	3,881.5	4,043.8

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# AN EXCELLENT YEAR WITH GREAT PROMISE FOR THE FUTURE

## DKK 3 billion in new capital

The Danish National Research Foundation received an impressive “Christmas gift” in December of last year. Passage of the Finance Act for 2015 secured the foundation a capital injection of DKK 3 billion, increasing the foundation’s total capital to DKK 6.5 billion. The new capital will make it possible for the foundation to start up new centers and professor programs for an additional 10 years and thereby support excellent research environments until 2036.

The foundation is very happy with and grateful for this capital injection. This additional funding marks a visionary decision by Danish politicians to support curiosity driven, bottom-up research, and it is encouraging that the decision was massively supported across the parties in the Danish Parliament. This active and keen interest in the foundation is a great motivation in our work to support and further groundbreaking research.

## Gender and diversity

Another highlight of last year was the foundation’s very successful annual meeting that focused on aspects of gender and diversity in Danish research. We need to bring all talents into play in Danish research, and the DNRF has been working for the last year to try to find out how we, in all humility, could help strengthen excellent research by strengthening the possibilities for women in research in Denmark.

We have interviewed researchers through the last year of our annual follow up meetings with the Centers and from the discussions we have

made a catalogue of recommendations (*Getting all Talents in Play*) for how we can strengthen gender and diversity in research. The catalogue provides a set of tools and recommendations, all concrete and practical, and all of the interviewed younger and more mature researchers agree that these means are useful when we want to get all talents into play.

The catalogue worked as a launch pad for our annual meetings discussions of gender and diversity. We encourage key stakeholders to include the valuable comments in future initiatives on the issue of gender and diversity in research. Therefore we have included our researcher’s comments and suggestions from the catalogue as the first part of this report’s feature on our annual meeting.

## 12 new Centers of Excellence

In the fall of 2014, the DNRF board decided to fund 12 new Centers of Excellence. With the addition of the 12 new centers, the number of Centers of Excellence funded by the DNRF totals 100.

The decision to fund the 12 new centers was a culmination of a process starting with the call for proposals for the foundation’s 8th application round in the spring of 2013.

Out of the 186 outline proposals the foundation received, 30 applicants were invited to submit full proposals. The final decision to fund the new centers is based on external reviews by world-class international peers, interviews with the applicants, and thorough and intense discussions by the board.

The selection process was very difficult because the mass of talent and the originality in the proposals at this stage are tremendously high. Deciding which centers to fund is tough, and the foundation is now looking forward to following the 12 new Centers of Excellence as they embark on their research endeavors in 2015. We are convinced that the centers will contribute considerably to tomorrow's research breakthroughs with original and innovative approaches to a wide range of important research questions.

The 12 new centers represent an investment of DKK 700 million, and the foundation has allocated another DKK 400 million for the possible extension of the centers — a total investment of more than DKK 1 billion.

The 8th application round showed an increase in the success rates of female applicants. Out of the 186 outline proposals, 20 percent were submitted by female applicants, and of the 12 new centers that have come out of the 8th application round, 33 percent will have female center leaders.

#### **Final evaluations of the 4th generation of Centers of Excellence**

In 2014 the centers that started in 2005 were evaluated by a total of 30 external peer reviewers. Twenty-six of the 30 reviewers rated the quality of the research at the DNRF Centers of Excellence as being world class within their fields. This shows that the DNRF Centers of Excellence play a crucial role in securing the highest possible quality in Danish research, and it confirms the conclusions of the international evaluation of the DNRF from 2013.

One recurring aspect of the final evaluations of the 4th generation of Centers of Excellence is the centers' immense research impact, especially in regard to international influence, multiple publications in highly recognized international journals, and an impressive capacity to build dynamic and creative research environments. These evaluations stamp "mission accomplished" on both the Centers of Excellence themselves, on the foundation's support during the ten-year grants and on the Center of Excellence instru-

# 3

#### **BILLION DKK**

The capital injection will enable the DNRF to support excellent research environments until 2036

# 12

#### **NEW CENTERS**

In the fall of 2014, the DNRF board decided to fund 12 new Centers of Excellence

# 12

#### **OUTGOING CENTERS**

26 of 30 reviewers rated the quality of the research at the DNRF Centers of Excellence as absolutely world class within their fields in the final evaluations

# 100

#### **CENTERS OF EXCELLENCE**

With the addition of the 12 new centers, the number of Centers of Excellence funded by the DNRF totals 100 since its first center established in 1993



ment itself. We are proud of our centers' success, and we are happy that the evaluations confirm that we are doing the right things to fulfill our purpose and mission: supporting excellent research.

But we can always do better. In connection with the final evaluations, the board asked the center leaders to note the strengths and weaknesses in regard to the Center of Excellence instrument. The center leaders said that the Center of Excellence funding mechanism is a tremendous means of support that makes it possible to focus on research. The freedom that a ten-year grant offers, combined with the foundation's trust in the individual researcher and the center as a whole, is a unique way to stimulate the creativity that is necessary to accomplish the truly innovative research results that can make a difference to all of us.

The board received good advice on how to ensure this in the future: Keep it simple. Don't follow the trend of becoming more and more bureaucratic. The DNRF should be on guard, as this may be a hard battle to win. The general trend is toward more bureaucracy and more top-down management.

The foundation's clear response to this legitimate concern is that one of our core values is trust. We believe that trust stimulates creative research. Accordingly, the DNRF's philosophy is that the talented researchers selected to lead the Centers of Excellence should have considerable freedom in handling the large and flexible grants at their disposal – now and in future.

### **Massive bird genome project**

During the past four years young researchers from DNRF Centers of Excellence lead a massive bird genome project which in 2014 resulted in 28 papers including eight papers back to back in a special issue of Science.

The research project is an illuminating example of the benefits that arise when centers do not constrain researchers to the core of the centers' research agendas, but facilitate opportuni-

ties for their most successful young researchers to draw on the center's core competencies and in doing so establish themselves as independent leaders within completely new research fields.

The massive project is among other sources funded by the National Genebank at BGI in China, the Danish National Research Foundation and the Lundbeck Foundation and it is exemplary of the strength of cooperation between foundations and research institutions across countries and research fields. The pages 38-41 tell the fascinating story of the bird's evolution.

### **The board of the DNRF**

The board of the DNRF consists of nine highly recognized researchers from six different countries. A board composed of international members is unique in the Danish funding system, and being internationally composed benefits the board's work in a number of ways. When processing applications, the board is able to draw on a broad range of international experience that balances the board's decisions between a Danish context and an international outlook.

The board takes a keen interest in the development of the centers. The chair, one or two board members, the director, and a research adviser visit each Center of Excellence annually at follow-up meetings. This gives us very direct insight into the research that is being carried out as well as other issues that can be of importance for the centers' wellbeing. It provides an opportunity to give advice or make adjustments if things go awry and, at the same time, offer insight into how the funding mechanism works and how it can best be applied in different environments.

2014 was indeed an excellent year. The capital injection of DKK 3 billion gives the DNRF the freedom to continue and fine-tune its efforts to support excellent research. This is wonderful news for the foundation and a great motivation for the DNRF to strive even higher in our initiatives to secure the best possible return on our research investments to the benefit of all. The

year 2014 was also characterized by excellence due to the exceptional quality of both our centers and the Niels Bohr professors and the ground-breaking research they foster. We are confident that our 12 new Centers of Excellence, all of our active centers, the Niels Bohr Professors, and the Danish-Chinese Research Centers will contribute considerably to growth and welfare in Denmark with original and innovative approaches to a wide range of important research questions.

The excellent final evaluations of the 4th generation of centers show that we are on the right track, and today we are wiser about how to close the gender gap in research and use the full mass of available talent. This is a good starting point for 2015, during which we will initiate our 9th application round for Centers of Excellence and launch a new call for Niels Bohr Professorships.

**Professor Thomas Sinkjær**

Director at the Danish National Research Foundation

**Professor Liselotte Højgaard**

Chair of the Board of the Danish National Research Foundation



## WEALTH AND WISDOM – STEPPING STONES FOR OUR FUTURE WORK



**Professor Liselotte Højgaard**  
Chair of the Board of the Danish National  
Research Foundation

In early spring 2014, the DNRF was promised DKK 3 billion from the government, with Minister for Higher Education and Science Sofie Carsten Nielsen as the lead, and announced by Prime Minister Helle Thorning Schmidt and Minister for Economy Margrethe Vestager, now the EU Commissioner for Competition. The new capital injection was a result of the positive international evaluation of the DNRF in 2013 led by Dr. Wilhelm Krull.

In late December 2014, the promise of the 3 billion became reality with the passing of the finance act. This was indeed a happy day for the DNRF.

We would like to thank the ministers, the government, and all Danish politicians for being so visionary and positive toward research in Denmark.

Although this new endowment will have a positive effect on research in Denmark, it will be even more important and beneficial for Danish society, since basic, cutting-edge research is crucial for future innovation, wisdom and wealth. As reported in our publication “Curiosity pays off,” the DNRF is behind 2% of Danish public research funding, but 15% of the granted patents springs from DNRF centers. This is very remarkable, and interesting because we do not fund projects with the aim of obtaining patents, but with the aim of supporting the very best basic research.

With the new capital, the DNRF will continue to do what it does best for another ten years. It will develop its activities by working to get all talents into play in the funding of the curiosity-driven research that is crucial to the future of Denmark. The foundation will ensure that there is an optimal framework for creative environments and innovative research results.

The DNRF adopted awareness as a special initiative in 2014 in regard to gender balance in research. We discussed the gender imbalance in research at the follow-up meetings at all of our centers and at board meetings. We put the issue on the agenda of our annual meeting, and we followed and participated in the public debate.

The gender gap in research is a problem because Denmark will lose its competitive advantage if the research domain as a whole doesn't increase its ability to innovate. The challenge of the gender imbalance in research is not only about getting more women to stay in research.



“ The vision is to support and further research that is groundbreaking. Research that may end up making a difference to the way we live and think.

Liselotte Højgaard

It's also about attracting the best talent to the research arena in order to achieve the best research results. Using an increasingly more diverse talent mass will trigger a necessary increase in the innovative power and originality of research. If we want maximum return on our research investments and a cutting edge competitive position internationally, there is no way around it: Without compromising excellence we need to close the gender gap in research as a first step toward employing the full spectrum of the diverse talent pool in research.

The foundation will continue to monitor the distribution of gender at DNRF centers, and at the annual follow-up meetings we will ask the center leaders to explain the development of the gender distribution at their centers. The board will analyze and reflect on the data collected and discuss how we can improve the quality of research by strengthening a gender and diversity balanced management of research talent.

The new capital and the wisdom we have gained on issues of gender and diversity will be two important stepping stones for our future work. It will be a privilege to continue the good work of the DNRF in 2015. We very much look forward to exciting collaboration with our Centers of Excellence, Niels Bohr Professors, Danish-Chinese research centers and affiliated researchers. It is a true privilege to be your foundation and part of your family.

Thank you to the DNRF director, Professor Thomas Sinkjær, and staff: Mogens Klostergaard Jensen, Vibeke Schrøder, Connie Hansen,

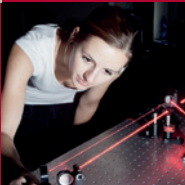
Gitte Tofterup Hansen, Johanne Juhl, Jeanne Meinholt, Metha Nielsen, Mogens Henrik Sørensen, Niels Bisballe, Katrine Ratjen, and Sofie ven't Veen. Thank you to my fellow board members for the work you did and the huge effort you made in 2014 in selecting the new Centers of Excellence and organizing the follow-up meetings. Thank you also for shouldering the heavy financial duty involved with the administration of the foundation and for developing the strategy for the new endowment.

Thank you to our collaborators at the universities and other foundations, both private and public, in Denmark and congratulations to the Danish Council for Independent Research on its positive evaluation in 2014.

# THE GENDER GAP IN RESEARCH



THE DANISH NATIONAL  
RESEARCH FOUNDATION  
GETTING ALL  
TALENTS IN PLAY





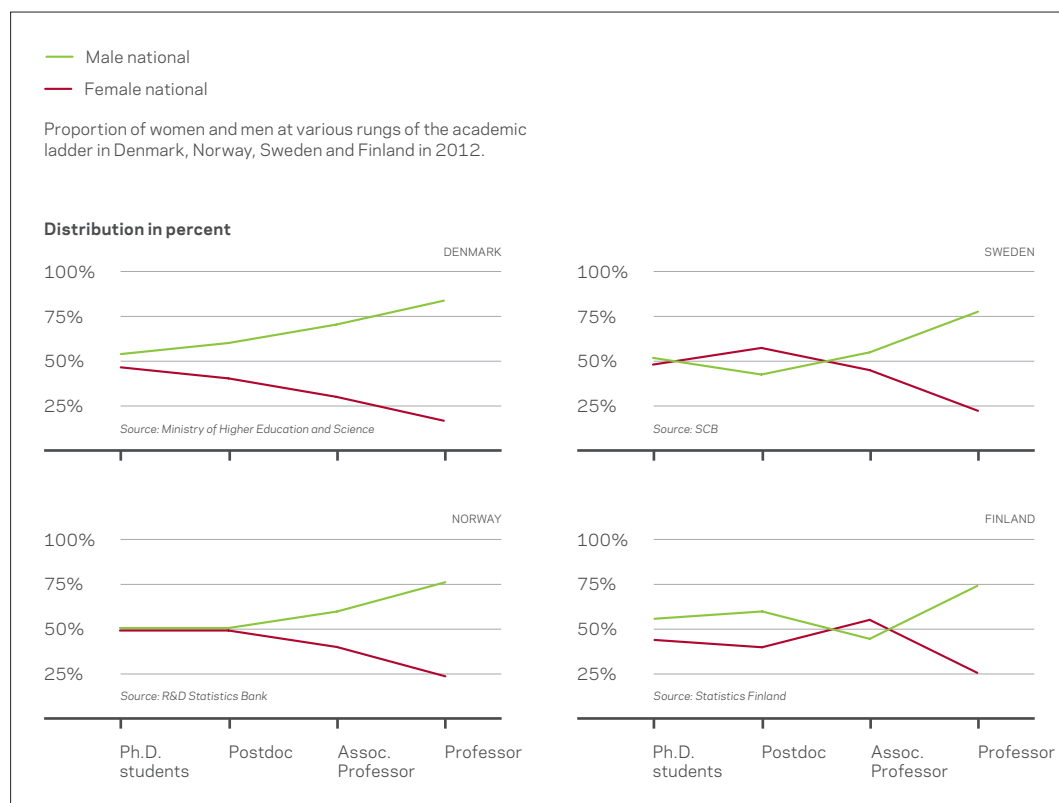
Professor Liselotte Højgaard, Chair DNRF

The theme of this year's annual meeting was decided in the light of recommendations from the international panel which evaluated the DNRF in 2013. The panel recommended that the foundation launches initiatives to improve the skewed gender balance at director and senior level at the DNRF Centers of Excellence.

Taking this recommendation very seriously the foundation put this topic on the agenda at its annual follow-up meetings in order to elucidate the problem at the centers and the research community at large. The foundation has collected comments and recommendations from the centers in the publication *Getting all Talents in Play*.

Chair and professor Liselotte Højgaard opened the annual meeting with a presentation of the facts about the gender imbalance (figure below). A gender balance this skewed calls for action and Liselotte Højgaard encouraged key stakeholders to include the valuable comments and suggestions collected in *Getting all Talents in Play* in future initiatives on the issue of gender and diversity in research.

FIGURE 1  
GENDER DISTRIBUTION



During 2013/2014 the DNRF asked approximately 500 female and 100 male researchers and other staff from the centers to discuss two main questions: "Is there a problem?" and "If yes, what can be done about it?".

The feedback was diverse and, at times, even contradictory. Some of the comments and suggestions were directed at the political system, others at university leadership, and yet others at the research community at large. The following projection of the feedback from the DNRF Centers of Excellence is divided into three categories depending on the audience to which the recommendations or comments are directed.

#### DIRECTED TO THE LEGISLATURE

##### **The babies**

A powerful factor behind the female dropout rate in the transition from Ph.D. student to faculty positions is children. Starting a career often coincides with starting a family, and this creates barriers on several levels. First, having employees on maternity and paternity leave may create extra expense for employers. Since women take more time off for leave than men, this could be a source of discrimination against women. At many centers, it was recommended that the disfavor shown to both women and men on maternity and paternity leave be removed, e.g., by creating a fully reimbursed childbirth accommodation fund for academia, or by equal sharing of leave between mother and father.

Second, Danish rules for maternity/paternity leave do not allow the researcher to work, take courses, or attend workshops, during the period of leave. This excludes the parent from the research environment to an extent that is not desirable neither for the parent nor the research group. To alleviate this problem, some suggested a legislative regulation of shared maternity/paternity leave, optional maternity leave after the first three months, or part-time maternity leave. Another suggestion was that people on leave should be allowed to do research and even have possibilities for babysitting, in order to have time to write articles.

When center researchers were asked if a 12-month maternity leave is necessary, there was a strong consensus that taking the full 12-month leave must be an individual decision. Likewise, there was a strong consensus that legislative initiatives on this matter need to go hand in hand with clear strategies from university leadership to support the balance between starting research careers and starting families.

##### **Initiatives targeted at women**

The younger researchers at the centers seem to be divided into two groups on the topic of special initiatives for female researchers such as the FREJA program (the Danish Research Councils), the Minerva program at the Max Planck Society, or the YDUN program recently initiated by the Danish Council for Independent Research. Many of the younger researchers are against such initiatives, worrying that such programs would mark them as secondrate researchers. Others argued that special initiatives are needed to attract more female researchers to faculty positions. One center leader noted that it doesn't matter how you are hired if you do your job well.

#### DIRECTED TO THE UNIVERSITIES

##### **Mentor programs and clear strategies**

Feedback from the centers unanimously states that mentoring is of great value. It can play an important role in strengthening the future career paths of young scientists and is recommended for both female and male scientists. Furthermore, mentor programs may help accelerate an open debate in the research societies in general as well as internal discussions in the specific research environments about the barriers to getting all talents in play. In this way, mentor programs can help facilitate structural changes in the way we organize research.

Many researchers requested clear strategies to ensure the continuity of research and research careers in connection with parental leave, e.g., having access to child care facilities or having the opportunity to bring publishing up to speed after maternity and paternity leave. A grant

after maternity leave in order to have time for writing and publishing results could be of great value, as could a reduction in teaching responsibilities immediately after the leave and lab technician assistance during and after the leave. Mentors or senior role models are important assets in implementing such strategies.

### **Staying abroad**

The opportunity or requirement to go abroad during the Ph.D. and post-doctoral years often coincides with the childbearing years, and to many young researchers, family stability and career security are key concerns when children are small.

On top of this, long stays abroad are expensive for young families with children, since day care in foreign countries is expensive and families often have to get by on one income.

Another challenge is the negative effect the requirement of a stay abroad can have on a spouse's career. Suggestions to alleviate these obstacles for dual career couples include splitting the stays abroad into several shorter periods, offering financial support to defray the extra cost of travel and living abroad with children, and, if possible, offering the spouse career opportunities.

### **Better career safety**

In order to get women to stay in research, universities need to create clear and long-term career paths. Tenure track positions are one suggestion often mentioned when debating the topic of gender imbalance. Adjusting the hiring criteria could be another way to go about it. One center leader pointed out that getting the topranked applicant doesn't guarantee that the applicant will produce the best science or have the highest impact on his or her field of research. Instead, he suggested using profiles of excellence as hiring criteria, that is, weighing in other factors such as supervision, teaching, and mentoring – or simply the criterion of diversity – when hiring.

## **DIRECTED TO RESEARCH COMMUNITY AT LARGE**

### **Publishing requirements and criteria**

Scientific publishing is key to funding and career advancement. The current publishing requirements and criteria put women at a relative disadvantage in two regards: First, they publish less because of maternity leave. Second, the most prestigious journals favor traditionally maledominated fields. A change in requirements, alertness to new research fields and criteria was mentioned as possible ways to improve the situation. The dilemma here is to do so while not compromising excellence.

### **Difference in mentality**

At the meetings, men and women spoke openly about a difference in mentality between men and women regarding their approach to research. At most of the centers researchers agreed that, generally speaking, some women are less competitive than men. It was pointed out by some that to be successful in research women – to a certain extent – have to adopt a male attitude.

This difference in mentality may constitute a barrier to the utilization of all talent, partly because competitive behavior is rewarded with grants and positions, and it may be one of the reasons why some women choose other career paths. Embracing diversity is necessary if we want to utilize all talents in research.



### Closing the gender gap in research

Speakers at the annual meeting, Center Leader and Professor Dorthe Berntsen, Center Leader and Professor Jens Hjorth, Post-doc associated with the NORDSEE center Emma Hammarlund, Post-doc previously associated with the PUMPKIN center Bjørn Pedersen, Professor Bente Rosenbeck and keynote speaker Professor Londa Schiebinger each suggested how to address and fix the gender gap in research.

### The stereotype threat

Addressing the issue of the gender gap in research, Professor Dorthe Berntsen focused on the concept of the stereotype threat. The stereotype of women as having less intellectual capacity than men is as much an internal as an external threat. It reduces performance, causing women to undersell their own ideas, under-perceive their opportunities, understate the implications of their findings, overestimate the importance of critiques, and become too

cautious/less ambitious – all decisive factors when it comes to utilizing female talent in research. The figure below shows performances of males and females on a mathematical test when told: "We normally see gender differences on this test" versus "we normally see no gender differences on this test" – exemplifying a result of the stereotype threat.

Suggestions to alleviate barriers specifically at the early career stage:

- Address doubts
- Increase transparency
- Promote networking

“ I thought I could get a long way by coaching female (and male) junior researchers, helping them to see and reach for opportunities (yes, you can do it!), giving them major responsibilities (1st author roles) for projects. But then I ran into another problem... maternity leave.

Center Leader and Professor Dorthe Berntsen

FIGURE 2  
GENDER DIFFERENCES

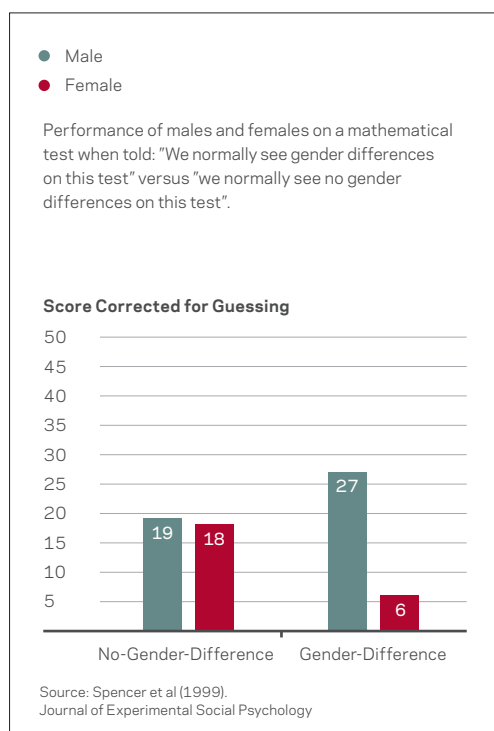
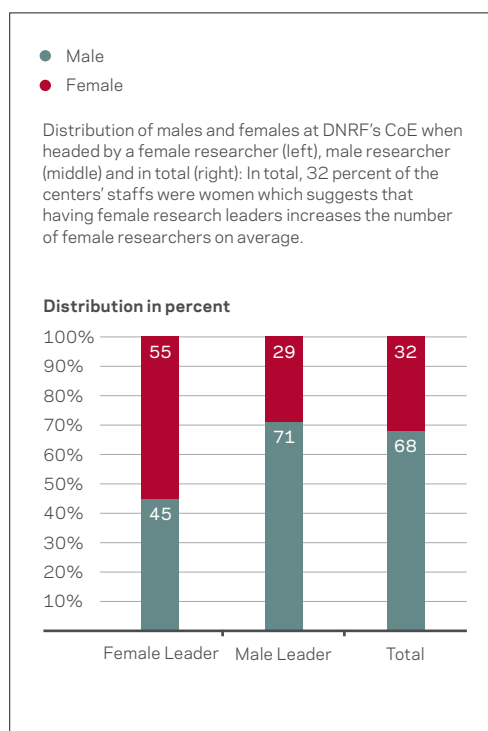


FIGURE 3  
GENDER DISTRIBUTION BY LEADER'S GENDER





“ Fixing the leak means gaining a competitive scientific advantage as well as increased competitiveness on special schemes. It stimulates a better and more varied work environment, which is also an advantage because an attractive workplace improves recruiting at all levels.

Center Leader and Professor Jens Hjorth

#### Maternity leave

Speakers Dorthe Berntsen and Bjørn Pedersen pointed out that the undesirable reality of today's research community is that giving young female researchers key positions in team work is risky because of possible maternity leaves. Maternity leave has major implications for large research projects, including delayed publications, stranded projects, the disappearance of the key person, and financial burdens in connection with maternity leaves. On top of this are professional consequences for the individual woman: fewer first authorships, weaker networks, and less experience with leadership.

#### Why we should not leave this problem for women to fix

Generally, women hire more women than men do (figure 3, left page), and we often point to this fact as one way to close the gender gap in research. But in his talk, Bjørn Pedersen pointed out how this might backfire, especially for young female group leaders who are likely to have more female staff: On average, female group leaders will be hit harder by the effects of women taking long maternity leaves simply because they have more female staff.

Suggestions from speakers on how to alleviate barriers caused by maternity leave:

- Use the Centers of Excellence instrument to keep women's intellects in the game
- Promote initiatives to enforce justice and fairness with regard to maternity leave
- Have parental leave evenly shared by women and men – maybe enforced by law
- Work at eliminating the stereotype threat by engaging women and the research community as a whole in the cause

#### How DNRF center leaders can make a difference

In his talk at the DNRF annual meeting, Professor Jens Hjorth had one single and very clear message to the DNRF, universities and the research community as a whole: hire women. That's what he has done at his center from the very beginning – with great success.

To Center Leader Jens Hjorth there are no excuses for not taking action to close the gender gap in research right away. In his opinion it would be natural for Center of Excellence leaders to show the way. They have the credibility, the time, and the means to succeed in fixing the leaky pipeline if they treat it like a project, he said.

“ I don't know why there is a gender gap in research – I just fix it.

Center Leader and Professor Jens Hjorth

**Gendered Innovations:  
Excellence in the making**

Between 1997 and 2000, 10 drugs were withdrawn from the U.S. market because of their lifethreatening health effects: eight of those drugs showed greater severity in women (U.S. GAO, 2001). Ultimately this tells the story of bad research.

With this story as point of departure, John L. Hinds Professor of History of Science at Stanford Londa Schiebinger gave an introduction to the importance of gender perspectives in research design. Professor Schiebinger is director of Gendered Innovations, a joint project between the European Commission and the U.S. National

Science Foundation. The purpose of the project is to harness the creative power of sex and gender analysis to discover new things. Excellence in the making in regard to sex and gender analysis is achieved through two main points of departure:

- By developing practical methods of sex and gender analysis for scientists and engineers
- By providing case studies as concrete illustrations of how sex and gender analysis leads to innovation



Speakers Professor Bente Rosenbeck and Professor Londa Schiebinger at the annual meeting.



From the left: Chairman of the Danish Rectors' Conference Ralf Hemmingsen, Director Anne-Marie Levy Rasmussen, Chair of the Danish Council for Independent Research Peter Munk Christiansen, Center Leader and Professor Dorte Dahl-Jensen, Professor and President of the Royal Academy of Science and Letters Kirsten Hastrup, and Chair of the Danish Council for Research and Innovation Policy Jens Oddershede.

### Stakeholder debate

The annual meeting was rounded off with a stakeholder debate moderated by Professor and Director Thomas Sinkjær.

The publication *Getting All Talents in Play* lists a number of recommendations directed to the legislature, the universities and the research community at large. The annual meeting's panel members jointly represented the three decision-making levels.

Issues in the debate were:

- Tenure track
- Change of culture
- Economic incentives
- Leadership development and mentor programs
- Special initiatives
- Focus on diversity of talent
- Goal-setting

The panel members all agreed that the most important thing when addressing the gender gap in research is not to lose top talent. This suggests a shift from talking about women and men to talking about managing the pool of talent.

# 12 NEW CENTERS OF EXCELLENCE

“ From the Board of the DNRF we would like to congratulate our new Centers of Excellence and welcome them to the DNRF family. It is a heavy obligation to be trusted with such a large sum of public money, and we look very much forward to follow and support you as you transform the funding into brilliant research.

Professor Liselotte Højgaard, Chair DNRF



## CENTER FOR INTELLIGENT ORAL DRUG DELIVERY USING NANO AND MICROFABRICATED CONTAINERS (IDUN)



**Center leader:** Professor Anja Boisen

**Host institution:** Technical University of Denmark

**Period:** 2015-2021

**Grant:** 56.0 MDKK

“ In IDUN we intend to design, realize and characterize micrometer sized containers for oral administration of drug with the vision of using them in HIV treatment, Peptic ulcer care and insulin delivery.





## CENTER FOR CARBON DIOXIDE ACTIVATION (CADIAC)

“ The goal of CADIAC is to establish itself as one of the internationally leading research centers dedicated to the activation and conversion of CO<sub>2</sub> to useful chemicals of societal benefit applying cutting edge science in catalysis.

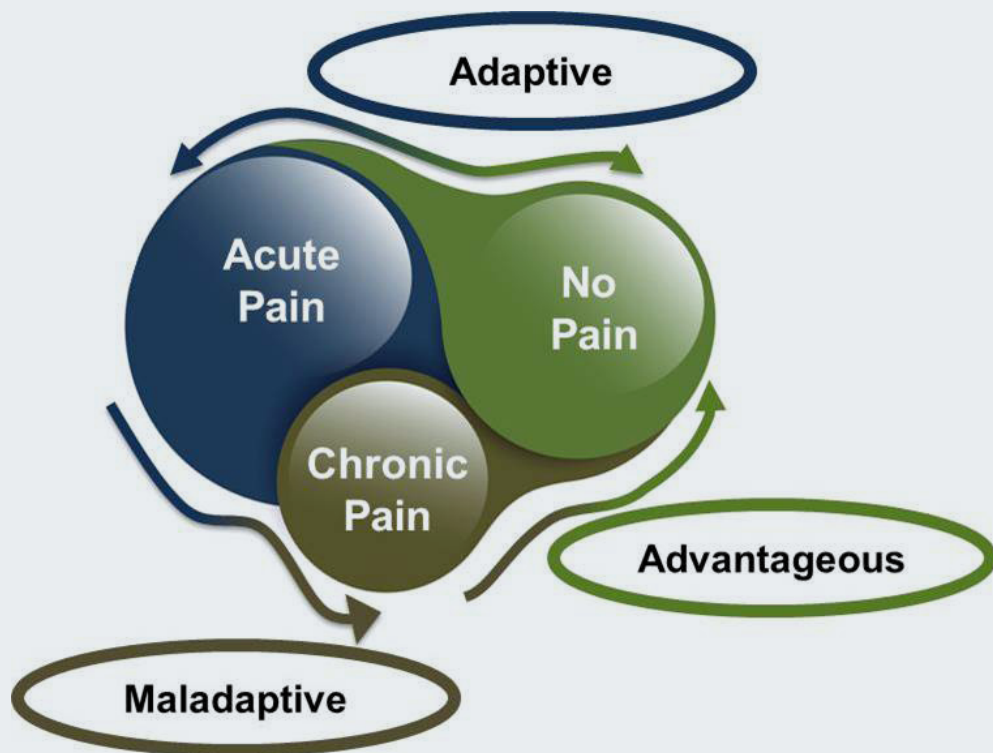


**Center leader:** Professor Troels Skrydstrup

**Host institution:** Aarhus University

**Period:** 2015-2021

**Grant:** 60.0 MDKK



## CENTER FOR NEUROPLASTICITY AND PAIN (CNAP)

“ CNAP will apply a biomedical engineering approach where new advanced pain provocation and probing platforms will be discovered and applied to reveal novel aspects of the human pain neuroplasticity.

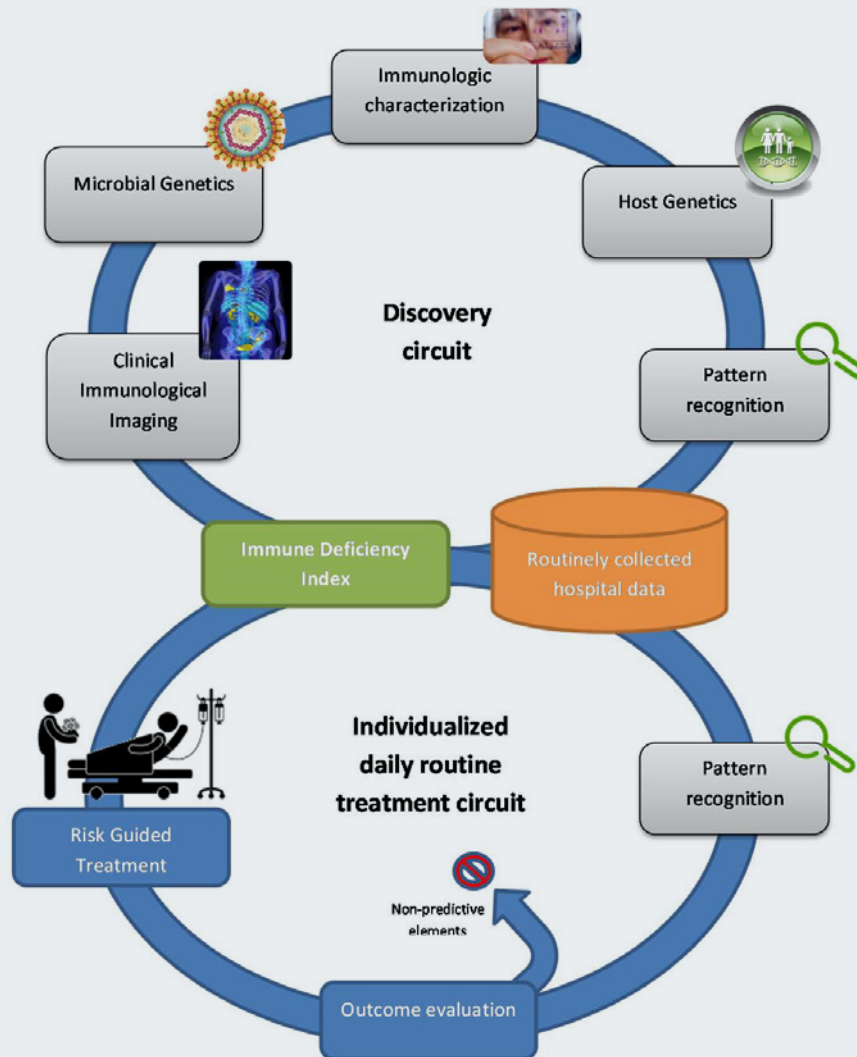


**Center leader:** Professor Thomas Graven-Nielsen

**Host institution:** Aalborg University

**Period:** 2015-2021

**Grant:** 60.0 MDKK



## CENTER FOR PERSONALIZED MEDICINE OF INFECTIOUS COMPLICATIONS IN IMMUNE DEFICIENCY (PERSIMUNE)

“ PERSIMUNE aims to identify novel host defense mechanisms and patterns explaining the variation in risk of infectious complications, and applying it in order to personalize treatment and care.



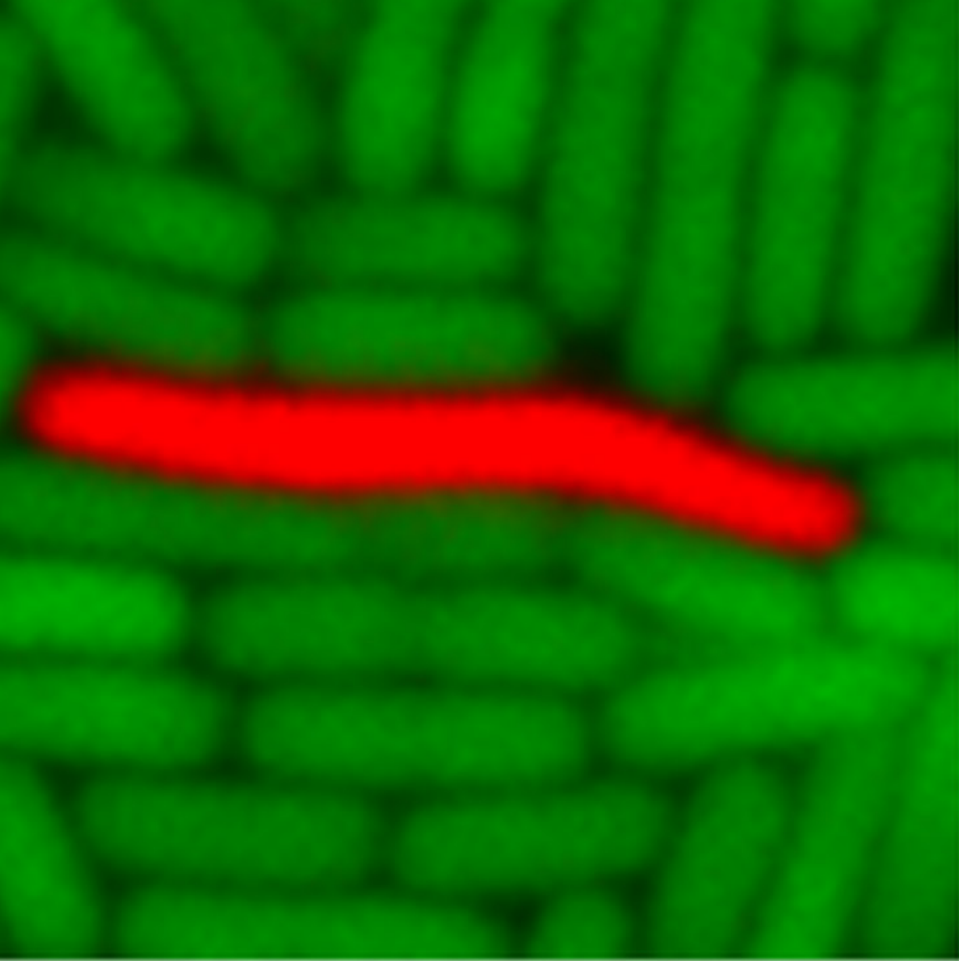
**Center leader:** Professor Jens Lundgren

**Host institution:** Rigshospitalet

**Period:** 2015-2021

**Grant:** 60.0 MDKK





## CENTER FOR BACTERIAL STRESS RESPONSE AND PERSISTENCE (BASP)



**Center leader:** Professor Kenn Gerdes

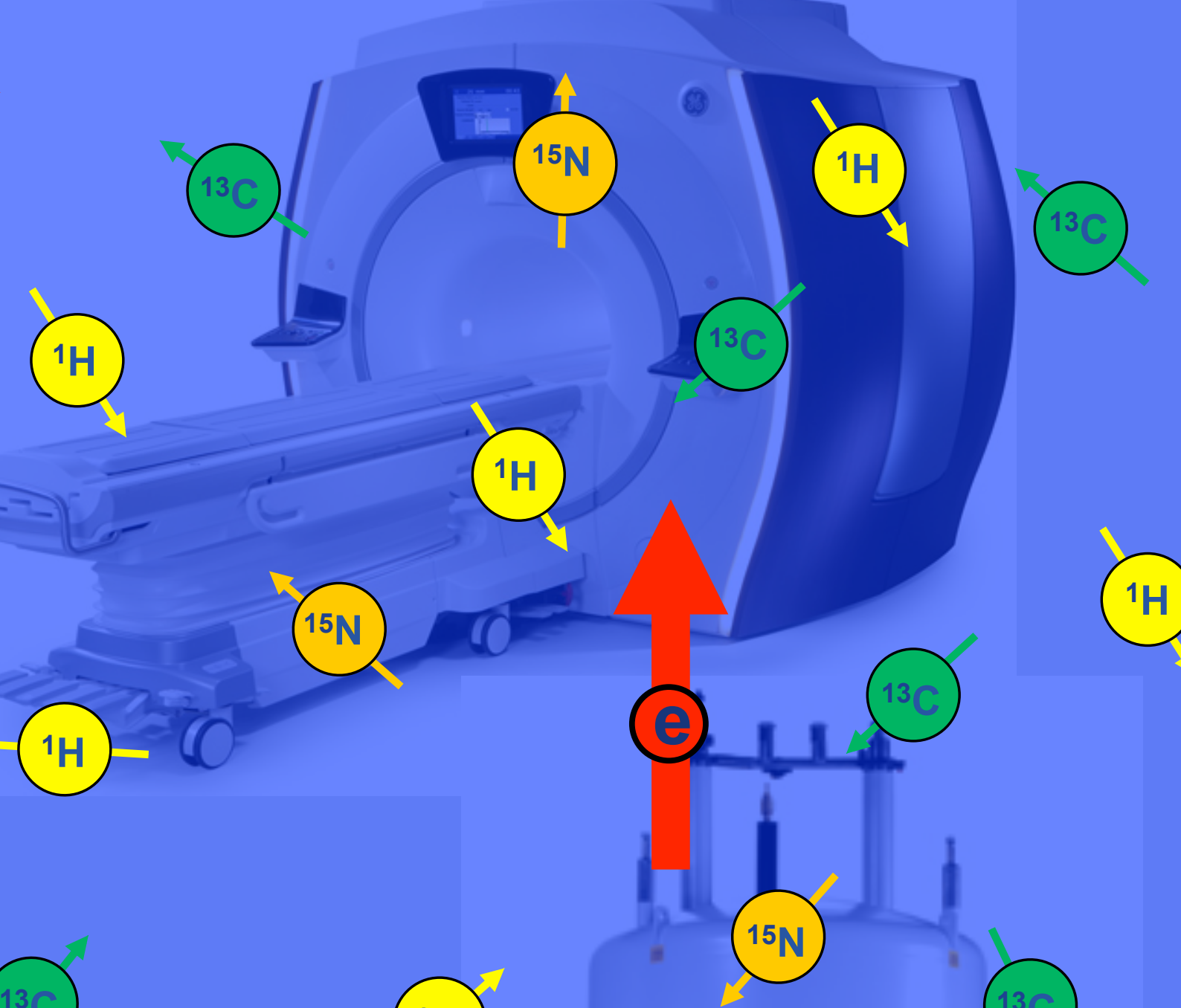
**Host institution:** University of Copenhagen

**Period:** 2015-2021

**Grant:** 50.0 MDKK

“ The individual research groups of the DNRF and Novo Nordisk Foundation BASP Center will unite their efforts to achieve their common goal of understanding molecular mechanisms behind heterogeneity-dependent survival of bacterial populations and the phenomenon of bacterial persistence.





## CENTER FOR HYPERPOLARIZATION IN MAGNETIC RESONANCE

“ The mission of the center is to address basic scientific questions of hyperpolarization by Dynamic Nuclear Polarization (DNP) with the aim of enabling completely new applications of Magnetic Resonance in the study of chemical reactions in real-time in vivo and in vitro.




**Center leader:** Professor Jan Henrik Ardenkjær-Larsen

**Host institution:** Technical University of Denmark

**Period:** 2015-2021

**Grant:** 55.0 MDKK



## CENTER FOR STEM CELL DECISION MAKING (STEMPHYS)



**Center leader:** Professor Lene Oddershede

**Host institution:** University of Copenhagen

**Period:** 2015-2021

**Grant:** 60.0 MDKK

“ The interdisciplinary StemPhys center joins forces of physics and biology to significantly advance our understanding of stem cell commitment with the ambitious goal of being able to control and reverse the differentiation process.

## CENTER FOR CHROMOSOME STABILITY (CCS)

“ Our ultimate aim is to develop new preventative or therapeutic strategies for combating human diseases associated with chromosomal instability.



**Center leader:** Professor Ian D. Hickson

**Host institution:** University of Copenhagen

**Period:** 2015-2021

**Grant:** 65.0 MDKK





## CENTER FOR AUTOPHAGY, RECYCLING AND DISEASE (CARD)

“ We are delighted to have this unique opportunity to elucidate the orchestration of cellular energy balance, damage and autophagy and to exploit such knowledge to tackle human diseases.



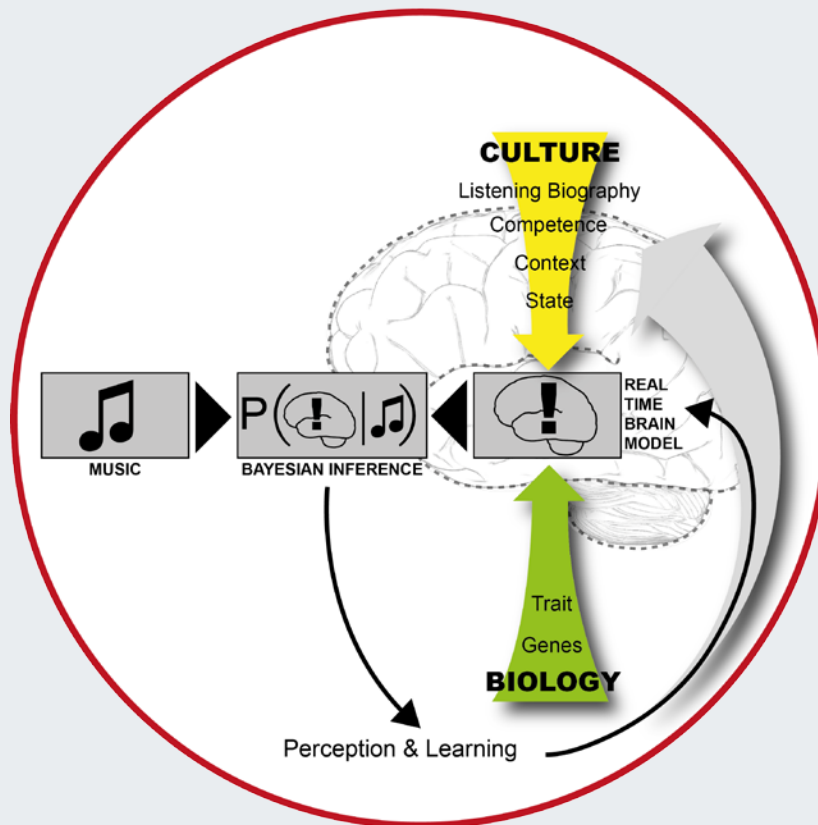
**Center leader:** Professor Marja Jäättelä

**Host institution:** The Danish Cancer Society

**Period:** 2015-2021

**Grant:** 50.0 MDKK

## PREDICTIVE CODING of MUSIC



## CENTER FOR MUSIC IN THE BRAIN (MIB)



**Center leader:** Professor Peter Vuust

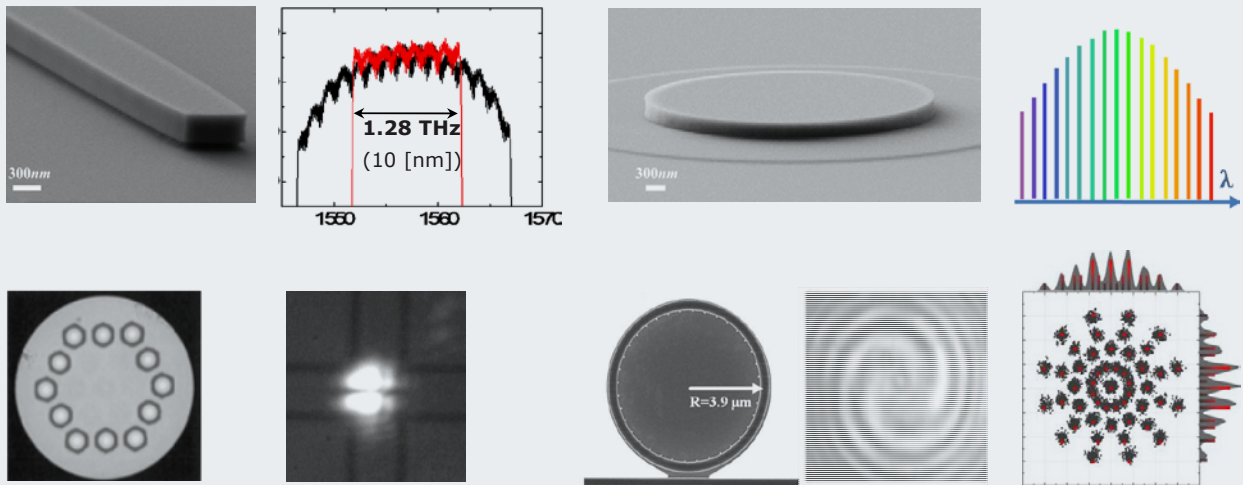
**Host institution:** Aarhus University

**Period:** 2015-2021

**Grant:** 52.0 MDKK

“ MIB is going to address the dual questions of how music is processed in the brain and how this can inform our understanding of fundamental principles behind brain processing in general.





## CENTER FOR SILICON PHOTONICS FOR OPTICAL COMMUNICATIONS (SPOC)

“ The SPOC center will address the optical communication infrastructures of the future and aims to find solutions to the major challenges of communication systems — the energy consumption and potential capacity.



**Center leader:** Professor Leif Katsuo Oxenløwe  
**Host institution:** Technical University of Denmark  
**Period:** 2015-2021  
**Grant:** 59.0 MDKK





## CENTER FOR URBAN NETWORK EVOLUTIONS (URBNET)



**Center leader:** Professor MSO Rubina Raja

**Host institution:** Aarhus University

**Period:** 2015-2021

**Grant:** 65.0 MDKK

“ The UrbNet center aims to develop research that will offer comparison of the archaeology of urbanism from Medieval Northern Europe to the Ancient Mediterranean and the Indian Ocean World and determine how, and to what extent, past urban networks catalyzed societal and environmental expansions and crises in the past.

“ By letting the best people grapple with the problems they are passionate about, we set the stage for real scientific breakthroughs. We know that it produces exceptional results when applicants pursue their dream projects, and, who knows, maybe a Nobel Prize, too, one day.

Professor Thomas Sinkjær, Director DNRF

The Center of Excellence (CoE) program is DNRF's primary funding mechanism and the foundation's flagship. A center grant is large and flexible, and a center may have a lifetime of up to 10 years. Only top researchers with the most ambitious ideas will be awarded a CoE through fierce competition involving a two-stage application process. The objective of the CoE program is to strengthen Danish research by providing the best possible working conditions and organizational set-up for selected top researchers. Centers may be established within or across all fields of research.

The DNRF's clear strategy is to focus on supremely talented individuals and provide them with sufficient funds, long-term funding horizons, and autonomy.



# 100 CENTERS OF EXCELLENCE

Søren Kierkegaard Research Centre (SKC), **Niels Jørgen Cappelørn**, University of Copenhagen / The Danish Epidemiology Science Center (DANC), **Thomas W. Kjaer**, Aarhus University / Theoretical Astrophysics Center (TAC), **Igor Novikov**, University of Copenhagen, Center for Atomic Physics (AC), **Thomas W. Kjaer**, University of Denmark / Centre for Basic Research in Computer Science (BRICS), **Glynn Winskel**, Aarhus University / International Research Center for Sensing (DCRS), **Søren Nørvang Christensen**, Technical University of Denmark / Danish Lithosphere Centre (DLC), **Hans Christian Ørskov**, **K. Darwin Murrell**, The Royal and Veterinary Agricultural University / Center of Biological Sequence Analysis (CBS), **Søren Brunak**, Technical University of Denmark / Muscle Research Centre (CMRC), **Bengt Saltin**, Copenhagen University Hospital / Center for Sensory-Motor Interaction (SMI), **Thomas W. Kjaer**, Center for Crystallographic Studies (CCS), **Sine Larsen**, University of Copenhagen / Centre for Enzyme Research, **Kaj Frank Jensen**, University of Copenhagen / Veterinary Agricultural University / Centre for Semiotic Research, **Per Aage Brandt**, Aarhus University / Copenhagen Polis Centre (CPC), **Thomas W. Kjaer**, National Museum of Denmark / Economic Policy Research Unit (EPRU), **S. B. Nielsen and P. B. Sørensen**, University of Copenhagen / Center for Chemistry (SPOCC), **Morten Meldal**, Carlsberg Laboratory / Center for Catalysis, **Karl Anker Jørgensen**, Aarhus University / Center for Chemistry (SPOCC), **Gary Schaffer**, University of Copenhagen / Network in Mathematical Physics and Stochastics (MaPhySto), **Ole E. Barndorff-Nielsen**, Aarhus University / Center for Experimental Bio Informatics (CEBI), **Peter Roepstorff and Matthias Mann**, University of Southern Denmark / Metal Structures In Four Dimensions (M4D), **D. J. Jensen and H. F. Poulsen**, Technical University of Denmark / Nucleic Acid Center (NAC), **Thomas W. Kjaer**, Copenhagen / Center for Biomembrane Physics (MEMPHYS), **Ole G. Mouritsen**, University of Southern Denmark / Center for Quantum Chemistry (CQC), **Thomas W. Kjaer**, Quantum Protein Centre (QuP), **Henrik Bohr**, Technical University of Denmark / Center of Functionally Integrative Neuroscience (CFIN), **Thomas W. Kjaer**, **Tommerup**, University of Copenhagen / Centre for the Study of the Cultural Heritage of Medieval Rituals, **Nils Holger Petersen**, University of Copenhagen / Research (CfS), **Dan Zahavi**, University of Copenhagen / Nordic Center for Earth Evolution (NordCEE), **Don Canfield**, University of Southern Denmark / Center of Inflammation and Metabolism (CIM), **Bente Klarlund Pedersen**, Copenhagen University Hospital / Centre for Genotoxic Stress (GTS), **Thomas W. Kjaer**, / Centre for mRNP Biogenesis and Metabolism (mRNP), **Torben Heick Jensen**, Aarhus University / Center for Insoluble Protein Structures (CIP), **Thomas W. Kjaer**, University / Centre for Viscous Liquid Dynamics (Glass and Time), **Jeppe Dyre**, Roskilde University / Dark Cosmology Centre (DARK), **Thomas W. Kjaer**, Copenhagen / Centre for Textile Research (CTR), **Marie-Louise Nosch**, University of Copenhagen / Center for Models of Life (CMOL), **Klaus H. Plesch**, / Center for Sustainable and Green Chemistry (CSG), **Claus Hviid Christensen**, Technical University of Denmark / Centre for Molecular Catalysis (CREATES), **Niels Haldrup**, Aarhus University / Centre for Carbohydrate Recognition and Signalling (CARB), **Jens Stougaard**, Aarhus University / **Kurt Vesterager Gothelf**, Aarhus University / Centre for Epigenetics, **Kristian Helin**, University of Copenhagen / Centre for Ice and Snow (CIS), **Thomas W. Kjaer**, University / Centre for Membrane Pumps in Cells and Disease (PUMPKIN), **Poul Nissen**, Aarhus University / Center on Autobiography (CA), **Francesco Sannino**, University of Southern Denmark / Center for Particle Physics (DISCOVERY), **Peter Hansen**, University of Copenhagen / Center for Molecular Catalysis (CMC), **Bo Brummerstedt Iversen**, Aarhus University / Center for GeoGenetics, **Eske Willerslev**, University of Copenhagen / Centre for Energy and Climate (CEC), **Carsten Rahbek**, University of Copenhagen / Centre for Star and Planet Formation (STARPLAN), **Martin Bizzanti**, Astrophysics Centre (SAC), **Jørgen Christensen-Dalsgaard**, Aarhus University / Copenhagen Center for Glycomics (CCG), **Henrik Clausen**, / Center for Dynamic Molecular Interactions (DynaMo), **Barbara Halkier**, University of Copenhagen / Center for Nanostructured Graphene (CNG), / Center for Financial Frictions (FRIC), **David Lando**, Copenhagen Business School / Center for International Courts (iCourts), **Mikael Rasmussen**, Medieval Literature (CML), **Lars Boje Mortensen**, University of Southern Denmark / Center for Chromosome Stability (CCS), **Ian Hickman**, Center for Music In the Brain (MIB), **Peter Vuust**, Aarhus University / Center for Carbon Dioxide Activation (CADIAC), **Troels Skrydstrup**, Response and Persistence (BASP), **Kenn Gerdes**, University of Copenhagen / Center for Neuroplasticity and Pain (CNAP), **Thomas Gammelgaard**, **Boisen**, Technical University of Denmark / Center for Silicon Photonics for Optical Communications (SPOC), **Leif Katsuo Oxenløwe**, University of Denmark / Center for Autophagy, Recycling and Disease (CARD), **Marja Jäätelä**, Danish Cancer Society / Center for Personalized Medicine (CPM)

entre (DESC), **Jørn Olsen**, Statens Serum Institut / Centre for Labour Market and Social Research (CLS), **Niels Westergaard Nielsen**, AP), **Jens Ulrik Andersen**, Aarhus University / Center for Atomic-Scale Materials Physics (CAMP), **Jens Kehlet Nørskov**, Technical research Centre for Computational Hydrodynamics (ICCH), **Per Madsen**, Technical University of Denmark / Danish Centre for Remote **an Larsen**, Geological Survey of Denmark and Greenland / Danish Centre for Experimental Parasitology (CEP), **Peter Nansen and** Technical University of Denmark / Centre for Biomolecular Recognition, **Peter E. Nielsen**, University of Copenhagen / The Copenhagen **as Sinkjær**, Aalborg University / Centre for Sound Communication (CSC), **Axel Michelsen**, University of Southern Denmark / Centre University of Copenhagen / Centre for Gene Regulation and Plasticity of Neuro-endocrine Network, **Lars-Inge Larsson**, The Royal and PC), **Mogens Herman Hansen**, University of Copenhagen / Centre for Maritime Archaeology, **O. C. Pedersen and S. H. Andersen**, The Center for Demographic Research, **Hans Chr. Johansen**, University of Southern Denmark / Centre for Solid Phase Organic Combinatorial Center for Plant-Microbe Symbiosis, **Henriette Giese**, RISØ National Laboratory / Danish Center for Earth System Science (DCESS), **n**, Aarhus University / Center for Molecular Plant Physiology (PlaCe), **Birger Lindberg Møller**, The Royal Veterinary and Agricultural k / Center for Human-Machine Interaction, **Annelise Mark Pejtersen**, RISØ National Laboratory / Center for Fundamental Research: AC), **Jesper Wengel**, University of Southern Denmark / Centre for Applied Microeconometrics (CAM), **Martin Browning**, University of Optics (QUANTOP), **Eugene S. Polzik**, University of Copenhagen / Water and Salt Research Centre, **Søren Nielsen**, Aarhus University / l), **Albert Gjedde and Leif Østergaard**, Aarhus University / Wilhelm Johannsen Centre for Functional Genome Research (WJC), **Niels** University of Copenhagen / Centre for Black Sea Studies (PONTOS), **Pia Guldager Bilde**, Aarhus University / Center for Subjectivity uthern Denmark / Center for Individual Nanoparticle Functionality (CINF), **Ib Chorkendorff**, Technical University of Denmark / Centre ENOTOXIC), **Jiri Lukas**, Danish Cancer Society / Centre for Social Evolution (CSE), **Jacobus J. Boomsma**, University of Copenhagen ctures (inSPIN), **Niels Chr. Nielsen**, Aarhus University / Center for Oxygen Microscopy and Imaging (COMI), **Peter R. Ogilby**, Aarhus o), **Jens Hjorth**, University of Copenhagen / Centre for Language Change in Real Time (LANCHART), **Frans Gregersen**, University of im Sneppen, University of Copenhagen / Danish Arrhythmia Research Centre (DARC), **Søren-Peter Olesen**, University of Copenhagen lar Movies (CMM), **Martin Meedom Nielsen**, University of Copenhagen / Center for Research in Econometric Analysis of Time Series University / Centre for Comparative Genomics, **Rasmus Nielsen**, University of Copenhagen / Centre for DNA Nanotechnology (CDNA), d Climate, **Dorthe Dahl-Jensen**, University of Copenhagen / Center for Massive Data Algorithmics (MADALGO), **Lars Arge**, Aarhus ical Memory Research (Con Amore), **Dorthe Berntsen**, Aarhus University / Center for Particle Physics & Origin Mass CP3 – Origins, hagen / Centre for Symmetry and Deformation (SYM), **Jesper Grodal**, University of Copenhagen / Center for Materials Crystallography or Quantum Geometry of Moduli Spaces (QGM), **Jørgen Ellegaard Andersen**, Aarhus University / Center for Macroecology, Evolution rro, University of Copenhagen / Center for Vitamins and Vaccines (CVIVA), **Christine Stabell Benn**, Statens Serums Institut / Stellar ausen, University of Copenhagen / Center for Permafrost Dynamics in Greenland (CENPERM), **Bo Elberling**, University of Copenhagen ne (CNG), **Antti-Pekka Jauho**, Technical University of Denmark / Center for Geomicrobiology, **Bo Barker Jørgensen**, Aarhus University ask Madsen, University of Copenhagen / Center for Quantum Devices (QDev), **Charles Marcus**, University of Copenhagen / Center for son, University of Copenhagen / Center for Stem Cell Decision Making (StemPhys), **Lene Oddershede**, University of Copenhagen / rrup, Aarhus University / Center for Urban Network Evolutions (UrbNet), **Rubina Raja**, Aarhus University / Center for Bacterial Stress raven-Nielsen, Aalborg University / Center for Intelligent oral Drug delivery Using Nano and microfabricated containers (IDUN), **Anja e**, Technical University of Denmark / Center for Hyperpolarization in Magnetic Resonance, **Jan Henrik Ardenkjær-Larsen**, Technical onalized Medicine of Infectious complications in Immune Deficiency (PERSIMUNE) . **Jens Lundgren**, Rigshospitalet

## FINAL EVALUATIONS OF THE 4TH GENERATION OF CENTERS OF EXCELLENCE

Twelve Centers of Excellence, established in 2005, recently underwent their final evaluation ahead of the expiration of DNRF funding in 2015. The purpose of the final evaluations is to elucidate and assess from a ten-year perspective the research performed.

To the foundation, the final evaluations also provide an indication of how well the Centers of Excellence funding mechanism is working in regard to the parameters it is designed to stimulate: excellent scientific quality, internationalization, originality, impact, creativity and training of the next generation of top researchers.

When the DNRF Centers of Excellence perform well on these parameters, it helps secure the highest possible quality in Danish research and a competitive position internationally.

Of the 30 reviewers, 26 rated the quality of the research at the DNRF Centers of Excellence as absolutely world class within their fields and graded the research as excellent. The foundation found it very satisfactory to know that, to a large extent, the centers excelled in the above-mentioned parameters.

### THE 12 OUTGOING CENTERS OF EXCELLENCE AND CENTER LEADERS ARE:

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Center for Textile Research (CTR)  
Professor Marie-Louise Nosch

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Dark Cosmology Center (DARK)  
Professor Jens Hjorth

---

Center for Viscous Liquid Dynamics (Glass and Time)  
Professor Jeppe Dyre

---

Center for Models of Life (CMOL)  
Professor Kim Sneppen

---

Center for Individual Nanoparticle Functionality (CINF)  
Professor Ib Chorkendorff

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Center for mRNP Biogenesis and Metabolism (mRNP)  
Professor Torben Heick Jensen

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Center for Oxygen Microscopy and Imaging (COMI)  
Professor Peter R. Ogilby

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Nordic Center for Earth Evolution (NORDSEE)  
Professor Don Canfield

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Center for Social Evolution (CSE)  
Professor Jacobus J. Boomsma

---

Center for Inflammation and Metabolism (CIM)  
Professor Bente Klarlund Pedersen

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Danish Arrhythmia Research Center (DARC)  
Professor Søren-Peter Olesen

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Center for Language Change in Real Time (LANCHART)  
Professor Frans Gregersen

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“ One of the great successes of the Center of Excellence program, as also stressed by the peer reviewers, has been the center leader’s ability to hire smart people and let them loose on topical challenges. This has broadened the focus of the research and created new, exciting research of excellent quality.

Professor Thomas Sinkjær, Director DNRF

**Excellent scientific quality** is expected when the DNRF funds a Center of Excellence. Centers are headed by distinguished scientists who have not only shown excellence in their own research but also proven themselves as visionary leaders able to form a creative and dynamic research community. By choosing such leaders, the DNRF wants to enable excellent scientific research that has a major **impact** and the potential for breakthroughs that may transform science itself, open up new opportunities, and thus, ultimately, change the way we live and think. The final evaluations show that this approach works. Here are selected examples from different evaluation reports.

- “ The center is undoubtedly a leading, world-class center. Only few other entities come to mind that are comparable in topic and scope. To this reviewer’s knowledge, no entities has yet produced anything that would be comparable to the scientific quality of this Center of Excellence.
- “ The depth and quality of the research and the insights that have been gained are truly outstanding.
- “ The center is a showcase for how excellent fundamental research can directly impact technology that is of societal importance.

Excellent scientific research is vital to successful **internationalization** because excellence is the basis of the international status that is essential for attracting the best people. The opposite is also true: Internationalization is crucial to excellence because it means gaining a constant influx of new ideas and new perspectives, and it encourages diversity at all levels and increases the competitiveness of Danish research. Here are some of the things the international experts said about **internationalization at the Centers of Excellence**:

- “ The Center visitor program has been an outstanding success. More than 100 research visitors have been hosted per year, and this has helped generate and maintain an intellectually invigorating level of research activity.

- “ Active participation in major international consortia is an essential way to remain at the forefront of research. The center’s members have achieved this, ensuring local influence and involvement in continuing developments in the subject area. The surveys led by the center will ensure continuing leadership and influence for years to come.

**Originality and creativity** may be buzzwords in the context of research, but when the main purpose is scientific excellence, the pairing is paramount. Research ideas funded by the DNRF are required to be ambitious, original, and daring, and creativity is necessary throughout the process of excellent research from conceiving the idea to formulating the research questions and putting together various methodological approaches in order to solve them. To the DNRF, the best strategy is clearly to help creativity thrive at the centers because this makes for frontline research. More often than not, fruitful **interdisciplinary** approaches are an outcome of the creativity at DNRF Centers of Excellence.

- “ The research is multidisciplinary, calling on earth-science disciplines spanning the range from basic geology and paleontology, through geochemistry and geodynamics of the solid earth, to biogeochemistry, microbial ecology and molecular biology. Taken as a whole, the body of research undertaken in the center can be characterized as being unusually innovative, creative and remarkable in the extent to which it addresses questions of major importance in the Earth sciences.
- “ By bringing together analytical techniques and methodologies from a wide range of disciplines the center has developed a new set of methodologies, which are far more comprehensive and rigorous than any that existed previously. These will provide the gold standard for research in the area of textiles in future.

Many centers combine a number of different research fields or disciplines, searching for new insights in the gaps between the traditional disciplines or within emerging areas. In this way, centers provide excellent training environments for the next generation of highly original researchers. The center's **training of the next generation of top researchers** is very important because it secures the continuation of the center's impact and thereby a continued return on the initial research investment.

“ The center has an outstanding educational track record in the large number and quality of Ph.D. students, post-docs and junior faculty that have been mentored. The coming together of young people from different academic backgrounds and nationalities, their exposure to interdisciplinarity in the activities of the center and to the interaction of theory with experiment is a significant and long-term contribution of the center to society.

“ The center has proven itself to be an important and attractive training ground for young scholars, allowing them to get involved in research at an early stage, and to work alongside leading senior researchers in the subject area.

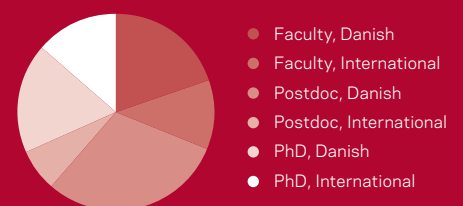
#### A mark of success

The final evaluations are a mark of the centers' immense success. The evaluations also confirm that the Centers of Excellence funding instrument has been working very well throughout the ten-year grant period. Many center leaders find that the time when the grant period draws to a close is a difficult one. The DNRF sympathizes with this feeling, but hope that the centers' research activities are now well-embedded at the universities, and the foundation wish everyone involved in the centers' activities all the best in the future.

#### IMPACT OF THE 4TH GENERATION OF CENTERS OF EXCELLENCE

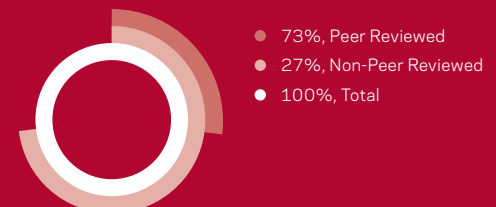
# 2250

FULL-TIME EQUIVALENTS



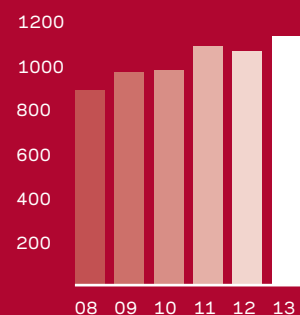
# 6000

PUBLICATIONS



# 6000

ECTS-POINTS WORTH OF LECTURING



From 2008, where the foundation started collecting ECTS data, to 2014 the 12 centers lectured equivalent to 6123 ECTS points

## YOUNG RESEARCHERS FROM DNRF CENTERS OF EXCELLENCE LEAD MASSIVE BIRD GENOME PROJECT

The genomes of modern birds tell the story of how today's winged rulers of the sky evolved after the mass extinction that wiped out dinosaurs and many other organisms 66 million years ago. The story has come to light, thanks to a four-year international collaboration. It not only represents a genomic study of unprecedented scale but also involves a remarkable young leadership team that grew from, and beyond, the core of several Centers of Excellence.

The findings were reported nearly simultaneously in 28 papers published in December 2014, including two large flagship papers and six regular papers back-to-back in a special is-

sue of Science and 20 more in journals such as Genome Biology and GigaScience.

The first 11-page flagship Science article revealed that very few bird lineages survived the mass extinction of dinosaurs 66 million years ago. Around this time, in a short interval of just five to 10 million years, these lineages gave rise to the more than 10,000 bird species that comprise 95 percent of all bird species living today. This contradicts the idea that bird diversification blossomed 10 to 80 million years earlier, as some recent studies have suggested. Instead, the project strengthens the theory that a "big bang" for bird evolution followed closely after the dinosaurs' extinction, a probable theory because of the suddenly freed-up ecological niches.

The second 10-page Science article describes the big picture of genome evolution in birds. Together with five other papers in the special issue, it reports how some of the earliest bird species diverged, answering many long-standing questions about the common ancestor of birds, crocodilians, and dinosaurs – a group collectively known as archosaurs – and shedding new light on the evolution of avian sex chromosomes, vocal learning in both birds and humans, how colorful feathers evolved and the process that led to birds lose their teeth.

“ The impressive scope of the study is a good example of the potential of joint funding – in this case from the DNRF, the Lundbeck Foundation and the National Genebank at BGI in China.

Professor Liselotte Højgaard, Chair DNRF



From Science Vol. 346 (#6215) 12 December 2014. Reprinted with permission from AAAS. Photo: © Flip De Nooyer/Foto Natura/Minden Pictures/Corbis

“ The leadership of the project, and the research itself, is thus a result of the synergy between young researchers that often originates within the Centers of Excellence, but then expands into new, independent research projects that lie outside the centers’ original research horizons.

Professor Thomas Sinkjær, Director DNRF

The study is the largest whole genomic study across a single vertebrate class to date, and it has helped to answer numerous fundamental questions on an unprecedented scale. The success of this project could only be achieved through collaboration between hundreds of scientists, the strong involvement and support of BGI, China, and, not least, scientific leadership.

#### **Synergy between DNRF Centers of Excellence and a consortium of 200 scientists with Danish-Chinese-American leadership**

This massive comparative genomics project benefitted from access to multiple supercomputers on which hundreds of years of computational time was used to process all the data. It took more than four years to resolve the fundamental questions of genome evolution in birds. The project involved more than 200 scientists at over 80 institutions, in 20 different countries. It was led by Guojie Zhang (BGI, China and the Department of Biology, University of Copenhagen), M. Thomas P. Gilbert (the Natural History Museum of Denmark, University of Copenhagen), and Erich Jarvis (Duke University and the Howard Hughes Medical Institute).

The project had very strong Chinese-Danish leadership – and commenced following a meeting between Guojie Zhang and Thomas Gilbert at BGI in Shenzhen. Both are associated with DNRF Centers of Excellence (the Center for Social Evolution and the Center for Geogenetics, respectively). The ornithological aspects of the project were further developed in a dialogue with

ornithologists of the DNRF Center for Macroecology, Evolution and Climate, primarily Jon Fjeldså, Knud Jønsson and center leader Carsten Rahbek. Thus the project was established and conducted across institutional and center borders.

#### **Stepping forward with genomics**

The results of previous attempts to reconstruct the avian family tree using partial DNA sequencing or anatomical and behavioral traits have been contradictory and confusing. Because modern birds split into species in quick succession, they did not evolve sufficient distinct genetic differences to clearly determine their early branching order. To resolve the timing and relationships of modern birds in the project, the scientists used whole-genome DNA sequences to infer the bird species tree. While previously such approaches used data from 10 to 20 genes to try to infer the species relationships, this project resulted in the sequencing of well over 14,000 genes per individual species. This whole-genome approach revealed a somewhat different phylogeny than what has been proposed in the past, in particular because non-coding sequences were shown to be essential for inferring the true species tree.

#### **For answers, new computational tools needed**

Increasingly sophisticated and more affordable genomic sequencing technologies, and the advent of computational tools for reconstructing and comparing whole genomes, have allowed the consortium to resolve these controversies with better clarity than ever before.



With over 14,000 genes reported per species, the size of the data sets and the complexity of analyzing them required new approaches to computing evolutionary family trees.

These were developed by computer scientists within the project. The algorithms used required the use of parallel processing supercomputers at the Munich Supercomputing Center, the Texas Advanced Computing Center, the San Diego Supercomputing Center, and DTU's Center for Biological Sequence Analysis. The computational challenges in estimating the avian species tree used around 300 years of CPU time, and some analyses required supercomputers with a terabyte of memory.

#### The start of something even bigger

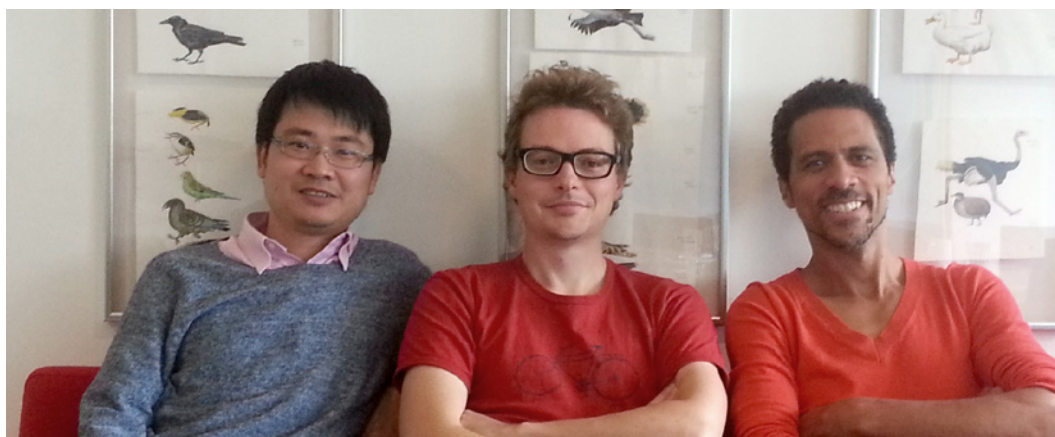
This sweeping genome-level comparison of an entire class of life is being powered by frozen bird tissue samples collected over the past 30 years by museums and other institutions around the world. Samples are sent as fingernail-sized chunks of frozen flesh, mostly to Duke University and the University of Copenhagen, for DNA separation. Most of the genome sequencing and critical initial analyses of the genomes were then conducted by BGI. The avian genome consortium has now created a database that is publicly available for scientists to study the genetic basis of complex avian traits.

Setting up the pipeline for the large-scale study of whole genomes – collecting and organizing tissue samples, extracting the DNA, analyzing its quality, sequencing, and managing torrents of new data – was a massive undertaking. But this work should help inform other major efforts related to the comprehensive sequencing of vertebrate classes. To encourage other researchers to dig through this 'big data' and discover new patterns that were not seen in small-scale data before, the avian genome consortium has released the full data set to the public in GigaScience, and in NCBI, ENSEMBL and CoGe databases.

“The internationalization and diversity of researchers in our consortia, not least in the leadership (picture), reflects a new order of cutting edge research in Danish and international research.

Carsten Rahbek, Center for Macroecology, Evolution and Climate

“The Avian Phylogenomic Project” is among other sources funded by the National Genebank at BGI in China, the Danish National Research Foundation and the Lundbeck Foundation.



Three young researchers took the lead on a major bird genomics project involving 200 scientists, 80 institutions and 20 different countries. From left to right: Guojie Zhang, Tom Gilbert and Erich Jarvis. Guojie and Tom are both associated with DNRF Centers and had the support and opportunity to collaborate and establish themselves with a new research field outside the centers





The new bird species tree of the 48 avian groups has shed light on many long-standing questions in biology. Drawing by Jon Fjeldsø.

## GUNNAR ÖQUIST RECEIVES THE KNIGHT'S CROSS FROM HER MAJESTY THE QUEEN

Gunnar Öquist (born 1941), Professor Emeritus in plant physiology and world class scientist received the order of Dannebrog's knight's cross in November 2014.

Gunnar Öquist has contributed immeasurably to the Danish and international research community including the Danish National Research Foundation.

Gunnar Öquist was part of the panel which evaluated the DNRF in 2003. In 2005 he accepted to become member of the foundation's board where he, for eight years, played a significant role in the creation the foundation's success.

“ Denmark – Danish research owe you a lot, and this gratitude is expressed by Her Majesty Queen Margrethe II, who has decided to grace you with the knight's cross.

Uffe Toudal Pedersen, Permanent Secretary



Gunnar Öquist,  
Professor Emeritus in plant physiology

Gunnar Öquist has been involved in research evaluations all over the world and with his comprehensive knowledge he has contributed considerably to refine framework conditions for research worldwide. Gunnar Öquist is one of the main authors of the leading Swedish report *Fostering breakthrough research: A comparative study*, which emphasises Danish Elite research as a story of success.

As Permanent Secretary of The Royal Swedish Academy of Sciences from 2003-2010 Gunnar Öquist has had an immensely important role for research worldwide among other things by awarding Nobel Prizes. In his capacity of Permanent Secretary Gunnar Öquist created well-merited admiration and respect throughout the international research community.

Gunnar Öquist is always humble towards the ideas, and to the point sharp as a hawk, but in a very kind way. The DNRF congratulates Gunnar Öquist with the Order of Dannebrog's knight's cross.

“ Thank you to Minister for Higher Education and Science Sofie Carsten Nielsen and the politicians of Denmark for your active and keen interest in research. You know better than most politicians around the world that research is one of the most important building bricks of modern society.

Professor Liselotte Højgaard, Chair DNRF



Sofie Carsten Nielsen,  
Minister for Higher Education and Science

## THE FOUNDATION IN BRIEF

- The DNRF was established in 1991 as an independent organization with the objective of funding basic research at a high international level.
- In 1991, the foundation received an endowment of 2 billion DKK (270 M EUR) from Parliament.
- The foundation's lifespan was extended in 2008 by a capital injection of 3 billion DKK (400 M EUR) and another 3 billion is allocated on the 2015 finance bill. This capital injection will ensure the existence of the foundation until 2036.
- Since 1991, the DNRF has committed itself to supporting Danish research institutions with 7,3 billion DKK (almost 1 billion EUR).
- The DNRF spends approximately 450 M DKK (around 60 M EUR) annually.
- The Center of Excellence program is the flagship of the foundation. A total of 100 centers have been established since 1993.

## ONGOING ACTIVITIES

### CENTERS OF EXCELLENCE ESTABLISHED IN 2005

#### Nordic Center for Earth Evolution (NordCEE)

Location:	University of Southern Denmark (and University of Copenhagen)
Center leader:	Professor Don Canfield
Total grant:	89.4 MDKK



#### Center for Individual Nanoparticle Functionality (CINF)

Location:	Technical University of Denmark
Center leader:	Professor Ib Chorkendorff
Total grant:	84.5 MDKK



#### Center for Inflammation and Metabolism (CIM)

Location:	Rigshospitalet (and University of Copenhagen)
Center leader:	Professor Bente Klarlund Pedersen
Total grant:	55.8 MDKK



#### Center for Social Evolution (CSE)

Location:	University of Copenhagen
Center leader:	Professor Jacobus J. Boomsma
Total grant:	76.8 MDKK



#### Center for mRNP Biogenesis and Metabolism (mRNP)

Location:	Aarhus University
Center leader:	Professor Torben Heick Jensen
Total grant:	80.0 MDKK



#### Embedment, Center for Insoluble Protein Structures (inSPIN)

Location:	Aarhus University
Total grant:	80.0 MDKK

#### Center for Oxygen Microscopi and Imaging (COMI)

Location:	Aarhus University
Center leader:	Professor Peter R. Ogilby
Total grant:	50.3 MDKK





**Center for Viscous Fluid Dynamics (Glass and Time)**

Location: Roskilde University

Center leader: Professor Jeppe Dyre

Total grant: 68.4 MDKK

**Dark Cosmology Center (DARK)**

Location: University of Copenhagen

Center leader: Professor Jens Hjorth

Total grant: 114.3 MDKK

**Center for Language Change in Real Time (LANCHART)**

Location: University of Copenhagen

Center leader: Professor Frans Gregersen

Total grant: 71.0 MDKK

**Center for Textile Research (CTR)**

Location: University of Copenhagen

Center leader: Professor Marie-Louise Nosch

Total grant: 44.7 MDKK

**Center for Models of Life (CMOL)**

Location: University of Copenhagen

Center leader: Professor Kim Sneppen

Total grant: 52.1 MDKK

**Danish Arrhythmia Center (DARC)**

Location: University of Copenhagen (and Rigshospitalet)

Center leader: Professor Søren-Peter Olesen

Total grant: 69.7 MDKK



## CENTERS OF EXCELLENCE ESTABLISHED IN 2007

**Center for Research in Econometric Analysis of Time Series (CREATES)**

Location: Aarhus University

Center leader: Professor Niels Haldrup

Total grant: 80.2 MDKK

**Center for Carbohydrate Recognition and Signaling (CARB)**

Location: Aarhus University

Center leader: Professor Jens Stougaard

Total grant: 90.6 MDKK



**Center for DNA Nanotechnology (CDNA)**

Location:	Aarhus University
Center leader:	Professor Kurt Vesterager Gothelf
Total grant:	94.5 MDKK

**Center for Epigenetics**

Location:	University of Copenhagen (and University of Southern Denmark)
Center leader:	Professor Kristian Helin
Total grant:	111.0 MDKK

**Center for Ice and Climate**

Location:	University of Copenhagen
Center leader:	Professor Dorthe Dahl-Jensen
Total grant:	116.0 MDKK

**Center for Massive Data Algorithmics (MADALGO)**

Location:	Aarhus University
Center leader:	Professor Lars Arge
Total grant:	72.5 MDKK

**Membrane Pumps in Cells and Disease (PUMPKIN)**

Location:	Aarhus University
Center leader:	Professor Poul Nissen
Total grant:	106.3 MDKK



## CENTERS OF EXCELLENCE ESTABLISHED IN 2009/2010

**Center on Autobiographical Memory Research (Con Amore)**

Location:	Aarhus University
Center leader:	Professor Dorthe Berntsen
Total grant:	84.1 MDKK

**Center for Cosmology and Particle Physics Phenomenology (CP<sup>3</sup> - Origins)**

Location:	University of Southern Denmark
Center leader:	Professor Francesco Sannino
Total grant:	80.0 MDKK

**Center for Particle Physics (Discovery)**

Location:	University of Copenhagen
Center leader:	Professor Peter H. Hansen
Total grant:	80.0 MDKK

**Center for Symmetry and Deformation (SYM)**

Location:	University of Copenhagen
Center leader:	Professor Jesper Grodal
Total grant:	90.1 MDKK



**Center for Materials Crystallography (CMC)**

Location:	Aarhus University
Center leader:	Professor Bo Brummerstedt Iversen
Total grant:	105.2 MDKK

**Center for Geogenetics**

Location:	University of Copenhagen
Center leader:	Professor Eske Willerslev
Total grant:	100.4 MDKK

**Center for Quantum Geometry of Moduli Spaces (QGM)**

Location:	Aarhus University
Center leader:	Professor Jørgen Ellegaard Andersen
Total grant:	89.3 MDKK

**Center for Macroecology, Evolution and Climate (CMEC)**

Location:	University of Copenhagen
Center leader:	Professor Carsten Rahbek
Total grant:	111.0 MDKK

**Center for Star and Planet Formation (STARPLAN)**

Location:	University of Copenhagen
Center leader:	Professor Martin Bizzarro
Total grant:	82.4 MDKK



## CENTERS OF EXCELLENCE ESTABLISHED IN 2012

**Center for Medieval Literature (CML)**

Location:	University of Southern Denmark
Center leader:	Professor Lars Boje Mortensen
Total grant:	36.0 MDKK

**Center for Dynamic Molecular Interactions (DynaMo)**

Location:	University of Copenhagen
Center leader:	Professor Barbara Halkier
Total grant:	49.0 MDKK

**Center for Permafrost Dynamics in Greenland (CENPERM)**

Location:	University of Copenhagen
Center leader:	Professor Bo Elberling
Total grant:	60.0 MDKK

**Center for Quantum Devices (qDev)**

Location:	University of Copenhagen
Center leader:	Professor Charles Marcus
Total grant:	64.4 MDKK



**Center for Financial Frictions (FRIC)**

Location: Copenhagen Business School

Center leader: Professor David Lando

Total grant: 48.0 MDKK

**Center for Nanostructured Graphene (CNG)**

Location: Technical University of Denmark

Center leader: Professor Antti-Pekka Jauho

Total grant: 54.0 MDKK

**Center for Geomicrobiology**

Location: Aarhus University

Center leader: Professor Bo Barker Jørgensen

Total grant: 58.1 MDKK

**Center for International Courts (iCourts)**

Location: University of Copenhagen

Center leader: Professor Mikael Rask Madsen

Total grant: 42.0 MDKK

**Stellar Astrophysics Center (SAC)**

Location: Aarhus University

Center leader: Professor Jørgen Christensen-Dalsgaard

Total grant: 55.0 MDKK

**Copenhagen Center for Glycomics (CCG)**

Location: University of Copenhagen

Center leader: Professor Henrik Clausen

Total grant: 62.0 MDKK

**Center for Vitamins and Vaccines (CVIVA)**

Location: Statens Serum Institut

Center leader: Professor Christine Stabell Benn

Total grant: 58.0 MDKK



## CENTERS OF EXCELLENCE TO BE ESTABLISHED IN 2015

**Center for Chromosome Stability (CCS)**

Location: University of Copenhagen

Center leader: Professor Ian D. Hickson

Total grant: 65.0 MDKK (granted in 2015)

**Center for Stem Cell Decision Making (StemPhys)**

Location: University of Southern Denmark

Center leader: Professor Lene Oddershede

Total grant: 60.0 MDKK (granted in 2015)





**Center for Music in the Brain (MIB)**

Location: Aarhus University  
 Center leader: Professor Peter Vuust  
 Total grant: 52.0 MDKK (granted in 2015)

**Center for Carbon Dioxide Activation (CADIAC)**

Location: Aarhus University  
 Center leader: Professor Troels Skrydstrup  
 Total grant: 60.0 MDKK (granted in 2015)

**Center for Urban Network Evolutions (UrbNet)**

Location: Aarhus University  
 Center leader: Professor Rubina Raja  
 Total grant: 65.0 MDKK (granted in 2015)

**Center for Bacterial Stress Response and Persistence (BASP)**

Location: University of Copenhagen  
 Center leader: Professor Kenn Gerdes  
 Total grant: 50.0 MDKK (granted in 2015)

**Center for Neuroplasticity and Pain (CNAP)**

Location: Aalborg University  
 Center leader: Professor Thomas Graven-Nielsen  
 Total grant: 60.0 MDKK (granted in 2015)

**Center for Intelligent Oral Drug Delivery using Nano and Microfabricated Containers (IDUN)**

Location: Technical University of Denmark  
 Center leader: Professor Anja Boisen  
 Total grant: 56.0 MDKK (granted in 2015)

**Center for Silicon Photonics for Optical Communications (SPOC)**

Location: Technical University of Denmark  
 Center leader: Professor Leif Katsuo Oxenløwe  
 Total grant: 59.0 MDKK (granted in 2015)

**Center for Hyperpolarization in Magnetic Resonance**

Location: Technical University of Denmark  
 Center leader: Professor Jan Henrik Ardenkjær-Larsen  
 Total grant: 55.0 MDKK (granted in 2015)

**Center for Autophagy, Recycling and Disease (CARD)**

Location: The Danish Cancer Society  
 Center leader: Professor Marja Jäätelä  
 Total grant: 50.0 MDKK

**Center for Personalized Medicine of Infectious Complications in Immune Deficiency (PERSIMUNE)**

Location: Rigshospitalet  
 Center leader: Professor Jens Lundgren  
 Total grant: 60.0 MDKK (granted in 2015)



## JOINT FUNDING ACTIVITIES

**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center for Proteases and Cancer**

Location: Aarhus University

Leader: Professor Peter A. Andreasen

Total grant: 21.5 MDKK

**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center of Breast Cancer Research**

Location: University of Copenhagen

Leader: Professor Nils Brünner

Total grant: 22.7 MDKK

**National Natural Science Foundation of China (NSFC), Danish-Chinese Center for  
Self-Assembly and Function of Molecular Nanostructures on Surfaces**

Location: Aarhus University

Leader: Professor Flemming Besenbacher

Total grant: 24.8 MDKK

**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center for Molecular Nano-Electronics**

Location: University of Copenhagen

Leader: Professor Thomas Bjørnholm

Total grant: 24.5 MDKK

**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center for Nanometals**

Location: Technical University of Denmark

Leader: Professor Dorte Juul Jensen

Total grant: 23.7 MDKK

**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center for Organic-based Photovoltaic Cells with Morphology Control**

Location: Technical University of Denmark

Leader: Professor Frederik Christian Krebs

Total grant: 25.0 MDKK

**National Natural Science Foundation of China (NSFC), Danish-Chinese Center for  
Applications of Algebraic Geometry in Coding Theory and Cryptography**

Location: Technical University of Denmark

Leader: Professor Tom Høholdt

Total grant: 13.1 MDKK

**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center for the Theory of Interactive Computation**

Location: Aarhus University

Leader: Professor Peter Bro Miltersen

Total grant: 24.9 MDKK



**National Natural Science Foundation of China (NSFC),  
Danish-Chinese Center for IDEA4CPS: Foundations for Cyber-Physical Systems**

Location:	Aalborg University
Leader:	Professor Kim Guldstrand Larsen
Total grant:	24.4 MDKK



**Centre National de la Recherche Scientifique (CNRS)**

Total grant:	(1.7 MDKK, included in the above mentioned center grants).
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**National Science Foundation (NSF)**

Total grant:	(4.5 MDKK, included in the above mentioned center grants).
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## DNRF'S NIELS BOHR PROFESSORSHIPS ESTABLISHED IN 2013

**Professor Anna Lowenhaupt Tsing, University of California, Santa Cruz**

Location:	Department of Culture and Society, Aarhus University
Total grant:	29.0 MDKK



**Professor David Needham, Duke University**

Location:	Department of Physics, Chemistry and Pharmacy, University of Southern Denmark
Total grant:	29.0 MDKK



**Professor Lars Hesselholt, Nagoya University**

Location:	Department of Mathematical Sciences, University of Copenhagen
Total grant:	30.0 MDKK



**Professor Charles Lesher, University of California, Davis**

Location:	Department for Geoscience, Aarhus University
Total grant:	30.0 MDKK



**Professor Jaan Valsiner, Clark University**

Location:	Department of Communication and Psychology, Aalborg University
Total grant:	20.0 MDKK



**Professor Subir Sarkar, University of Oxford**

Location:	Niels Bohr Institute, University of Copenhagen
Total grant:	29.0 MDKK



## COURSE ACTIVITIES FOR CENTER LEADERS/OUTREACH PROGRAM FOR CENTERS

Total grant:	6.2 MDKK
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## TOTAL ASSETS AND RETURN ON INVESTMENT

In 2014, the foundation distributed 436 MDKK, which was close to the annual average amount of 441 MDKK (in 2014 prices) allowed by the regulations. Total return on investment was 337 MDKK. Broken down into asset classes, return on equities amounted to 154 MDKK and return on bonds amounted to 183 MDKK. Administrative and financial expenses amounted to 16 MDKK.

The net capital was reduced from 3.650 MDKK to 3.535 MDKK. Thus, the capital injection of 3 billion in March 2015 DKK has increased total assets to 6.5 billion DKK.

### Return on equities

Foreseeing a limited investment horizon ending in 2026, the board decided at the beginning of 2014 to gradually reduce the allocation to equities. In the first quarter of 2014 the equity share was reduced from 35.00% to 33.75% and the bond share correspondingly increased from 65.00% to 66.25%. However, taking into account that the foundation would most likely receive 3,000 MDKK in 2015 and that the foundation's life span would be increased to 2036, the question arose in May 2014 as to whether the foundation should put the current quarterly reduction of the equity share on hold. As a result, the current reduction of the equity share was suspended.

Up to 30% of total assets have been invested in the Deutsche Bank x-tracker Custom Global Equity. The passively managed equity portfolio matched the MSCI benchmark in 2014. The performance was 12.7% inclusive of a currency USD and JPY hedge of -5.5%.

Less than 1% of the funds have been invested in the passively managed Danske Invest Global Index. The performance was 12.9% compared to the MSCI benchmark 13.3% inclusive of a -5.0% USD and JPY currency hedge.

In addition to the two global MSCI (Morgan Stanley Capital International, developed countries) portfolios, the foundation has invested up to 4% of total assets in Danske Capital's Global Emerging Markets portfolio. This combination ensures that the foundation's total equity holding has a 100% exposure to MSCI World AC (All Countries). The performance of the emerging markets portfolio was 11.1% versus the benchmark 11.2%.

The two Danske Capital equity portfolios are covered by Danske Capital's Socially Responsible Investment (SRI) policy with ongoing screening by Ethix SRI Advisors. The foundation's Custom Global Equity portfolio is fully consistent with Danske Capital's SRI policy.

### Return on bonds

36% of total assets have been managed by Nykredit in a portfolio including Danish government and mortgage bonds. Return on investment was 8.4% compared to the benchmark 7.0%. In late April the benchmark duration was reduced by 0.5 years. The Nordea Danish government bonds benchmark, with constant duration of 5 years, was tightened up with a 0.50 % outperformance requirement.

The global inflation-linked bond investment amounts to 20% of total assets. Performance was 6.0% compared to the benchmark 5.5%. Benchmark is defined by a portfolio composed of 60% Barclays 33% US 33% Eurozone 33% Global Customized AA3+, and 40% Barclays Global Inflation-Linked Bond Index 1-10Y, currency hedged 95% to DKK.

The performance of the Danske Capital European corporate bond portfolio was 8.1% versus the benchmark 8.2% (Barclays Capital Euro Major Corporate Index).



Return on investment	2014	2013	2012	2011	2010
Bonds, MDKK	182.7	-38.1	182.4	261.4	164.5
Equities, MDKK	153.8	256.1	207.7	-71.3	169.7
Total return, MDKK	336.5	218.0	390.1	190.1	334.2
Time-weighted return % <sup>1)</sup>	9.3	5.6	10.7	5.2	8.5
Benchmark %	8.7	5.6	10.1	4.9	8.8
Return according to legal basis % <sup>2)</sup>	3.8	4.2	4.9	5.5	5.8
Time-weighted return Annualized, 5 years % <sup>3)</sup>	7.9	8.7	5.3	3.7	3.3
Benchmark Annualized, 5 years %	7.6	8.5	5.2	3.8	3.3
Return according to legal basis Annualized, 5 years % <sup>4)</sup>	4.8	5.2	5.5	5.7	5.5

- 1) The annual time-weighted return of the total investment is a weighted average of each portfolio's time-weighted return. A time-weighted return is calculated as  $((1 + (i_{\text{period1}})) \times (1 + (i_{\text{period2}})) \times \dots - 1)$ , where  $i$  is the return in percent.
- 2) From January 1, 2007 to July 1, 2008, opening balance assumes a 3% real return plus the annual rate of inflation. Since July 1, 2008 a 3.3% annual real return has been assumed.
- 3)  $((1 + (\text{time-weighted return}_{\text{year1}})) \times (1 + (\text{time-weighted return}_{\text{year2}})) \times \dots)^{(1/(\text{number of years}) - 1)}$ , where the time-weighted return is calculated in percent and the number of years is 5.
- 4) Calculated by the same method as the annualized time-weighted return.

### Total return

Total return on investment in 2014 was 9.3%, which was 0.6% ahead of benchmark for the total portfolio. Inflation was 0.5%. Including the calculated real return of 3.3%, the benchmark according to the legal basis was 3.8%.

From a 5-year perspective covering the years 2010-2014, the annual return has been highly satisfactory: an annual return of 7.9% against an annual benchmark of 7.6%. As can be seen from the table, the calculated return according to the legal basis has declined corresponding to the current very low inflation rate.

### The capital injection

In 2014, the Parliament decided to grant the foundation 3 billion DKK for another 10 years at the same annual distribution level. Consequently, the life of the foundation has been extended from 2026 to 2036 and the distributions will continue at the current level. The foundation received the capital injection at the beginning of 2015, and the foundation's revised investment strategy was in place as of mid-December 2014.

### Donation of DKK 500,000 from J. H. Schultz Foundation

In May 2014, the DNRf received good news. The board of the J.H. Schultz Foundation has decided to donate half a million DKK to the DNRf. This is the first time that the DNRf has received a private donation. The Schultz Foundation was established in 1988 when Ole Trock-Jansen donated 95% of the Schultz company's stocks to the newly established foundation.

## THE BOARD

In 2014, the board conducted 6 regular meetings and was represented at 33 follow-up center meetings. The composition of the board was as follows:



**Liselotte Højgaard (Chair)**

Professor, University of Copenhagen,  
Head of Department, Rigshospitalet  
Nominated by the Minister for Higher  
Education and Science  
(01.01.13-31.12.18)



**Svend Erik Larsen**

Professor, Department of Aesthetics and  
Communication – Comparative Literature,  
Aarhus University. Nominated by the Danish  
Council for Independent Research  
(01.01.12-31.12.15)



**Bo Ernø Honoré (Deputy chairman)**

Professor, Department of Economics,  
Princeton University. Nominated by Danish  
Rectors' Conference  
(01.01.12-31.12.15)



**Christina Moberg**

Professor, Royal Institute of Technology,  
KTH, Stockholm. Nominated by the Danish  
Council for Strategic Research  
(01.11.13-31.10.17)



**Bart De Moor**

Professor, KU Leuven  
Nominated by the Minister for  
Higher Education and Science  
(01.11.13-31.10.17)



**Birgitte Possing**

Professor, the Danish State Archives  
Nominated by the Joint Committee  
of Directors at the Governmental  
Research Institutes  
(01.01.12-31.12.15)



**Kirsten Hastrup**

Professor, Department of Anthropology,  
University of Copenhagen. Nominated by  
the Royal Danish Academy of Sciences  
and Letters  
(01.01.12-31.12.15)



**Eero Vuorio**

Director, professor, Biocenter Finland, University  
of Helsinki, Finland. Nominated by the Danish  
Council for Independent Research  
(01.11.13-31.10.17)



**Eivind Hiis Hauge**

Professor emeritus, Department of Physics,  
Norwegian University of Science and  
Technology. Nominated by the Danish  
Academy of Technical Sciences  
(01.11.13-31.10.17)

## STATEMENT BY MANAGEMENT ON THE ANNUAL REPORT

The board and the director have today considered and approved the annual report of the Danish National Research Foundation for the financial year 2014.

The annual report is presented in accordance with the Consolidated Act on the Danish National Research Foundation, the Danish Executive Order on the Administration of the Funds of the Danish National Research Foundation, the Royal Decree on the Charter of the Danish National Research Foundation and the provisions of the Danish Financial Statements Act with the adjustments resulting from the special nature of the Danish National Research Foundation.

In our opinion, the annual accounts give a true and fair view of the foundation's financial position at December 31, 2014 and of the results of its operations for the financial year January 1 to December 31, 2014. Also, we believe that the management commentary contains a fair review of the affairs and conditions referred to therein.

Finally, it is our opinion, that the established administrative procedures and internal controls, covered by the annual accounts, are in accordance with grants given, laws and other regulations, and also agreements entered into and normal practice.

Copenhagen, March 27, 2015

Thomas Sinkjær  
Director

Board members:

Liselotte Højgaard  
Chair

Bo Ernø Honoré  
Deputy Chairman

Bart De Moor

Kirsten Hastrup

Eivind Hiis Hauge

Svend Erik Larsen

Christina Moberg

Birgitte Possing

Eero Vuorio

## INDEPENDENT AUDITOR'S REPORT

TO THE BOARD OF THE DANISH  
NATIONAL RESEARCH FOUNDATION

### **Report on the financial statements**

We have audited the financial statements of the Danish National Research Foundation for the financial year 1 January to 31 December 2014, which comprise the accounting policies, income statement, balance sheet and notes. The financial statements are prepared in accordance with the provisions of the Danish Financial Statements Act subject to the adjustments caused by the special nature of the foundation.

### **Management's responsibility for the financial statements**

The board is responsible for the preparation of financial statements that give a true and fair view in accordance with the Danish Financial Statements Act subject to the adjustments caused by the special nature of the foundation, and for such internal control as the board determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error, as well as for electing and applying appropriate accounting policies, and making accounting estimates that are reasonable in the circumstances.

Furthermore, the board is responsible for transactions covered by the financial statements complying with the appropriations granted, statutes, other regulations, agreements and usual practice.

### **Auditor's responsibility**

Our responsibility is to express an opinion on the financial statements based on our audit. We conducted our audit in accordance with International Standards on Auditing and additional requirements under Danish audit regulation as well as generally accepted government auditing standards, see the Danish Act on the auditing of the government accounts, and the contract of the Danish National Research Foundation pursuant to S 9(2) Danish Auditor General's Act. This requires that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing audit procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the foundation's preparation of financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the foundation's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates



made by the board, as well as the overall presentation of the financial statements.

The audit also involves assessing whether business processes and internal controls have been established, supporting that the transactions covered by the financial statements comply with the appropriations granted, statutes, other regulations, agreements and usual practice.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Our audit has not resulted in any qualification.

### **Opinion**

In our opinion, the financial statements give a true and fair view of the foundation's financial position at 31 December 2014 and of the results of its operations for the financial year 1

January to 31 December 2014 in accordance with the Danish Financial Statements Act subject to the adjustments caused by the special nature of the foundation. It is also our opinion that business processes and internal controls have been established, supporting that the transactions covered by the financial statements comply with the appropriations granted, statutes, other regulations, agreements and usual practice.

### **Statement on the management commentary**

Pursuant to the Danish Financial Statements Act, we have read the management commentary. We have not performed any further procedures in addition to the audit of the financial statements.

On this basis, it is our opinion that the information provided in the management commentary is consistent with the financial statements.

Copenhagen, March 27, 2015

### **Deloitte**

Statsautoriseret Revisionspartnerselskab

Jens Sejer Pedersen  
State Authorised  
Public Accountant

# ACCOUNTING POLICIES

The annual report is presented in accordance with the Consolidated Act on the Danish National Research Foundation, the Danish Executive Order on the Administration of the Funds of the Danish National Research Foundation, the Royal Decree on the Charter of the Danish National Research Foundation and the provisions of the Danish Financial Statements Act governing reporting class C enterprises (large) with the adjustments resulting from the special nature of the foundation.

The provisions of the Danish Financial Statements Act governing reporting class C enterprises (large) prescribe preparation of a cash flow statement. Due to the nature of the foundation's activities, the cash flows cannot reasonably be broken down by cash flows from operating, investing and financing activities, for which reason the cash flow statement has been omitted, referring to Section 11(3) of the Danish Financial Statements Act. Also, the foundation has decided to derogate from the format requirements laid down by the Danish Financial Statements Act for the income statement in order to illustrate the special nature of the foundation.

The accounting policies applied are consistent with those applied last year.

## INCOME STATEMENT

### Interest income

Interest income from bonds and bank deposits have been accrued to the effect that they relate to the financial year under audit.

### Dividend

Dividend received on shares is included in the income statement at the time of distribution.

### Realized capital gains and losses on and market value adjustments of securities

Realized capital gains and losses on and market value adjustments of securities (bonds and equities) are included in the income statement.

### Other income

Under the Danish Appropriation Act, more funds have been made available to the foundation for distribution. The funds are recognized when transferred to the foundation.

### Distribution

Funds distributed are expensed in the financial year in which they are distributed. Funds are distributed as research plans are implemented, see note 16b. Time lags may exist to a limited extent.

### External expenses for the scientific activities of the Foundation

Such expenses comprise expenses for the foundation's scientific activities, including expenses for the consideration of applications and evaluation of grants.

## BALANCE SHEET

### Fixed assets

Leasehold improvements are recognized in the balance sheet at cost less accumulated depreciation. Fixed assets are depreciated straight-line over their estimated useful lives of five years.

Office equipment and furniture is recognized at cost less accumulated depreciation. Office equipment and furniture is depreciated straight-line over their estimated useful lives, meaning three years for IT hardware and software and five years for other office equipment.

Assets costing less than DKK 15,000 per unit are expensed in the year of acquisition.

**Securities**

Listed securities (bonds and equities) are measured at fair value (quoted price) at the balance sheet date.

Bonds redeemed at the time of presentation of the annual accounts are recognized at par value.

Other investments are measured at the lower of the value at the date of acquisition and fair value.

**Distribution obligations**

Distributions by the foundation mainly take the form of multiannual total grants awarded over a number of years as research projects are completed, however, grants usually are not awarded for more than a six-year period.

The distribution obligations which can be accommodated by equity and budgeted earnings, are not provided for in the balance sheet. Instead, distribution obligations are disclosed in notes 16a and 16b stating estimated residual amounts to be distributed.

**Income tax**

The foundation is not liable to tax.

**Foreign currency translation**

Foreign currency transactions are translated into Danish kroner applying the exchange rate at the transaction date.

Realized and unrealized gains and losses are recognized in capital income in the income statement.

Bank deposits and securities denominated in foreign currencies are translated into DKK applying the balance sheet date exchange rate. Realized and unrealized foreign exchange gains and losses are recognized in capital income in the income statement.

**Derivative financial instruments**

The Danish National Research Foundation only applies derivative financial instruments to hedge the currency and interest rate risks involved in the portfolio of securities.

Changes in the fair value of derivative financial instruments classified as and complying with the requirement for hedging the fair value of a recognized asset or a recognized liability are recorded in the income statement together with changes in the value of the hedged asset or the hedged liability. In doing so, symmetrical recognition of gains and losses on the item hedged and the hedging instrument, respectively, is ensured.

Premiums received or paid as well as forward premiums and discounts are recognized in the income statement over the terms of the instruments.

The fair value of derivative financial statements classified as and qualifying for hedging of an instrument to hedge a recognized asset or liability is recognized in the balance sheet along with the asset or liability to which hedging relates.

# INCOME STATEMENT

## JANUARY 1 – DECEMBER 31

	Note	2014	2013
<b>Return on investment</b>			
Realized gains and losses, bonds		79,339,626	25,449,254
Unrealized gains and losses, bonds		103,319,986	-63,573,430
Realized gains and losses, equities		-42,911,333	58,106,839
Unrealized gains and losses, equities		196,692,508	198,027,827
Interest, bank deposits		16,643	16,923
<b>Return on investment, total</b>		<b>336,457,430</b>	<b>218,027,413</b>
<b>Other receipts, net</b>	1	<b>518,225</b>	<b>73,973</b>
<b>Costs</b>			
Distributions	16	-435,943,624	-423,038,546
Custody and bank fees etc.	2	-4,221,098	-3,252,208
Salaries etc.	3	-7,573,660	-7,308,452
Office expenses	4	-497,603	-648,859
Premises	5	-890,287	-846,841
Accountant/attorney remuneration etc.	6	-873,874	-1,027,159
External expenses, external research activities	7	-1,253,931	-1,855,918
Other costs	8	-891,754	-899,586
<b>Costs, total</b>		<b>-452,145,831</b>	<b>-438,877,569</b>
<b>Loss before depreciation</b>		<b>-115,170,176</b>	<b>-220,776,183</b>
Depreciation	9	-112,209	-73,002
<b>Loss for the year</b>		<b>-115,282,385</b>	<b>-220,849,185</b>



# BALANCE SHEET AS OF DECEMBER 31

	Note	2014	2013
<b>ASSETS</b>			
<b>Fixed assets</b>			
<b>Tangible fixed assets</b>			
	10		
Leasehold improvements		267,019	66,521
Office equipment and furniture		16,749	37,258
		283,768	103,779
<b>Fixed asset investments</b>			
	11		
Other investments		69,453	51,228
Deposits		215,516	211,248
		284,969	262,476
<b>Fixed assets, total</b>		568,737	366,255
<b>Current assets</b>			
<b>Receivables</b>			
Accrued interest		18,373,040	20,817,549
Other receivables		108,251	68,962
Deferred charges		93,517	259,747
		18,574,808	21,146,258
<b>Liquid funds</b>			
Securities, bonds	12	2,249,393,592	2,320,119,928
Securities, equities	13	1,245,055,462	1,294,791,722
Bank deposits	14	24,507,737	16,602,136
		3,518,956,791	3,631,513,786
<b>Current assets, total</b>		3,537,531,599	3,652,660,044
<b>ASSETS, TOTAL</b>		3,538,100,336	3,653,026,299

## EQUITY AND LIABILITIES

<b>Net capital</b>	15	3,535,354,160	3,650,636,545
<b>Payables</b>			
<b>Short-term payables</b>			
Payables and back costs		2,746,176	2,389,754
<b>Payables, total</b>		2,746,176	2,389,754
<b>EQUITY AND LIABILITIES, TOTAL</b>		3,538,100,336	3,653,026,299
<b>Distribution obligations</b>	16		
<b>Contingent liabilities</b>	17		

# NOTES

	2014	2013
<b>1 OTHER RECEIPTS, NET</b>		
Private donation	500,000	0
Receipts, intellectual property rights	0	41,648
Market value adjustment, other investments, see note 11	18,302	32,325
<b>Other receipts, total</b>	<b>518,302</b>	<b>73,973</b>
<b>2 CUSTODY AND BANK FEES, ETC.</b>		
Bonds	2,864,668	2,691,567
Equities	662,080	539,220
Fees, portfolio managers	3,526,748	3,230,787
Remuneration regarding investment of capital injection	673,250	0
Bank	9,610	10,762
Other	11,490	10,659
<b>Custody and bank fees, total</b>	<b>4,221,098</b>	<b>3,252,208</b>
<b>3 SALARIES ETC.</b>		
Director and board members	2,509,439	2,502,813
Salaries, other employees	4,360,736	4,181,029
Wage reimbursement	-146,700	0
Pension costs	655,659	620,889
Holiday allowance	150,808	-27,059
Danish Labor Market Supplementary Pension Scheme (ATP)	43,718	30,780
<b>Salaries etc., foundation staff, total</b>	<b>7,573,660</b>	<b>7,308,452</b>
Average staff number, accounting year	10	9
<b>4 OFFICE EXPENSES</b>		
Office supplies	42,917	74,644
Postage and freight	16,351	39,883
Telephone, Internet	114,841	120,413
Minor acquisitions	59,433	128,460
Journal, books, etc.	19,318	27,269
Servicing contracts etc.	244,743	258,190
<b>Office expenses, total</b>	<b>497,603</b>	<b>648,859</b>

	2014	2013
<b>5 PREMISES</b>		
Rent of office	644,548	627,744
Electricity, heating	84,465	76,339
Cleaning	155,349	134,870
Repairs and maintenance	5,925	7,888
<b>Premises, total</b>	<b>890,287</b>	<b>846,841</b>
<b>6 ACCOUNTANT/ATTORNEY REMUNERATION ETC.</b>		
Accountant remuneration, Deloitte	203,750	290,000
Accountant remuneration, Office of the Auditor General	0	-4,440
Accountancy consultation, Deloitte	10,625	47,063
Attorney's remuneration	65,000	71,503
Other consultancy services	594,499	623,033
<b>Accountant/attorney remuneration etc., total</b>	<b>873,874</b>	<b>1,027,159</b>
<b>7 EXTERNAL EXPENSES, RESEARCH ACTIVITIES</b>		
Peer review expenses	492,743	684,246
Preparation of publications	184,581	121,132
Research presentations, meetings etc.	436,438	876,872
European Science Foundation, Science Europe membership fee	140,169	173,668
<b>External expenses, research activities, total</b>	<b>1,253,931</b>	<b>1,855,918</b>
<b>8 OTHER EXPENSES</b>		
Travelling and accomodation	627,314	622,478
Advertising	52,474	14,506
Entertainment expenses, gifts	12,412	7,259
Courses	9,621	80,569
Insurance	99,768	92,172
Cost of staff and board	90,165	82,602
<b>Other expenses, total</b>	<b>891,754</b>	<b>899,586</b>
<b>9 DEPRECIATION</b>		
Leasehold improvements, see note 10	91,700	33,260
Office furniture and equipment, see note 10	20,509	39,742
<b>Depreciation, total</b>	<b>112,209</b>	<b>73,002</b>

	Leasehold improvements	Office equipment and furniture	Total
<b>10 TANGIBLE FIXED ASSETS</b>			
Acquisition cost, January 1, 2014	1,545,734	1,009,388	2,555,122
Additions	292,198	0	292,198
Disposals	0	0	0
Acquisition cost, December 31, 2014	1,837,932	1,009,388	2,847,320
Depreciation, accumulated, January 1, 2014	-1,479,213	-972,130	-2,451,343
Depreciation for the year			
Reversed depreciation, disposals for the year	-91,700	-20,509	-112,209
Depreciation, accumulated, December 31, 2014	-1,570,913	-992,639	-2,563,552
<b>Book value at year-end</b>	<b>267,019</b>	<b>16,749</b>	<b>283,768</b>

	Other investments	Deposits	Total
<b>11 FIXED ASSET INVESTMENTS</b>			
Acquisition cost, January 1, 2014	1,773,954	211,248	1,985,202
Additions	0	4,268	4,268
Disposals	0	0	0
Acquisition cost, December 31, 2014	1,773,954	215,516	1,989,470
Value adjustments, accumulated, January 1, 2014	-1,722,726	0	-1,722,726
Value adjustment for the year	18,225	0	18,225
Reversed value adjustments, disposals for the year	0	0	0
Value adjustments, accumulated, December 31, 2014	-1,704,501	0	-1,704,501
<b>Book value at year-end</b>	<b>69,453</b>	<b>215,516</b>	<b>284,969</b>

Other investments include 0.0026% of the capital stock of a listed research- and development company, previously received as remuneration for intellectual property rights. The value of the investment is the listed value as of December 31.

	2014	2013
<b>12 SECURITIES, BONDS</b>		
<b>Asset classes</b>		
Danish bonds	1,299,433,298	1,255,930,710
European corporate bonds	355,798,488	348,070,610
Global inflation-linked bonds	594,161,806	716,118,608
<b>Bonds, total</b>	<b>2,249,393,592</b>	<b>2,320,119,928</b>
<b>Danish bonds</b>		
<b>Distribution by type of security:</b>		
Mortgage bonds	997,922,558	998,320,030
Government bonds	301,510,740	257,610,680
	<b>1,299,433,298</b>	<b>1,255,930,710</b>

Option adjusted duration December 31, 2014: 4.58 (December 31, 2013: 5.46)



**European corporate bonds****Distribution by rating category and forward currency contract:**

	2014	2013
AA	19,232,579	8,651,890
A	120,870,181	95,833,640
BBB	215,397,611	244,381,015
Forward currency contracts, EUR	-99,929	-212,693
Forward currency contracts, USD	-68,958	127,136
Interest-rate futures, EUR	462,843	-769,157
Interest-rate futures, USD	4,161	58,779
	355,798,488	348,070,610

Rating category according to Standard & Poor's Long-Term Credit Rating.  
Option adjusted duration, December 31, 2014: 4.75 (December 31, 2013: 4.17).

**Global inflation-linked bonds****Distribution by country and forward currency contract:**

	2014	2013
Denmark	10,459,744	0
Canada	9,395,412	14,496,539
Germany	82,509,795	74,769,837
France	100,065,938	143,854,835
Great Britain	145,324,322	142,876,924
Japan	0	28,925,682
Sweden	16,950,498	8,415,825
USA	226,846,786	289,444,202
New Zealand	2,466,031	0
Australia	4,908,536	12,766,545
Forward currency contracts, CAD	-123,380	224,036
Forward currency contracts, EUR	-96,906	-142,956
Forward currency contracts, GBP	-1,395,151	-626,587
Forward currency contracts, JPY	0	815,465
Forward currency contracts, SEK	84,258	-167,051
Forward currency contracts, USD	-3,120,458	424,551
Forward currency contracts, NZD	-58,389	0
Forward currency contracts, AUD	-55,230	40,761
	594,161,806	716,118,608

Option adjusted duration, December 31, 2014: 4.67 (December 31, 2013: 4.64).

	2014	2013
<b>13 SECURITIES, EQUITIES</b>		
<b>Distribution by type of security and forward currency contract</b>		
DB x-tracker, Custom Global Equity	1,069,094,918	1,088,682,794
Danske Invest Global Index	51,473,389	58,614,840
Danske Invest Global Emerging Markets I	131,525,500	138,168,740
Forward currency contracts, JPY	-1,627,555	3,408,693
Forward currency contracts, USD	-5,410,790	5,916,655
<b>Equities, total</b>	<b>1,245,055,462</b>	<b>1,294,791,722</b>
<b>14 LIQUID FUNDS</b>		
Cash	1,091	4,511
Current bank accounts	323,229	798,852
Portfolio accounts	24,183,417	15,798,773
<b>Liquid funds, total</b>	<b>24,507,737</b>	<b>16,602,136</b>
<b>15 NET CAPITAL</b>		
Net capital, January 1	3,650,636,545	3,871,485,730
Loss for the year	-115,282,385	-220,849,185
<b>Net capital, December 31, total</b>	<b>3,535,354,160</b>	<b>3,650,636,545</b>

## 16A DISTRIBUTION OBLIGATIONS

2014 distributions and total grants, DKK thousand

Grant No		Ordinary distribution period 1	Ordinary distribution period 2	Embedment/ extension	Grants total	Disbursed 2014	Residual disbursement, expected
<b>Centers established in 1993/94</b>							
1.	Søren Kierkegaard Research Center	27,739	55,404	6,250	89,393		*
2.	The Danish Epidemiology Science Center	41,932	42,302	11,850	96,084		*
3.	Center for Labour Market and Social Research	25,127		1,293	26,420		*
4.	Theoretical Astrophysics Center	47,340	37,961	2,084	87,385		*
5.	Center for Atomic Physics	53,999	42,888	3,011	99,898		*
6.	Center for Atomic-Scale Materials Physics	39,595	48,335	1,804	89,734		*
7.	Center for Basic Research In Computer Science	32,608	15,925		48,533		*
8.	International Research Centre for Computational Hydrodynamics	43,950		4,586	48,536		*
9.	Danish Center for Remote Sensing	50,742			50,742		*
10.	Danish Lithosphere Center	71,874	77,853	23,800	173,527		*
11.	Danish Center for Experimental Parasitology	48,013	40,487	12,729	101,229		*
12.	Center for Biological Sequence Analysis	25,271	35,000		60,271		*
13.	Center for Biomolecular Recognition	35,080			35,080		*
14.	The Copenhagen Muscle Research Center	72,326	83,397	1,681	157,404		*
15.	Center for Sensory-Motor Interaction	25,000	42,958	21,371	89,329		*
16.	Center for Sound Communication	22,713	23,520	1,655	47,888		*
17.	Center for Crystallographic Studies	25,451	29,062	1,065	55,578		*
18.	Center for Enzyme Research	22,472		809	23,281		*
19.	Center for Gene Regulation and Plasticity of Neuro-Endocrine Network	37,571		2,442	40,013		*
20.	Center for Semiotic Research	12,741		5,000	17,741		*
21.	Copenhagen Polis Center	7,991	10,078	636	18,705		*
22.	Center for Maritime Archaeology	40,364	50,047		90,411		*
23.	Economic Policy Research Unit	17,921	14,654	5,020	37,595		*
	To be carried forward	827,820	649,871	107,086	1,584,777	0	0

## 16A DISTRIBUTION OBLIGATIONS

2014 distributions and total grants, DKK thousand

Grant No		Ordinary distribution period 1	Ordinary distribution period 2	Embedment/ extension	Grants total	Disbursed 2014	Residual disbursement, expected
	Brought forward	827,820	649,871	107,086	1,584,777	0	0
<b>Other activities</b>							
24.	The National Center for Register-Based Research	11,573	15,000		26,573		*
25.	Statistics Denmark, Research Unit Aarhus	7,090	3,122		10,212		*
26.	Research Machine, Statistics Denmark	1,357			1,357		*
27.	ERAS (Danish Data Archives)	6,401			6,401		*
28.	Research School, Århus	74,913		20,161	95,074		*
29.	Research School, Aalborg	39,572			39,572		*
30.	Danish National Birth Cohort	17,990			17,990		*
<b>Centers established in 1997/98</b>							
31.	Center for Solid Phase Organic Combinatorial Chemistry	20,527	18,928	577	40,032		*
32.	Center for Catalysis	24,986	26,857	3,044	54,887		*
33.	Center for Plant-Microbe Symbiosis	22,799		1,320	24,119		*
34.	Center for Demographic Research	34,987			34,987		*
35.	The Danish Center for Earth System Science	49,718		9,569	59,287		*
36.	Network in Mathematical Physics and Stochastics	23,519	6,937	5,863	36,319		*
37.	Center for Molecular Plant Physiology	40,000	45,597	3,961	89,558		*
38.	Center for Experimental Bioinformatics	34,603	35,674		70,277		*
39.	Center for Human-Machine Interaction	25,027			25,027		*
<b>Centers established in 2001</b>							
40.	Center for Metal Structures in 4 Dimensions	36,572	32,525	1,300	70,397		*
41.	Center for Nucleic Acid (NAC)	34,307	32,550		66,857		*
42.	Center for Applied Microeconometrics	24,787		1,936	26,723		*
43.	Center for Biomembrane Physics	35,137	27,316	3,140	65,593		*
44.	Center for Quantum Optics	29,800	42,071	8,724	80,595		*
	To be carried forward	1,423,485	936,448	166,681	2,526,614	0	0

## 16A DISTRIBUTION OBLIGATIONS

2014 distributions and total grants, DKK thousand

Grant No		Ordinary distribution period 1	Ordinary distribution period 2	Embedment/ extension	Grants total	Disbursed 2014	Residual disbursement, expected
	Brought forward	1,423,485	936,448	166,681	2,526,614	0	0
45.	The Water and Salt Research Center	32,503	19,379	14,001	65,883		*
46.	Quantum Protein Center	30,468		5,311	35,779		*
47.	Center of Functionally Integrative Neuroscience	33,765	40,864	1,334	75,963		*
48.	Wilhelm Johannsen Center for Functional Genome Research	30,226	29,453	144	59,823		*
<b>Centers established in 2002</b>							
49.	Center for the Study of Cultural Heritage of Medieval Rituals	15,209	10,813	1,393	27,415		*
50.	Center for Black Sea Studies	17,292	16,321	1,316	34,929		*
51.	Center for Subjectivity Research	17,416	14,691	4,271	36,378		*
<b>Initiatives established in 2003</b>							
52.	National Platform for Integrative Biology	17,909			17,909		*
<b>Centers established in 2005</b>							
53.	Nordic Center for Earth Evolution	43,954	45,440		89,394	6,981	7,882
54.	Center for Individual Nanoparticle Functionality	38,942	45,605		84,547	8,456	6,113
55.	Center for Inflammation and Metabolism	25,824	30,000		55,824	6,288	3,000
56.	Center for Genotoxic Stress	39,533	15,500	10,500	65,533	1,689	*
57.	Center for Social Evolution	32,827	43,928		76,755	7,039	3,991
58.	Center for mRNP Biogenesis and Metabolism	39,264	40,686		79,950	5,114	3,593
59.	Center for Insoluble Protein Structures	39,934	25,500	14,526	79,960	8,603	2,301
60.	Center for Oxygen Microscopy and Imaging	22,228	28,026		50,254	5,505	1,679
61.	Center for Viscous Fluid Dynamics	38,391	30,001		68,392	5,412	6,800
	To be carried forward	1,939,170	1,372,655	219,477	3,531,302	55,087	35,359



## 16A DISTRIBUTION OBLIGATIONS

2014 distributions and total grants, DKK thousand

Grant No		Ordinary distribution period 1	Ordinary distribution period 2	Embedment/ extension	Grants total	Disbursed 2014	Residual disbursement, expected
	Brought forward	1,939,170	1,372,655	219,477	3,531,302	55,087	35,359
62.	Dark Cosmology Center	49,162	65,123		114,285	15,497	5,695
63.	Center for Language Change in Real Time	29,757	41,202		70,959	8,449	3,419
64.	Center for Textile Research	19,387	23,272	2,089	44,748	4,458	3,773
65.	Center for Models of Life	22,053	30,090		52,143	7,808	6,258
66.	Danish Arrhythmia Research Center	29,692	40,000		69,692	6,200	5,436
67.	Center for Sustainable and Green Chemistry	18,320		6,477	24,797		*
68.	Center for Molecular Movies	29,606		5,813	35,419		*
<b>Niels Bohr Professorships established in 2006</b>							
69.	David Arnot, University of Copenhagen	18,915		1,093	20,008		*
70.	Dale T. Mortensen, Aarhus University	12,630			12,630		*
71.	Nikolai Reshetikhin, Aarhus University	21,118			21,118		*
72.	Christopher Frith, Aarhus University	12,136		897	13,033		*
73.	Cathie Martin, University of Copenhagen	11,044		5,779	16,823		*
74.	Hassan Aref, Technical University of Denmark	10,642		153	10,795		*
<b>DNRF Professorships established in 2007</b>							
75.	Steen Rasmussen, University of Southern Denmark	21,164		910	22,074		*
76.	Jørgen S. Nielsen, University of Copenhagen	18,872		218	19,090		*
77.	John Couchman, University of Copenhagen	19,811		2,106	21,917		*
<b>Centers established in 2007</b>							
78.	Center for Research in Econometric Analysis of Time Series	40,204	40,000		80,204	9,367	14,709
79.	Center for Carbohydrate Recognition and Signalling	45,581	45,000		90,581	9,827	18,439
80.	Center for Comparative Genomics	6,363		10,126	16,489		*
81.	Center for DNA Nanotechnology	44,501	50,000		94,501	11,090	19,103
82.	Center for Epigenetics	61,029	50,000	-16	111,013	13,595	22,441
83.	Center for Ice og Climate	60,985	55,000		115,985	11,619	27,305
84.	Center for Massive Data Algorithmics	32,541	40,000		72,541	8,857	18,734
85.	Center for Membrane Pumps in Cell and Disease	56,296	50,000		106,296	12,714	18,023
	To be carried forward	2.630.979	1.902,342	255,122	4,788,443	174,568	198,694

## 16A DISTRIBUTION OBLIGATIONS

2014 distributions and total grants, DKK thousand

Grant No		Ordinary distribution period 1	Ordinary distribution period 2	Embedment/ extension	Grants total	Disbursed 2014	Residual disbursement, expected
	Brought forward	2,630,979	1,902,342	255,122	4,788,443	174,568	198,694
<b>Joint funding</b>							
86.	National Natural Science Foundation of China (NSFC), seminars	641			641		*
86-1.	NSFC, Danish-Chinese Center for Proteases and Cancer	11,534	10,000		21,534	1,914	509
86-2.	NSFC, Danish-Chinese Center of Breast Cancer Research	12,681	10,000		22,681	2,794	105
86-3.	NSFC, Danish-Chinese Center for Self-Assembly and Function of Molecular Nanostructures on Surfaces	14,755	10,000		24,755	5,621	3,207
86-4.	NSFC, Danish-Chinese Center for Molecular Nano-Electronics	14,536	10,000		24,536	3,748	3,401
86-5.	NSFC, Danish-Chinese Center for Nanometals	13,589	10,069		23,658	3,123	1,826
86-6.	NSFC, Danish-Chinese Center for Proton Conducting Systems	14,537			14,537		*
86-7.	NSFC, Danish-Chinese Center for Organic-based photovoltaic cells	15,000	10,000		25,000	3,814	5,974
86-8.	NSFC, Danish-Chinese Center for Applications of Algebraic Geometry	11,221		1,833	13,054	1,833	0
86-9.	NSFC, Danish-Chinese Center for the Theory of Interactive Computation	14,908	10,000		24,908	4,057	7,517
86-10.	NSFC, Danish-Chinese Center for IDEA4CPS: Foundations for Cyper-Physical Systems	14,399	10,000		24,399	3,165	10,303
87.	Max Planck Society, Center for Geomicrobiology	24,029			24,029		*
<b>Course activities for center leaders/outreach program</b>							
88.	Management course/communication	3,550	2600		6,150	775	3,191
<b>Centers established in 2009/2010</b>							
89.	Center on Autobiographical Memory Research	42,085	42,000		84,085	12,652	42,000
90.	Center for Cosmology and Particle Physics Phenomenology	40,000	40,000		80,000	10,565	39,367
91.	Center for Particle Physics	40,000	40,000		80,000	8,634	40,000
92.	Center for Symmetry and Deformation	50,104	40,000		90,104	11,103	45,897
93.	Center for Materials and Crystallography	50,000	55,173		105,173	10,158	55,000
94.	Center for Geogenetics	50,210	50,207		100,417	13,320	41,229
	To be carried forward	3,068,758	2,252,391	256,955	5,578,104	271,844	498,220

## 16A DISTRIBUTION OBLIGATIONS

2014 distributions and total grants, DKK thousand

Grant No		Ordinary distribution period 1	Ordinary distribution period 2	Embedment/ extension	Grants total	Disbursed 2014	Residual disbursement, expected
	Brought forward	3,068,758	2,252,391	256,955	5,578,104	271,844	498,220
95.	Center for Quantum Geometry of Moduli Spaces	54,271	35,000		89,271	11,959	33,567
96.	Center for Macroecology, Evolution and Climate	60,746	50,277		111,023	16,103	50,709
97.	Center for Star and Planet Formation	38,400	44,000		82,400	11,967	34,854
<b>Centers established in 2012</b>							
98.	Centre for Medieval Literature	36,000			36,000	6,626	21,821
99.	Center for Dynamic Molecular Interactions	49,000			49,000	9,991	29,341
100.	Center for Permafrost Dynamics in Greenland	60,000			60,000	9,217	25,793
101.	Center for Quantum Devices	64,415			64,415	6,705	34,585
102.	Center for Financial Frictions	48,000			48,000	7,433	32,692
103.	Center for Nanostructured Graphene	54,000			54,000	12,746	24,621
104.	Center for Geomicrobiology	58,149			58,149	11,189	34,078
105.	Center for International Courts	42,000			42,000	5,972	29,067
106.	Stellar Astrophysics Center	55,000			55,000	10,098	35,938
107.	Copenhagen Center for Glycomics	62,000			62,000	10,318	31,200
108.	Center for Vitamins and Vaccines	58,000			58,000	9,334	35,018
<b>Niels Bohr Professorships established in 2013</b>							
109.	Anna Tsing, Aarhus University	29,000			29,000	4,226	23,234
110.	David Needham, University of Southern Denmark	29,000			29,000	5,315	19,708
111.	Lars Hesselholt, University of Copenhagen	30,000			30,000	4,213	23,472
112.	Charles Leshner, Aarhus University	29,952			29,952	2,340	26,266
113.	Jaan Valsiner, Aalborg University	20,000			20,000	4,021	14,299
114.	Subir Sarkar, University of Copenhagen	29,000			29,000	4,327	23,274
<b>Centers to be established in 2015</b>							
125.	Center for Autophagy, Recycling and Disease	50,000			50,000		50,000
		4,025,691	2,381,668	256,955	6,664,314	435,944	1,131,757

The number of grants listed in the key figures includes the Centers of Excellence, the joint funding activities and the Niels Bohr Professorships, listed on pages 44-51. Grants terminated before December 2014 are marked with a \*.

All payments are subject to a contractual qualification that the foundation has to receive the expected and required revenue.

## 16B DISTRIBUTION OBLIGATIONS

Annual disbursements, DKK thousand:	Disbursed	Expected disbursements to activities listed above	Total
1993	19,133		
1994	141,708		
1995	154,509		
1996	176,194		
1997	200,876		
1998	247,751		
1999	243,346		
2000	224,484		
2001	228,789		
2002	256,877		
2003	239,916		
2004	173,489		
2005	195,185		
2006	195,225		
2007	242,803		
2008	321,277		
2009	274,998		
2010	387,270		
2011	358,754		
2012	390,990		
2013	423,039		
2014	435,944		
2015		427,411	
2016		307,520	
2017		223,318	
2018		107,501	
2019		57,939	
2020		8,068	
	5,532,557	1,131,757	6,664,314

The disbursements specified above are distributed according to the expected year of disbursement.

Disbursements are made on the basis of the grant holders' revised budgets. In consequence, the final presentation of accounts to the foundation may result in adjustments of the disbursements for the following years.

## 16C EXPECTED DISTRIBUTIONS 2015-2018

In addition to the distribution obligations listed in notes 16a and 16b, new centers will be established in 2017 as a result of the 9th application round, which will be announced in 2015. In the period 2015-2018, total distributions are expected to be as follows:

	MDKK
2015	477
2016	421
2017	442
2018	442
	<u>1,782</u>

## 17 CONTINGENT LIABILITIES

The foundation has to give six months' notice to terminate the tenancy agreement at December 31, 2019 at the earliest. The obligation amounts to DKK 3,345,031.

The foundation has entered into forward currency contracts for the purchase and sale of the following currencies (amounts calculated in the currencies in question):

	2014	
Currency	Purchase	Sale
AUD	0	953,000
USD	19,055,245	126,489,952
JPY	6,139,991	1,494,002,608
CAD	0	1,781,000
EUR	0	72,780,000
GBP	224,000	15,300,000
SEK	0	20,000,000
NZD	0	506,000

	2013	
Currency	Purchase	Sale
AUD	126,000	2,440,628
USD	12,208,810	145,923,807
JPY	0	2,057,440,802
CAD	0	3,800,000
EUR	2,635,000	79,104,857
GBP	4,200,000	21,075,000
SEK	202,000	20,000,000

The market price of the forward currency contracts as of December 31 is set at the value of the securities in question, see notes 12 and 13.



The foundation has entered into interest-rate futures for the purchase and sale of the following, calculated in the currencies in question:

2014		
Currency	Purchase	Sale
USD	0	300,000
EUR	0	4,600,000

2013		
Currency	Purchase	Sale
USD	0	500,000
EUR	5,500,000	1,000,000

The market price of the interest-rate futures as of December 31 is set at the value of the securities in question, see note 12.

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#### **Audit**

The annual accounts of the foundation must be audited by the Auditor General and a state authorised public accountant to be appointed by the board for a term of three years. The appointment is subject to approval by the Minister for Higher Education and Science. Jens Sejer Pedersen, State Authorised Public Accountant is appointed for the period May 1, 2013 – April 30, 2016.

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Thomas Sinkjær  
Liselotte Højgaard (in chief)

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