novo nordisk fonden

Strategy for the Novo Nordisk Foundation

2019–2023

ORIGINS OF THE NOVO NORDISK FOUNDATION

The scientists

Marie Krogh

August Krogh

The clinician:

H.C. Hagedorn

The investor:

August Kongsted

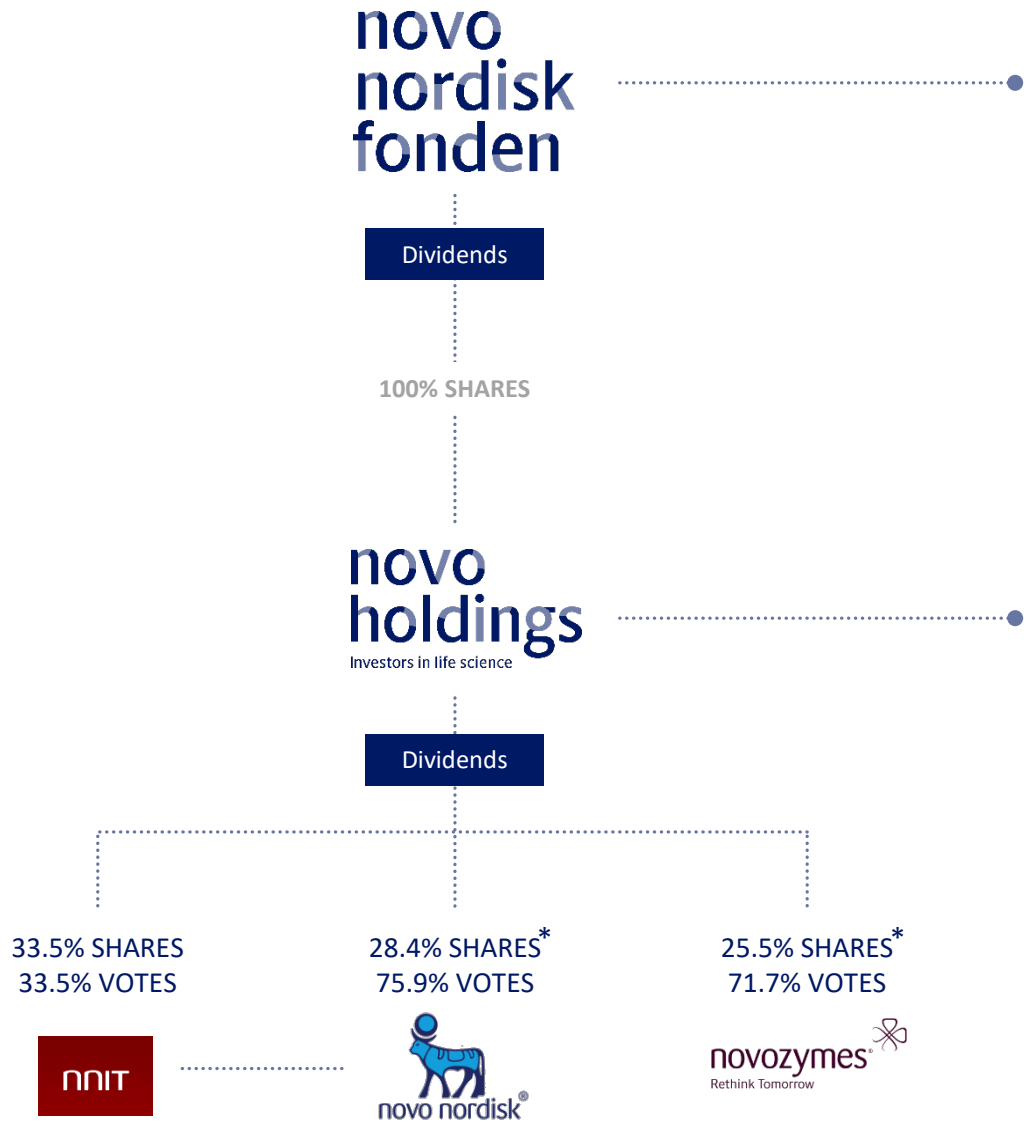
The entrepreneurs:

Thorvald Pedersen

Harald Pedersen

novo nordisk fonden

An independent foundation with corporate interests



Grants

Grants awarded in 2018:
EUR 529 million
(DKK 3.9 billion)

Scientific research
Diabetes treatment
Innovation
Education & outreach
Humanitarian and social causes

Investments

Result in 2018:
EUR 1.6 billion
(DKK 11.9 billion)

Principal investments
Venture investments
Seed investments
Financial investments

*) Through Novo Holdings, the Foundation has A-shares in Novo Nordisk and Novozymes.

A-shares have 10 times voting power per share

Our objectives

Corporate objective

- to provide a stable basis for the commercial and research activities of the Novo Group companies
  (and of companies in which the Novo Holdings A/S may hold a material equity interest or over which it may have material influence)

Grant-giving objectives

- to support physiological, endocrinological, metabolic and other medical research,
- to support Danish research hospital activities within diabetes,
- to support other scientific, humanitarian and social purposes

Our vision

The Novo Nordisk Foundation's ***vision*** is to contribute significantly to research and development that improves the lives of people and the sustain-ability of society.

Our mission

- To enable Novo Nordisk A/S and Novozymes A/S to create world-class business results and contribute to growth
- To develop knowledge-based environments in which innovative and talented people can carry out research of the highest quality and translate discoveries into new treatments and solutions
- To inspire and enable children and young people to learn

Our centre of gravity

- The primary geographical focus of the Foundation's grant-awarding activities will be Denmark, followed by the Nordic countries
- The Foundation's commercial activities will be international

Grant-awarding focus areas and long-term objectives

Biomedical and health science research and applications

Enable people to live healthier and better lives by facilitating research that advances knowledge of human health and disease, solves health challenges and develops the health care system.

Patient-centred and research based care

Make Denmark a global leader in delivering patient-centred and research based care for peoble with diabetes and facilitate the development of patient-centred and research based care within diabetes co-morbidities and other endocrine disorders.

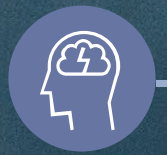
Life science research and industrial applications promoting sustainability

Act for and inspire development of a more sustainable world by supporting research that translates to life science solutions to benefit people and the environment.

Natural and technical science research and interdisciplinarity

Catalyze natural and technical science research, particularly in fields with potential interdisciplinary application to the life and health sciences and industrial biotechnology.

Education, outreach and innovation

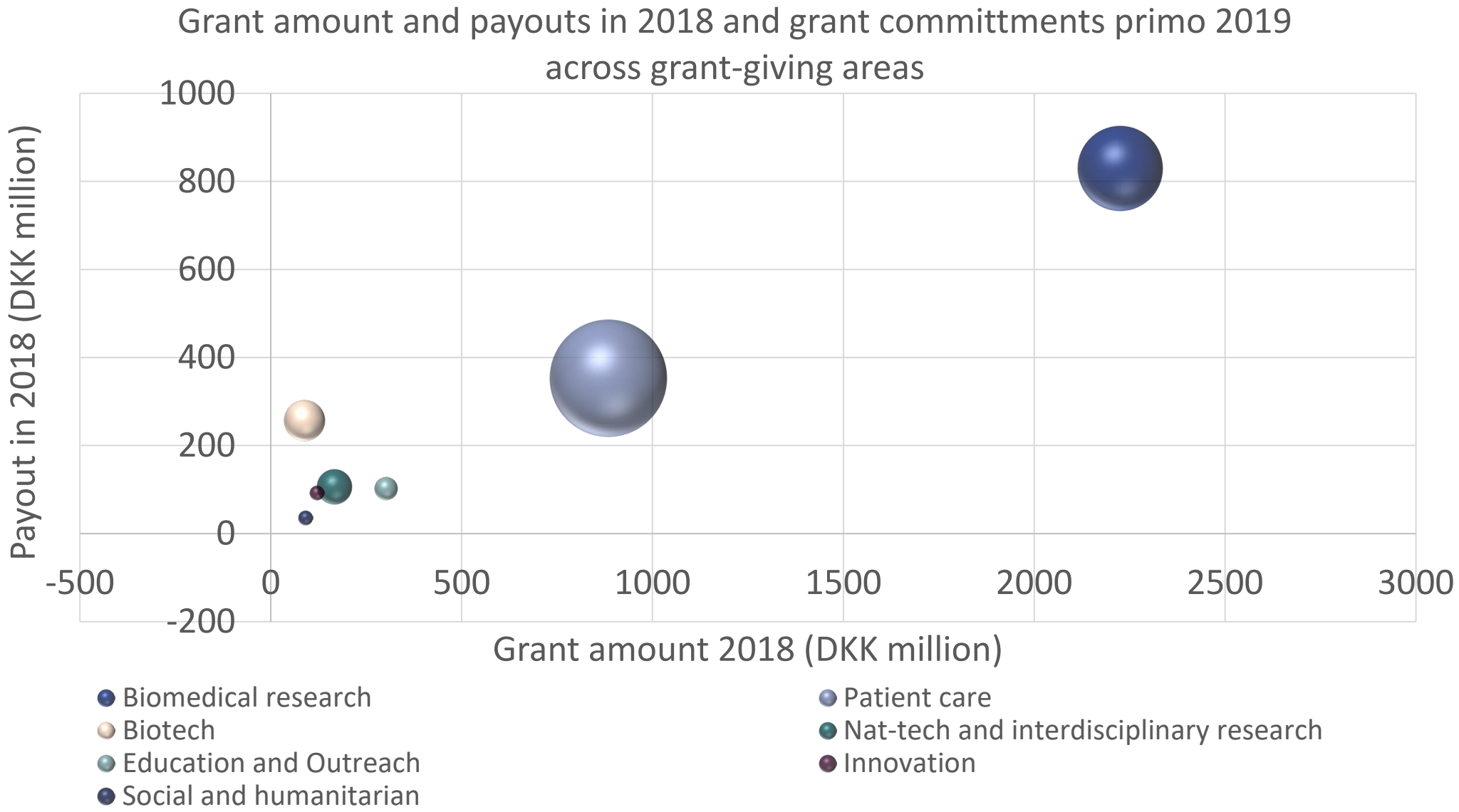


Support general science education and cultivate scientific and technical competencies and engagement.

To benefit people, promote life science ecosystems that translate scientific discoveries into products and solutions and drive growth.

Social, humanitarian and development aid

Improve the lives and prospects of vulnerable children and young people through education, developing competencies and other interventions.


Grant amount and payouts in 2018 and grant committments primo 2019 across grant-giving areas
Payout in 2018 (DKK million)
1000
800
600
400
200
0
-200
-500
0
500
1000
1500
2000
2500
3000
Grant amount 2018 (DKK million)
Biomedical research
Biotech
Education and Outreach
Social and humanitarian
Patient care
Nat-tech and interdisciplinary research
Innovation

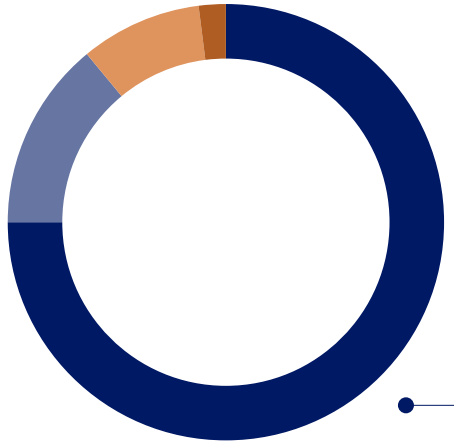
Funding of public research in Denmark

Novo Nordisk Foundation's share of the **total funding**:

2018: 6%
(estimate)

Novo Nordisk Foundation's share within the **life-sciences**:

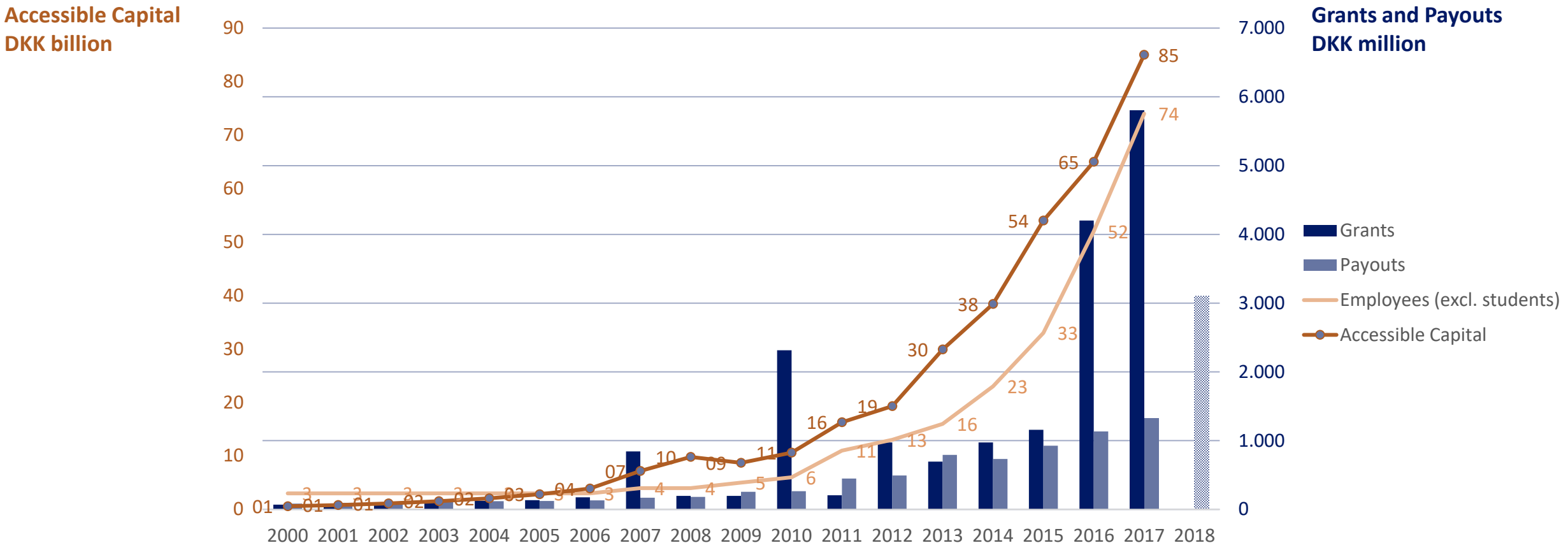
2018: 25%
(estimate)



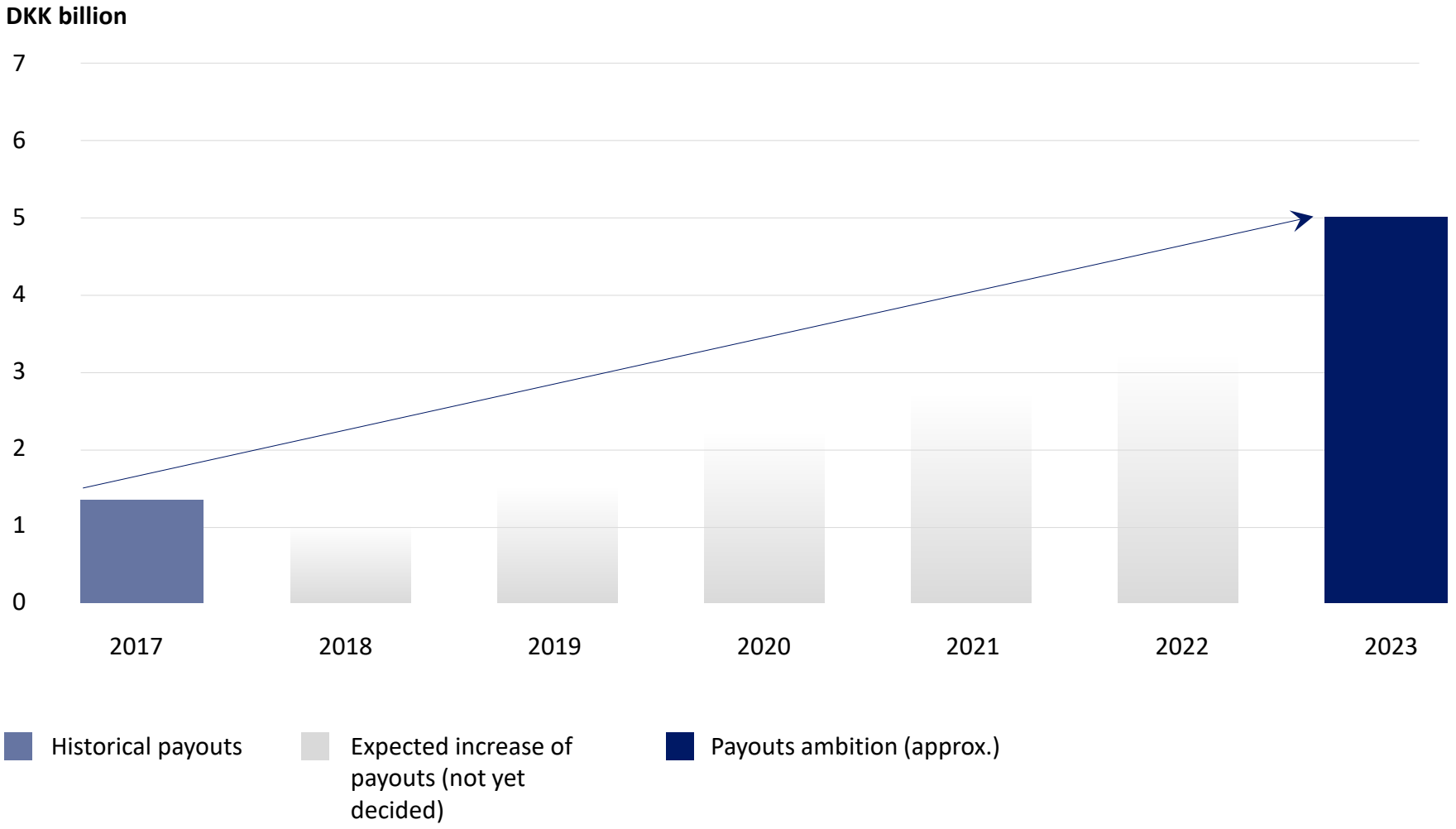
2018

National public funding **74%**
Private foundations **14%**
Foreign src. Incl. EU **9%**
Private Danish companies **3%**

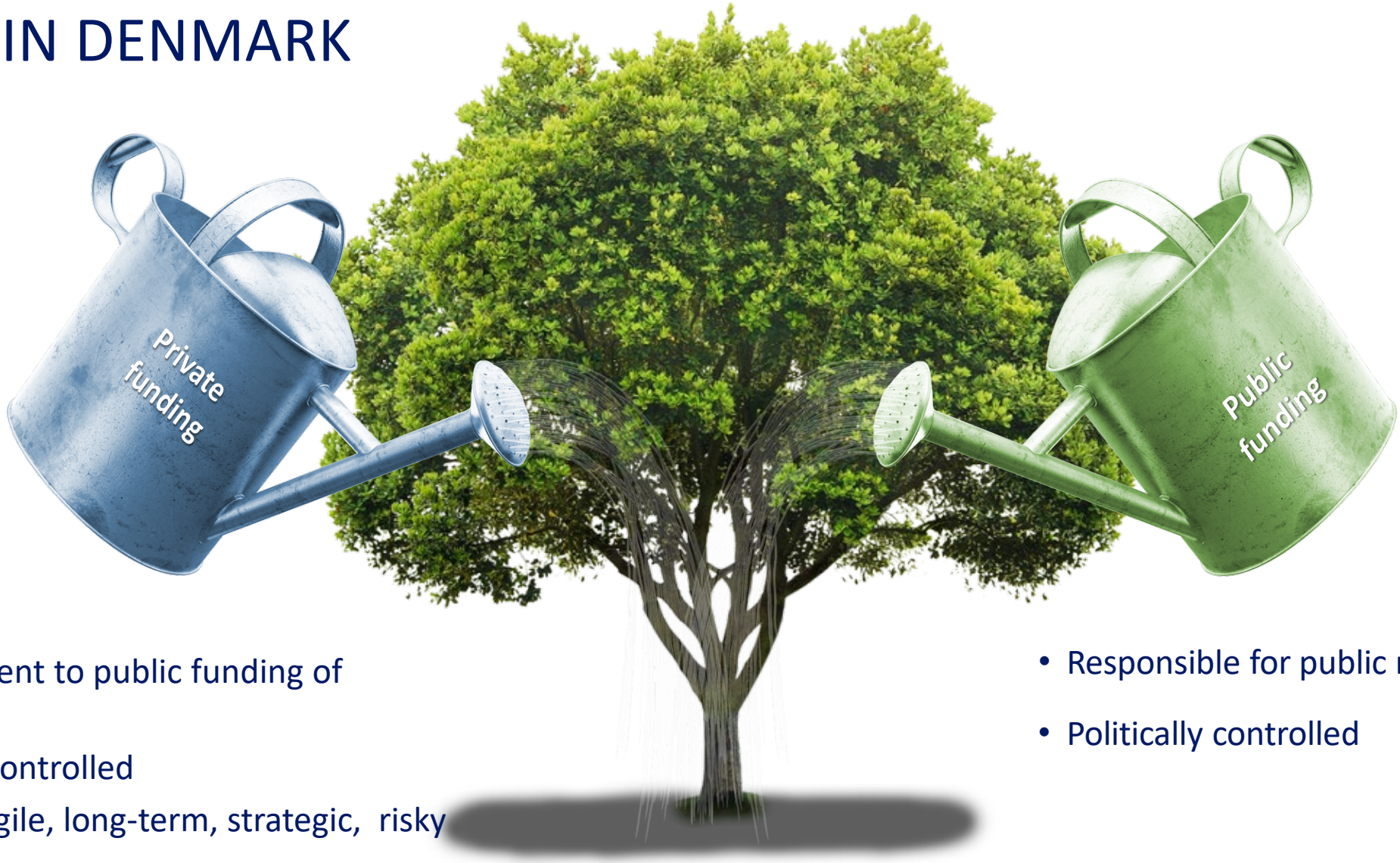
Development in grants, payouts, accessible capital and employees



Growth trajectory for total payouts by the Novo Nordisk Foundation



ROLES IN DENMARK

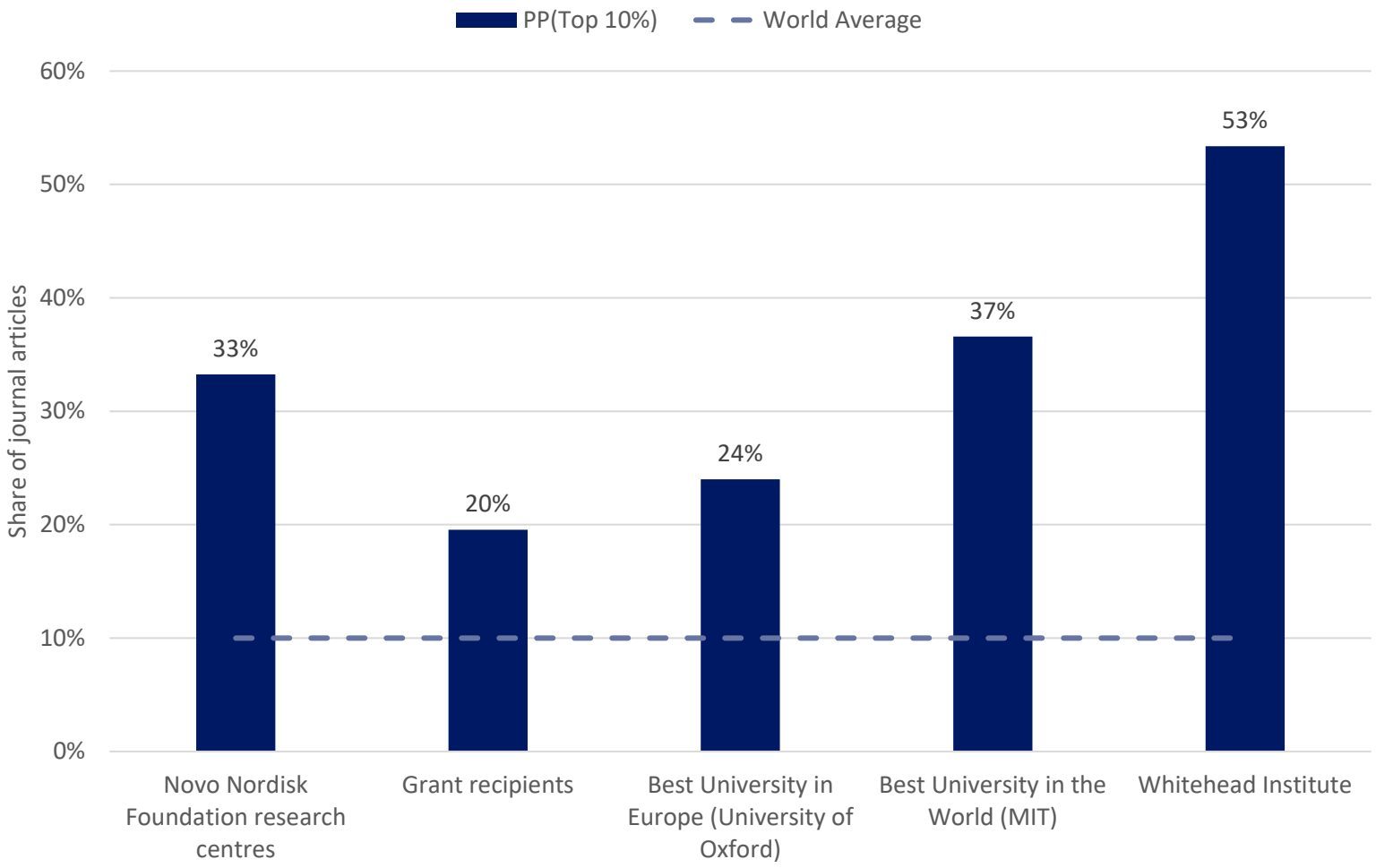


- Supplement to public funding of research
- Privatly controlled
- Can be agile, long-term, strategic, risky

- Responsible for public research
- Politically controlled

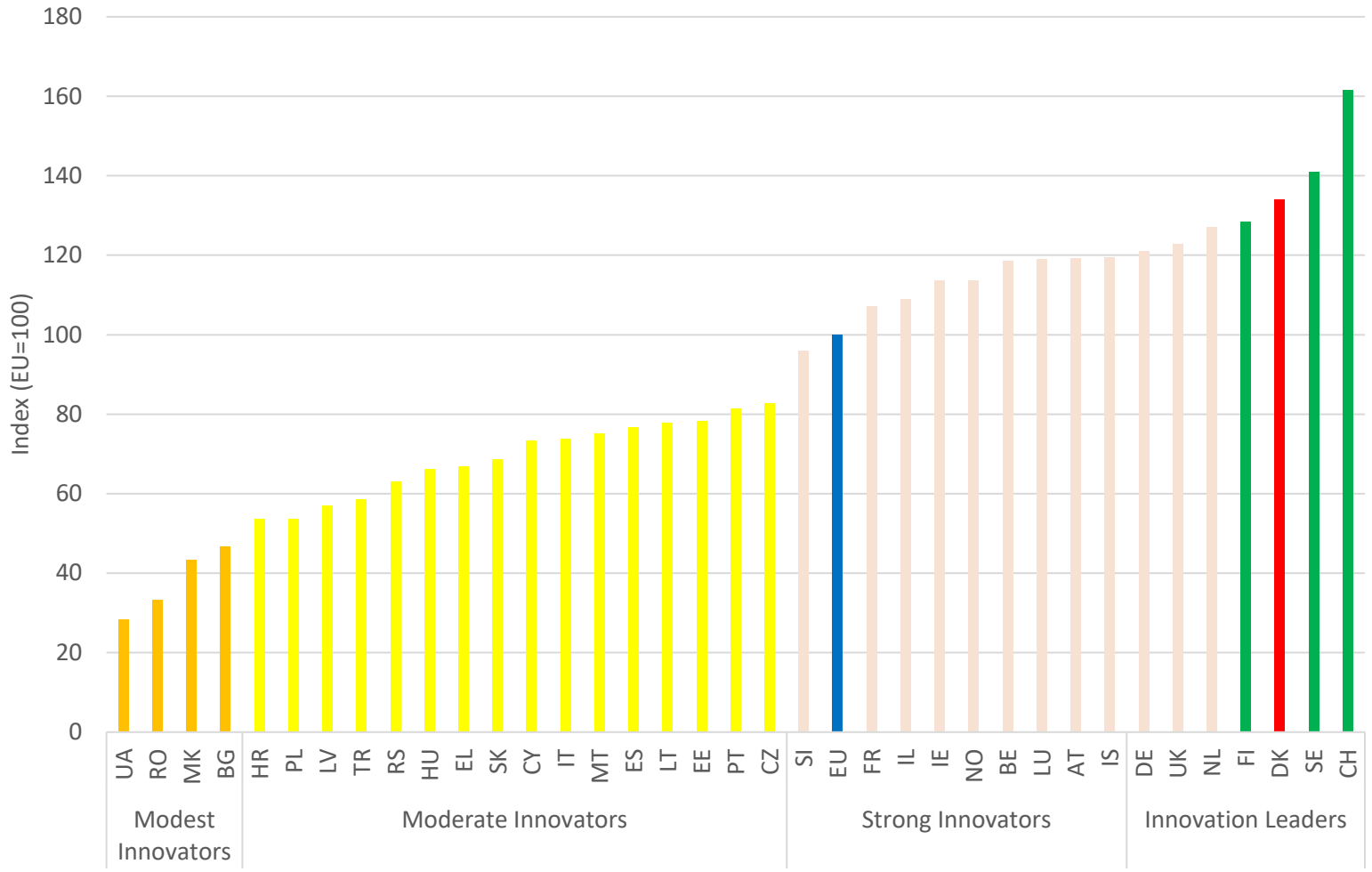
Benchmark of citation impact of journal articles

- PP(top 10%) within biomedical and health sciences. 2013-2015



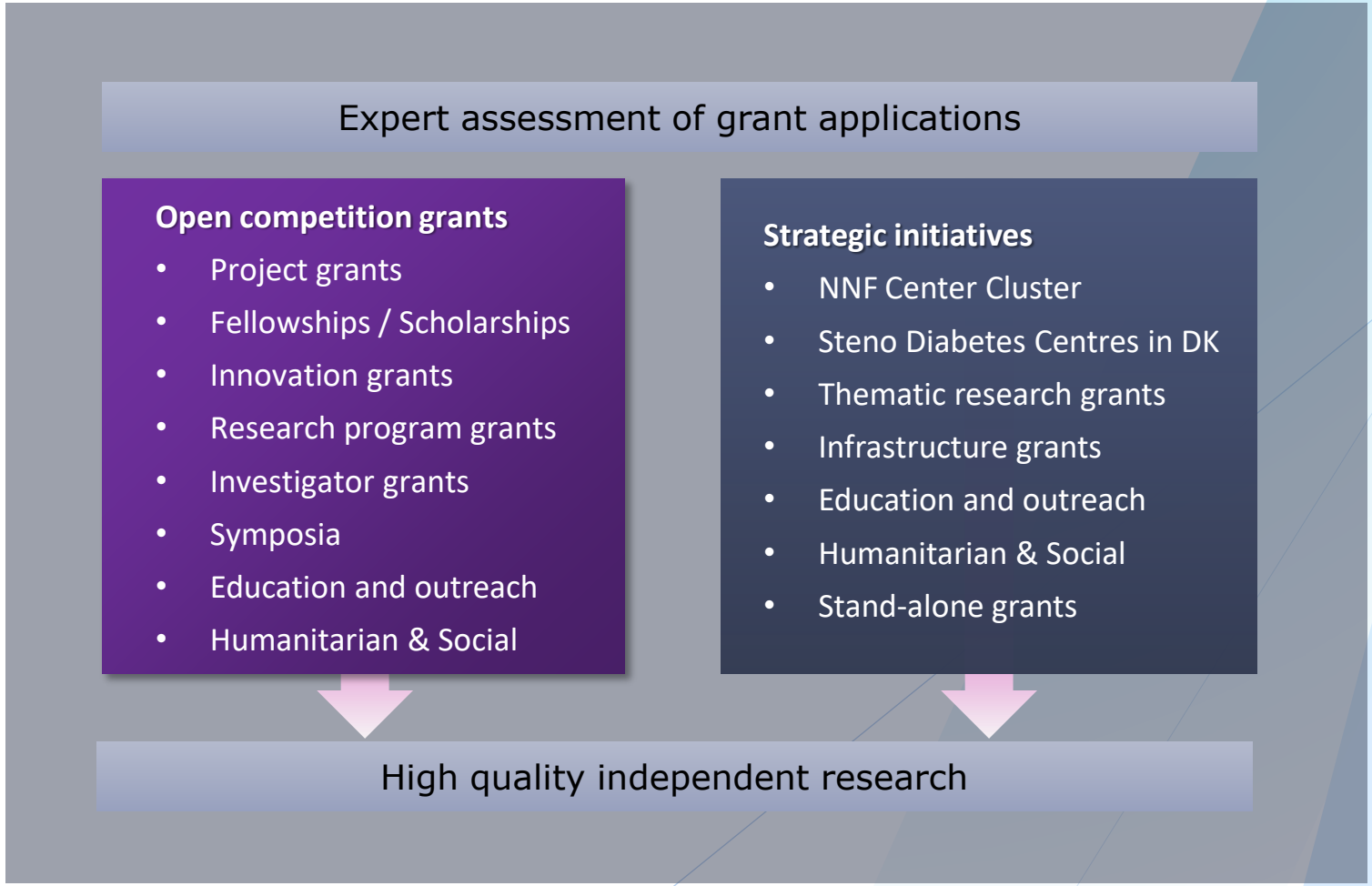
- Source: Novo Nordisk Fonden (2018): Societal Impact of Novo Noridks Foundation Grants 2017

Performance of EU-28 Member States' Innovation systems. 2016



Source: European Innovation Scoreboard 2017:
http://ec.europa.eu/DocsRoom/documents/24829

TWO WAYS
OF AWARDING RESEARCH GRANTS



novo nordisk fonden

Research and innovation grants

18 COMMITTEES
~100 COMMITTEE MEMBERSHIPS (~80 MEMBERS)

- Committee on Bioscience and Basic Biomedicine
- Committee on Clinical and Translational Medicine
- Committee on Endocrinology and Metabolism – Nordic Countries
- Committee on Biotechnology-based Synthesis and Production Research – Nordic Countries
- Committee on Nursing Research
- Committee on Research in Art and Art History

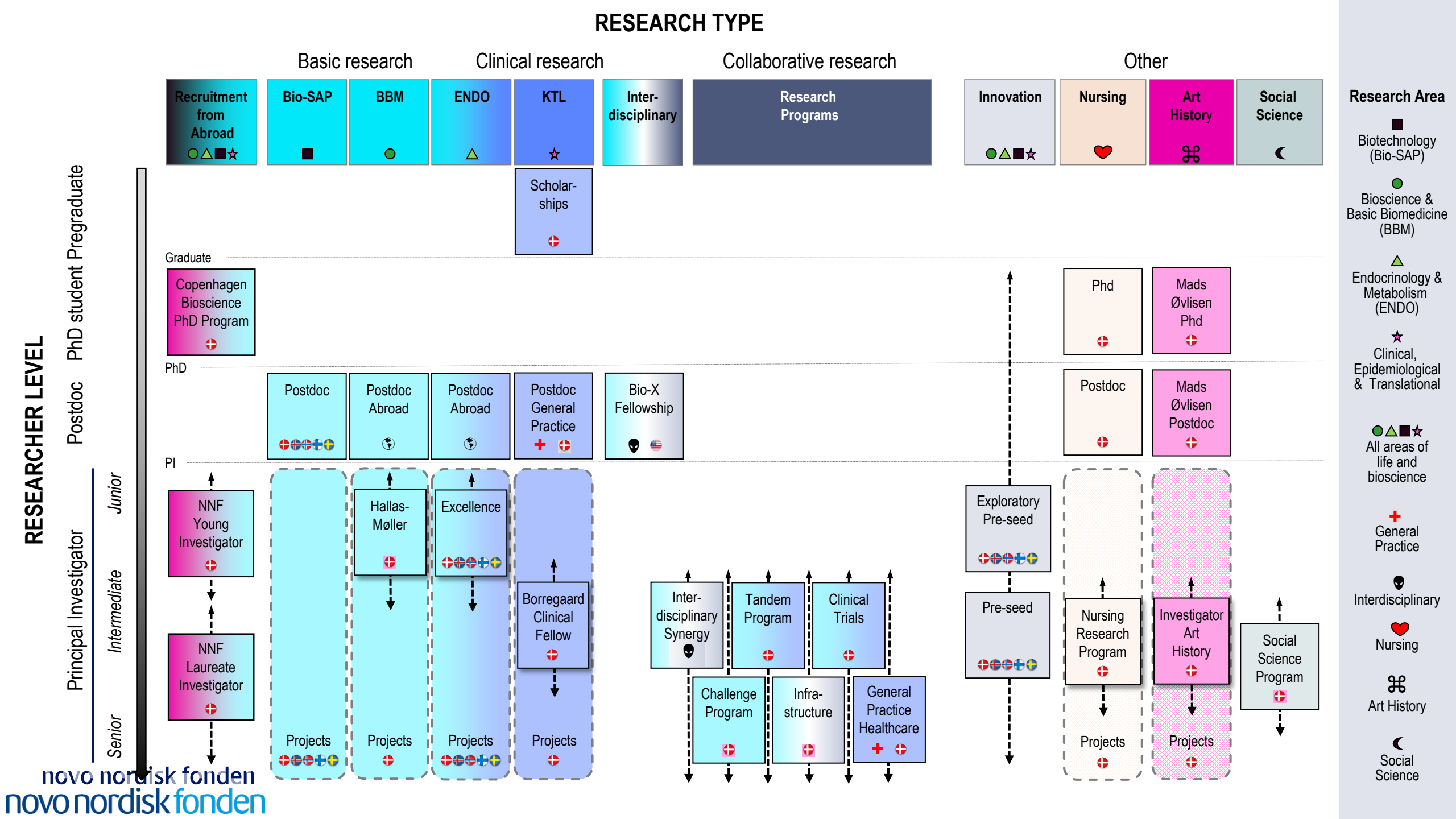
- Committee on Interdisciplinary Research
- Committee on the Challenge Programme (x3)
- Committee on Steno Research Collaboration
- Committee on the Infrastructure Programme
- Committee on the Social Science Research Programme

- Committee on International Research Leader Grants

- Committee on the NNF Symposia - Nordic
- Committee on the Novo Nordisk Prize
- Committee on the Novozymes Prize - European

- Committee on Exploratory Pre-seed Grants (Nordic Countries)

Novo Nordisk Fonden supports clinical and general practice medicine, epidemiological and translational research, biomedical science, biotechnological research, basic research within natural sciences with relevance for understanding the human organism, and innovation activities within these fields.
In addition, we support nursing research and research in art and art history.



novo nordisk fonden

Committee on Endocrinology and metabolism – 9 Members

Anna Christina Krook
Professor, Department of Physiology and Pharmacology,
Karolinska Institutet,
Stockholm, Sweden

Pål Rasmus Njølstad, Professor, KG Jebsen Center for Diabetes Research,
University of Bergen and
Consultant, Haukeland University Hospital, Bergen, Norway

Mikael Knip, Professor of Pediatrics and Chief Physician, Children's Hospital,
Helsinki University Central Hospital, Department of Paediatrics,
University of Helsinki, Finland

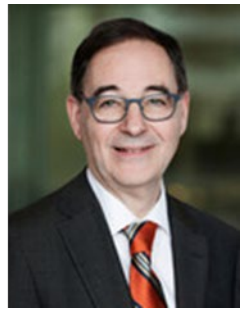
Lea Sistonen, Professor of Cell and Molecular Biology,
Department of Biosciences,
Åbo Akademi University,
Turku, Finland

Trine Bjøro, Professor, Department of Medical Biochemistry,
University of Oslo and Head,
Thyroid Programme,
Oslo University Hospital, Norway

Mette M. Rosenkilde
Professor, Department of Neuroscience
and Pharmacology, University of Copenhagen,
Denmark

Lena Eliasson, Professor,
Institut for Klinisk Videnskab,
Lund Universitets Diabetescenter,
Malmø, Sverige

Laszlo Hegedüs, Professor,
Department of Endocrinology and Metabolism, Odense University Hospital
University of Southern Denmark

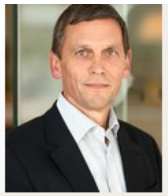


Mikael Rydén, Professor,
Clinical and Experimental Adipose Tissue Research,
Karolinska and
Senior Consultant in Endocrinology,
Karolinska University Hospital

novo nordisk fonden

Committee on Biotechnology-based Synthesis and Production Research

HENRIK CALLESEN
Chair
Professor, PhD, DVSc, Department of Animal Science, Aarhus University, Denmark



VINCENT G. H. EIJSINK
Professor, Department of Chemistry, Biotechnology and Food Science, Norwegian University of Life Sciences, Ås, Norway

MERJA ELISA PENTTILÄ
Research Professor, VTT Technical Research Centre of Finland Ltd, Espoo, Finland

JAN K. SCHJØRRING
Professor and Head, Section of Plant and Soil Science, Department of Plant and Environmental Sciences, Faculty of Science, University of Copenhagen, Denmark

STEVE OLIVER
Professor, Department of Biochemistry, University of Cambridge and Director, Cambridge Systems Biology Centre, United Kingdom

SARA LINSE
Professor in Molecular Protein Science and Physical Chemistry, Department of Biochemistry and Structural Biology, and Department of Chemistry, Lund University, Sweden

DAVID SPRING
Professor, Department of Chemistry, University of Cambridge, United Kingdom

novo nordisk fonden

Committee on Exploratory Pre-seed Grants

LARS FUGGER
Chair, professor, MD, PhD., Nuffield Department of Clinical Neurosciences, Division of Clinical Neurology, John Radcliffe Hospital, University of Oxford, United Kingdom

SØREN KRAGH MOESTRUP
Professor, Department of Biomedicine, Aarhus University and Institute of Molecular Medicine, University of Southern Denmark

Has been a member since 2011

THUE W. SCHWARTZ
Professor of Molecular Pharmacology, Department of Neuroscience and Pharmacology, University of Copenhagen, Denmark

EMMANUELLE COUTANCEAU
Investment Director, Novo Seeds, Novo A/S, Denmark

LENE ODDERSHEDE
Professor, Group Leader of the Optical Tweezers Group, Niels Bohr Institute

MORTEN GRAUGAARD DØSSING
Investment Director, Novo Seeds, Novo A/S, Danmark

Has been a member since 2017

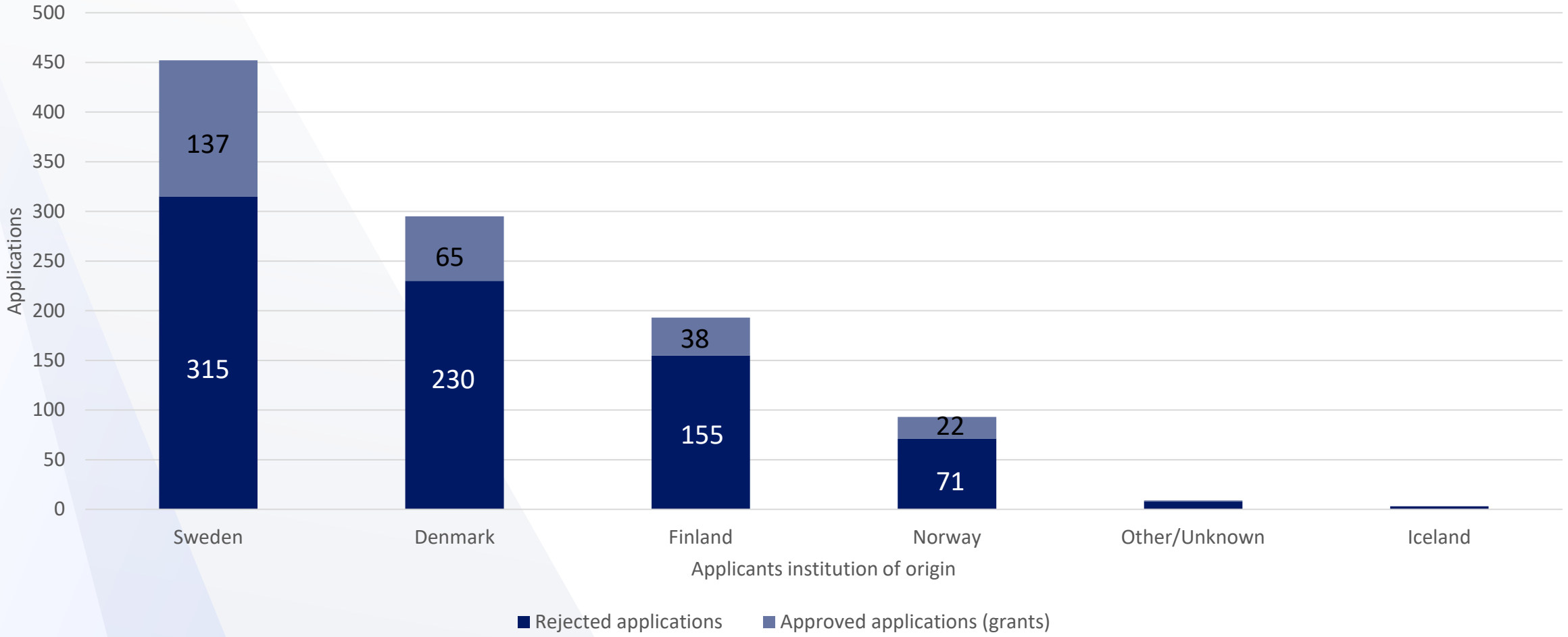
DIANA MUFTIC
Associate, Novo Seeds, Novo A/S, Denmark

Has been a member since 2017

novo nordisk fonden

Committee on Endocrinology and Metabolism

Funded and non-funded grant applications 2013-2016



novo nordisk fonden

Postdoctoral fellowships, Project grants, Investigator grants, Innovation grants, Programme grants

novo nordisk fonden

Postdoctoral Fellowships

Funding mainly covers applicants' own salary, direct running costs, travelling for and participation in conferences, etc.

Additional for Postdoc Fellowships for Research Abroad (*only*): Support for expenses related to relocation, accompanying family members, and general expenses related to living abroad (visa processing, health insurance, etc.).

novo nordisk fonden

POSTDOC FELLOWSHIPS

POSTDOC FELLOWSHIPS FOR RESEARCH IN *BIOTECHNOLOGY-BASED SYNTHESIS & PRODUCTION*

Purpose

- Fundamental and applied research aimed at generating products in improved and more sustainable ways

Eligibility

- Applicant must have obtained Phd degree within 6 years
- Anchored at institution in Nordic country
- Projects must involve:
  - Clear element of biotechnology
  - Can be combined with any other scientific or engineering discipline

FACTS

Place of research: Nordic countries

Duration: 1-3 years, at least 1 year at own (Nordic) institution, 6-12 months abroad

Grant amount: DKK 800.000 per year + DKK 100.000 for stay abroad

Grants per year: Approx. 8 per year

Total grant budget: DKK 13,4 mio.

Evaluation: Committee on Biotechnology-based Synthesis and Production (BioSAP)

novo nordisk fonden

POSTDOC FELLOWSHIPS

POSTDOC FELLOWSHIPS FOR RESEARCH ABROAD

- ***BIOSCIENCE AND BASIC BIOMEDICINE***
- ***ENDOCRINOLOGY AND METABOLISM – NORDIC***

Purpose

- Give young promising researchers the opportunity to gain experience, training and knowledge in an international research environment
- Facilitate the grantees return to, and continued career in, the research environment after stay abroad

Eligibility

- Applicant must have obtained Phd degree within 5 years
- Grantee must be associated to home institution throughout fellowship, even when abroad

FACTS

Place of research: Anywhere abroad

Duration: 4 years: 3 years abroad + 1 year in Denmark or Nordic country

Grant amount: DKK 4 mio.

Grants per year: 4 (BBM) + 6 (ENDO) per year

Total grant budget: DKK 40 mio.

Evaluation: Committee on Bioscience and Basic Biomedicine; Committee on Endocrinology and Metabolism – Nordic

novo nordisk fonden

Project grants

Grants aimed at providing operating expenses, funds for technical or scientific assistants (e.g. post docs or ph.d. stipends), travel expenses and publication costs

Applicant **cannot** apply for own salary!

novo nordisk fonden

PROJECT GRANTS

PROJECT GRANTS

Purpose

- Maintain a broad range of research at the highest international level, within:
  - Bioscience and basic biomedicine (BBM)
  - Endocrinology and metabolism (Nordic) (ENDO)
  - Clinical and translational medical research (KTL)
  - Biotechnology-based synthesis and production (Nordic) (BioSAP)

Eligibility

- Applicants must have own salary and be principal investigators (or in the process of establishing themselves as PIs).
- 1 application per applicant per committee
- 1 application per project

FACTS

Place of research: Denmark/Nordic countries

Duration: 1-3 years

Grant amount: DKK 300.000 to 3 mio.

Grants per year: 150-200 grants per year

Total grant budget: DKK 209,5 mio.

Evaluation: By relevant committee, as indicated by the subjects

novo nordisk fonden

Investigator grants

Establishment and/or development of **research leaders** at all career stages.

Grants aimed at providing own salary (stipend) and funding for running costs, technical and scientific assistants (e.g. post docs and ph.d. stipends) and other relevant expenses for long-term projects (5+ years).

novo nordisk fonden

NEW INITIATIVE: NNF CAREER DEVELOPMENT GRANTS

Purpose

- To support the best and the most creative research leaders at all steps of their careers.
- To stimulate excellence and the possibility to pursue ambitious and relevant projects.

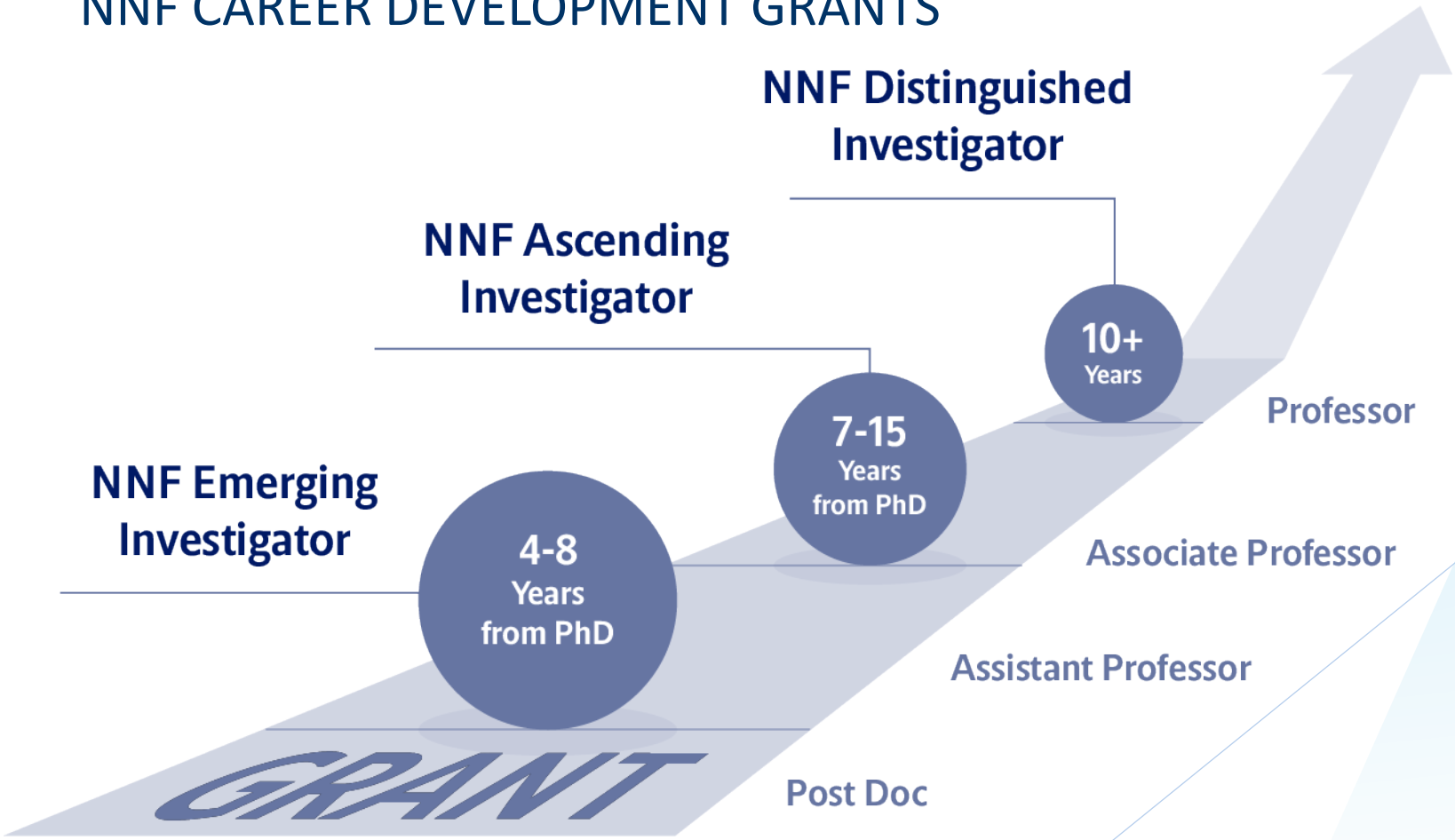
Eligibility

- Each targets principle investigators at specific career-stages, with relevant requirements in each call.
- Excellence is the main evaluation criteria.
- The project and the applicant must be anchored at a Danish research institution.

novo nordisk fonden

INVESTIGATOR GRANTS

NNF CAREER DEVELOPMENT GRANTS



FACTS

Place of research: Denmark – Nordic countries

Duration: 5 years

Grant amount: Up to DKK 10 mio.

Grants per year: 4X12 grants per year

Total grant budget: EUR 64 mio. per year

Evaluation: All four main committees

novo nordisk fonden

YOUNG INVESTIGATOR AWARD

Purpose

- For outstanding early- to mid-career scientists abroad to come to and to carry out their research in Denmark
- Strengthen and internationalize Danish research

Eligibility

- Any nationality, employed abroad, not worked in Denmark during the application process
- Must establish principal research lab in Denmark
- Applicant must be a PI with independent research programme (for less than 7 years)

FACTS

Place of research: Denmark (from abroad)
Duration: 7 years
Grant amount: Up to DKK 25 mio.
Grants per year: 4 grants per year
Total grant budget: DKK 100 mio.
Evaluation: Committee on International Research Leader Grants + peer review

novo nordisk fonden

INVESTIGATOR GRANTS

LAUREATE RESEARCH GRANT

Purpose

- For outstanding established scientists abroad to come to and to carry out their research in Denmark
- Strengthen and internationalize Danish research

Eligibility

- Any nationality, employed abroad, not worked in Denmark during the application process
- Must establish principal research lab in Denmark
- PI with independent research programme (for 7 years or more)

FACTS

Place of research: Denmark (from abroad)
Duration: 7 (+7) years
Grant amount: Up to DKK 50 (+35) mio.
Grants per year: 2 grants per year
Total grant budget: DKK 100 (+70) mio.
Evaluation: Committee on International Research Leader Grants + peer review

DATES

Appl. round opens: November 29, 2017
Application deadline: January 17, 2018

novo nordisk fonden

Programme grants

Collaborative grants aimed at groups of researchers (one main applicant and 1 to 4 co-applicants depending on the type of programme). Applicants and co-applicants should be established researchers.

Funds can be used to cover own salary, salary for scientific (e.g. faculty, post docs, ph.d. stipends) and technical assistants, operating expenses, travel and publication expenses.

novo nordisk fonden

PROGRAMME GRANTS

INTERDISCIPLINARY SYNERGY PROGRAMME

Purpose

- Stimulate an interdisciplinary research culture, across scientific disciplines and techniques
- Creative and novel high-risk/high-gain research ideas
- Strengthen and internationalize Danish research

Eligibility

- Applicant anchored in Denmark + 1-3 co-applicants
- Applicants should all be from different disciplines (biology, engineering, IT, medicine, mathematics, anthropology, physics, psycology, chemistry, etc.)

FACTS

Place of research: Denmark – co-applicants from all countries

Duration: 3 years

Grant amount: DKK 15 mio.

Grants per year: 8 grants per year

Total grant budget: DKK 120 mio.

Evaluation: Committee on Interdisciplinary Research + peer review

novo nordisk fonden

PROGRAMME GRANTS

CHALLENGE PROGRAMME

Purpose

- To overcome specific challenges in health, technology and the environme
- Centre-like research environments
- Collaboration, interaction and education

Eligibility

- Applicant anchored in Denmark + 1-3 co-applicants
- Thematic calls:
  - Prevention of diabetes and treatment of diabetes complications (2015)
  - Human and plant microbiomes (2015)
  - Antibiotic resistance and alternative antibiotics (2016)
  - Oral drug delivery of biopharmaceuticals (2016)
  - Big Data in Biomedicine (2017)
  - Design and Engineering of Biological Molecules and Systems (2017)
  - Protein Chemistry – Structure, Function and Application (2018)
  - Pathophysiology, Diagnosis and Treatment of Nonalcoholic Steatohepatitis (2018)
  - Understanding Obesity at the Cellular Level (2018)

FACTS

Place of research: Denmark – co-applicants from all countries

Duration: 6 years

Grant amount: EUR 8 mio.

Grants per year: 6 grants per year

Total grant budget: EUR 48 mio.

Evaluation: Committee(s) on the Challenge Programme

novo nordisk fonden

Major aspects of research applications assessed by reviewers

The scientific proposal

- Quality, originality and significance
- Within scope of Call?

The approaches and methodologies

- Feasibility and novelty
- The research environment

The investigator(s)

- Qualifications and expertise for the work proposed

The costs for conducting the work

- Justification for the proposed budget

novo nordisk fonden

Copenhagen Bioscience Cluster

a novo nordisk foundation initiative

- Five large research centres
- EUR 0.8 billion invested
- 10 year center grant duration
- Over 800 staff in total
- 300 researchers recruited abroad

- Increase the visibility of research and innovation in the region
- Recruit outstanding scientists and talent
- Stimulate cross-pollination between academia, hospitals and industry
- Contribute to a knowledge based society

Copenhagen Bioscience Conferences

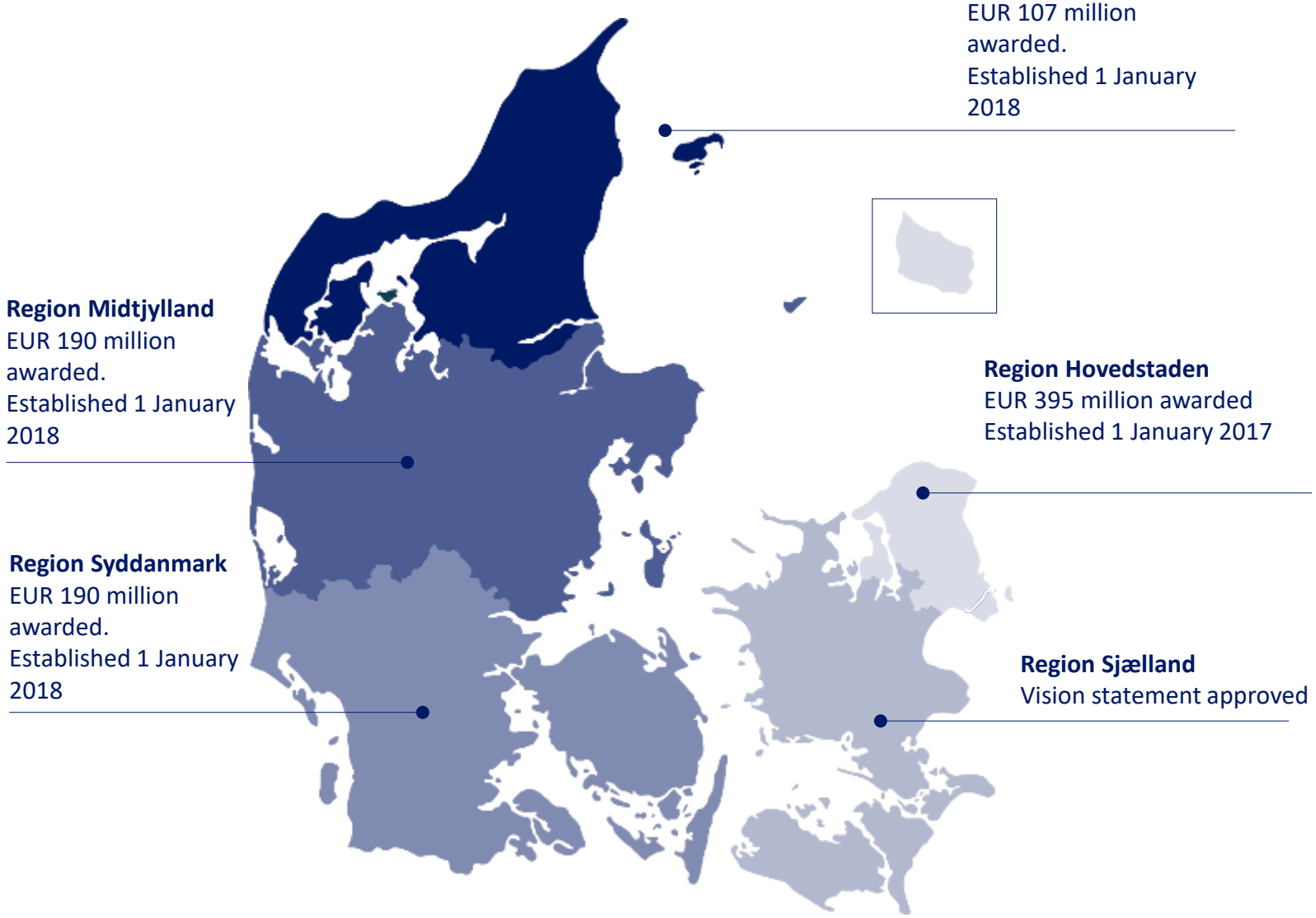
a novo nordisk foundation initiative

novo nordisk fonden

Diabetes Centers

Steno Diabetes Centers will raise the level of care for everyone with diabetes in Denmark through:

- Evidence-based treatment through Denmark's five administrative regions
- Nationwide collaboration on research, health promotion and education
- Access to everyone with diabetes in Denmark with opportunities for large cohort studies



novo nordisk fonden

BII will promote collaborative, interdisciplinary, research-based innovation in the life sciences and help build viable start-up companies with the necessary skills to ensure such innovations become widely available solutions.

BII

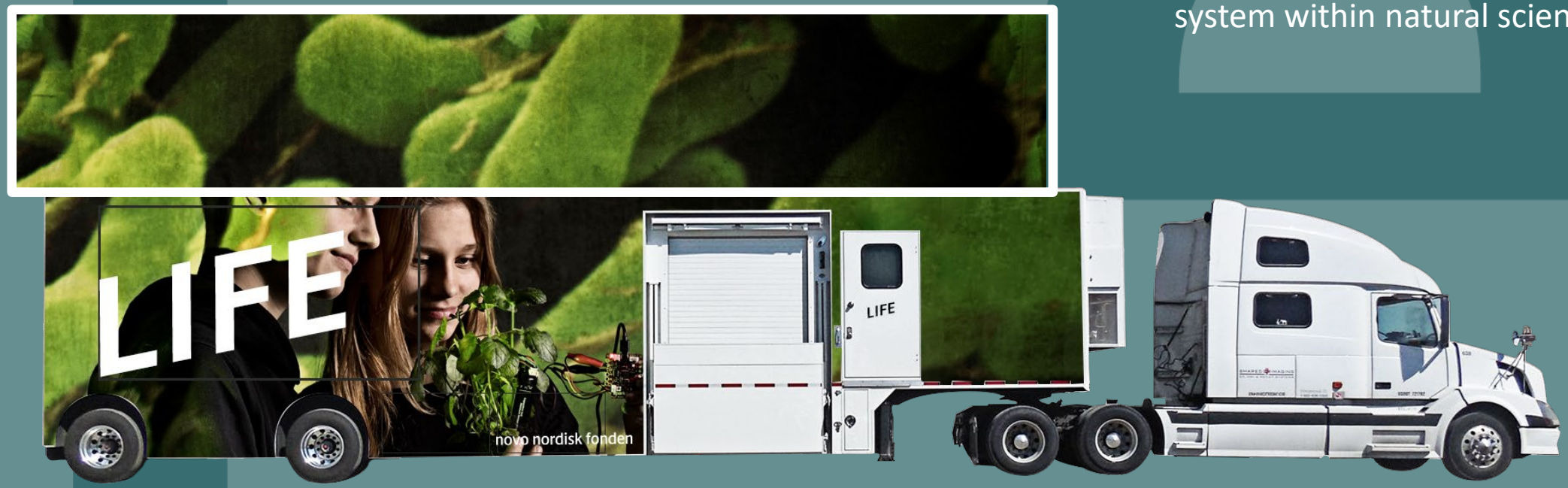
BioInnovation Institute

New solutions through innovation in life science

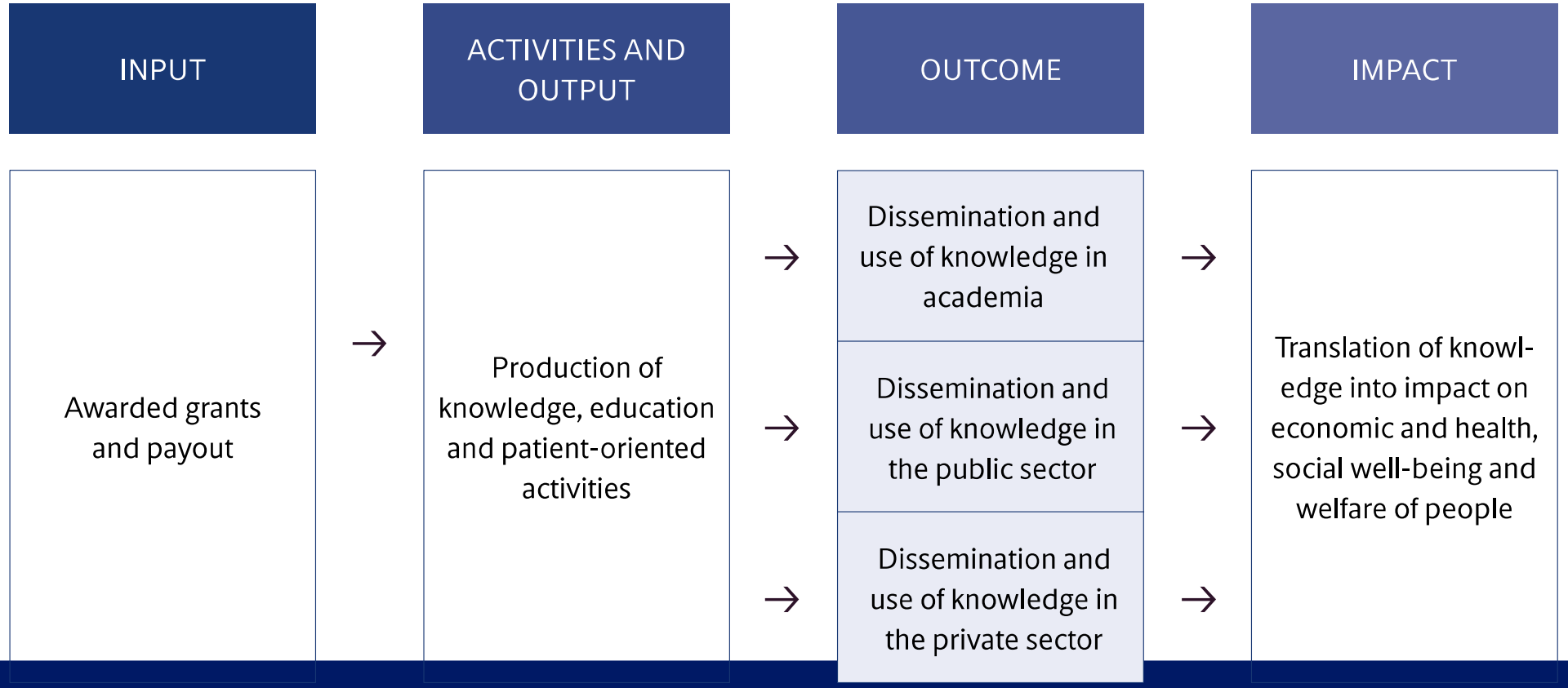
An international research, innovation and entrepreneurship initiative in Denmark

LIFE
Learn, inspire, fascinate, engage

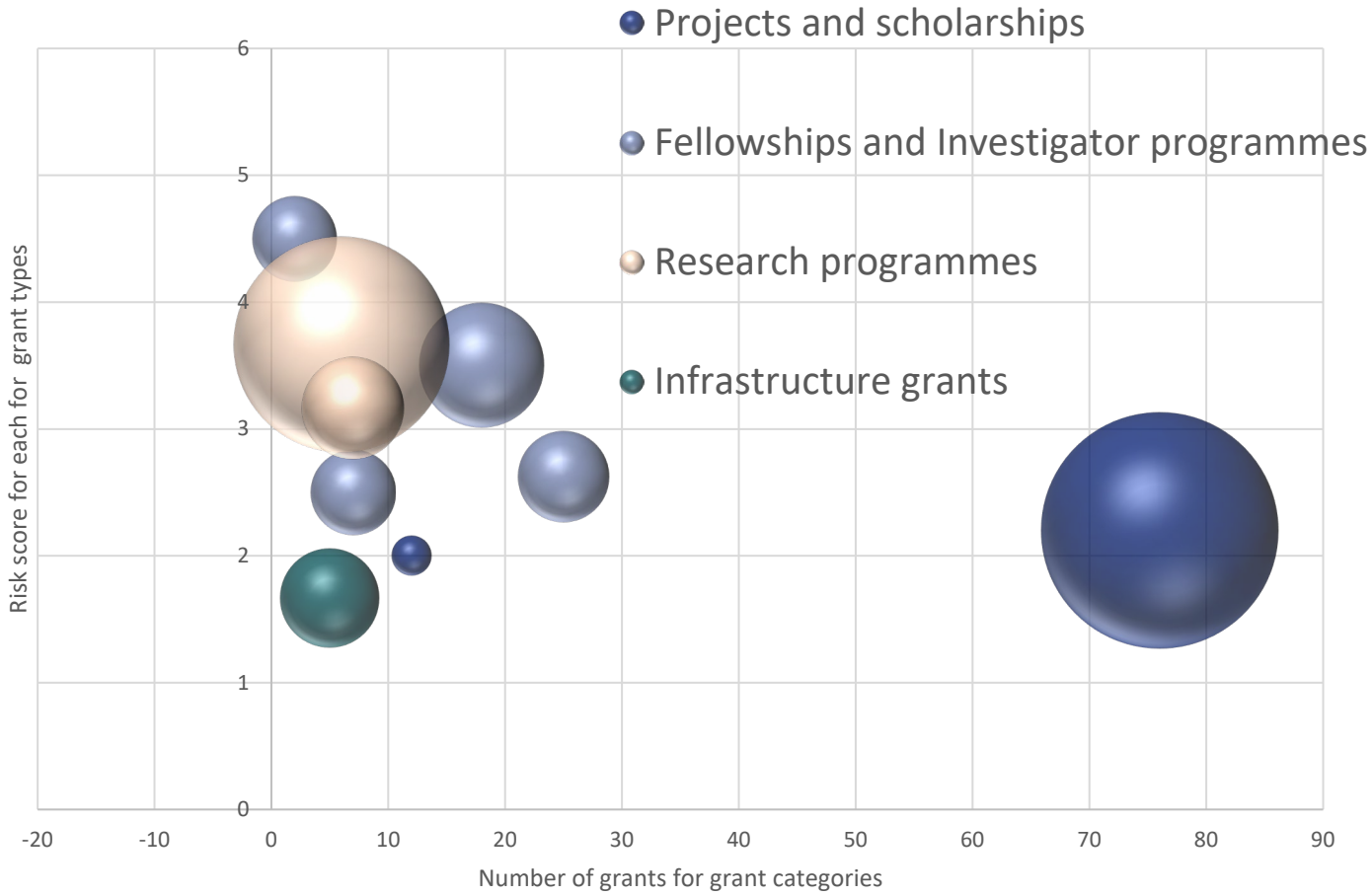
- Disseminate applied sciences to school children and teachers
- Spur the interest for natural sciences among children and adolescents
- Increase the number of applicants for educations within natural sciences
- Foster a world-class education system within natural science



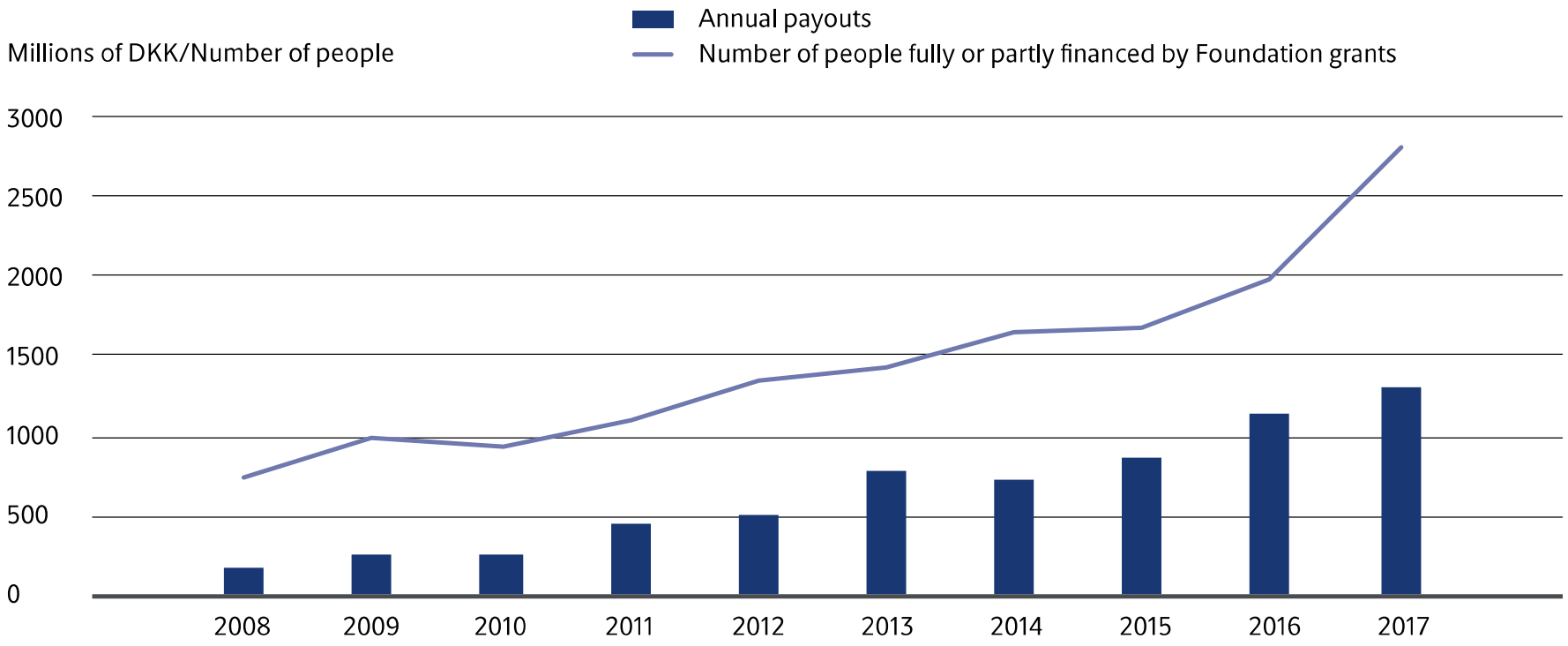
The model of impact



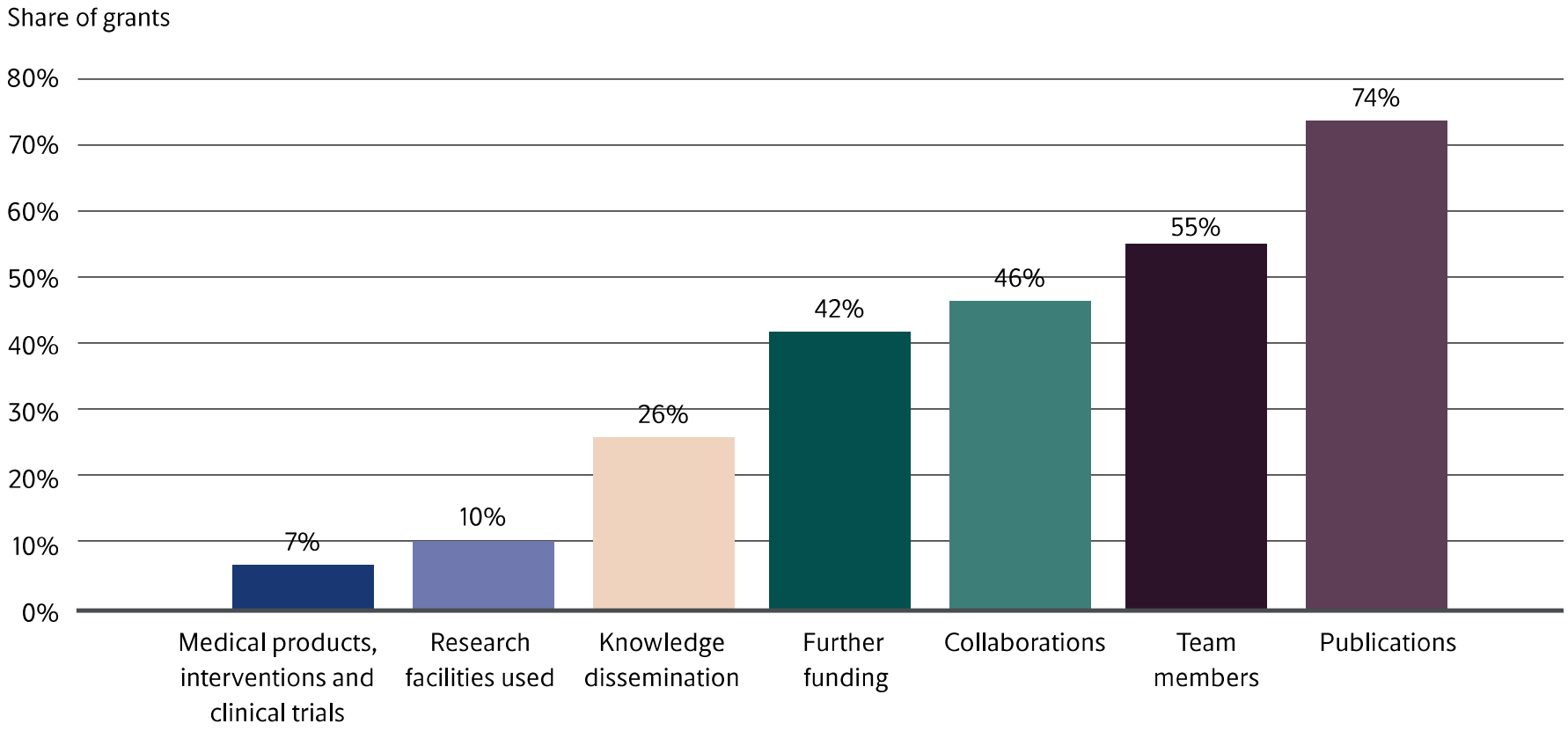
Risk versus input (grants and amount) in reserach grants awarded in Open Competion



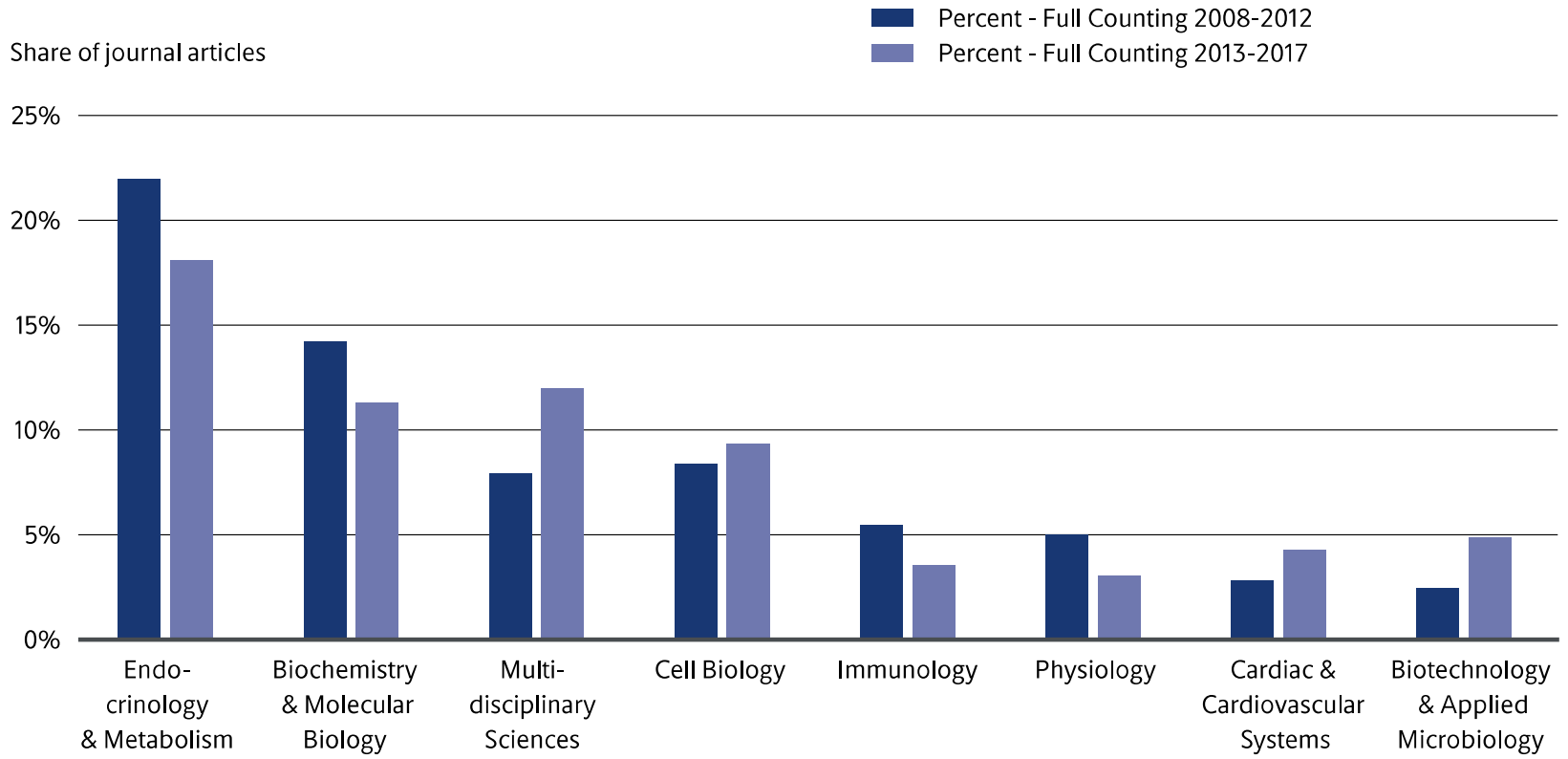
Input:
Payouts and people fully or partly financed by NNF



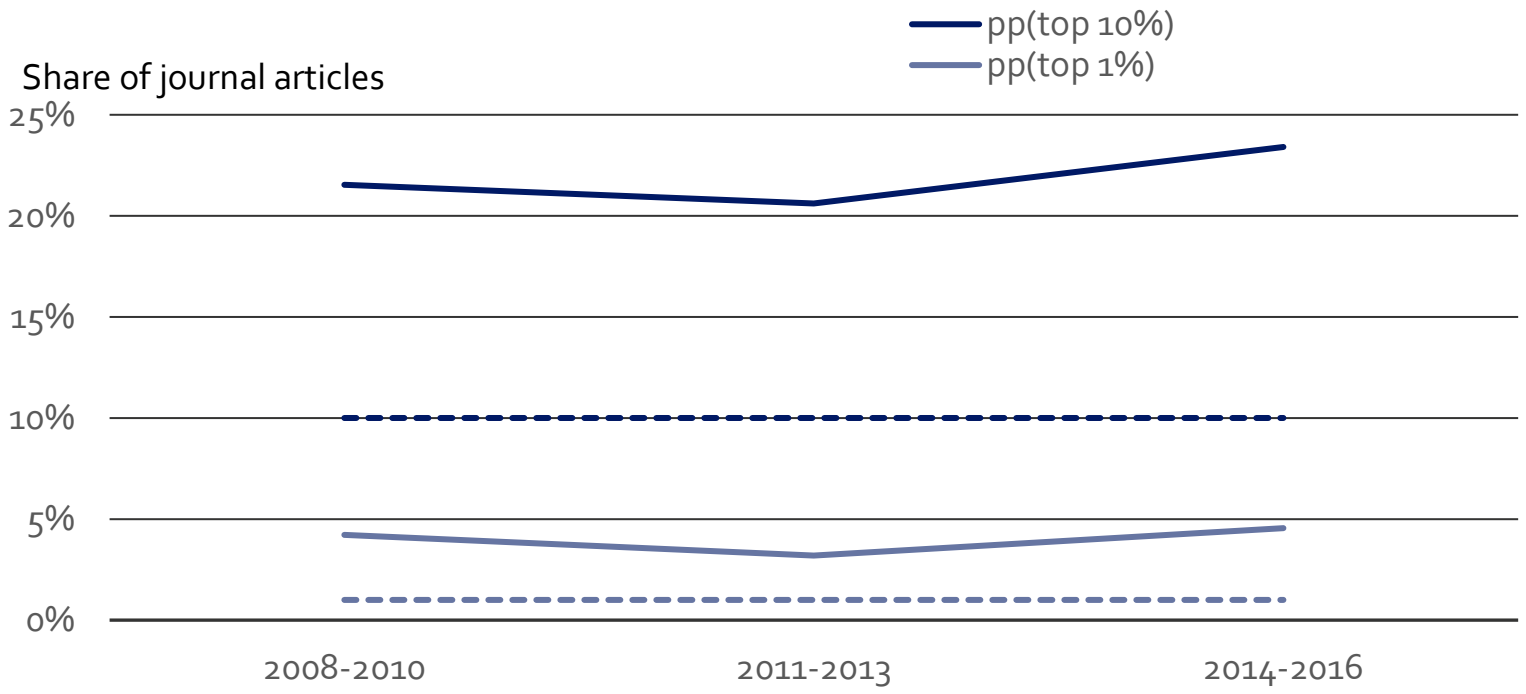
Activities and output:
628 completed grants reported in 2014-2016



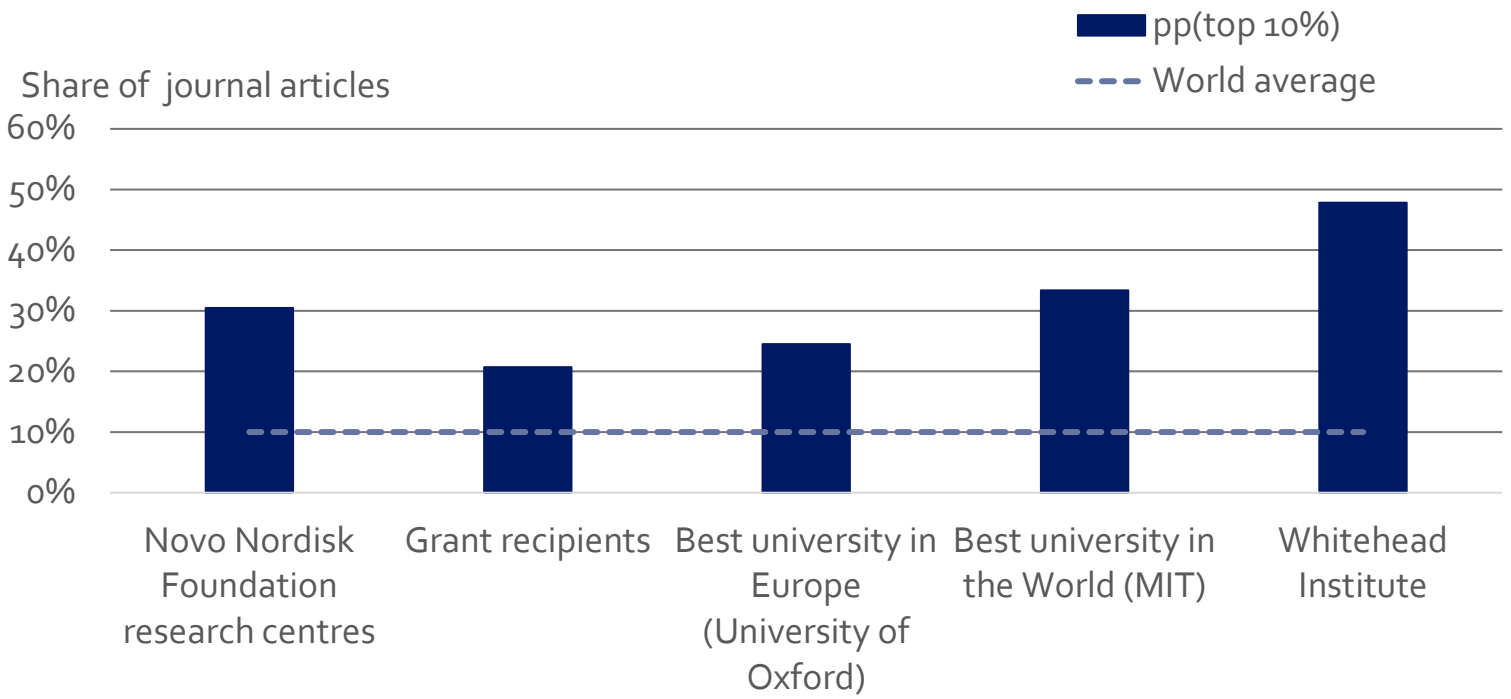
Distribution of journal articles in selected subject categories



Citation impact for NNF grant recipients, PP(top 1%) and PP(top 10%), all sciences

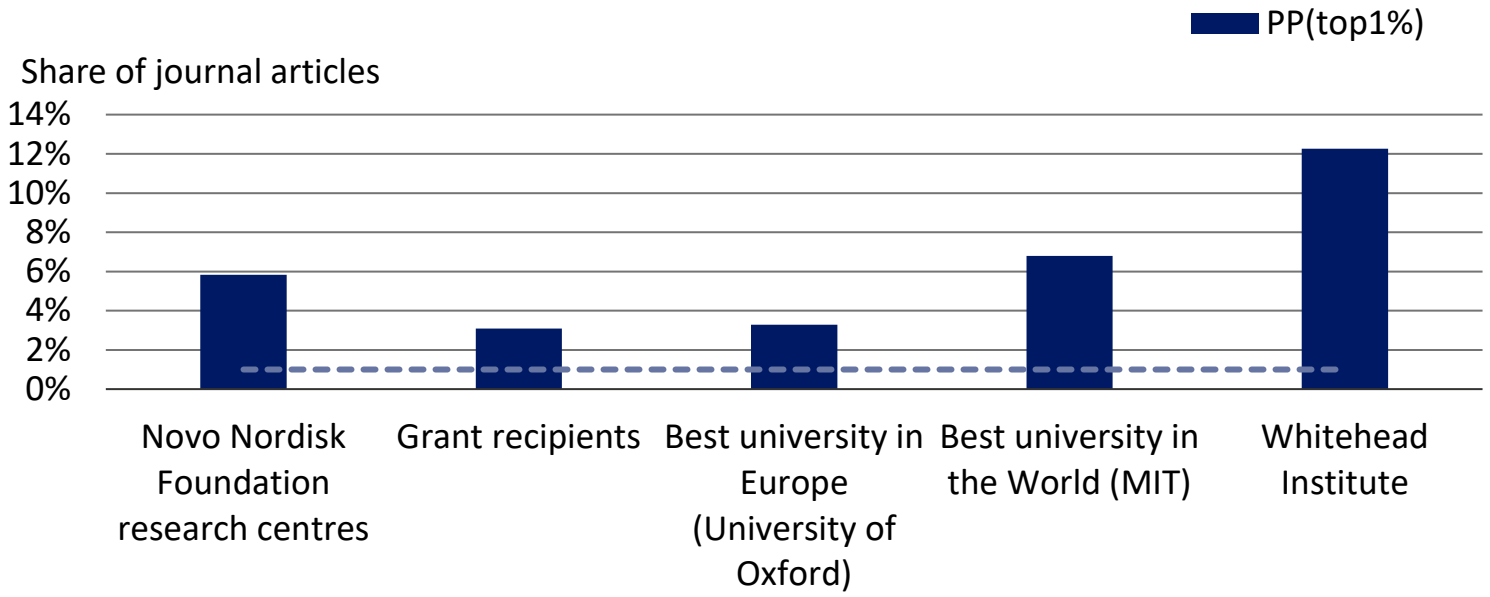


Citation impact for grant recipients – international benchmarking (biomedical research, 2014-2016), PP(top 10%)



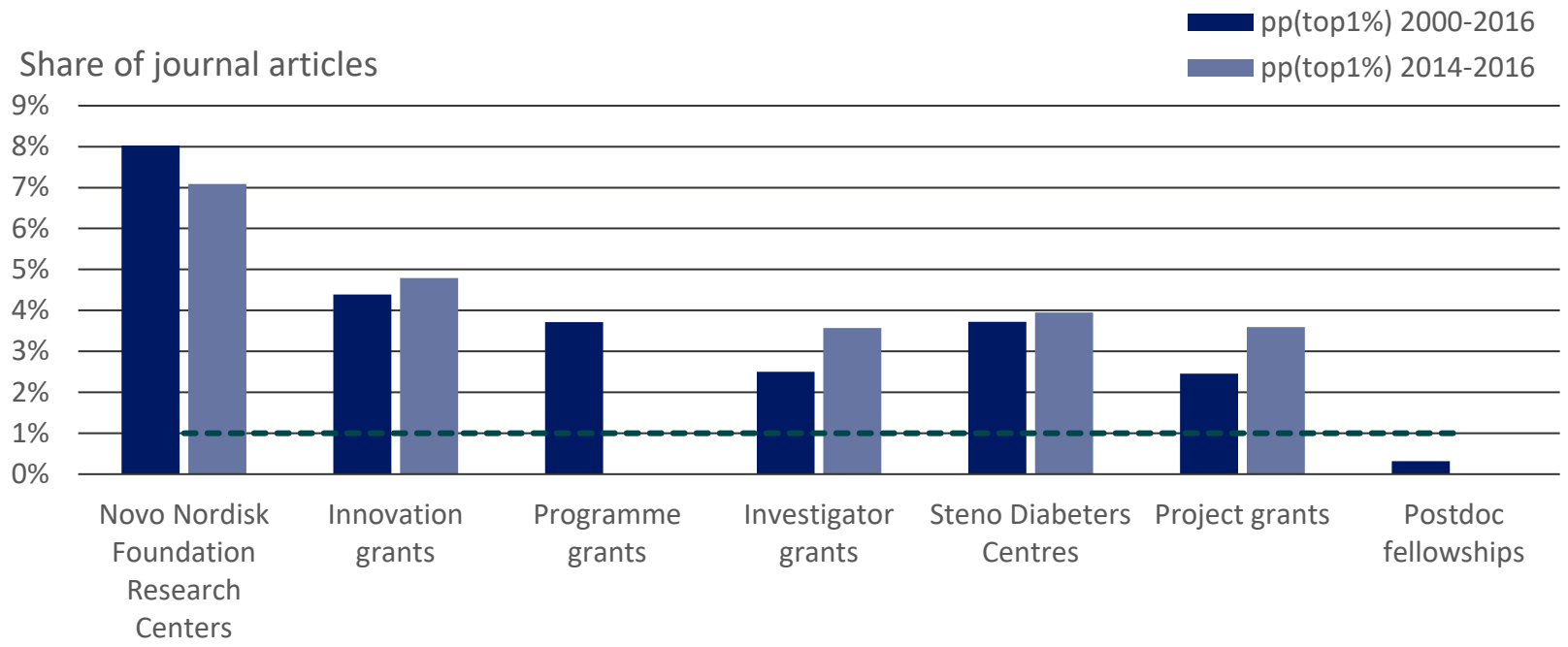
Sources: Novo Nordisk Foundation/researchfish* and Danish Centre for Studies in Research and Research Policy

Citation impact for grant recipients – international benchmarking (biomedical research, 2014-2016), PP(top 1%)



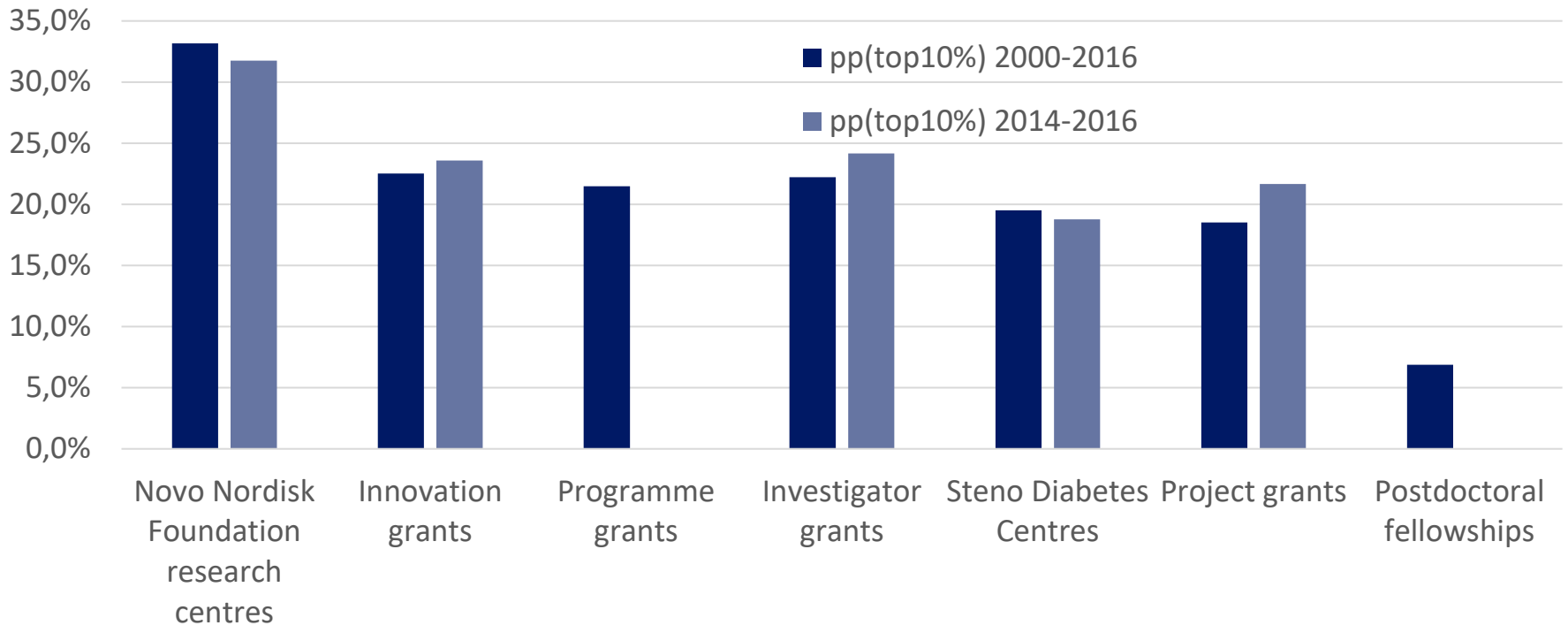
Sources: Novo Nordisk Foundation/Researchfish* and Danish Centre for Studies in research and Research Policy

Citation impact for grant recipients – grant type benchmarking, PP(top 1%)

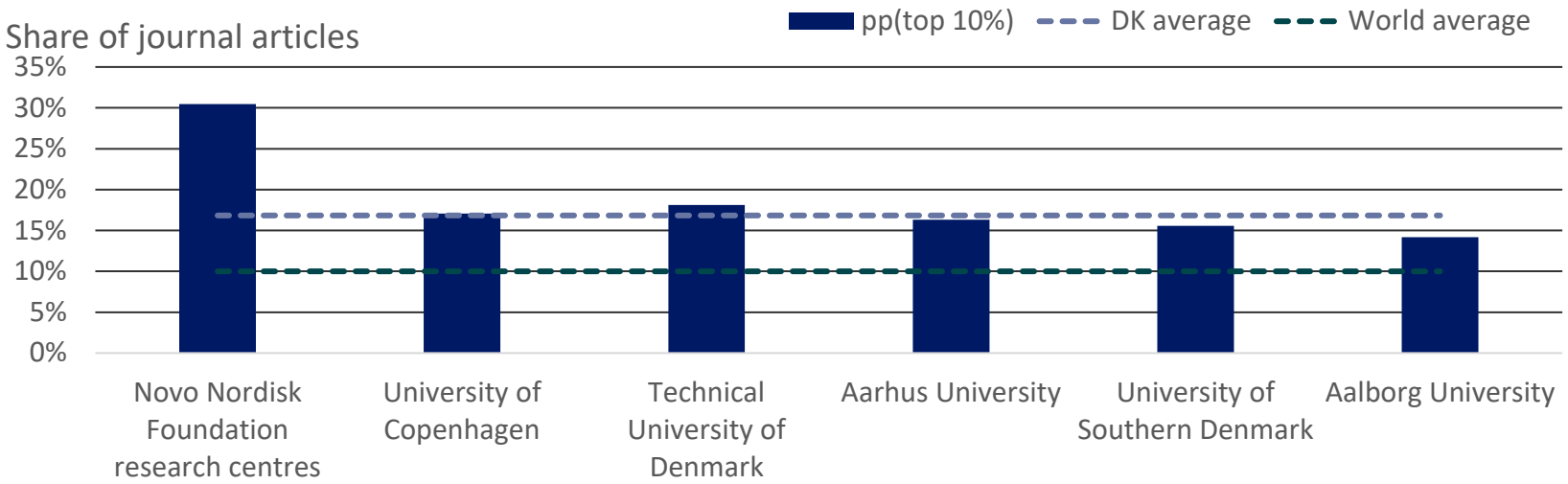


Note: Fpr specification of the grant types, please visit http://novonordiskfonden.dk/en/ansogning.
For some grant areas, there are too few publications in the period 2014-2016 to reliably calculate PP(top 10%)

Citation impact of journal articles by type of grant - PP(top 10%)



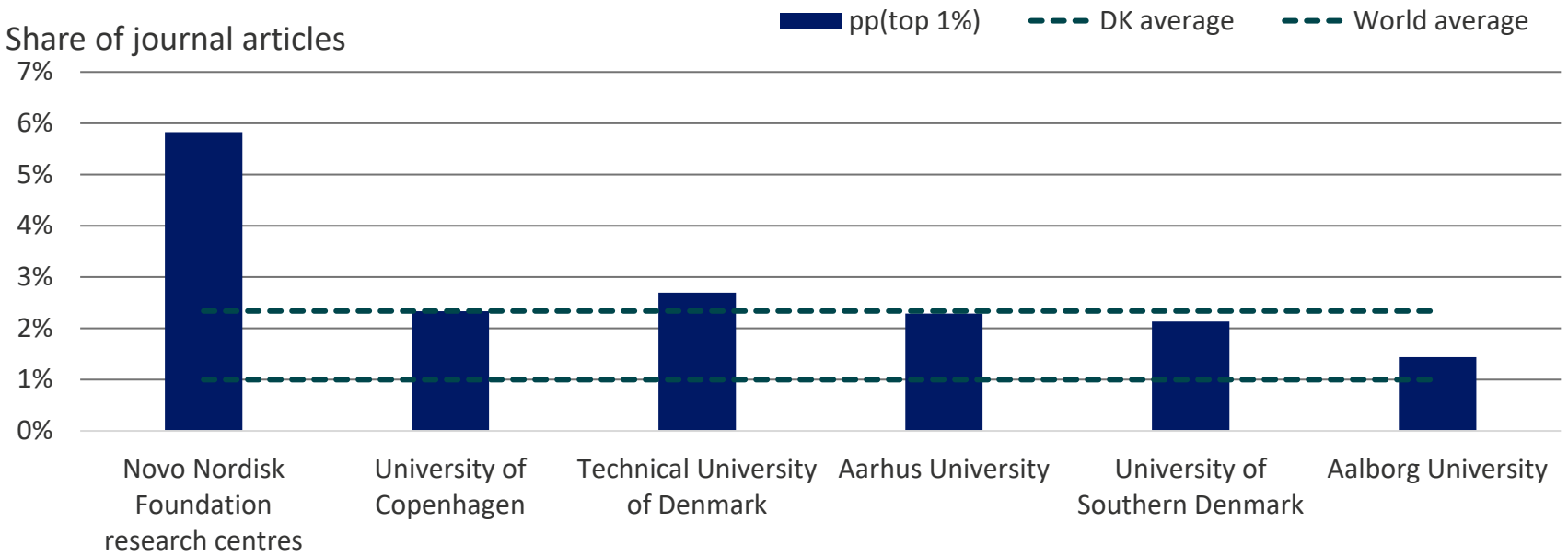
Citation impact of journal articles published in biomedical and health sciences by researchers affiliated with the Novo Nordisk Foundation research centres and universities in Denmark - PP(top 10%), 2014–2016



Note: All journal articles by the research centres are matched with journal articles within the biomedical and health sciences from the universities.

Sources: Novo Nordisk Foundation/researchfish* and Danish Centre for Studies in Research

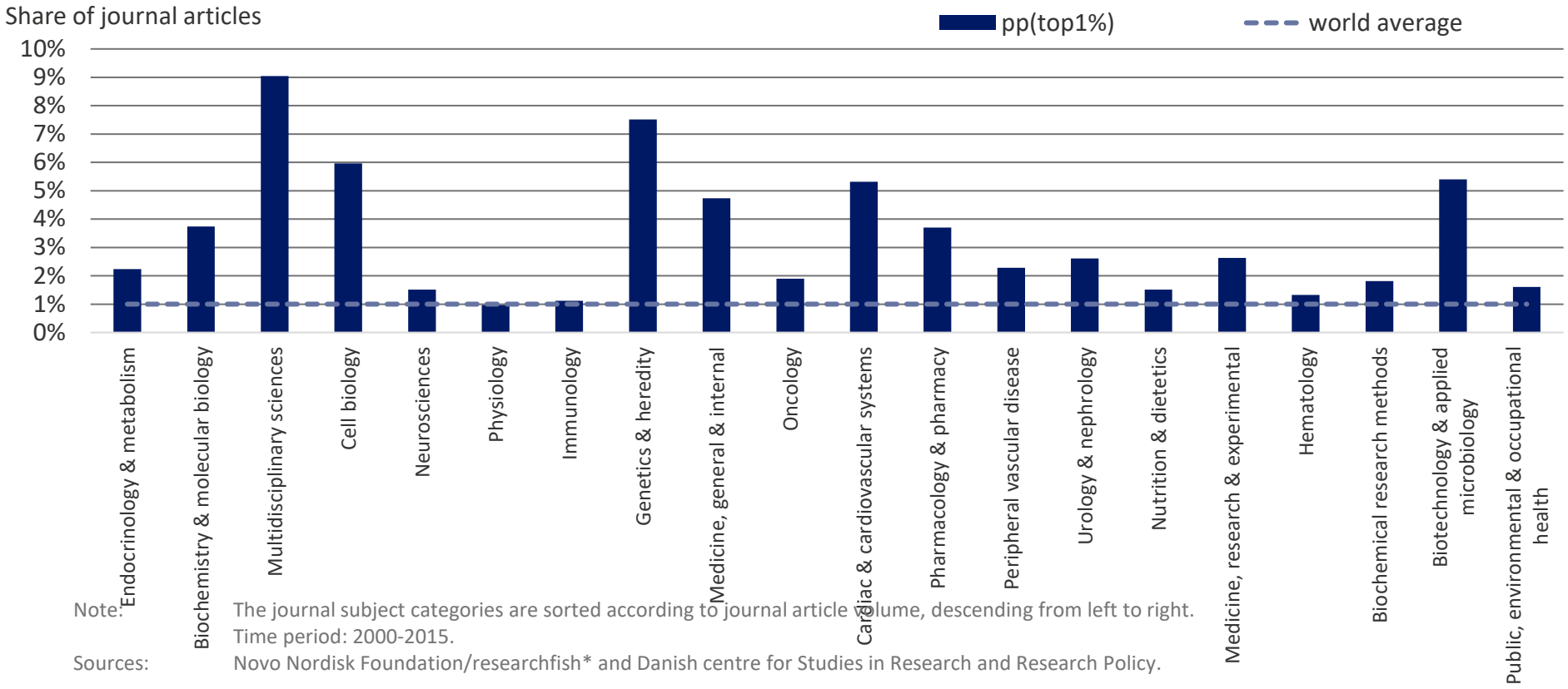
Citation impact of journal articles published in biomedical and health sciences by researchers affiliated with the Novo Nordisk Foundation research centres and universities in Denmark - PP(top 1%), 2014–2016



Note: All journal articles by the research centres are matched with journal articles within the biomedical and health sciences from the universities.

Sources: Novo Nordisk Foundation/researchfish* and Danish Centre for Studies in Research and Research Policy.

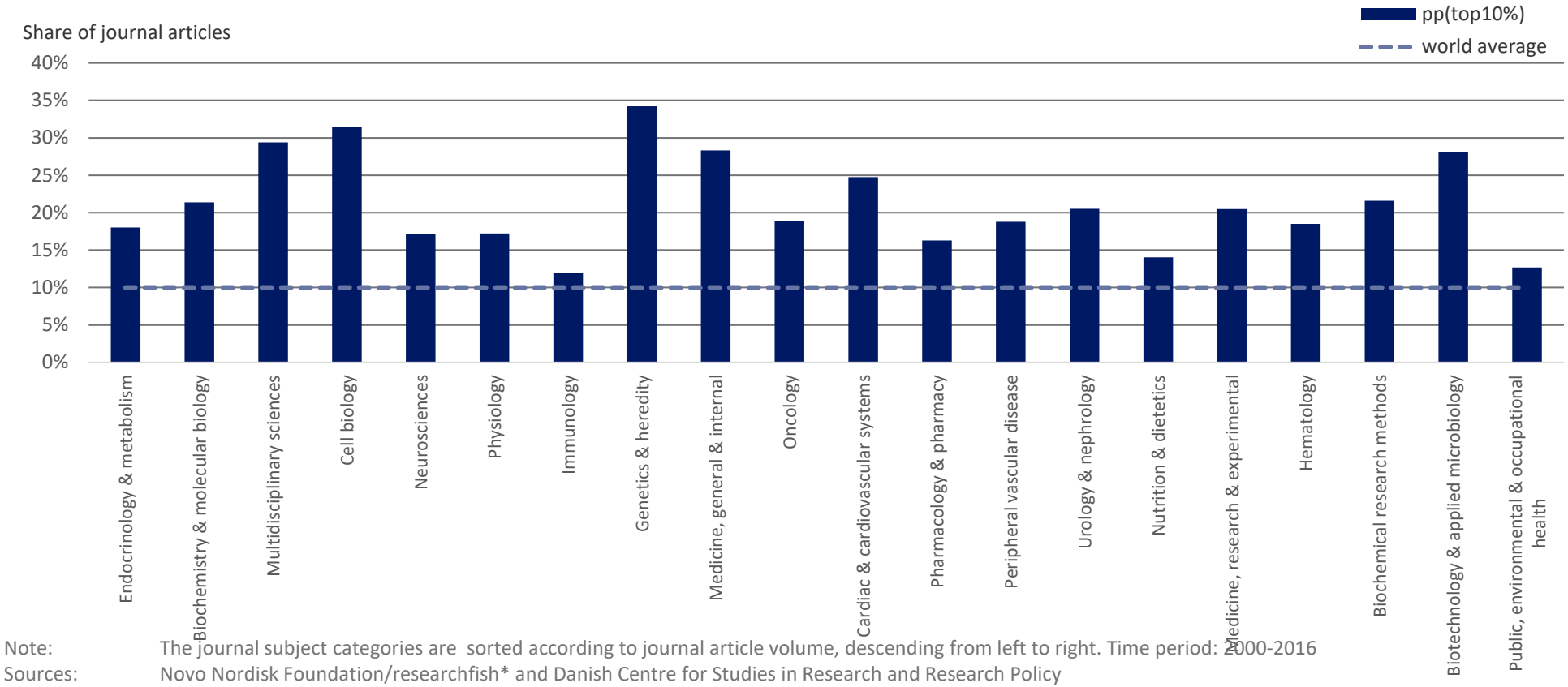
Citation impact of journal articles by journal subject category - PP(top 1%), 2000-2016



Note: The journal subject categories are sorted according to journal article volume, descending from left to right.
Time period: 2000-2015.

Sources: Novo Nordisk Foundation/researchfish* and Danish centre for Studies in Research and Research Policy.

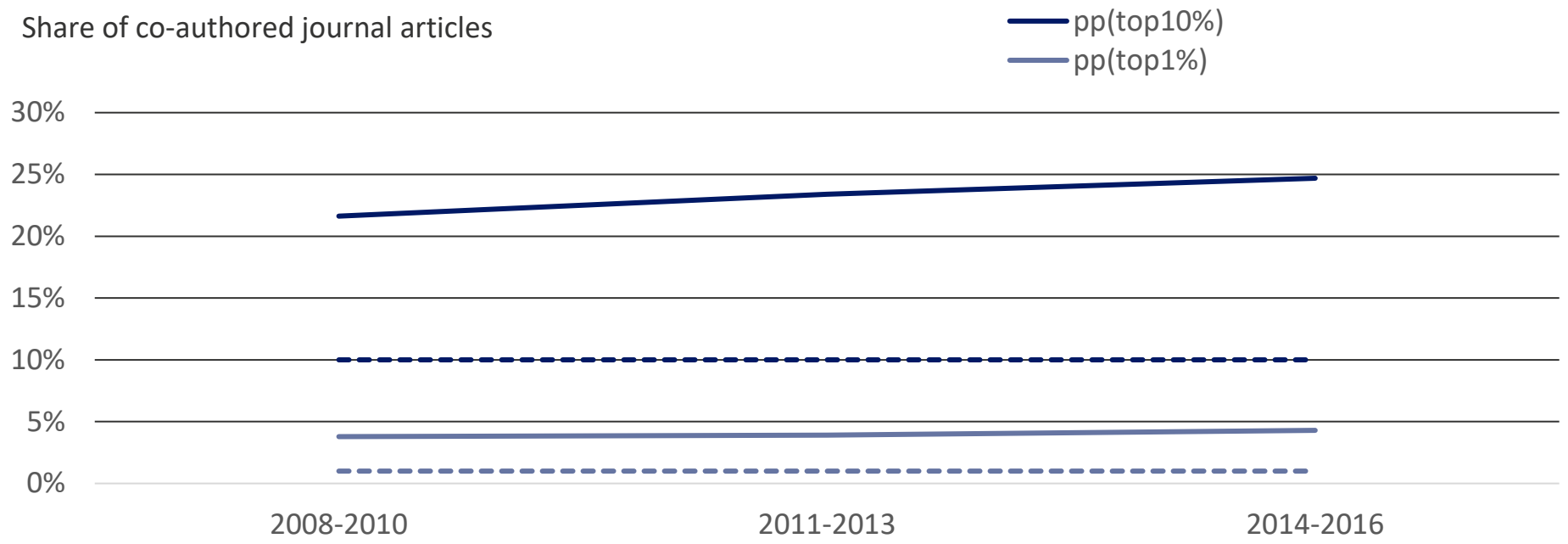
Citation impact of journal articles by journal subject category - PP(top 10%), 2000-2016



Note: The journal subject categories are sorted according to journal article volume, descending from left to right. Time period: 2000-2016

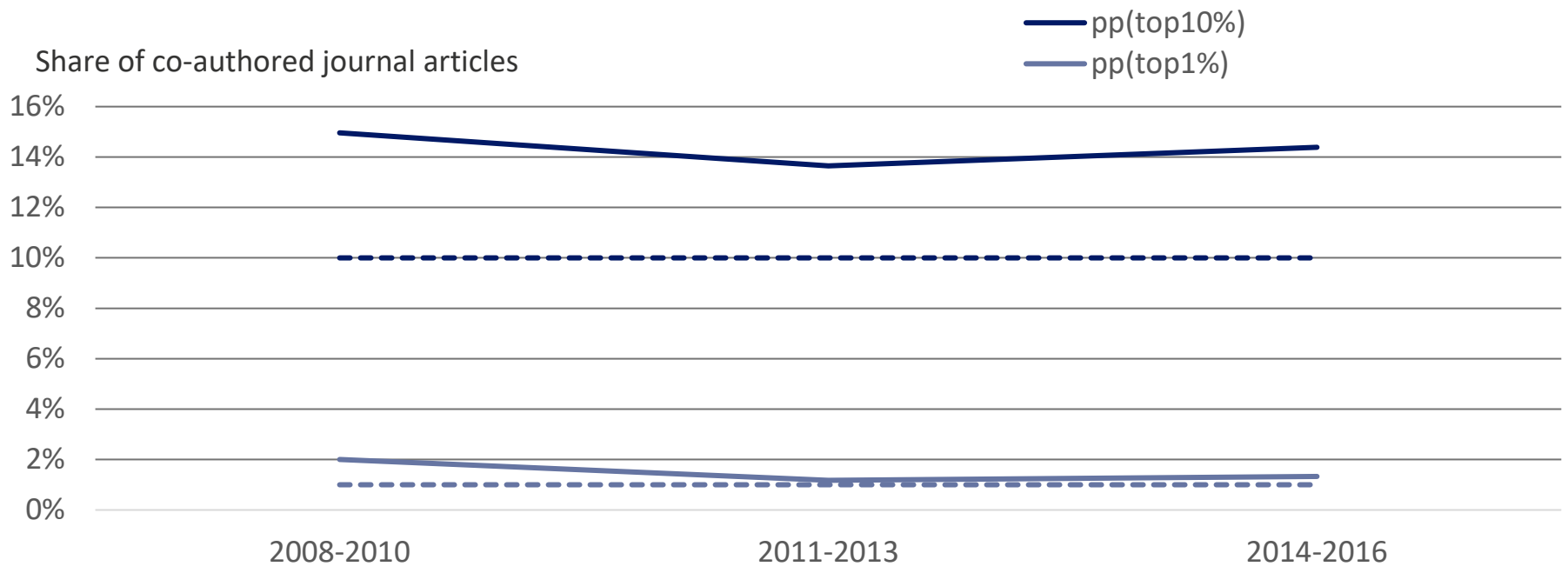
Sources: Novo Nordisk Foundation/researchfish* and Danish Centre for Studies in Research and Research Policy

Citation impact of internationally co-authored journal articles within academia with all sciences - PP(top 1%), PP(top 10%), 2008–2016



Sources: Novo Nordisk Foundation/researchfish* and Danish Centre for Studies in Research and Research Policy.

Citation impact of nationally co-authored journal articles within academia with all sciences - PP(top 1%), PP(top 10%), 2008–2016



Sources: Novo Nordisk Foundation/researchfish* and Danish Centre for Studies in Research and Research Policy

Tracking public research dissemination into the public health sector

Public research activity

Research activity conducted by the recipients of Foundation grants and published in journals. Grant recipients have published 14,429 journal articles since 2000.

Clinical guidelines

53% of the diabetes guidelines and 18% of the cardiovascular disease guidelines in Denmark and elsewhere reference journal articles by recipients of Foundation grants.

General practitioners

General practitioners continuously update their knowledge from multiple sources.

79% of general practitioners acquire knowledge about the treatment of diabetes and cardiovascular diseases from clinical guidelines; 65% acquire knowledge from journals, and 28% from journal articles.

Patients

74% of the general practitioners say that clinical guidelines have resulted in more uniform treatment of their patients.

23% of the general practitioners say that using clinical guidelines has improved the health of their patients, and 33% say that using guidelines has made treatment more effective.

Tracking public research dissemination into the private sector

Public research activity

Public research funded by the Foundation.

Collaboration

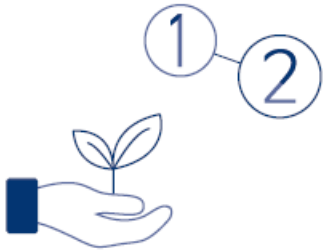
In 2017, recipients of Foundation grants collaborated with 266 companies in 351 collaborations; 26% of the companies were Danish.

Journal articles

Grant recipients publish their research in scientific journals.

Industrial researchers co-authored 11% of Foundation-funded journal articles.

Patent activities and citings

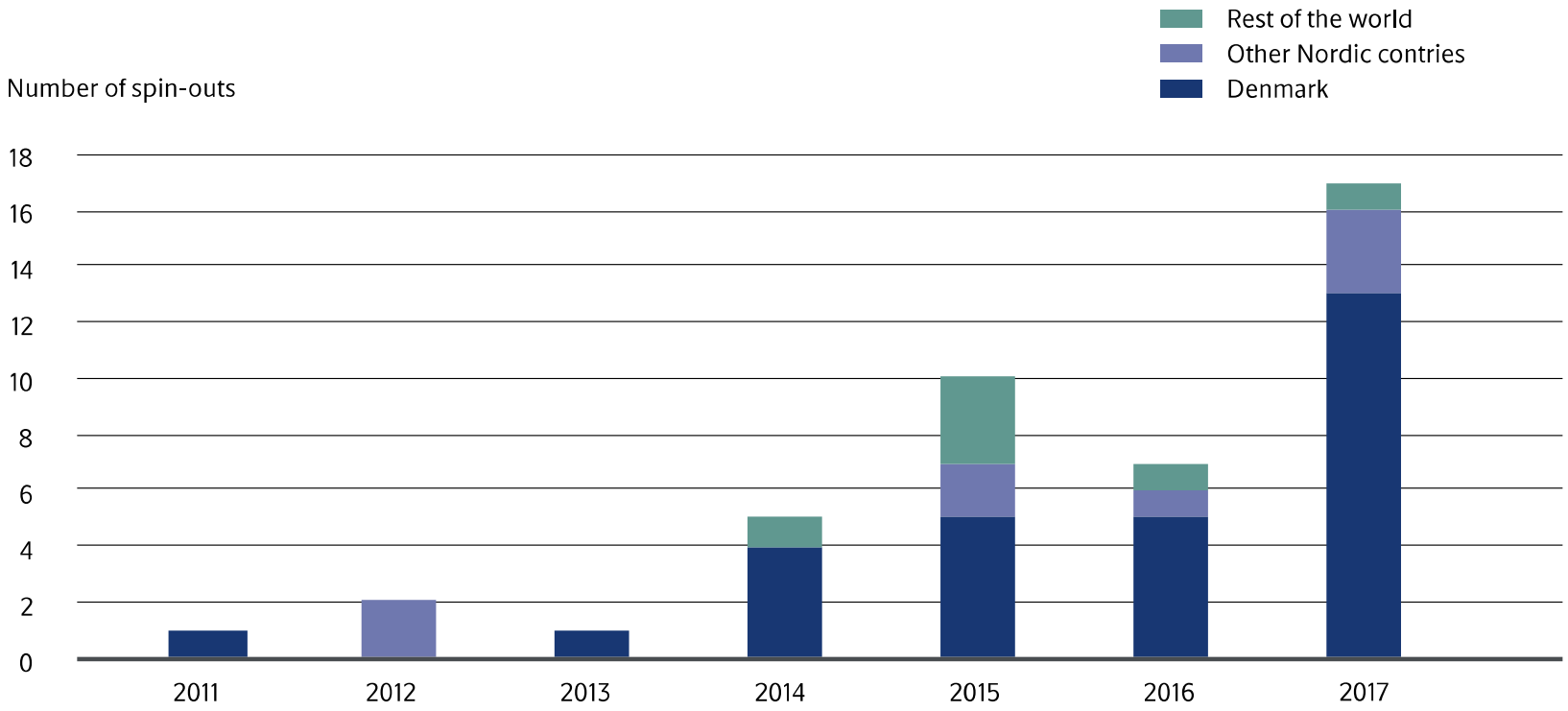


1 of 16 funded journal articles cited in patent applications and patents.

2600 citings of funded journal articles in more than 2100 patent applications and patents.

Recipients of Foundation grants reported 115 patent applications and 13 patents between 2013 and 2017.

Commercialisation outcome: 43 spin-outs

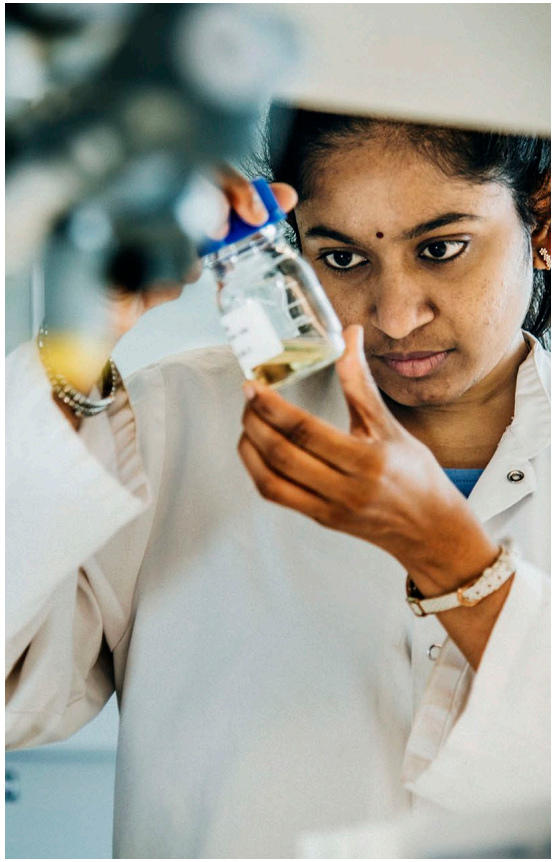


Biomedical and health science research and applications

Biomedical and health science research is central to the Foundation's heritage and identity, especially within physiology, metabolism and endocrinology. The Foundation already has a strong track record in this area, supporting world-class basic research in biomedicine that paves the way for advances in translational medicine and innovative clinical applications. In the future the Foundation will expand its activities and impact beyond physiology, metabolism and endocrinology.

Activities:

- basic biomedical research;
- translational biomedical research and technologies;
- clinical research;
- health-related data science;
- research in patient-centred healthcare and treatment systems; and
- training programmes and methods related to biomedical and health science research.



Life science research and industrial applications promoting sustainability

Given the escalating global sustainability challenges and potential for research to make a positive impact in reducing environmental footprint, the Foundation will increase its focus on life science research and industrial applications promoting sustainability.

The Foundation's activities will focus on:

- industrial biotechnology;
- plant and food biotechnology;
- environmental biotechnology;
- basic research and platforms and technologies supporting research on sustainability; and
- training programmes and methods related to life science research and industrial applications promoting research on sustainability.

Natural and technical science research and interdisciplinarity

Given the important role of research in the natural and technical sciences and how it contributes to advances in biomedicine and biotechnology, the Foundation will increase its focus on natural and technical science research and interdisciplinarity in the 2019–2023 strategy.

Since interdisciplinary scientific research plays an increasingly important part in driving new discoveries, the Foundation can advance its mission by supporting a strong interdisciplinary research basis in Denmark.

Activities:

- basic natural and technical science research with potential interdisciplinary application to biomedicine, health sciences or biotechnology;
- selected other research fields that are potentially relevant to biomedicine, health sciences or biotechnology; and
- training programmes and methods related to natural and technical science research and interdisciplinarity.