

Report on research collaborations in the Nordic countries

Impact

Executive summary

Novo Nordisk Foundation



Between 2018 and 2022, the Novo Nordisk Foundation (NNF) financed 372 project with main applicants from Sweden, Norway or Finland. The total funding allocated to these projects is EUR 149 million.



Between 2018 and 2022, NNF financed 28 projects with co-applicants from Sweden, Norway and Finland collaborating with Danish main applicants. The total funding allocated to these projects is EUR 44 million.



In 2022 NNF funded 16 senior researchers and 283 young researchers, PhDs and Postdocs, in projects involving main applicants from Sweden, Norway and Finland.

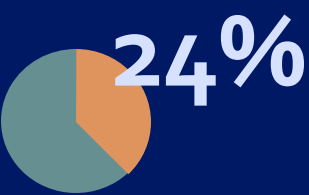
Grant recipients

210

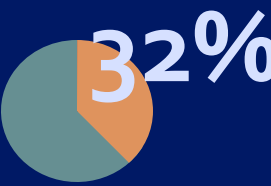
Between 2018 and 2022, Nordic NNF grant recipients collaborated with 210 international companies. 75 are in the biotechnology sector, and 76 have less than 50 employees.

63

Between 2018 and 2022, Danish NNF grant recipients collaborated with 63 Nordic companies. 21 are in the biotechnology sector, and 29 have less than 50 employees.



Between 2018 and 2022, Nordic NNF grant recipients have co-authored 2059 publications with international researchers. 24% of the publications are among the top 10% most cited in their field.



Between 2018 and 2022, Danish NNF grant recipients have co-authored 2399 publications with Nordic researchers. 33% of the publications are among the top 10% most cited in their field.

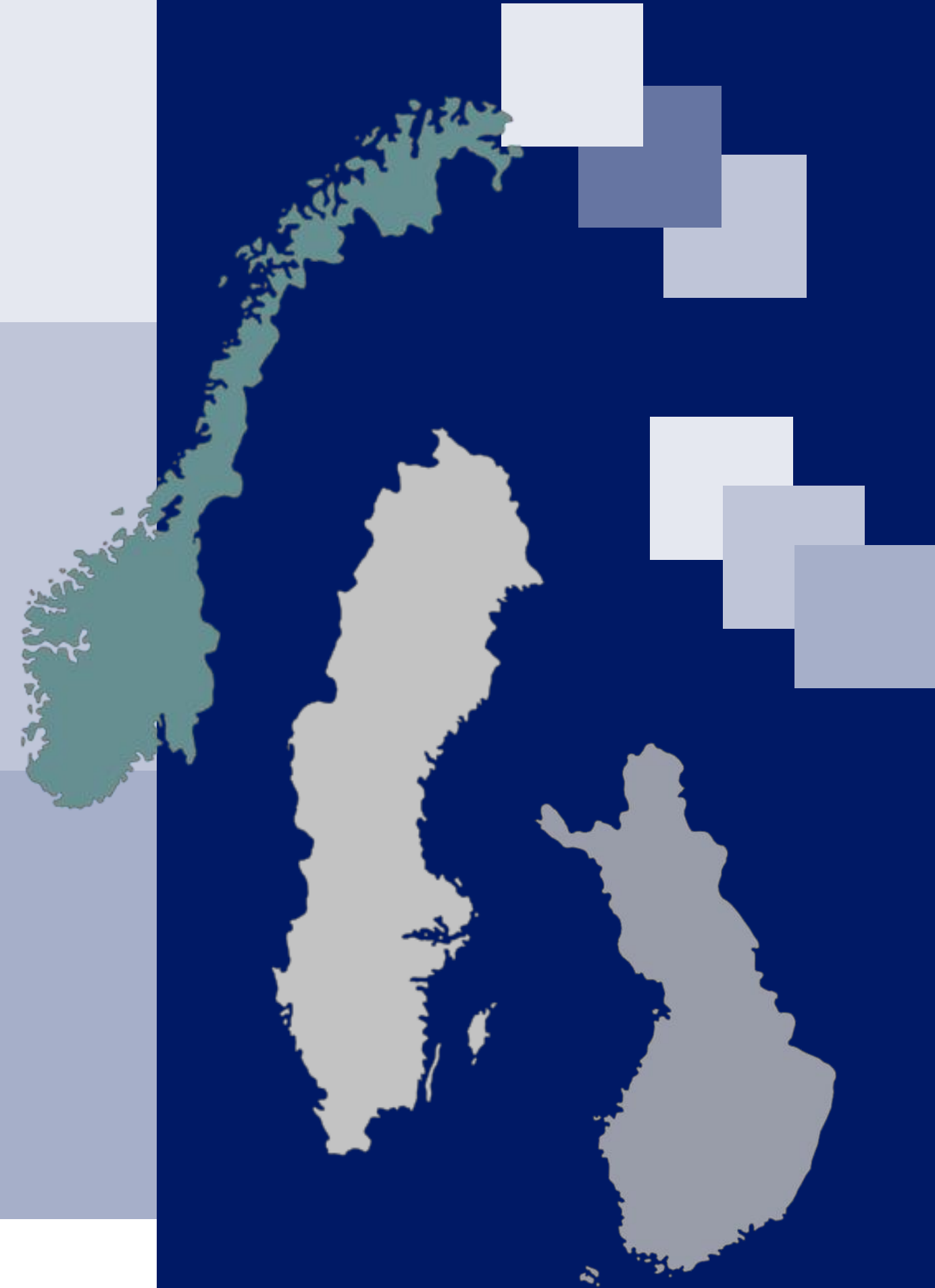
Introduction

This report is presented in two parts;

- Nordic NNF grant recipients' collaboration with international partners
- Danish grant recipients' collaboration with Nordic partners

This report showcases NNF's contribution to the Nordic academic community and industry.

Through figures and case studies, it demonstrates the different kinds of relationships and activities between NNF grant recipients and Nordic partners. Data in the presentation are based on activities between 2018 and 2022 (inclusive).



Novo Nordisk Foundation



The history of the Novo Nordisk Foundation



The Novo Nordisk Foundation dates back to 1922, when Nobel laureate August Krogh returned home from the United States and Canada with permission to produce insulin in the Nordic countries. This marked the beginning of the development of world-class diabetes medicine in Denmark and the establishment of several foundations that, many years later, merged into today's Novo Nordisk Foundation.

1952 – the **Novo Foundation** was established as the owner of the Novo Terapeutisk Laboratorium.

1989 – the Novo Foundation and the Nordisk Insulin Foundation were merged into **Novo Nordisk Foundation** as part of the merger between the two firms Novo Terapeutisk Laboratorium and Nordisk Insulinlaboratorium in Novo Nordisk A/S.

In 2022 the **Novo Nordisk Foundation** awarded 695 grants with a total amount of EUR 1.0 billion.

For more information, please see the [Impact Report 2022](#)

1922 – the **Nordisk Insulin Foundation** was established as the owner of the Nordisk Insulinlaboratorium. The founders agreed that the profit from the sale of diabetes medicine should be used for scientific and humanitarian purposes.

The Novo Nordisk Foundation is an independent Danish enterprise foundation



Facts about the Novo Nordisk Foundation

1

The world's
largest
measured in assets:

EUR 84 billion

3

The world's
third largest
measured in grants

2022 in numbers

Awarded DKK

7.5 billion

EUR 1.0 billion

Paid out DKK

5.2 billion

EUR 693 million

695

Grants awarded

3,070

Applications
received

18%

Success rate for
research applications
in open calls

Investment result 2022

3.1 DKK billion

EUR 413 million

Our vision to improve people’s health and the sustainability of society and the planet is pursued through a three-pronged mission

Improving the lives of people by progress research and innovation in prevention and treatment of cardiometabolic and infectious diseases



Theme 1: Preventing cardiometabolic disease



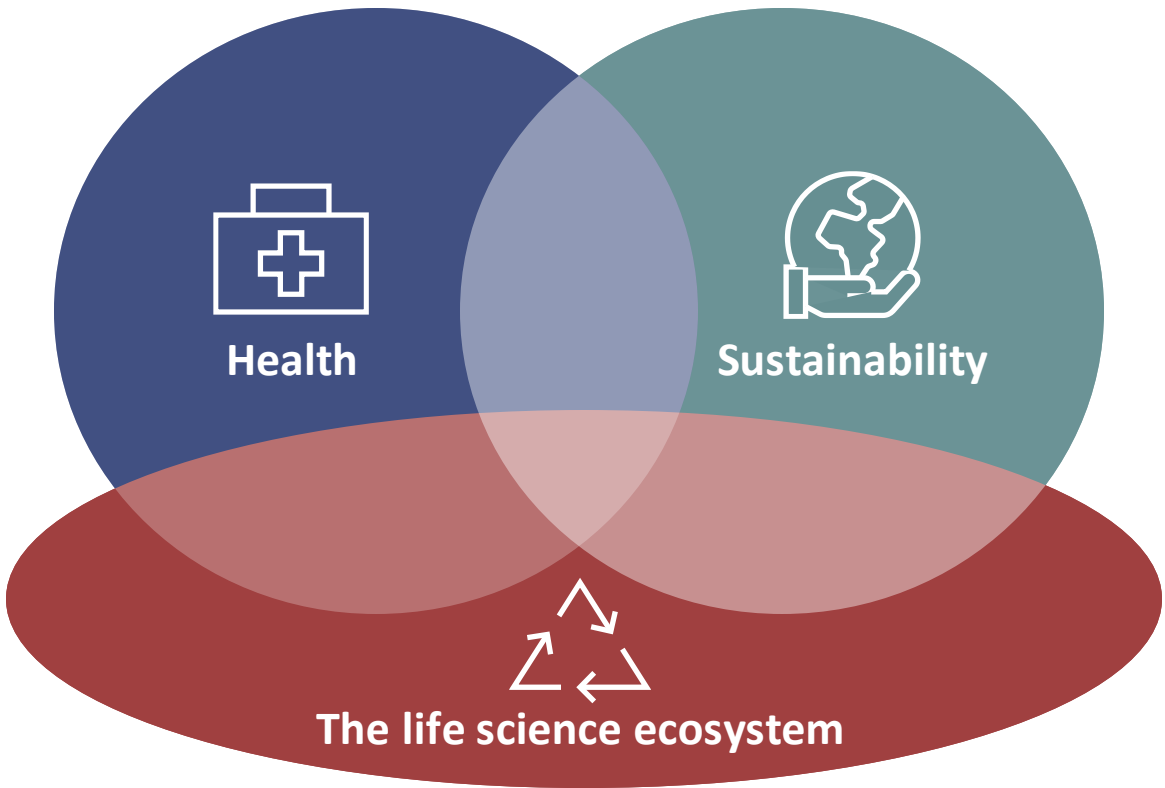
Theme 2: Understanding and managing cardiometabolic disease



Theme 3: Fighting inequity in health



Theme 4: Strengthening epidemic preparedness



Improving the sustainability of society by advance knowledge and solutions to support the green transition in society



Theme 1: Sustainable and high-yield agriculture



Theme 2: Sustainable food for healthy diets



Theme 3: High-impact climate change mitigation technologies



Theme 4: Supporting society in the green transition

Invest in scientific research, education and innovation to enable a world class life science ecosystem



Theme 1: Fundamental research



Theme 2: Enabling research infrastructures and technologies



Theme 3: Translational capacity and societal impact



Theme 4: Education and science capital

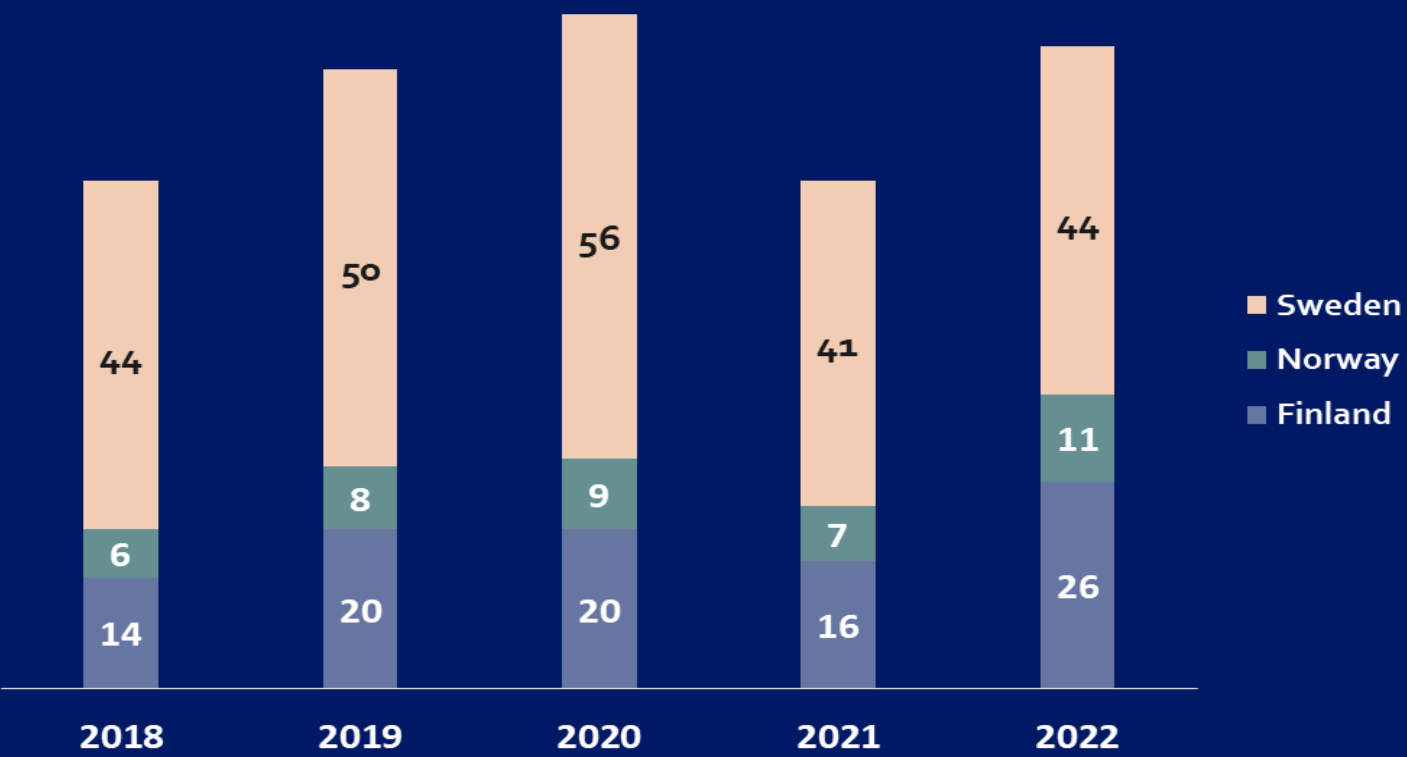


International academic
and industry
collaborations involving
NNF grant recipients
from the Nordic
countries 2018-2022

Centre of gravity

The centre of gravity for NNF is Denmark, followed by the Nordic countries of Finland, Norway, and Sweden. The Foundation awards grants to both Danish and Nordic researchers and to collaborations between researchers in the Nordic countries.

Between 2018 and 2022, the foundation has awarded **372** grants to main applicants in Norway, Sweden and Finland, **8** of these being collaborative projects with Danish partners.



372 projects funded by NNF include Nordic researchers as main applicants

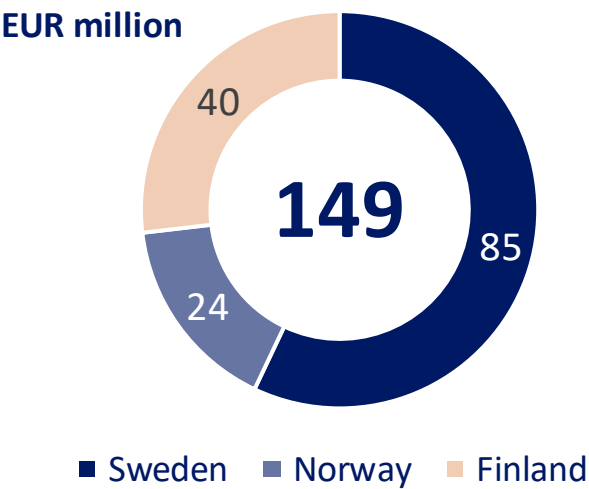
The Novo Nordisk Foundation has in the last five years (2018-2022) funded 372 project with main applicants from Sweden, Norway and Finland. The total funding allocated to these projects is EUR 149 million.

The funded projects span programme areas including Biomedicine, Biotechnology, Innovation and Social & Humanitarian. 337 projects were awarded in open competition, while 35 were awarded as standalone grants.



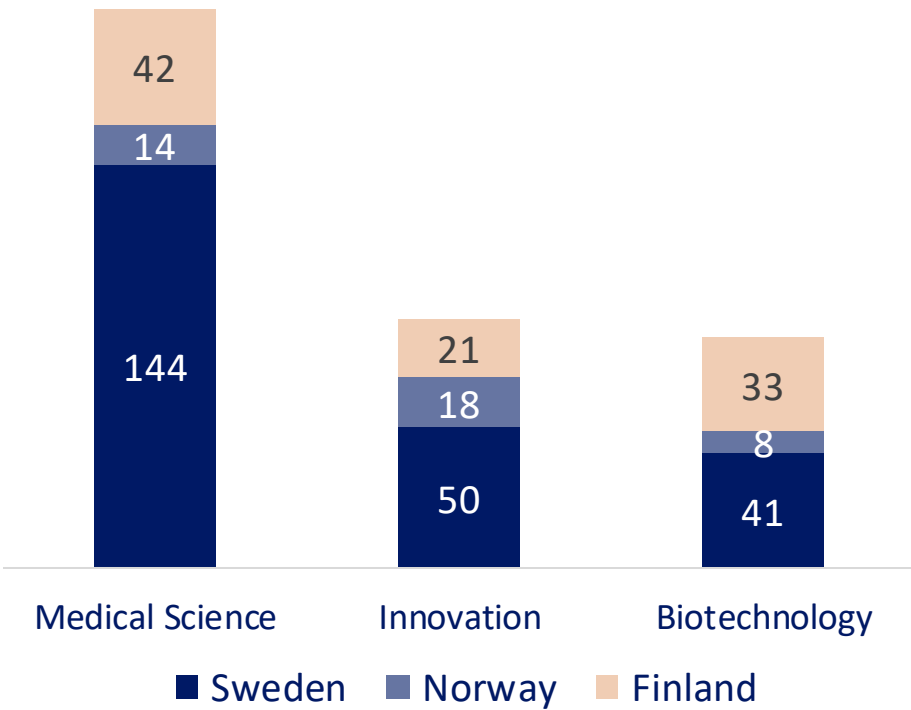
NNF fund Nordic main applicants

Total funding allocated to projects with Nordic main applicants.

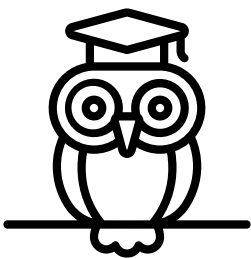


Nordic NNF grants span several programme areas

Number of NNF grants with Nordic main applicants.



Institutional affiliation of Nordic main applicants awarded a NNF grant



The **372** grants amounting to EUR **149** million are distributed between **39** different institutions in the Nordic countries, comprising universities, university hospitals, foundations and research organizations.



Karolinska Institute has received EUR **31** million in funding for a total of **79** projects.



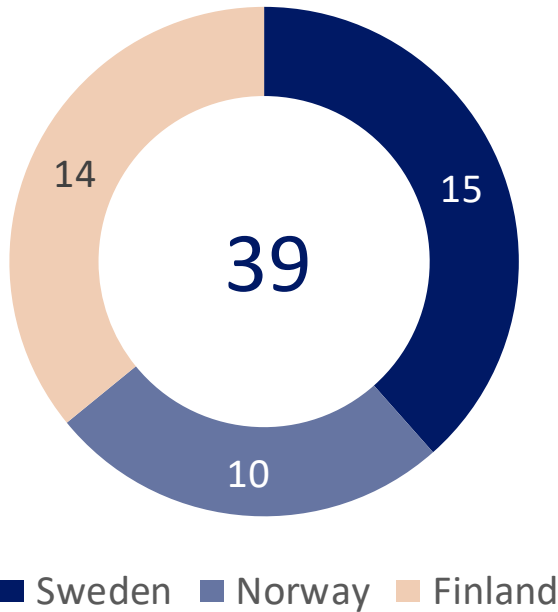
University of Bergen has received EUR **6** million in funding for a total of **11** projects.



University of Helsinki has received EUR **16** million in funding for a total of **28** projects.

NNF grants reach universities, university hospitals, foundations and research organizations

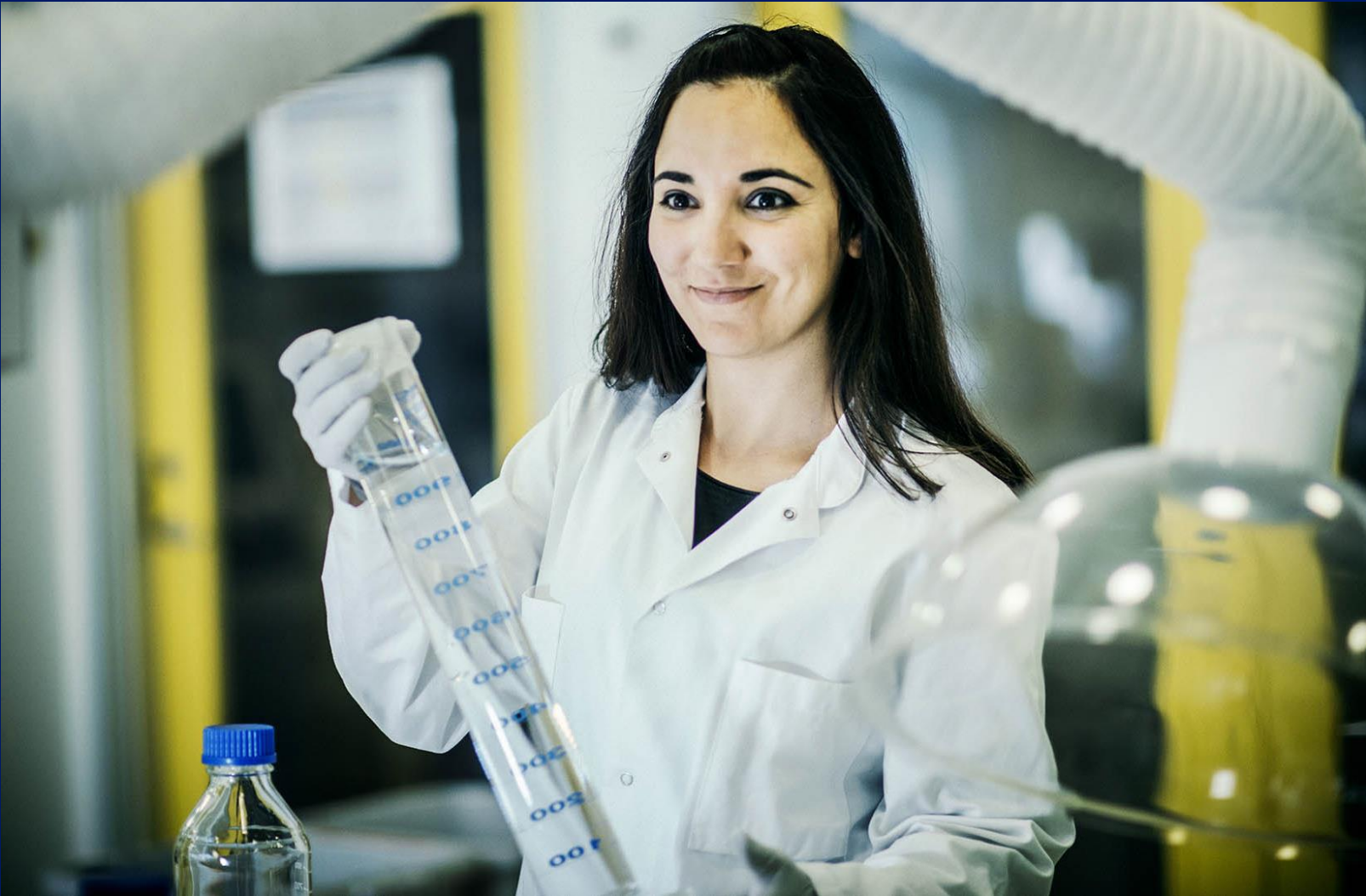
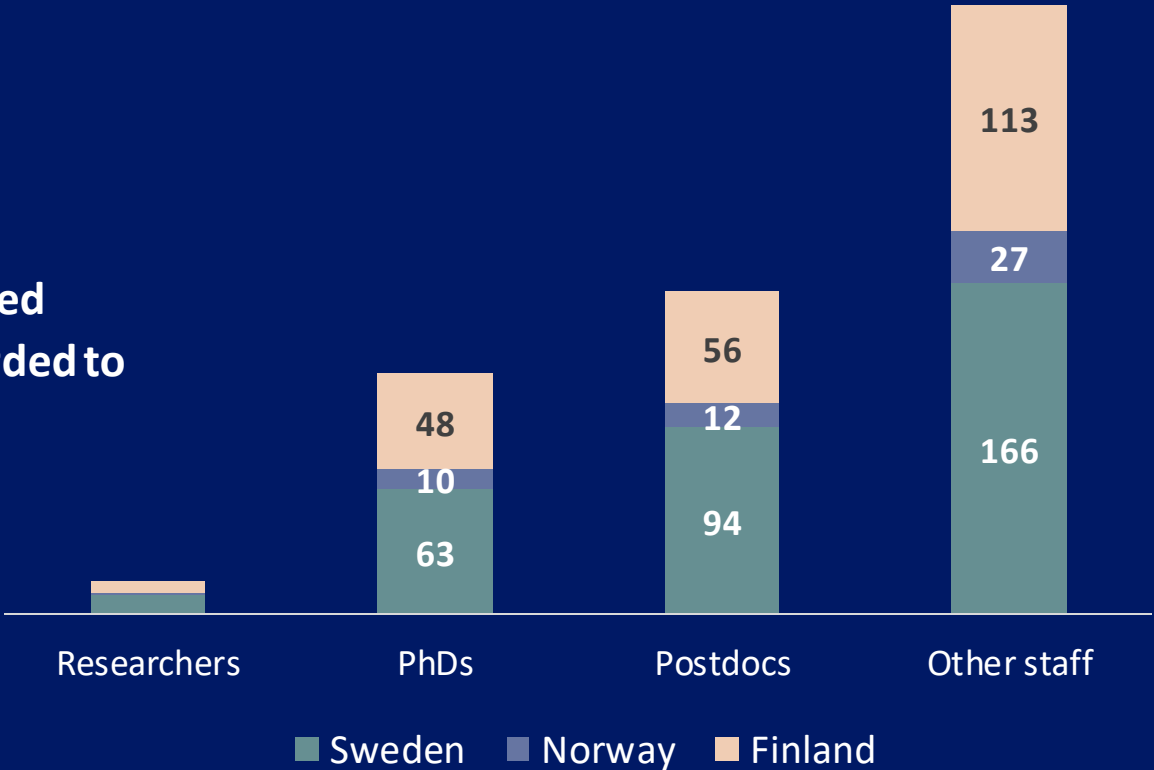
Number of institutions of Nordic main applicants awarded a NNF grant



Fostering the development of research talent at all levels

In 2022 the Novo Nordisk Foundation supported 16 researchers, 121 PhDs, 162 Postdocs and 306 other staff at Nordic based research institutions through projects awarded to Nordic main applicants.

Number of people supported through NNF projects awarded to Nordic main applicants.



Since 2014, **203** young Nordic researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences for young research talent.

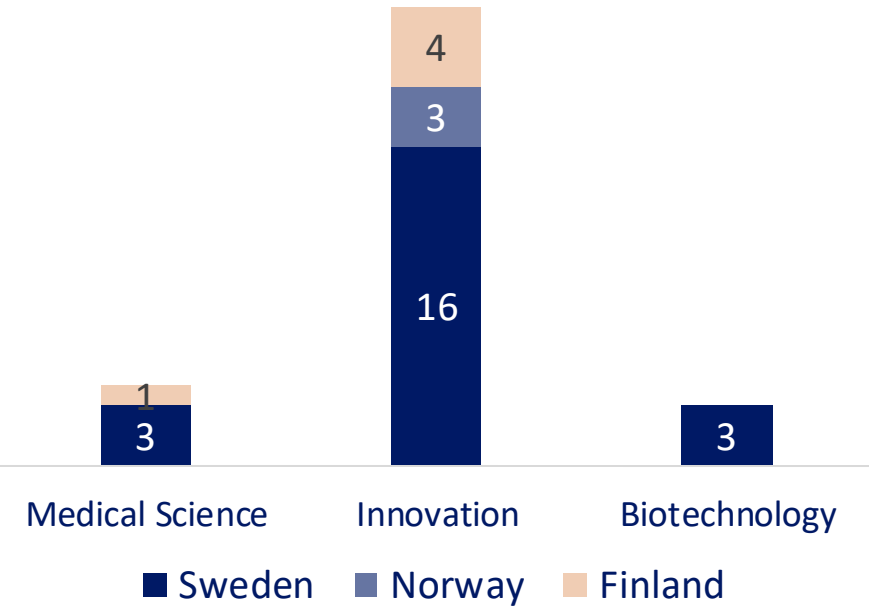
The Copenhagen Bioscience Conferences are a series of scientific conferences within biomedicine and biotechnology. They bring together some of the world’s top researchers and young talent to discuss the latest scientific results and topics within their field. The purpose of the conferences is to enable participants to build an international network and to exchange knowledge and ideas.

Patents from projects with Nordic main applicants

The Foundation’s projects with Nordic main applicants have in the last five years (2018-2022) produced a total of 30 patents and patent applications, 3 of these are granted patents. The patents and applications span programme areas including Innovation, Medical Science and Biotechnology.

Nordic NNF patents span several programme areas

Number of NNF patent applications and patents with Nordic main applicants.



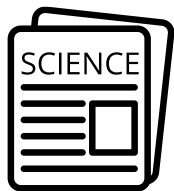
In 2020, **Lund University** researchers were granted a patent for a medical device for cardiac surgery. The patent is attributed to a project that received funding from NNF in 2018.



In 2021, **Tampere University** researchers were granted a patent for a method for QT correction. The patent is attributed to a project that received funding from NNF in 2020.



Nordic NNF grant recipients collaborate with many international partners



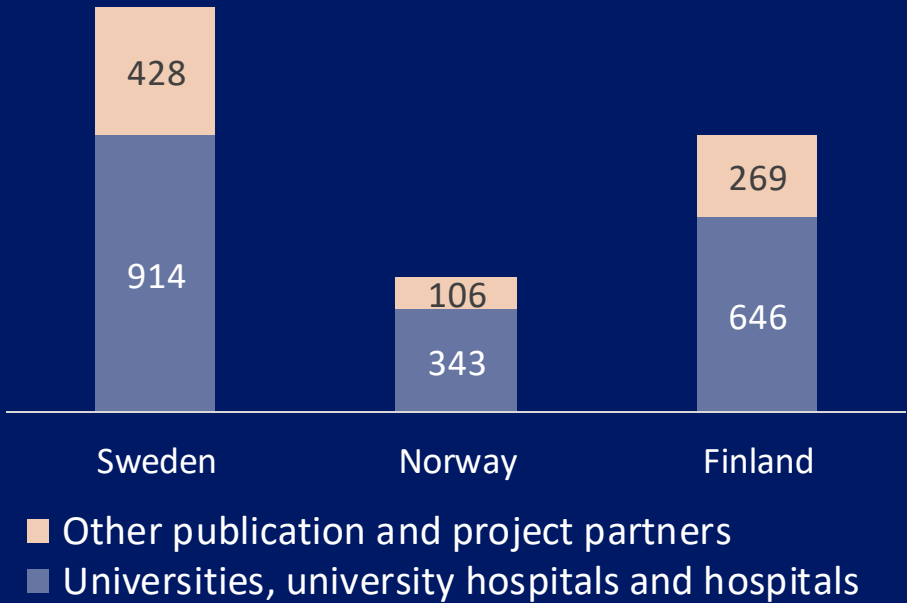
The Foundation’s Nordic grant recipients have many collaborations with national and international project partners. In total, 1844 partners contribute to the collaborations with Nordic NNF grant recipients.



74 countries are represented in the publication and project partnerships with Finnish NNF grant recipients. The same number is **77** and **39** for Sweden and Norway, respectively.

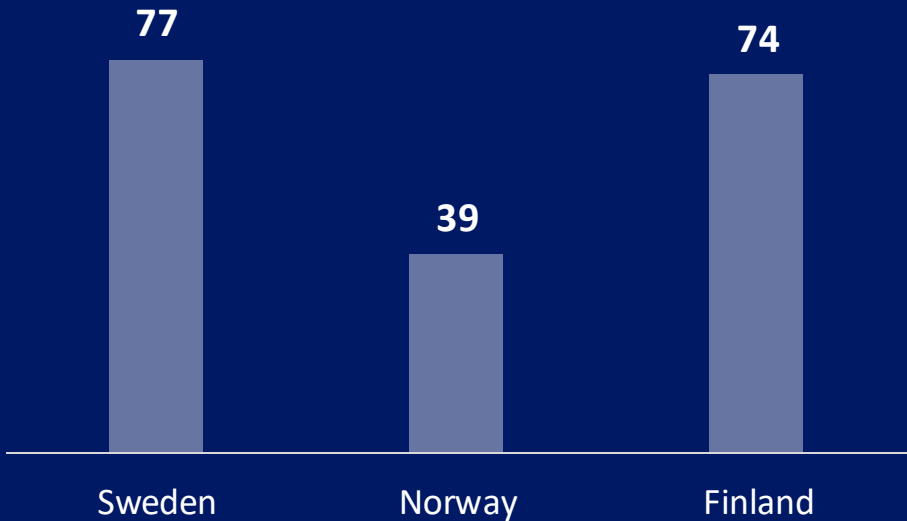
Nordic grant recipients collaborate frequently with national and international project partners

Number of publication and project partners that contribute to the collaborations.



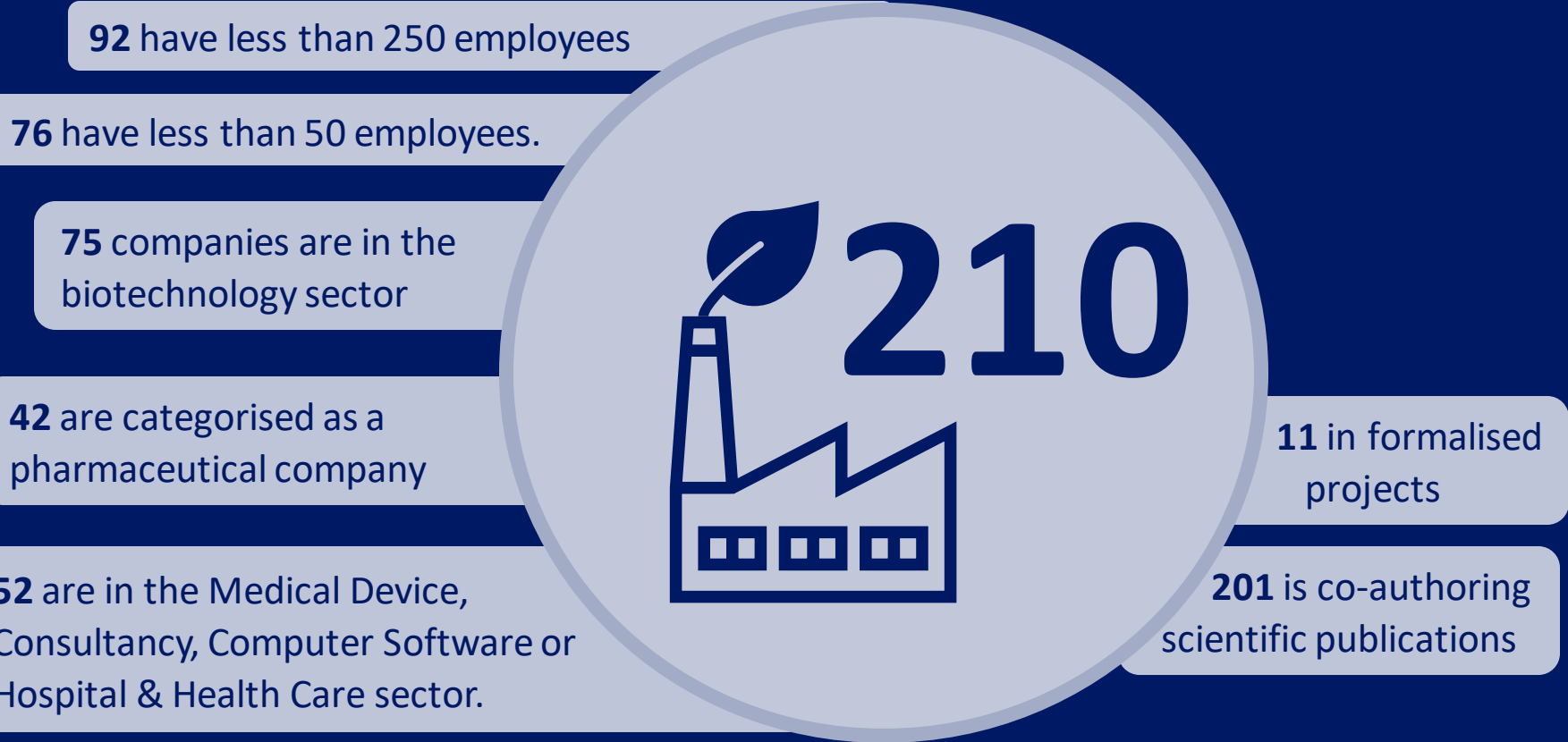
Nordic grant recipients collaborate with international project partners all around the world

Number of countries represented in the publication and project partnerships.



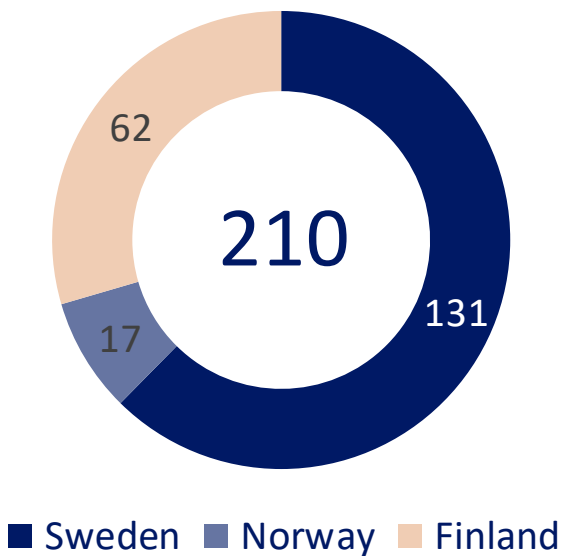
Nordic NNF grant recipients collaborate with many national and international companies

In total 210 national and international companies collaborate with Nordic NNF grant recipients



Nordic NNF main applicants collaborate with international companies

Number of companies that contribute to the collaborations, either through publications or as project partners.



Nordic NNF grant recipients collaborate internationally



Between 2018 and 2022, Nordic grant recipients have published **2059** publications in internationally recognized journals.



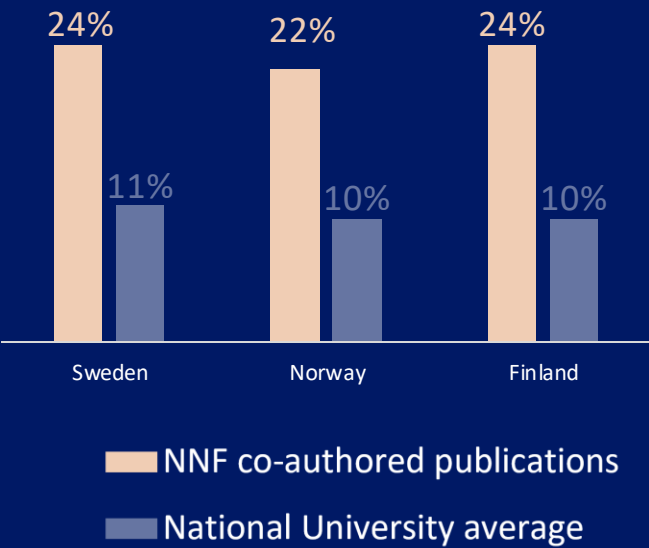
23.8% of the publications are within the top 10% most cited publication in their research field. The national average among the top Nordic universities is 10.6%



74.8% of the publications are co-authored with researchers affiliated with an organization outside the country of interest. The national average among the top Nordic universities is 67.2%.

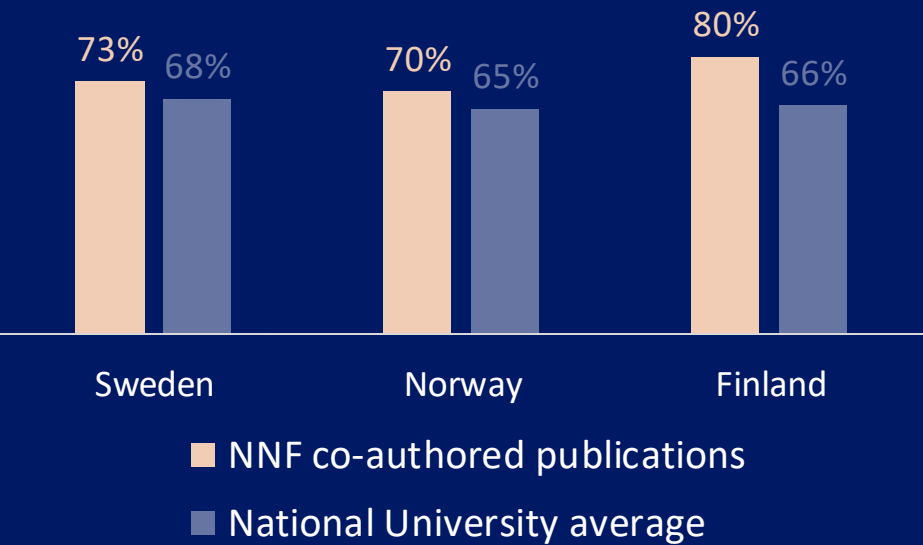
NNF grants contribute to research excellence

Share of publications among the top 10% most cited world-wide in the same research field and year



Nordic grant recipients publish frequently with international peers

Share of publications co-authored by Nordic researchers and researchers affiliated with an institution located outside the country of interest.



Nordic NNF grant recipients’ collaboration with top international universities

Top 10 universities collaborating with NNF’s Swedish, Norwegian and Finnish grant recipients ranked by number of publication collaborations

Sweden			Norway			Finland		
		Publication collaborations			Publication collaborations			Publication collaborations
1	Harvard University, United States, #6	86	1	University of Bristol, United Kingdom, #59	17	1	Norwegian University of Science and Technology, Norway, #438	82
2	University of Helsinki, Finland, #442	84	2	University of Oxford, United Kingdom, #11	15	2	Imperial College London, United Kingdom, #13	52
3	University of Oxford, United Kingdom, #11	70	3	Harvard University, United States, #6	14	3	The University of Edinburgh, United Kingdom, #73	39
4	University of Copenhagen, Denmark, #198	45	4	King's College London, United Kingdom, #40	11	4	University of Bristol, United Kingdom, #59	38
5	Imperial College London, United Kingdom, #13	45	5	University of Helsinki, Finland, #442	8	5	University of Oxford, United Kingdom, #11	29
6	Australian Catholic University, Australia, #44	42	6	University of California San Diego, United States, #24	8	6	University of Copenhagen, Denmark, #198	28
7	Medical University of Vienna, Austria, #273	41	7	University of Geneva, Switzerland, #129	8	7	University College London, United Kingdom, #23	25
8	University of Bergen, Norway, #437	40	8	University College London, United Kingdom, #23	8	8	University of Tartu, Estonia, #669	22
9	King's College London, United Kingdom, #40	37	9	University of Exeter, United Kingdom, #40	7	9	King's College London, United Kingdom, #40	21
10	The University of Sheffield, United Kingdom, #120	37	10	Imperial College London, United Kingdom, #13	7	10	University of Warwick, United Kingdom, #118	21



Nordic academic and industry collaborations involving Danish NNF grant recipients 2018-2022

Between 2018 and 2022, NNF has funded 28 projects to consortia of Nordic and Danish applicants



The Novo Nordisk Foundation has awarded a total of EUR **44** million to **28** projects with Nordic co-applicants collaborating with Danish main applicants.



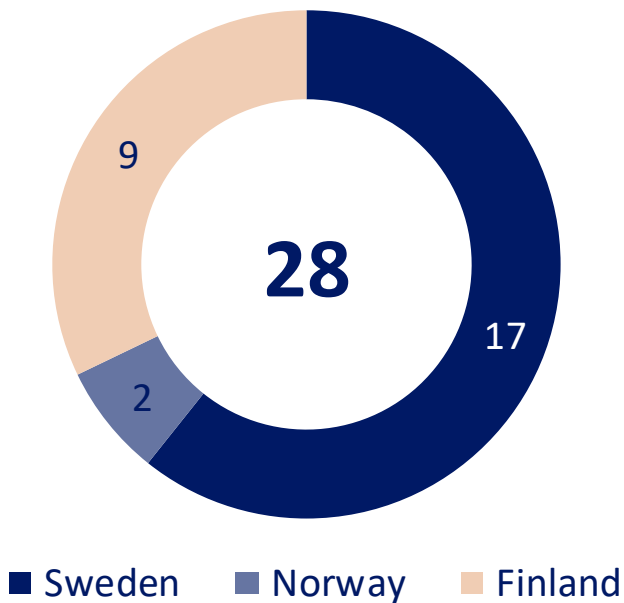
16 Nordic universities and university hospitals have contributed to the collaborations.



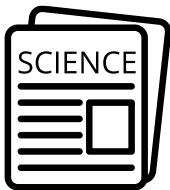
University of Helsinki is co-applicant for a Challenge Programme grant. The EUR 8 million grant has a duration of six years starting in 2021.

Danish NNF grants recipients collaborate with Nordic partners

Number of project collaborations between Danish NNF grant recipient and Nordic partners



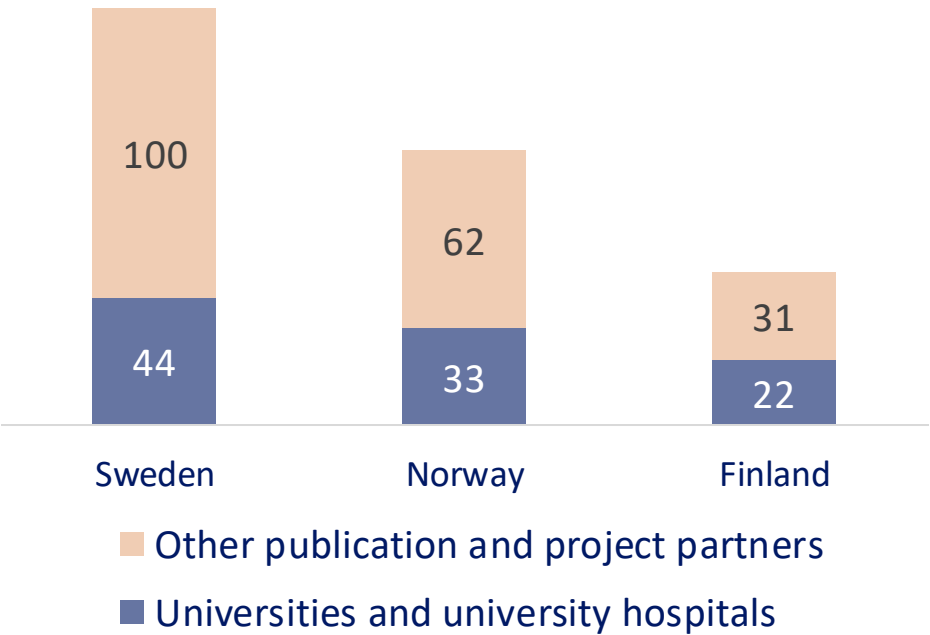
Danish NNF grant recipients collaborate with many Nordic partners



The Foundation’s Danish grant recipients have many collaborations with international project partners, including **144** collaborations between Danish and Swedish partners. Of these, **44** are universities or university hospitals.

Danish grant recipients collaborate frequently with Nordic project partners

Number of publication and project partners that contribute to the collaborations.



A collaboration between **Aarhus University** and **University of Helsinki** investigate the population genetic consequences of the dramatic declines observed in insect diversity and abundance, and the potential consequences for their ability to perform ecosystem services such as pollination and natural pest control. The project will utilize cutting-edge methods such as large-scale whole genome sequencing and environmental DNA approaches, and performance assays to establish relationships between genetic diversity and functional responses.



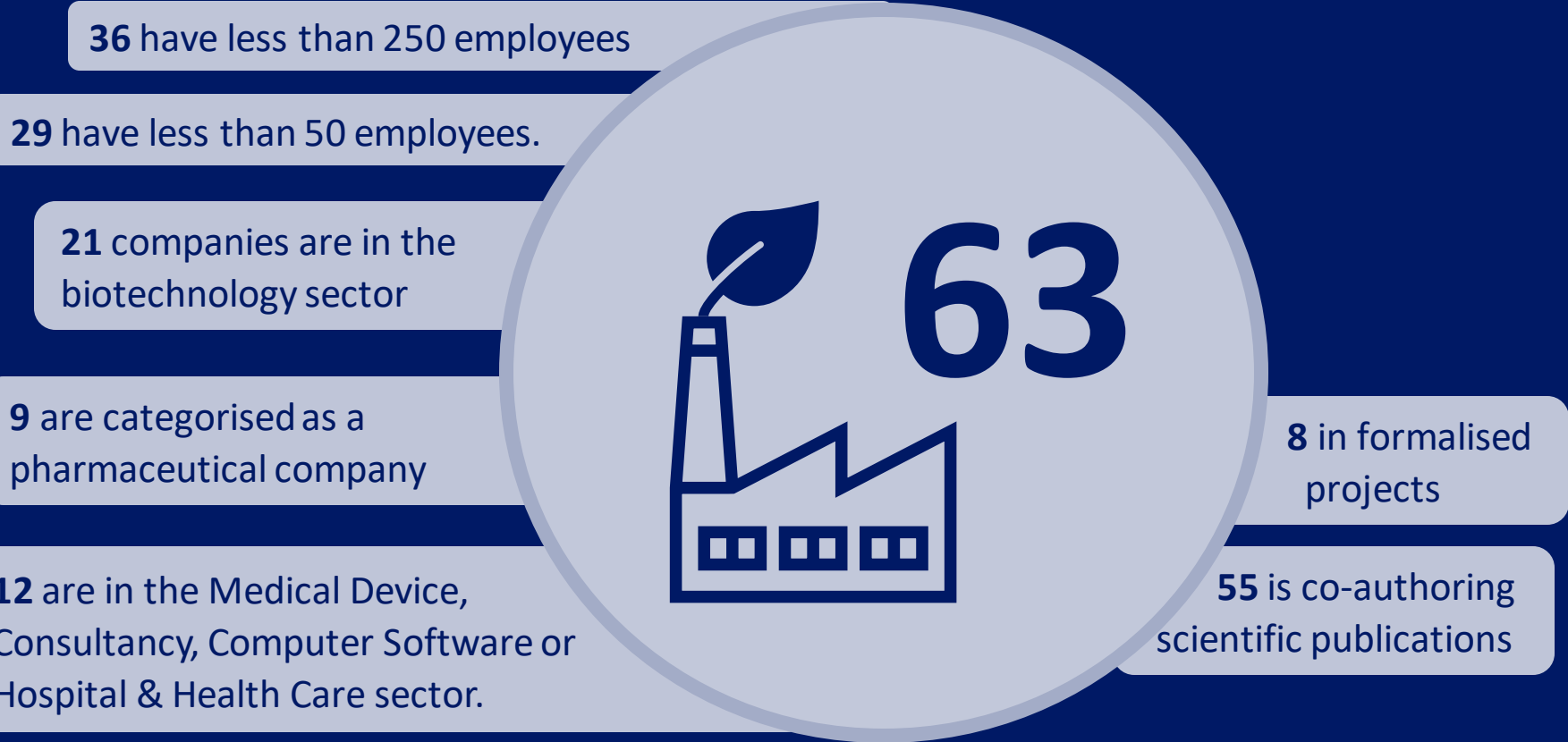
Danish NNF Grant recipients’ collaboration with top Nordic universities

Top Nordic universities collaborate with Danish NNF grant recipients

Sweden				Norway				Finland			
		Project collaborations	Publication collaborations			Project collaborations	Publication collaborations			Project collaborations	Publication collaborations
1	Karolinska Institutet	6	447	1	University of Oslo	1	124	1	Aalto University	0	3
2	Stockholm University	2	59	2	Norwegian University of Life Sciences	0	7	2	University of Helsinki	4	207
3	Swedish University of Agricultural Sciences	0	23	3	University of Bergen	0	89	3	University of Oulu	1	32
4	Chalmers University of Technology	0	242	4	Norwegian University of Science and Technology	2	97	4	University of Jyväskylä	0	13
5	University of Gothenborg	2	109	5	University of Stavanger	0	0	5	University of Turku	2	75
6	Lund University	4	298	6	UiT The Arctic University of Norway	4	39	6	University of Eastern Finland	0	87
7	KTH Royal Institute of Technology	0	55	7	Agder University	0	6	7	University of Tampere	0	59
8	Uppsala University	5	160	8	Oslo Metropolitan University	0	3	8	Åbo Akademi University	0	2
9	Linköping University	0	46	9	University of South-Eastern Norway	0	3	9	University of Vaasa	0	0
10	Örebro University	0	55	10	Nord University	0	0	10	University of Lapland	0	0

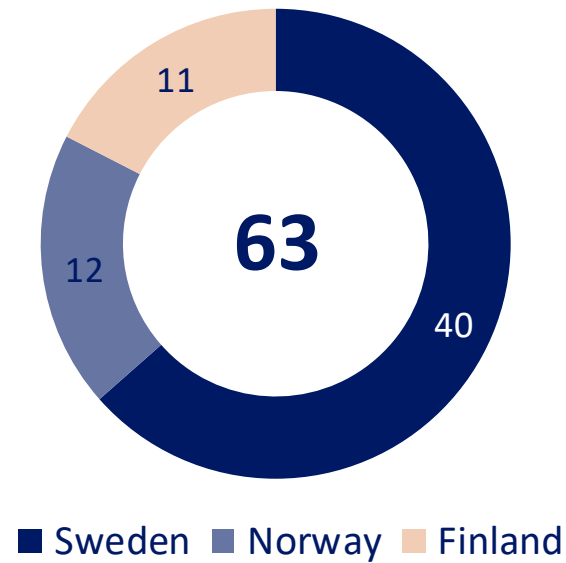
Danish NNF grant recipients collaborate with Nordic Companies

In total 63 Nordic companies collaborate with Danish NNF grant recipients



Danish NNF main applicants collaborate with Nordic companies

Number of companies that contribute to the collaborations, either through publications or as project partners.



Publication collaborations between Danish NNF grant recipients and Swedish partners



Between 2018 and 2022, Danish NNF grant recipients have co-authored **2399** publications with researchers located in the Nordic countries.



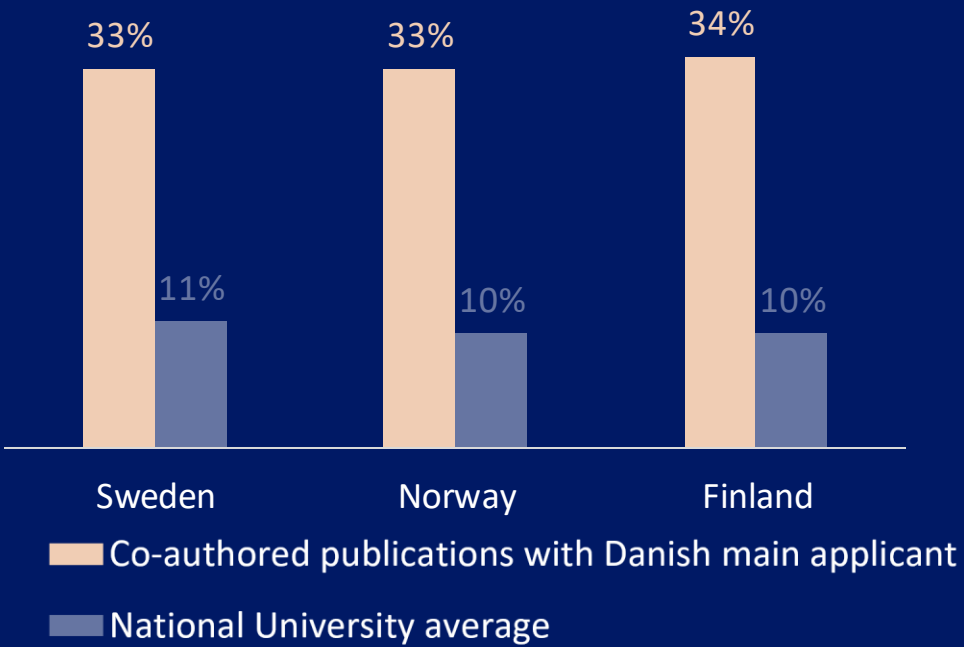
33.2% of the publications are within the top 10% most cited publication in their research field. The national average among the top Nordic universities is 10.6%.



The highest number of Swedish co-authored publications come from Karolinska Institutet (447 publications). In Norway and Finland, the highest number comes from Oslo University Hospital (122 publications) and University of Helsinki (207 publications) respectively.

NNF grants contribute to research excellence

Share of publications among the top 10% most cited world-wide in the same research field and year



Case stories

A University Collaboration



A collaboration between **Aalborg University** and **the University of Eastern Finland** develop the first-ever multi-scale mathematical model of knee osteoarthritis. This comprehensive model facilitates computer-driven investigations into various patient-specific KOA treatment options and their predicted outcomes from the body to the cellular levels.

A Hospital Collaboration



A collaboration between **Karolinska University Hospital** and **Copenhagen University Hospital** is looking at the safety of using nasally administered ketamine and sufentanil for the treatment of pain in children. The collaboration has provided access to a registry containing clinical data corresponding to approximately 3,000 treatments. This allows for a systematic review of a large cohort of children spanning 10 years of treatment and will provide invaluable information for future treatments of pain in children.

The NNF Dashboard on Grants and Impact

The NNF Dashboard is your gateway to information about the entire value chain of grant development, starting with Calls & Applications, through to awarded grants and their impact. In addition to visualising numbers on awarded grants, gender distribution of grant holder and grant recipients host institutions, the NNF Dashboard provides insights and details on the overall development year-to-year.

For more information, please visit

<https://novonordiskfonden.dk/facts-and-figures/>



Appendix and additional slides

Methods and sources

Methods:

- National collaborations were defined as either a project collaboration or a publication collaboration funded by NNF with at least one collaborator/institute with origin in the Nordic countries.
- International collaborations were defined as either a project collaboration or a publication collaboration funded by NNF with at least one collaborator/institute with origin outside the country of interest.
- University rankings were based on the time period 2018-2022, across all sciences, with institutions with at least 100 publications and based on the PP(top10%).
- Co-publications were defined as publications with at least one Swedish, Finnish or Norwegian author and one Danish author.
- National industry collaborators were defined as collaborations with companies registered in Sweden, Norway or Finland.
- International industry collaborators were defined as collaborations with companies registered outside Sweden, Norway and Finland.
- Nordic grant recipients were defined as successful NNF grant applicants.
- The number of Nordic attendees at the Copenhagen Bioscience Conference series were defined as applicants and attendees registered to a Nordic research institute.

Sources:

- Researchfish (NNF grant data)
 - Research publication collaborations
 - Company project collaborations
 - Publications
- NNF-Data Platform, NORMA and OMADA (NNF grant application data)
 - Applicants of Swedish, Finnish or Norwegian origin
 - Co-applicants
 - Copenhagen Bioscience PhD programme applicants
- The Leiden Ranking 2022
 - University rankings
 - Publication impact data