Annual Report 2016

386 research ideas financed with

DKK 938 million
“Drawing on the Council’s expertise, we spot new ideas. That’s our core task”

- Peter Munk Christiansen

DEFINITION

For Danish Council for Independent Research (DFF), 2016 brought some major changes which will have implications for the Council’s range of funding instruments, practices and regulatory framework in the new year. First of all, the Council has introduced a new instrument, DFF-International Postdoc, which has its first application deadline in Spring 2017 and is intended to further the mobility among young researchers. Also, DFF will change its Danish name from the current Det Frie Forskningsråd to Danmarks Frie Forskningsfond, and in this connection the Council will be given authority to finance thematic research.

FOCUS ON THE SOCIETAL EFFECTS OF RESEARCH

One initiative that involves a long-term perspective is the RESEARCH2025 catalogue. The purpose of this catalogue is to provide a foundation as well as inspiration for the political decision-making concerning the strategic research priorities of the future.

“Our contribution is to point to positions of strength in Danish research, and also to identify areas where basic research could be further strengthened in Denmark,” Peter Munk Christiansen says about the catalogue. Just as is the case now, our future academic and scientific research should have a strong societal focus. In 2016 Danish Council for Independent Research published the leaflet 5 Ways of Research Impact, which describes the effects that independent research has for the business sector, the public sector, the educational system, our legislative system as well our cultural development. Safeguarding our independent research is also a way of attending to the societal impacts of research in general.

“There is no contradiction between supporting good curiosity-driven research and believing that academic and scientific research must be useful to society. All good research is useful to society. The two things go hand in hand,” Peter Munk Christiansen points out.

VITAL ROLE IN THE FOOD CHAIN OF RESEARCH

One of the highlights of Danish research in 2016 is the success story of Qubiz. Based at the University of Copenhagen, Qubiz – or the Quantum Innovation Center – consists of a group of researchers from the University of Copenhagen, the Technical University of Denmark and Aarhus University, who work on revolutionising various technologies using quantum mechanics. Innovation Fund Denmark has invested DKK 80 million in the project, just as Qubiz has entered a partnership with Microsoft. To a large extent, the project has been founded on grants from DFF.
“Within a relatively short period DFF has invested DKK 70 million in activities that now have developed into the project supported by Innovation Fund Denmark. This is a perfect illustration of how the food chain of scientific research works, how epistemological explorations may lead to the next big computer venture,” Peter Munk Christiansen explains.

That the Council provides a stepping stone for researchers’ new ideas is also evident from a Gallup survey conducted among 495 previous recipients of DFF grants. Almost three out of four DFF-supported projects go on to receiving further funding from public or private research foundations. Other projects generate results or solutions which benefit companies, the public sector or the educational sector directly.

SLIMMER SAPERE AUDE PROGRAMME
DFF entered 2016 with a considerable reduction in its allocated funds for research, DKK 250 million less than in 2015.

“We have had to implement a 25 percent cut in our funds by removing a couple of funding instruments. Thus we cancelled our Individual Postdoc grants and we had to do the same with the Sapere Aude Advanced Grants. Because we discontinued the Individual Postdoc grants, we also had to terminate the Sapere Aude Talent grants, because this instrument was awarded as internationalisation funds to Individual Postdoc recipients. Now, we have decided to gather our talent promotion initiative in one new instrument, the International Postdoc grant. The first application deadline for this instrument is in Spring 2017. It is an attempt to increase the international mobility among our young researchers who are at the beginning of their careers. We are really excited to see how many candidates with a Danish PhD would like to do their postdocs abroad,” Peter Munk Christiansen explains.

DFF’s reduced budget has also affected the number of projects being awarded a grant. Funding 386 projects in 2016, the Council has supported much fewer research projects than in 2015, including 84 fewer of the larger projects. As a small compensation, DFF has been awarded DKK 50 million more than anticipated from the national research reserve in 2017. “Taking an optimistic approach, we hope that this marks the end of a period of austerity and that in 2018 we will see improved financing opportunities for the many researchers who have been affected by the squeeze in the last couple of years,” Peter Munk Christiansen explains.

SMALLER GRANTS NEEDED FOR THE EMERGING TALENTS
“DFF’s success rates are worryingly low. In 2015 we awarded funding for 11 percent of the funds applied for. In 2016 the success rate dropped below 10 percent. Every time we distribute funds we have to say no to projects that without any doubt are worthy of support. Previously, it has been a consolation that if the researchers did not get funding from us, they could apply elsewhere. But the tendency is that a lot of the smaller instruments have now been converted into larger instruments. This is really troubling, because it becomes increasingly difficult for our emerging talents to obtain grants and sponsors,” Peter Munk Christiansen says of the growing and problematic hourglass effect. He adds:

“The average size of our grants is DKK 2.4 million per research project. Actually, for a young researcher that in many cases be sufficient to give him or her the opportunity to kick-start their research career.”

You can read more about the hourglass challenge, internationalisation and the highlights of 2016 in the following pages.
6 highlights of 2016

REPORT
Six key issues represented some of the highlights for Danish Council for Independent Research in 2016

Researcher profile 2016: Quantum physicist Ulrik Lund Andersen – a perfect example of how the food chain of Danish research works

In 2016, the team of researchers behind the quantum success story Qubiz partnered up with Microsoft to develop the super computers of tomorrow, which will have the capacity and size to handle the increasing amount of data required. It marks the beginning of a commercialisation of independent basic research in quantum physics in Denmark, an area of research that has taken up a leading position within a decade.

ULRIK LUND ANDERSEN
One the project’s leading figures and scientific directors, Professor Ulrik Land Andersen, has since 2006 received a total of approximately DKK 30 million for various research projects, e.g. through the prestigious Sapere Aude programme. It is not least due to his expertise that his projects have managed to attract both foreign researchers and investments from international companies.

All in all, between 2006 and 2015, DFF has invested DKK 70 million in 19 individual research ideas, divided between two out of three scientific directors and heads of research now involved in Qubiz.

TENDING TO THE FOOD CHAIN ELSEWHERE

DFF follows its investments and strives to support the food chain in Danish research by funding researcher-initiated ideas and helping talented researchers make their breakthroughs. A survey conducted in 2015 showed that 55 percent of DFF-financed projects subsequently receive funding from private foundations, while 16 percent continue under the auspices of the Innovation Fund Denmark. As for the medical sciences, 79 percent of DFF-supported research projects receive financing from private foundations. Recent figures show that nine out of 12 recipients of the Starting and Consolidator Grants awarded by the European Research Council (ERC) in 2016 have previously been awarded a DFF grant. In other words, Danish Council for Independent Research has an excellent track record for spotting original ideas that subsequently manage to gain a foothold within the research system at large.

International mobility promoted through DFF-International Postdoc grants

DFF has set new standards for postdoc grants, in order to promote internationalisation and facilitate research stays abroad for young researchers. Requiring a research stay abroad of minimum 1.5 years at a research institution of excellence, the new instrument DFF-International Postdoc is intended to motivate young researchers to go on research stays abroad of a longer duration. Figures from Danish Council for Research and Innovation Policy (DFIR) indicate that while young Danish researchers do travel abroad, the tendency, when visiting foreign research institutions of excellence, is that they seldom stay there for more than three months at a time.

LONGER RESEARCH STAYS ABROAD

The DFF-International Postdoc aims to strengthen the international mobility of young, talented researchers, as well as to develop and consolidate their research competence at the beginning of their careers. One of the thoughts behind the initiative is that longer research stays abroad for young, talented researchers will facilitate their increased participation in e.g. co-publications. But the grants will also help researchers establish an international network at an early stage, something which they will be able to benefit from throughout their careers.

With the DFF-International Postdoc, the Council seeks to strengthen the level of internationalisation while supporting the emerging talents in Danish research.

New agreement on the Danish Council for Independent Research and RESEARCH2025

In the autumn of 2016, several political parties representing the entire political spectrum signed a new agreement concerning the future role of DFF. As part of its new function, the Council will change its name in Danish to Danmarks Frie Forskningsfond. Under the agreement the Council will be authorised to distribute funds for thematic research. This enables the Council to utilise its existing academic and scientific expertise to chart the course for thematic research in the best possible way. What is vital is that additional funds are being allocated to support thematic research, so that the existing balance between independent and thematic/strategic research in the Danish research funding system can be maintained.

RESEARCH2025

In 2016, DFF has contributed to the RESEARCH2025 strategy. Among other things, the Council has helped to chart the preconditions for intensifying the Danish research efforts within the focus areas of the strategy:

- Green growth
- Improved health
- New technological possibilities
- People and society

It should be easier to bridge the divide between independent basic research and strategic research. Facilitating a potential cross-fertilisation between the two would be an advantage. However, a prerequisite for this is that the conditions for independent research are ensured, so as to create a continuous flow of new ideas that can be developed further in strategic and progressive ways, for the benefit of society.
5 ways in which research benefits society

Scientific research constitutes a key driver for the Danish economy and competitiveness, and provides society with vital knowledge. In 2016 DFF published 5 central ways in which research impacts society, in response to the growing interest in estimating the financial, societal and cultural benefits of academic and scientific research. Research plays an important role for Danish businesses, the public sector, the education sector, legislation and regulation as well as our cultural development at large.

THE 5 WAYS

1. Danish academic and scientific research generates results that can be exploited by the business sector and which are central to some of our global market leaders within research-based industries.

2. New knowledge can pave the way for new collaborations or lead to measures that improve the efficiency of the public sector.

3. Research-based education helps to ensure that the latest knowledge is disseminated to society via the candidates leaving our institutions of higher education.

4. Specific research-based findings may impact legislation and regulation in society.

5. Academic and scientific research feeds into our cultural development. In our globalised world, research sheds light on the processes of change and contributes to the public debate.

DFF’s five ways highlight the need for adopting a broad perspective when estimating the societal effects of research and the relevance of research activities. The five ways provide a springboard for further debate in 2017 on how to estimate the societal impact of academic and scientific research.

386 ideas - Original idea with a small budget led to breakthrough in 2016

In 2016, 386 research ideas benefited from the competitive research funds offered by DFF, with an average grant size of DKK 2.4 million. Due to the success rate of around 10 percent, the individual research project must distinguish itself by exhibiting a high international standard and push the scientific boundaries through its level of originality or by taking an innovative approach to a well-known scientific problem.

Due to the 25 percent cutback in the funds allocated to DFF under the public research budget, the Council had to reduce its number of funding instruments.

In continuation of an initiative from Danish Council for Research and Innovation Policy (DFiR), analyses suggest that a high number of smaller research projects produces a good research impact and contributes to the ecosystem of scientific research. On that basis DFF will continue to monitor the effect of investment sizes and its portfolio of instruments closely.

AN ORIGINAL IDEA AT DKK 2.3 MILLION

An original idea with a budget of just over DKK 2 million that was financed by DFF is a good illustration of how to bridge the divide between independent basic scientific research and strategic research. In 2016, Professor Claus Felby helped to set new standards for the biotech industry through a project that involves utilising the sun’s rays, the chlorophyll of plants and a specific enzyme, to degrade plant biomass into valuable chemical substances and biofuel. The discovery has the potential for revolutionising industrial production and increasing production speeds. Claus Felby’s original idea, realised on the basis of limited funds, paves the way for a new growth potential for Novozymes, which will now attempt to implement the research results at industrial scale. Claus Felby’s project has been elected as the Research Result of the Year, 2016 by the news magazine Ingeniøren (The Engineer).

Sapere Aude Starting Grants: 18 promising research projects launched

In 2016, DFF distributed 18 Sapere Aude: DFF-Starting Grants at a total sum of almost DKK 122 million. All the projects represent scientific excellence and involve ground-breaking research in their respective fields, and the 18 heads of research will now have to pick their research teams to carry out the original projects that are based on the recipients’ own ideas. Thus, 18 research teams are ready to unfold the potential of these projects, under the guidance of their team leaders. At the same time, this represents an important step in the individual careers of the heads of research, who with their Starting Grants are in a strong position to apply for further funding, such as ERC’s Consolidator Grants. The grants are awarded within the framework of the Council’s Sapere Aude initiative, which aims to give excellent researchers in Denmark the best possible conditions for creating ground-breaking new research results.

ZEOLITES

One of this year’s Starting Grant recipients is Søren Kegnæs from the Technical University of Denmark, who for his Sapere Aude project will develop new improved heterogeneous catalysts. Such catalysts will be beneficial for the environment and can be used to make the chemical industry more efficient and sustainable. In the project, Søren Kegnæs will give zeolite catalysts new properties by adding various metals. Among other things, this will increase the catalytic activity of the zeolites considerably.
386 ideas added to the food chain of Danish research in 2016

DFF’s budget for 2016 (DKK 935.3 million) was the lowest since 2010 (DKK 1.45 billion), as a result of the Danish Government’s 25 percent cuts. Consequently, it has been necessary to prioritise among the funding instruments in order to maintain a tolerable success rate and to ensure that the Council would still live up to the conditions of its legal framework, according to which the Council must work to promote the emerging talents of research and strengthen research excellence in Denmark.

The three levels of the research excellence programme Sapere Aude have been scaled back to level 2, the Starting Grant level, as the third Advanced Grant level has been dropped in 2016 and the level 1 instrument Research Talent will be dropped in 2017. In addition to this, the Individual Postdoc grant and the MOBILEX mobility grant have been replaced by the DFF-International Postdoc grant, which stipulates research stays abroad of a duration of at least 1.5 years at a foreign research institution of excellence. DFF has found that retaining the instruments DFF-Research Projects 1 and 2 provide a general opportunity for launching a wide range of ideas and projects, whether they are smaller, larger or more long-term, while the level 2 Sapere Aude Starting Grant gives the most talented young researchers an opportunity to advance their careers.

CONSEQUENCES OF THE BUDGET CUTS

As a result of the cutbacks, it has become more difficult for young researchers who find themselves on the threshold of a research career to find funding for their projects. This has consequences for the pool of emerging research talents in Denmark and for the potential richness that they would otherwise bring to the breeding ground of new ideas. The cutbacks also means that fewer ground-breaking research projects will be allowed to establish themselves, with the potential loss this entails for the respective fields of science and the Danish society.

156 FEWER IDEAS IN 2016

In hard figures, the reduced budget has meant that 156 fewer research ideas could be realised, as DFF awarded a total of 386 grants in 2016 compared with 542 grants in 2015.

Given the hitherto favourable prognosis of DFF-financed projects for attracting external financing from private foundations as well as ERC funds, this affects not only the research units within the sector, but the entire food chain and interacting ecosystem of Danish research, with possible consequences for Denmark’s leading position in the international race for knowledge. Danish research is at risk of losing its high ranking, capacity for generating ideas and socio-economic benefits, secured through steady and sustained investments in research and innovation, if the financing continues to be scaled down in 2017 and 2018.

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**ADVISORY TASKS IN 2016**

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<td>International cases</td>
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<td>Surveys**</td>
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*Advisory services rendered in connection with applications for other councils and foundations

**Surveys are usually commissioned by international organisations
**JOINT INSTRUMENTS**

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<th>DFF</th>
<th>Humanities</th>
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<th>Tech and Production Sciences</th>
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<td>Number of grants</td>
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<tr>
<td>Number of grants</td>
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<td>Number of grants</td>
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<td>Success rate</td>
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<th>DFF</th>
<th>Overall</th>
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<tr>
<td>Amount granted, DKK million</td>
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<td>Number of applications</td>
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<td>Number of grants</td>
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**Joint instruments**

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<th>Number of grants</th>
<th>Success rate (%) amount</th>
<th>Success rate (%) number</th>
<th>Average grant size (DKK million)</th>
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<td>15%</td>
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<td><strong>Total</strong></td>
<td>9,727</td>
<td>915</td>
<td>2,516</td>
<td>303</td>
<td>9.4%</td>
<td>12.0%</td>
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**Council-specific instruments**

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<th>Success rate (%) amount</th>
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<td>FSE-Research Stays Abroad</td>
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<td>9.5%</td>
<td>13.9%</td>
<td>2.4</td>
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* In 2016 Sapere Aude: DFF-Research Talent was distributed as a prize, awarded to 18 research talents, who received DKK 100,000 each. Consequently, only amount granted, number of applications and number of grants are listed here.

** DFF withdrew the instrument as a result of cutbacks in the funds allocated to the Council under the 2016 Danish Finance Act.

*** The Reformation Anniversary was a one-off grant of DKK 5 million, allocated to DFF under the 2016 Danish Finance Act.
Talented researchers trapped by the so-called hourglass effect

Danish research is faring really well compared with other countries. One of the reasons is that the research funding system in Denmark has managed to maintain a balanced distribution of funds for many years. Swedish Professor Gunnar Öquist has described the development as “the Danish research miracle”. His explanation for the Danish success is that, for a number of years, Denmark has strengthened its research environments through a combination of political stability within the funding structures, strong management of the universities and clear recruitment strategies that attract and retain the academic and scientific talents.

In supporting the food chain of research, the overall research funding system puts emphasis on the early and late career stages, in the form of career-promoting grants or larger grants for comprehensive and prestigious research projects. Mid-career researchers do not get the same amount of attention, and funding for excellent research projects in smaller research environments have been given low priority. This has resulted in a so-called hourglass effect, with less funding available and fewer opportunities for researchers who find themselves in the middle of the food chain. Some may abandon their research careers entirely, whereby Denmark misses out on excellent research and ground-breaking research results which could otherwise benefit society.

SMALLER PROJECTS AS LEVERAGE

DFF takes this problem seriously and wishes to redress the imbalance. The Council has a special role in terms of supporting the food chain of research by providing funding for smaller projects that may further research careers and which can be headed by research talents at assistant professor level as well as new and more established associate professors or young professors, who in this way get the opportunity to establish their own research teams. At the same time, DFF has to support the entire research community.
DFF must invest in the possibility for young researchers to develop original ideas and excellent research. Supporting young researchers is also a way of enabling them to apply for larger research grants e.g. through the basic research centres and the European Research Council (ERC). The latest figures show that among the Danish university researchers who received an ERC Starting or Consolidator Grant in 2016, nine out of 12 had previously been awarded DFF funding. Similarly, a survey from 2015 shows that 68 percent of the researchers who have received a DFF grant find that it has subsequently helped them to obtain other external research funds.

TENDENCY OF AWARDING LARGER GRANTS

A report published by Danish Council for Research and Innovation Policy, “Viden i verdensklasse – hvorfor klarer dansk forskning sig så godt?” (World-class knowledge – why is Danish research performing so well?), supports earlier analyses that describe a tendency of concentrating external funding in major grants for large-scale ventures. This tendency also applies to the funding offered by private foundations. That is why it is especially important to maintain the smaller funding instruments in connection with public research funding, otherwise we risk damaging the layer of emerging talents in Danish research.

COLLABORATIVE EFFORT TO MAINTAIN DENMARK’S POSITION AS A STRONG RESEARCH NATION

DFF cannot solve the hourglass problem single-handedly. It is a challenge that must be met in close collaboration between the research-financing organs, universities and politicians. In that way, it will be possible to incorporate and tackle associated problems, such as how to ensure natural career paths for the most promising research talents. DFF expects to address this issue during 2017.

GREATER NUMBER OF SMALLER GRANTS TO SUPPORT THE EMERGING TALENTS

Tine Jess, Professor, MD, Head of Department of Clinical Epidemiology at Frederiksberg and Bispebjerg Hospital, and in 2016 Vice Chair of the Young Academy

How can the problem with the hourglass effect be solved?

“Generally speaking, the large-scale instruments support already established researchers, who use the grants to hire more PhDs and postdocs. We have to support the ideas of the new generation by offering a greater number of smaller grants, and in this way ensure that the most promising talents are retained in Danish research. Otherwise we lose a natural supply of fresh talent all the way through the food chain.”

What should DFF and other research-financing organs do?

“It is important to note that the stiff competition there is for the relatively limited funds for independent research may exacerbate the hourglass problem. When the success rates drop, a strong CV becomes crucial in the fight for funding. That is why it is extremely difficult to obtain the necessary funding to establish yourself as a young researcher. I think that the best way for Denmark to safeguard its position in the long run is by supporting the ideas of the new generation of researchers with a greater number of smaller grants.”

How does the Young Academy view the need for larger grants versus smaller grants for the emerging talents?

“I think that the success of the Academy’s members has largely been founded on smaller grants that have enabled them to carry out research projects in their own names. But we represent the lucky few, and more needs to be done to secure the future of Danish research. More comprehensive support for the middle layer of researchers is required.”

What should the universities do?

“Permanent university tenures at top level can become stifling. If we are going to deliver world-class research, we need to be able to retain the most promising emerging talents. This can become difficult if the economy is strained by having too many permanent tenures at top level. Transparency and career guidance for those who are going to pursue a career outside the universities is also important.”

What should the politicians do?

“It is vital that the politicians ensure the continued funding of independent research. Due to funding cuts, the distribution of grants today does bear a resemblance to lottery draws among the best ideas. DFF should be allocated sufficient funds to ensure that also the brilliant ideas coming from emerging talents may be awarded grants.”

THE YOUNG ACADEMY

• Independent unit under the Royal Danish Academy of Sciences and Letters
• Established in 2011 as a scientific forum for young talented researchers
• Concerned with research policy related subjects, interdisciplinary collaborations and the dissemination of research to the wider public
No thanks to a provincial research environment

International mindset needed

Denmark produces academic and scientific research of a high international standard. This has been the conclusion of several surveys of the impact of Danish research. To maintain a world-class research environment and ensure that our researchers are retained in their research careers, collaborations with internationally recognised researchers in international elite environments are required, just as our researchers need to publish in internationally recognised journals and partake in international conferences and partnerships.

One of the responsibilities of DFF is to strengthen the level of academic and scientific research in Denmark, and the Council is committed to creating the best possible framework conditions to ensure that Danish research maintains its leading position. This applies both to established researchers and emerging research talents who strive to gain a foothold in the research world of tomorrow. In 2015 Danish Council for Research and Innovation Policy (DFiR) demonstrated that Danish researchers have a good track record for making shorter research stays abroad. But in order to gain a solid foothold in the best international research environments, Danish researchers must have the opportunity to go on longer research stays.

NEW FUNDING INSTRUMENT FOR LONGER RESEARCH STAYS ABROAD

Consequently, as of 2017 DFF has launched the DFF-International Postdoc grant to facilitate longer stays at international research environments outside of Denmark. The aim of this grant is to help research
talents to consolidate their own academic and scientific profile by carrying out a concrete research project at a foreign research institution for a period of minimum 1.5 years.

With the DFF-International Postdoc, DFF supports activities that help to increase the quality of Danish research, giving talents with a Danish research education the opportunity to pursue their own research in an international environment, something which it may be difficult to find funding for through the universities. In light of the cutbacks on public research in recent years, it is important to continue to facilitate long-term international collaborations if Danish research is going to maintain its leading international position.

INTERNATIONALISATION PROMOTED THROUGH OTHER INSTRUMENTS

While the new instrument DFF-International Postdoc targets the pool of emerging talents in Danish research, DFF also focuses on internationalisation in its other funding instruments which are aimed at more established researchers. Here parts of the funding may be used to attract talented researchers from abroad, and researchers at all career stages have the opportunity to participate in international activities. The Council continually adjusts its funding instruments, so that they may support and match the objective of facilitating the exchange of knowledge and participation in international research collaborations, for the benefit of Danish academic and scientific research.

IT WORKS

A survey from 2015 shows that there is a correlation between the impact of Danish research and the number of articles that Danish researchers co-publish with international colleagues. In another survey from the same year, DFF asked 641 of its grant recipients about the effects of international collaboration in their research projects. 79 percent of the respondents stated that their projects involved international collaborations to some or to a high degree, 81 percent said that international collaborations strengthened the quality of their research, while 70 percent pointed out that their involvement in international collaborations had increased after they had completed their DFF-funded projects. These findings are substantiated by recent figures, according to which nine out of 12 Danish researchers who received an ERC Starting or Consolidating Grant in 2016 had previously been awarded funding from DFF.

CHALLENGES TO THE INTERNATIONALISATION

DFF’s focus on internationalisation only accounts for some of the activities that are needed to maintain and strengthen Denmark’s leading position when it comes to academic and scientific research. The Council is pleased to see that other councils, foundations and organisations also focus on internationalisation and strive to address some of the challenges that it involves if Denmark is going to exploit the full potential of internationalisation.

One central issue is how research stays abroad can strengthen the researchers’ careers, and also what the prospects are for returning to Denmark after a couple of years abroad. But certain technical obstacles also need to be resolved, such as providing more favourable tax conditions for university researchers travelling abroad, so that it may become easier for them to cover their expenses when bringing their families with them on longer research stays abroad.

RESEARCHERS NEED TO BE MORE MOBILE

Jan Philip Solovej, Professor and Vice Chair of Danish Council for Independent Research

Why does DFF focus so much on the internationalisation of academic and scientific research?

“Denmark is a small country. Unless we ensure that our researchers have an international mindset, Denmark will not be able to generate research at the highest level. We will end up with a provincial research environment.”

How can DFF contribute to internationalisation?

“The Council plays a significant role because we have instruments that enable candidates to go abroad and take up research positions while their salaries are paid for by DFF. We are also good at helping talented foreign researchers come to Denmark.”

How can we make more researchers go abroad for research stays?

“It must be made easy and attractive to travel abroad. That is why DFF emphasises the importance of research stays abroad with our postdoc grant. That is what we call the International Postdoc. The Council collaborates with other players in making all the practical issues more manageable, e.g. by covering certain expenses in relation to accompanying families.”

How do we attract more excellent researchers to the Danish research environments?

“It must be made easy and attractive to come to Denmark and establish yourself as a top level researcher. Once again, we must not underestimate the importance of making it easier for candidates to bring their families. The universities have become better at focusing on that part of the equation, but there is still room for improvement.”

What can DFF contribute with to the internationalisation process that the universities cannot handle on their own?

“The universities tend to focus on their own researchers. With the International Postdoc grants, DFF gives the young researchers the opportunity to carry research abroad, and through the Sapere Aude programme we offer to bear the risks that may be involved in bringing a foreign researcher to Denmark.”

How do we overcome further obstacles for internationalisation?

“We would like to see further measures that would make it easier, financially speaking, to bring one’s family in connection with research stays abroad. For instance, the introduction of certain tax benefits could make it more viable for families. At the same time, it is important that there is not too much bureaucracy involved in travelling abroad. Mobility should be a main priority.”
The benefits of research to society are many – here are 5 of them
5 ways in which research impacts society

Academic and scientific research transforms and provides vital knowledge to society

Research constitutes a key driver for the Danish economy and competitiveness, and provides society with vital knowledge. But the beneficial societal effects of research amount to much more than what can be measured through calculable impact factors. In 2016 DFF published five central ways in which research impacts society, in response to the growing interest in estimating the returns of society’s investments in academic and scientific research. The purpose has been to provide five overall categories for describing the wide range of societal benefits that research has for our daily lives, and in this way sharpen the awareness of the many ways in which research impacts society.

Society continually invests in academic and scientific research, e.g. through DFF, and therefore it is vital to the Council that the funds distributed to support independent research have positive effects for society as well as the business sector.

Academic and scientific research is vital to the Danish economy, but it is just as important that our research provides solutions for societal challenges and helps to elucidate difficult issues for opinion formers and decision makers. In this way, research qualifies and brings substance to the ongoing debate as well as our cultural development, and generally contributes to enhancing the Danish culture of knowledge.

The concept of disruption is currently being discussed by policy makers in order to comprehend the extent of a new business model and the ways in which technological developments affect the labour market and job situation. But the concept is also relevant when talking about how research impacts society: Disruption of e.g. working procedures and production stages can occur as a result of ground-breaking research projects within robot technology or clinical research, where improved methods or diagnostic technology may lead to shorter hospital stays and help save lives. An example of a larger-scale disruption of social practices can be found in the two world-class research facilities in Lund, Sweden, the ESS and MAX IV laboratories, which focus on a vast array of areas within the technical and natural sciences, including medical drugs, foodstuff, packaging, structural engineering, cell biology and sustainable energy, generating new knowledge that will undoubtedly have great societal impact and revolutionise practices in many different sectors.

THE 5 WAYS

The knowledge generated by projects that DFF finances can be implemented in society in many ways.

1. Independent research generates results with potential commercial effects for the business sector, e.g. in the form of patents and spin off-enterprises, and independent research is especially crucial to a number of research-heavy corporations which are global market leaders, e.g. in the medical industry and the food industry, as it yields ground-breaking discoveries that pave the way for new competitive advantages. Every third project financed by DFF involves a partnership with private enterprises, and one in five grants awarded by DFF | Technology and Production Sciences results in a patent application.

2. Moreover, new knowledge gained from research can provide the foundation for new collaborations between the research
INDEPENDENT BASIC RESEARCH IS IMPORTANT FOR THE INDUSTRY

Bjerne S. Clausen, CEO, Haldor Topsøe A/S

Why is independent basic research valuable to the industry?

“There is no doubt that it is through independent basic research that we gain new epistemological insights. Such insights are rarely generated by thematically driven or strategic research. That’s not where we see the great basic scientific breakthroughs. And that is also why independent basic research is so important for the industry as well as for society.”

Does research lead to clear competitive advantages?

“The industry must constantly develop new products and technologies for our clients. Otherwise we lose our market shares. Consequently, we rely on a constant flow of new research results, and this is important to our ability to compete.”

Can you describe the interplay between Haldor Topsøe’s own ongoing research and public research?

“There is a close interplay between the two, both when it comes to co-financed PhD scholarships and collaborations between our researchers and researchers at the universities. The interplay typically occurs in connection with long-term projects where the goal is not to develop a specific product for the market tomorrow.”

How, in concrete terms, has Haldor Topsøe benefited from independent basic research?

“We currently collaborate with the Technical University of Denmark on a project where we turn glucose into a bioplastic, and this could easily become a very interesting area of business for Haldor Topsøe. This is just one example of how independent basic scientific research can yield results that the industry can benefit from very quickly.”

How would the major Danish industrial companies fare without Danish research?

“If you’re going to be able to compete internationally, you need to rely on international research. But this doesn’t mean that Danish research isn’t important. If we are going to be able to continue to attract highly qualified candidates from the Danish universities, it is clearly an advantage that they have been in contact with first-rate research. It is extremely important for us to collaborate with both Danish and foreign universities, to get quick access to the latest scientific discoveries. At the same time, it enables us to spot those talented candidates that we would like to recruit.”
CASE 1: THE SIGNIFICANCE OF INDEPENDENT RESEARCH FOR DANISH COMPANIES
Research Projects 1 and 2, Professor Robert Madsen, grant sum: DKK 10.2 million

From beets to plastic

Through catalysis the glucose in beets can be turned into plastic – a new competitive advantage for the company Haldor Topsøe A/S

Transforming glucose into plastic is not just an example of a strategic research project that builds on an independent research idea and which has a clear business potential for the research-based catalysis industry in Denmark. It is also an excellent example of how original research ideas can be adopted into the research system through financing from private foundations or strategic research funds. Researchers from the Department of Chemistry at the Technical University of Denmark and the company Haldor Topsøe AS have teamed up to turn glucose into a bioplastic that may replace oil-based plastic, which has obvious environmental advantages and may eventually become good business for the company. The project, CatzBioChem, is currently financed by Innovation Fund Denmark and is headed by Professor Robert Madsen at DTU Chemistry. “My research focuses on catalysis, metal-organic chemistry and carbohydrates, which this new project is a good example of. The project is a further development of my research on metal-catalysed reactions and carbohydrates, for which I was awarded three grants by DFF in the early stages, and which has enabled me to enter into the current collaboration with Haldor Topsøe AS. With the three DFF grants, my research team has been able to build the necessary expertise and experience in relation to catalysis that we now draw on in the CatzBioChem project,” says Robert Madsen.
CASE 2: THE SIGNIFICANCE OF INDEPENDENT RESEARCH FOR THE PUBLIC SECTOR

Sapere Aude: DFF-Starting Grant, Associate Professor Leticia Hosta-Rigau, grant sum: DKK 7 million

Artificial blood

Various scientific attempts have been made at finding a replacement for red blood cells. Now researchers are one step closer.

Scientists at the Technical University of Denmark are currently developing a replacement for red blood cells. The so-called oxygen carriers can be used when donor blood is not an option or unavailable. Blood transfusions, which in most cases involve the supply of red blood cells, play a central part in the treatment of traumatic injuries, e.g. in connection with accidents or natural disasters, in pre-transplant examinations and when treating anaemia. Donor blood is the best substitute, but due to an ageing population and the increasing number of operations, the demand for blood for transfusion is expected to rise by more than 10 percent within the next decade. By 2030, an annual shortage of more than three million red blood cell units is expected. Despite many decades of dedicated research, the effects of the first generation of oxygen therapeutics that came on the market have been questioned, and most of the products have been withdrawn. Consequently, there are currently no alternative blood or oxygen carrier solutions available that can be used in connection with emergency catastrophes. This project builds on the valuable experiences from the first generation of oxygen carrier solutions, seeking to develop and characterise sophisticated forms of replacement for red blood cells.
CASE 3: THE SIGNIFICANCE OF INDEPENDENT RESEARCH FOR RESEARCH-BASED EDUCATION

DFF-Research Project 2 Grant, Associate Professor Kirsten Marie Raahauge, grant sum: DKK 5.4 million

Qualifying architects of tomorrow to build successful welfare spaces

How is welfare formed through architecture?

Kirsten Marie Raahauge is an anthropologist with knowledge on how welfare spaces can attract or deter people. Together with a research team of architects and anthropologists she explores Danish welfare spaces. From the utopian ideas about welfare spaces and shabby ghettos of the 1970s and 1980s to contemporary notions of super hospitals, community psychiatry, caring for the elderly in their own homes, interdisciplinary learning spaces and the emergence of marginalised communities in a centralised welfare state, the demands for well-functioning welfare institutions have changed over the years, putting the onus on tomorrow’s architects not to repeat the architectural mistakes of the past, erected in dull, grey concrete. The project analyses the spatial dynamics and implications of the developments in the Danish welfare system since 1970, in order to understand the spaces of welfare, how they are deployed in everyday life and how they influence the development of welfare in Denmark. Moreover, the project examines contemporary welfare from an architectural as well as anthropological perspective, so that tomorrow’s architects and urban planners may have the concept of welfare at the top of their minds. The new insights will be disseminated among relevant decision makers and to the wider public, but also anchored in the educational sector, where Kirsten Marie Raahauge and her research team teach students of architecture and design in theoretical and historical visions of Danish welfare architecture and design.
CASE 4: THE SIGNIFICANCE OF INDEPENDENT RESEARCH FOR LEGISLATION AND REGULATION

Sapere Aude: DFF-Advanced Grant, Professor Peter Norman Sørensen, grant sum: DKK 5.7 million

Taxation of financial transactions may create better financial markets

Research project maps advantages and disadvantages

Professor Peter Norman Sørensen examines how information accompanies the prices in the financial markets, and whether a tax on financial transactions would be more beneficial than a disadvantage. Among other things, he will draw on existing experiences with taxes that have a behavioural effect, such as green taxes. In the financial markets it is common that traders possess different types of information. The asymmetry of information may hamper the individual traders – because who wants to buy shares from a seller who knows something that might affect the value of the shares negatively? One group in particular who exploit the potential of having more information before the other traders are the professional investors, who carry out what is called high-frequency trading with the help of computers and algorithms. But maybe a transactions tax could help to reduce such trading behaviour. Peter Norman Sørensen’s research shows that – at least on a theoretical level – the taxation of transactions would lead to lesser information asymmetries and thereby reduce the risks of making a bad deal. The prediction is also that it would enable the market to fulfil its real function better – which is to match more symmetrically informed buyers and sellers. Even though Peter Norman Sørensen’s project is a theoretical investigation, it may provide invaluable input in the form of a background analysis for any future plans to regulate the stock market through a new tax. Better functioning stock markets is a potential advantage, and ensuring a higher degree of information symmetry may reduce the risk of sudden crashes and unstable markets. On the other hand, imposing a financial transactions tax may drive the intermediaries – who have a stabilising effect – out of the market. This is what Peter Norman Sørensen’s research will investigate.
CASE 5: THE SIGNIFICANCE OF INDEPENDENT RESEARCH FOR CULTURE AND NATURE

Sapere Aude: DFF-Starting Grant, Associate Professor Riikka Tiivi Mariisa Rinnan, grant sum: DKK 7.5 million

The vegetation in the Arctic region is changing drastically due to global warming

But plant substances may contribute to dampening the temperature rises

During the global warming Arctic plants will release more organic compounds, which can help diminish the temperature increases. Riikka Rinnan carries out research on the exchange of reactive gases affecting the climate between the Arctic nature and the atmosphere. Her research provides vital new knowledge about the global warming. The Arctic region is interesting to investigate, because here the emission of volatile substances is almost ten times as sensitive to temperature rises as in more southern regions. The biogenic volatile organic compounds (BVOC) are crucial to the climate of the earth, as they both have a warming and a cooling effect in the atmosphere. With the future climate changes the emission of BVOC is expected to increase significantly in the Arctic region, and this will affect the Arctic ecosystems as well as the climate on earth. The project generates new knowledge that can be used to improve models for predicting how the BVOC emissions will interact with the global warming.
## 2016 in brief

### January

6  
Seminar for Sapere Aude: DFF-Research Talent recipients

### February

25  
Recipients of DFF’s Sapere Aude grants are honoured at the EliteForsk conference

29  
DFF distributes DKK 120 million for 62 DFF-Individual Postdoc grants

### May

1  
DFF participates in the Danish Science Festival (Forskningens Døgn)

### June

13  
DFF distributes DKK 125 million for 20 Sapere Aude: DFF-Starting Grant projects and 18 Sapere Aude: DFF-Research Talent prizes

16 - 18  
DFF participates in Folkemødet - Denmark’s Political Festival on Bornholm

22  
DKK 565 million are distributed for 164 DFF-Research Project 1 and 2 grants

30  
DFF launches a new funding instrument: DFF-International Postdoc

### September

21  
DFF publishes leaflet describing five ways of ensuring research impact in society

26  
Seminar for Sapere Aude: DFF-Research Talent recipients

### October

12  
Celebratory lecture held in Aarhus: “Vov at vide – Frontforskning fra Det Frie Forskningsråd” (Dare to know - cutting edge research from Danish Council for Independent Research), organised in collaboration with the Danish University Extension in Aarhus

14  
DKK 20.5 million distributed for Research Educations outside the Universities

17  
New political agreement on DFF’s future functions, which among other things involve the authority to support thematic research

### November

1  
DFF’s secretariat relocates to Odense

2  
DFF hosts the conference: “Når internationalisering fører til excellent forskning” (When internationalisation leads to excellent research)

3  
Political agreement on the distribution of the research reserve allocates DKK 143 million to DFF, DKK 50 million more than anticipated

17  
Celebratory lecture held in Copenhagen: “Vov at vide – Frontforskning fra Det Frie Forskningsråd” (Dare to know - cutting edge research from Danish Council for Independent Research), organised in collaboration with the Danish University Extension in Aarhus

29  
Peter Munk Christiansen reappointed as Chair of Danish Council for Independent Research
BOARD OF DIRECTORS
DFF’s Board of Directors is responsible for the Council’s overall political and strategic decisions, and together with the research councils it carries out DFF’s research advisory functions. The Board decides how the Council’s funds are to be distributed among the research councils. The Board has nine members, who have all been appointed by the Minister for Higher Education and Science based on their personal qualifications.
SOCIAL SCIENCES
Offers funding to researchers working within the social sciences. The council covers the following main disciplines: economics, sociology, political science and legal theory, as well as the societal aspects of various interdisciplinary subjects (e.g. communication studies, development studies, gender studies and cultural geography). FSE’s 12 members are all recognised researchers who have been appointed by the Minister for Higher Education and Science based on their personal qualifications.

MEDICAL SCIENCES
Offers funding to researchers who work with all aspects of basic, translational, clinical and socio-medical research in relation to human health and disease. FSS’s 18 members are all recognised researchers who have been appointed by the Minister for Higher Education and Science based on their personal qualifications.

TECHNOLOGY AND PRODUCTION SCIENCES
Offers funding to researchers who carry out basic research within technology and production sciences which is motivated by a specific problem or has a clear application-oriented perspective, aiming to solve a specific problem, develop new technologies and production systems or to provide new ways of meeting the needs of society. Epistemological research without any application-oriented perspectives and development activities will not be supported by FTP. The council’s 18 members are all recognised researchers who have been appointed by the Minister for Higher Education and Science based on their personal qualifications.
Secretariat of Danish Council for Independent Research

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24 ANNUAL REPORT 2016
# Key figures for 2016

## APPLICATIONS AND GRANTS IN 2016

### DFF | Humanities

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### DFF | Natural Sciences

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### DFF | Social Sciences

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<td>Amount applied for</td>
<td>1,116</td>
<td>101</td>
<td>9.0%</td>
<td>320</td>
<td>42</td>
<td>13.1%</td>
</tr>
<tr>
<td>Amount granted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
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</tr>
<tr>
<td>Number of applications</td>
<td></td>
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</tr>
<tr>
<td>Number of grants</td>
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<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### DFF | Medical Sciences

<table>
<thead>
<tr>
<th></th>
<th>Amount applied for, DKK million</th>
<th>Amount granted, DKK million</th>
<th>Success rate</th>
<th>Number of applications</th>
<th>Number of grants</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount applied for</td>
<td>1,708</td>
<td>226</td>
<td>13.2%</td>
<td>726</td>
<td>66</td>
<td>19.1%</td>
</tr>
<tr>
<td>Amount granted</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of applications</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of grants</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DFF | Tech and Production Sciences

<table>
<thead>
<tr>
<th></th>
<th>Amount applied for, DKK million</th>
<th>Amount granted, DKK million</th>
<th>Success rate</th>
<th>Number of applications</th>
<th>Number of grants</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount applied for</td>
<td>2,467</td>
<td>241</td>
<td>9.8%</td>
<td>596</td>
<td>66</td>
<td>11.1%</td>
</tr>
<tr>
<td>Amount granted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of applications</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of grants</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### DFF | Cross-council applications & grants*

<table>
<thead>
<tr>
<th></th>
<th>Amount applied for, DKK million</th>
<th>Amount granted, DKK million</th>
<th>Success rate</th>
<th>Number of applications</th>
<th>Number of grants</th>
<th>Success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount applied for</td>
<td>115</td>
<td>2</td>
<td>1.4%</td>
<td>30</td>
<td>1</td>
<td>3.3%</td>
</tr>
<tr>
<td>Amount granted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of applications</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Number of grants</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### DFF funds, 2016 budget (DKK million)

<table>
<thead>
<tr>
<th></th>
<th>Basic funding</th>
<th>Funds for special initiatives*</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFF</td>
<td>Humanities</td>
<td>103.0</td>
<td>23.9</td>
</tr>
<tr>
<td>DFF</td>
<td>Natural Sciences</td>
<td>170.5</td>
<td>47.4</td>
</tr>
<tr>
<td>DFF</td>
<td>Social Sciences</td>
<td>79.4</td>
<td>17.8</td>
</tr>
<tr>
<td>DFF</td>
<td>Medical Sciences</td>
<td>187.7</td>
<td>24.4</td>
</tr>
<tr>
<td>DFF</td>
<td>Technology and Production Sciences</td>
<td>204.9</td>
<td>31.0</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>745.5</td>
<td>144.5</td>
<td><strong>890.0</strong></td>
</tr>
<tr>
<td>Cross-council funds</td>
<td>16.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reformation Anniversary</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>762.4</strong></td>
<td><strong>149.5</strong></td>
<td><strong>911.9</strong></td>
</tr>
</tbody>
</table>

* Cross-council applications have been processed jointly by two or more research councils, and as a result they are not included in the figures for the individual councils.

### DFF total figures

- **Amount applied for, DKK million**: 9,842
- **Amount granted, DKK million**: 938
- **Success rate**: 9.5%
- **Number of applications**: 2,780
- **Number of grants**: 386
- **Success rate**: 13.9%

* The funds for special initiatives include the distribution of DKK 21.1 million earmarked for research educations outside the universities. Beyond that, in 2016 the funds have primarily been allocated to the Sapere Aude programme. In addition to the amounts listed in the table, funds were allocated to the budget of the Board of Directors, and DKK 4.9 million were ceded for the implemented reduction in the national budget in the beginning of June 2016.

### Average grant size at DFF, 2007-2016

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount awarded</td>
<td>1,101</td>
<td>1,201</td>
<td>1,321</td>
<td>1,331</td>
<td>1,234</td>
<td>1,283</td>
<td>1,216</td>
<td>1,382</td>
<td>1,209</td>
<td>938</td>
</tr>
<tr>
<td>Number of grants</td>
<td>922</td>
<td>869</td>
<td>628</td>
<td>629</td>
<td>514</td>
<td>535</td>
<td>457</td>
<td>542</td>
<td>542</td>
<td>386</td>
</tr>
<tr>
<td>Average grant size</td>
<td>1.2</td>
<td>1.4</td>
<td>2.1</td>
<td>2.1</td>
<td>2.4</td>
<td>2.4</td>
<td>2.7</td>
<td>2.5</td>
<td>2.2</td>
<td>2.4</td>
</tr>
</tbody>
</table>
**Number of DFF applications and grants, 2007–2016**

- **Applications**
  - The figures cover applications for the normal funding function of the research councils. The councils’ contributions to international organisations, expenses resulting from the councils’ academic activities etc. are not included.

- **Grants**
  - The figures cover applications for the normal funding function of the research councils. The councils’ contributions to international organisations, expenses resulting from the councils’ academic activities etc. are not included.

**Amounts applied for and distributed by DFF, 2007–2016**

- The amounts applied for and distributed are based on the applications processed by DFF each year. The figures cover applications for the normal funding function of the research councils. The councils’ contributions to international organisations, expenses resulting from the councils’ academic activities etc. are not included.

**Average success rates at DFF, 2007–2016 (%)**

- The average success rates are calculated based on the applications processed by DFF each year. The figures cover applications for the normal funding function of the research councils. The councils’ contributions to international organisations, expenses resulting from the councils’ academic activities etc. are not included.

**ADVISORY TASKS**

- **Advisory tasks of Danish Council for Independent Research, 2016 (number)**
  - Advisory services rendered in connection with applications for other councils and foundations.
  - Surveys are usually commissioned by international organisations.
DEVELOPMENT IN FUNDS ALLOCATED UNDER THE DANISH FINANCE ACTS

Funds allocated to DFF under the Danish Finance Acts 2007-2017, including the budgeted allocation for 2018
(prices adjusted for inflation 2017, DKK million)

DFF’s allocated funds measured as the share of the national research budgets 2007-2017

SAPERE AUDE

Sapere Aude: DFF-Starting Grants and DFF-Advanced Grants
Amounts applied for and distributed, 2016 (DKK million)

Sapere Aude: DFF-Research Talent
Amount awarded, 2016 (DKK million)

*In 2016 Sapere Aude: DFF-Research Talent was distributed as prizes. DKK 2.7 million were allocated to the instrument, of which DKK 2.3 million were distributed.

Sapere Aude: DFF-Starting Grants and DFF-Advanced Grants
Applications and grants, 2016 (number)

Sapere Aude: DFF-Research Talent
Applications and grants, 2016 (number)
Sapere Aude overall, success rates distributed by gender, 2016 (%)

- 9%
- 8%
- 7%
- 6%
- 5%
- 4%
- 3%
- 2%

Amounts distributed/applied for

Number of grants/applications

OTHER STATISTICS

Total number of grants and number of grants awarded to larger and long-term projects (over DKK 3 million, 2007-2016)

2.4

Average size of DFF grants

DKK million

Danish Council for Independent Research promotes Danish research by providing venture capital for smaller research projects, thereby enabling talented researchers to test promising ideas.
Age distribution of main grant recipients 2016, divided by funding instruments (number)

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Aged 40 or below</th>
<th>Above 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFF-Research Projects 1</td>
<td>21</td>
<td>102</td>
</tr>
<tr>
<td>DFF-Research Projects 2</td>
<td>12</td>
<td>52</td>
</tr>
<tr>
<td>DFF-Individual Postdoc grants</td>
<td>69</td>
<td>3</td>
</tr>
<tr>
<td>Research Educations outside the Universities (PhD)</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Sapere Aude 1</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Sapere Aude: DFF-Starting Grant</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Sapere Aude: DFF-Advanced Grant – stage 3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>FKK-Scientific Conferences</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Research Networks</td>
<td>Humanities</td>
<td>1</td>
</tr>
<tr>
<td>Journals</td>
<td>Humanities</td>
<td>1</td>
</tr>
<tr>
<td>DFF-Reformation Anniversary</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Research Stays Abroad</td>
<td>Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Clinician Scientist Positions</td>
<td>Medical Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Preadgerate Scholarships</td>
<td>Medical Sciences</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>153</strong></td>
<td><strong>233</strong></td>
</tr>
</tbody>
</table>

Multi-disciplinary applications submitted to individual research councils, and grants awarded, 2016 (%)*

<table>
<thead>
<tr>
<th>Council</th>
<th>Applications</th>
<th>Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFF</td>
<td>Humanities</td>
<td>46%</td>
</tr>
<tr>
<td>DFF</td>
<td>Natural Sciences</td>
<td>42%</td>
</tr>
<tr>
<td>DFF</td>
<td>Social Sciences</td>
<td>48%</td>
</tr>
<tr>
<td>DFF</td>
<td>Medical Sciences</td>
<td>51%</td>
</tr>
<tr>
<td>DFF</td>
<td>Technology and Production Sciences</td>
<td>33%</td>
</tr>
<tr>
<td><strong>DFF overall</strong></td>
<td><strong>44%</strong></td>
<td><strong>40%</strong></td>
</tr>
</tbody>
</table>

* Share of applications/grants where applicant has indicated that the research will be multi-disciplinary within the scientific fields covered by the council applied to.

Applications which according to the applicants involve multi-disciplinary research across several research councils, and grants awarded, 2016 (%)*

<table>
<thead>
<tr>
<th>Council</th>
<th>Applications</th>
<th>Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFF</td>
<td>Humanities</td>
<td>58%</td>
</tr>
<tr>
<td>DFF</td>
<td>Natural Sciences</td>
<td>28%</td>
</tr>
<tr>
<td>DFF</td>
<td>Social Sciences</td>
<td>34%</td>
</tr>
<tr>
<td>DFF</td>
<td>Medical Sciences</td>
<td>41%</td>
</tr>
<tr>
<td>DFF</td>
<td>Technology and Production Sciences</td>
<td>60%</td>
</tr>
<tr>
<td><strong>DFF overall</strong></td>
<td><strong>44%</strong></td>
<td><strong>41%</strong></td>
</tr>
</tbody>
</table>

* Share of applications/grants where applicant has indicated that the research will be multi-disciplinary across the scientific fields of several research councils.

Success rates at the Danish Council of Independent Research
Distributed by gender, 2016 (%)

| Gender | DFF-Research Projects 1 | DFF-Research Projects 2 | DFF-Individual Postdoc grants | Research Educations outside the Universities (PhD) | Sapere Aude 1 | Sapere Aude: DFF-Starting Grant | Sapere Aude: DFF-Advanced Grant – stage 3 | FKK-Scientific Conferences | Research Networks | Humanities | Journals | Humanities | DFF-Reformation Anniversary | Research Stays Abroad | Social Sciences | Clinician Scientist Positions | Medical Sciences | Preadgerate Scholarships | Medical Sciences | Total |
|--------|-------------------------|-------------------------|-------------------------------|-----------------------------------------------|--------------|-------------------------------|--------------------------------------------|-------------------------------|------------------|-----------|-----------|-------------------|----------------------|------------------|------------------------|-------------------|------------------|-------------------|-------|
| Female | 13%                     | 14%                     | 8%                            | 8%                                            | 13%          | 14%                           | 8%                                         | 8%                            | 13%              | 14%       | 8%        | 8%                 | 13%                  | 14%              | 8%                     | 8%                | 13%              | 14%              | 153   |
| Male   | 10%                     | 8%                      | 10%                           | 10%                                           | 11%          | 12%                           | 10%                                        | 10%                           | 11%              | 12%       | 10%       | 10%                | 11%                  | 12%              | 10%                    | 10%               | 11%              | 12%              | 233   |

PhD and postdoc grants, embedded* and individual, 2016 (number)

<table>
<thead>
<tr>
<th>Council</th>
<th>Applications</th>
<th>Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFF</td>
<td>Humanities</td>
<td>72</td>
</tr>
<tr>
<td>DFF</td>
<td>Natural Sciences and/or DFF</td>
<td>156</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>134</strong></td>
<td><strong>77</strong></td>
</tr>
</tbody>
</table>

* PhD or postdoc grants which are financed as part of a larger research project. Embedded postdoc grants can be partly fully financed by DFF.

Number of cross-council applications and grants at DFF, 2016 (number)

<table>
<thead>
<tr>
<th>Council</th>
<th>Applications processed by the Cross-Council Committee**</th>
<th>Applications reviewed jointly by several councils***</th>
<th>Number of cross-council grants awarded*****</th>
</tr>
</thead>
<tbody>
<tr>
<td>DFF</td>
<td>Natural Sciences, DFF</td>
<td>Medical Sciences and/or DFF</td>
<td>Technology and Production Sciences</td>
</tr>
<tr>
<td>DFF</td>
<td>Humanities and DFF</td>
<td>Social Sciences</td>
<td>19</td>
</tr>
<tr>
<td><strong>Across other council groupings</strong></td>
<td><strong>15</strong></td>
<td><strong>2</strong></td>
<td></td>
</tr>
</tbody>
</table>

DFF | 35 Council Committee processes all applications whose areas of research reach across the scientific delimitations of the respective research councils. In 2016 the Cross-Council Committee processed a total of 134 applications. Of these, 77 were submitted for joint review by several councils, while the remaining applications were submitted for cross-council review.

** All applications where the applicants requested joint reviewing by several councils or where the application has been submitted to the Cross-Council Committee.

*** All grants where several councils have been involved in the reviewing process (either as joint review or where another council than the processing council has issued an academic assessment in relation to parts the project).

**All applications where several councils have been involved in the reviewing process (either as joint review or where another council than the processing council has issued an academic assessment in relation to parts the project). Not necessarily financed by more than one council.
About Danish Council for Independent Research

Danish Council for Independent Research supports and promotes the most original ideas and initiatives in Danish research. In 2016 the Council has distributed 386 grants for research activities, at a total amount of approximately DKK 938 million. Grants are awarded for research projects that take their point of departure in the researchers’ own ideas.

The Council’s instruments are offered in free national competition and are not subject to any thematic or scientific limitations. Scientific quality is the most important assessment criterion in the distribution of funds, which are mainly awarded to research projects with ground-breaking potential. The average size of a DFF grant is DKK 2.4 million.

The Council continually works to create the best possible conditions for independent research in Denmark and to promote international research collaborations. Among other things, DFF does this by taking active part in the national debate on research policy issues and by providing research advisory services to the Danish Minister for Higher Education and Science, the Government, the Danish Parliament as well as other requisitioners. In addition, the Council is in continuous dialogue with significant stakeholders in order to ensure that Danish research yields the best possible results.

Danish Council for Independent Research continually monitors its research investments and strives to promote the application of research results as well as to increase the awareness of the societal impact of academic and scientific research.

Executive Order No. 1064 of 6 September, 2010 on the Danish Act on the Research Advisory System, etc. forms the regulatory framework for Danish Council for Independent Research and its activities.