

# Report on research collaborations and investments in Germany

Impact

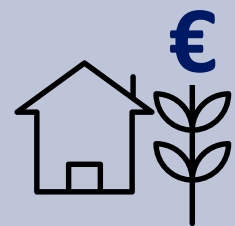


# Executive summary

## Novo Holdings



Ultimo 2021, Novo Holdings holds investments in 4 companies based in Germany. One Seed Investment, one Growth Equity Investment and two Principal investments.



Between 2017 and 2021, Novo Holdings has funded an average of 1 German company each year as part of its portfolio.

## Novo Nordisk Foundation



Between 2017 and 2021, the The Novo Nordisk Foundation (NNF) has awarded a total of €18.6 million to four projects involving German and Danish applicants.

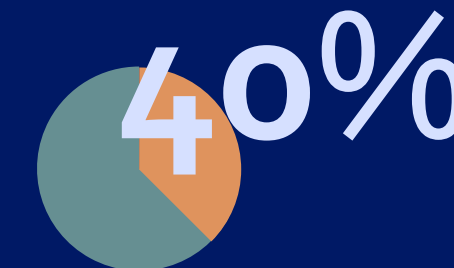


Since 2016, 57 young German researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences.

## Grant recipients



Between 2017 and 2021, the Danish grant recipients collaborated with 92 German companies. 38% are in the biotechnology sector, and 40% of the companies have less than 50 employees.



Between 2017 and 2021, Danish grant recipients and their German co-authors have published 1658 journal articles 29% of these are among the top 10% most cited in their field.

10/10

Out of the 10 most frequent German university partners for Danish grant recipients, all ten are among the 50 highest ranked universities world-wide.

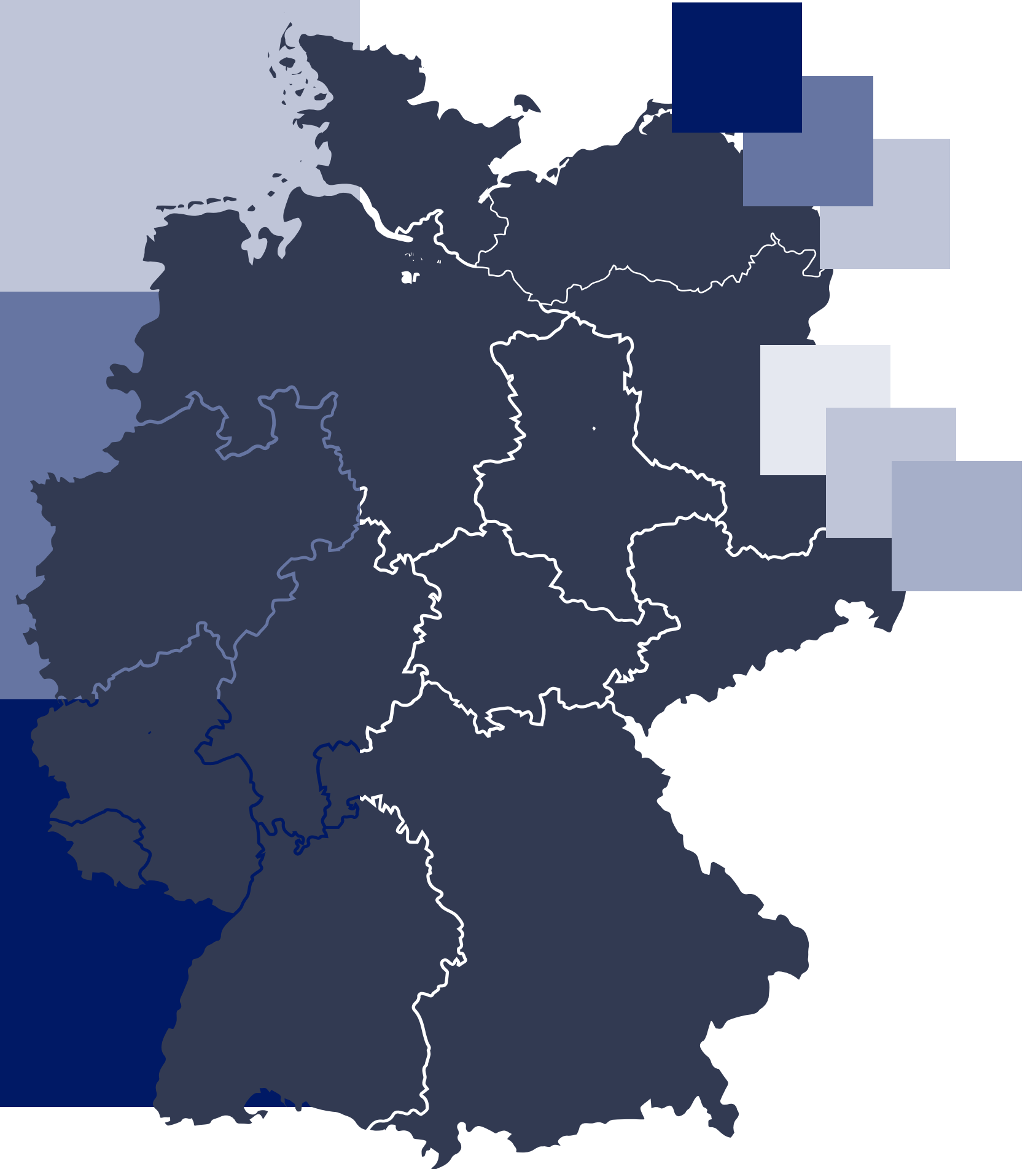
# Introduction

This report is presented in two parts;

- Activities that Novo Nordisk Foundation (NNF) grant recipients have with institutions or organisations in the Germany.
- An overview of Novo Holdings' investments in the Germany.

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

Through figures and case studies, it demonstrates the different kinds of relationships and activities between NNF grant recipients and Germany academic and industry partners. Data in the presentation are based on activities between 2017 and 2021 (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.

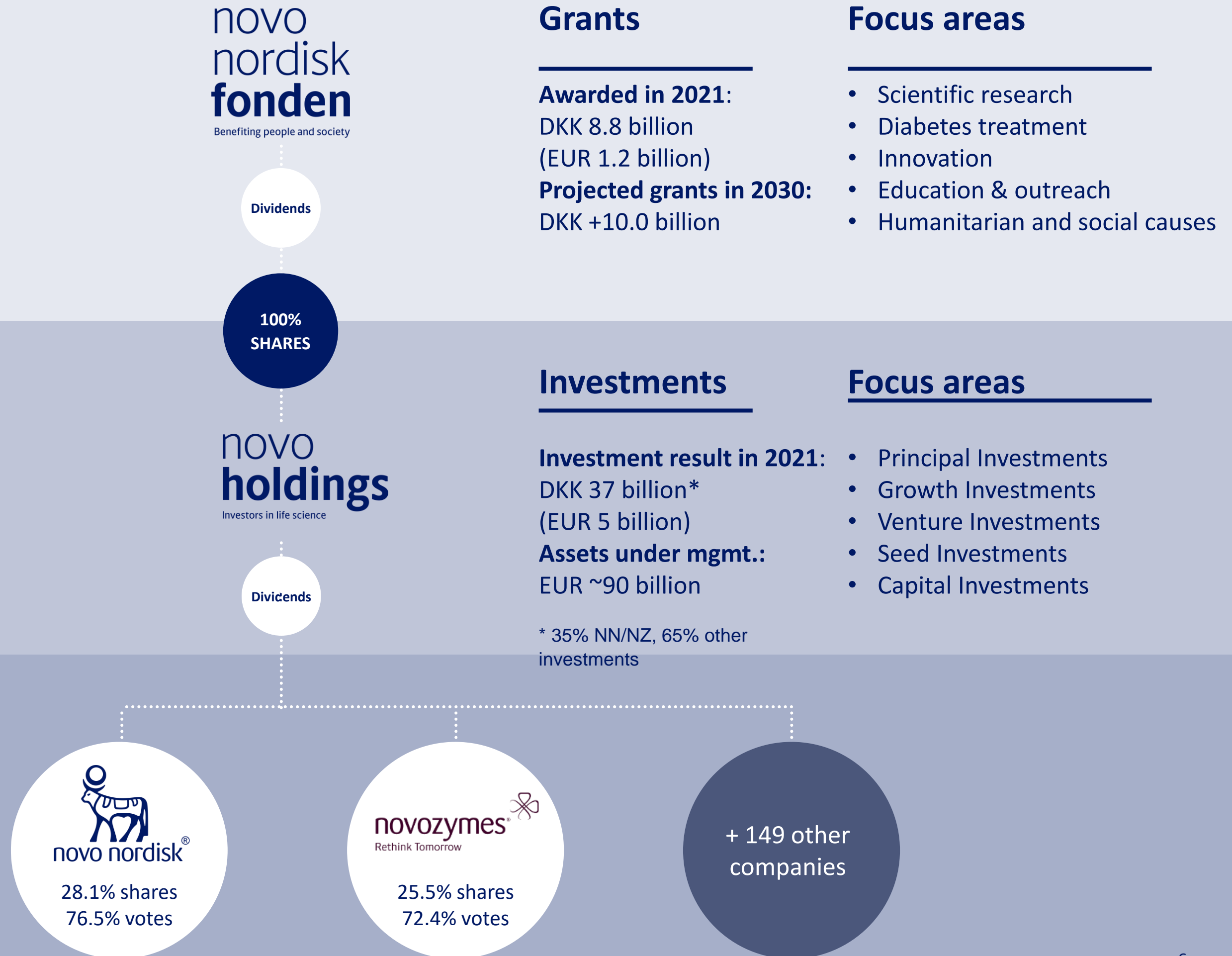
**1989** – the Novo Foundation and the Nordisk Insulin Foundation were merged into **Novo Nordisk Foundation** as part of the merger between the two firms Novo Terapeutisk Laboratorium and Nordisk Insulinlaboratorium in Novo Nordisk A/S.

In 2021 the **Novo Nordisk Foundation** awarded 617 grants with a total amount of €1183 million.

For more information, please see the [Impact Report 2020](#)

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

3

The world's  
third largest  
measured in grants

1

The world's  
largest  
measured in  
assets:  
EUR 92 billion\*

## 2021 in numbers

Awarded DKK  
**8.8** billion  
EUR 1.2 billion

Paid out DKK  
**4.8** billion  
EUR 645 million

**617**  
Grants awarded

**2,771**  
Applications  
received

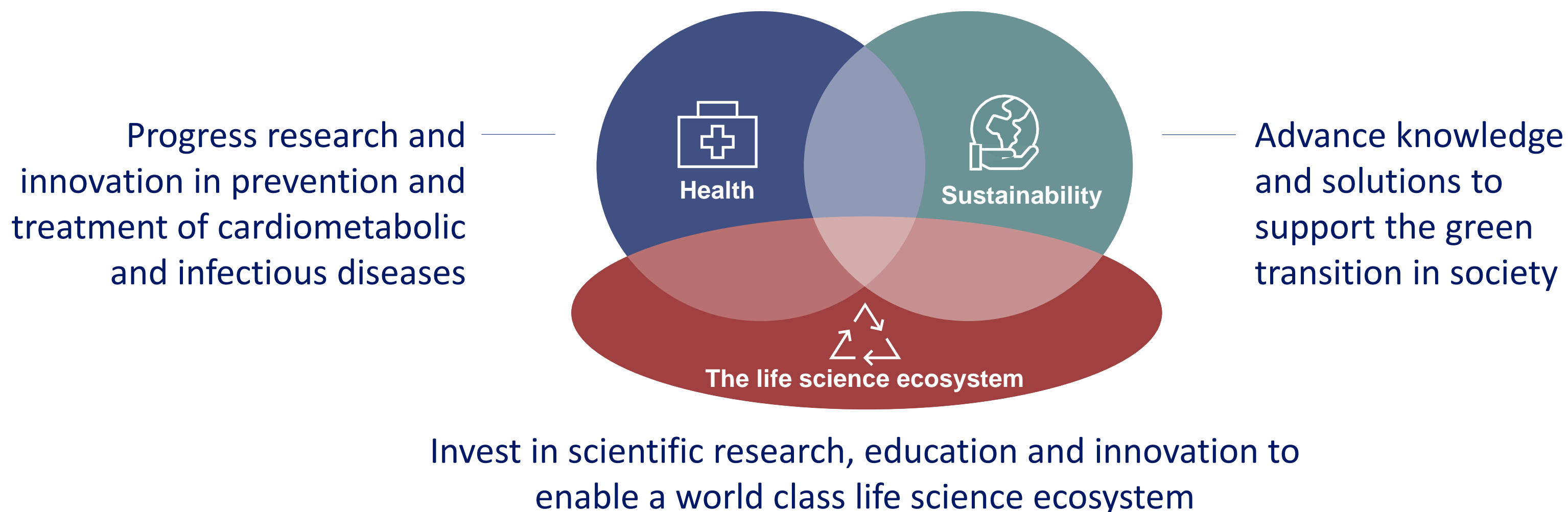
**18%**  
Success rate for  
research applications  
among open calls

Investment result 2021  
**37** DKK billion  
EUR 5 billion

\*Preliminary numbers year-end 2021

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

## Novo Nordisk Foundation's 2030 Strategy







German academic and  
industry collaborations  
involving NNF grant  
recipients 2017-2021



# Case stories

## A university collaboration

A collaboration between **Heinrich Heine University Düsseldorf** and **University of Copenhagen** is studying whether benefits of physical activity outweighs the risks. It is a study combining data on physical activity, air pollution, and cardiovascular disease. The research is possible only in Denmark, with the data possibilities available from registries, while the German collaborator is an expert in the field of air pollution and cardiovascular disease.

## A hospital collaboration

A collaboration between **University Hospital of Münster** and **Aarhus University Hospital** is identifying mutations in the gene SLC4A3 in Danish and German patients with short Q-T syndrome, a rare genetic type of abnormal heart rhythm. So far, 5 new mutations have been discovered, and research is ongoing to understand the physiological significance of the mutations by using both clinical data from the patients and experimentally using animal models in the laboratories.

Source: Novo Nordisk Foundation (2019) based on ResearchFish® reporting



# 4 projects funded by NNF include Danish and German researchers as co-applicants

The Novo Nordisk Foundation has in the last five years (2017-2021) funded **4** projects that have had **4** co-applicants from Germany. Co-applicants are members of the international group applying for an NNF grant. The total funding allocated to these projects is € **18.6 million**. All 5 projects were awarded in open competition.

- **University of Southern Denmark** and **University of Leipzig** have received funding for the project Mathematical Modelling for Microbial Community Induced Metabolic Diseases – NNF Funding € 6.2 million
- **University of Copenhagen** and **RWTH Aachen University** have received funding for a project within Plant Science – NNF Funding € 8.06 million
- **University of Copenhagen** has received funding for a Data Science Collaborative Research Programme with **Bielefeld University** – NNF Funding € 2.0 million



Since 2016, **57** young German researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences.

*“An opportunity that facilitate high level training for PhD students and postdocs”*

*NNF applicant, 2015*

# NNF Grant recipients' project collaborations with German partners

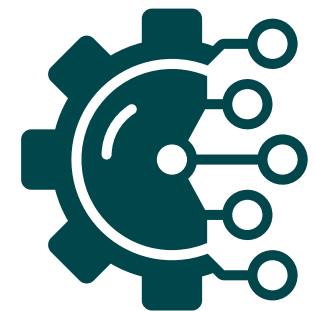
Between 2017 & 2021...



The Foundation's grant recipients have collaborated with many international project partners on projects, including **471** collaborations between Danish and German partners.



**195** of those partners are universities and university hospitals.



**85** German companies co-authored at least one scientific article with grant recipients from the Novo Nordisk Foundation.



# 10 out of 10 top universities collaborate with NNF grantees

## Top ranked universities in Germany

1	Ludwig Maximilian University of Munich
2	Georg-August-Universität Göttingen
3	University of Münster
4	Technical University of Munich
5	University of Bonn
6	Heidelberg University
7	University of Freiburg
8	Julius-Maximilians-Universität Würzburg
9	Karlsruhe Institute of Technology
10	University of Stuttgart

Source: Novo Nordisk Foundation, CWTS Leiden Ranking 2021



# Publication collaborations between NNF grant recipients and German partners



Between 2017 and 2021, NNF grant recipients have co-authored **1648** publications with researchers located in Germany.



The highest number of German partners come from the German Research Center for Environmental Health (174 publications) followed by the Ludwig-Maximilian-University München (129 publications) and Charité - University Medicine Berlin (117 publications).

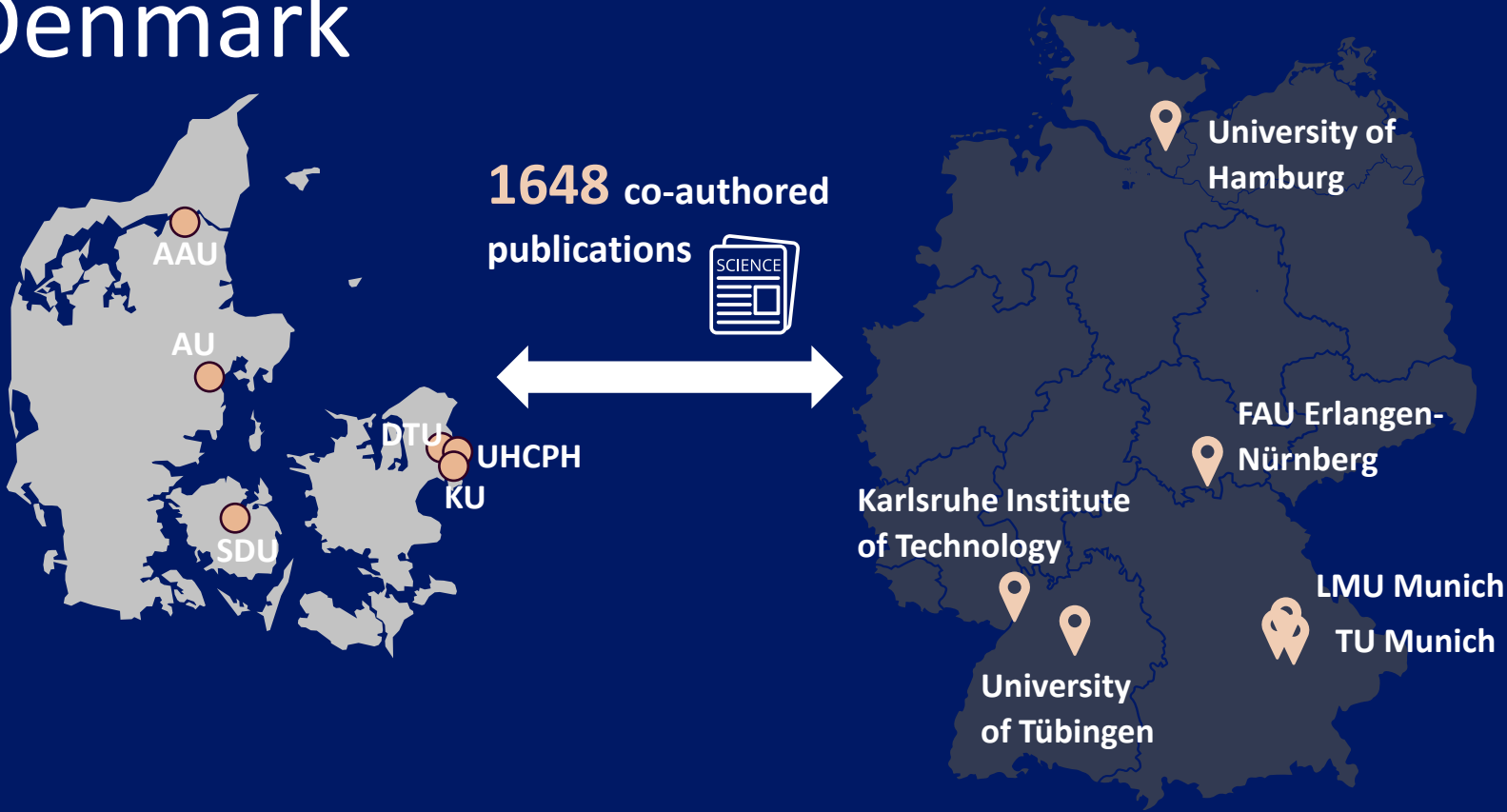


**58.7%** of the co-authored publications are within the three research areas *Immunology* and *Medicine* and *Biochemistry, Genetics & Molecular Biology*.



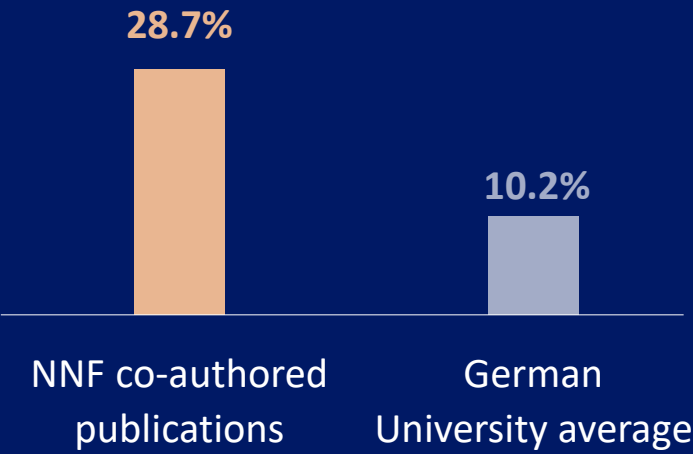
**28.7%** of the co-authored publications are within the top 10% most cited publication in their research field. The national average among the top German universities is 10.2%.

# Selected links between Germany and Denmark



## NNF grants contribute to research excellence

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





# Examples of collaborations between NNF grant recipients and German partners



## A database publication

*Danish and German researchers have collaborated and continue collaboration on building and maintaining the STRING database. STRING is a powerful database that aims to collect and integrate protein information, by consolidating known and predicted protein–protein association data for a large number of organisms.*

*Reporting in Researchfish, 2019*

## A Nature publication

*Danish and German researchers have collaborated on a paper published in Nature. They discovered how the most common antidiabetic medicine Metformin changes the gut microbiota, and how this can explain both some of the drug's therapeutic but also adverse effects.*

*Reporting in Researchfish, 2019*

## A Nature Genetics publication

*A collaboration involving amongst others Danish and German researchers have resulted in the first ever genetic risk sites for ADHD based on genome-wide research on a cohort of more than 50,000 people.*

*Reporting in Researchfish, 2019*

Source: Novo Nordisk Foundation (2019) based on ResearchFish® reporting

# Researchers receiving grants from the Novo Nordisk Foundation collaborate with German companies

**92** companies located in Germany collaborate with the NNF grant recipients either on formalised research projects (9) or by co-authoring scientific publications (85)

**49%** of companies have less than 250 employees, and 36 have less than 50 employees.

**35** companies are in the biotechnology sector.

**9** are categorised as pharmaceutical companies.

**29** are either in the Medical Device sector, Software sector, Consultancy or Hospital & Health Care sector.

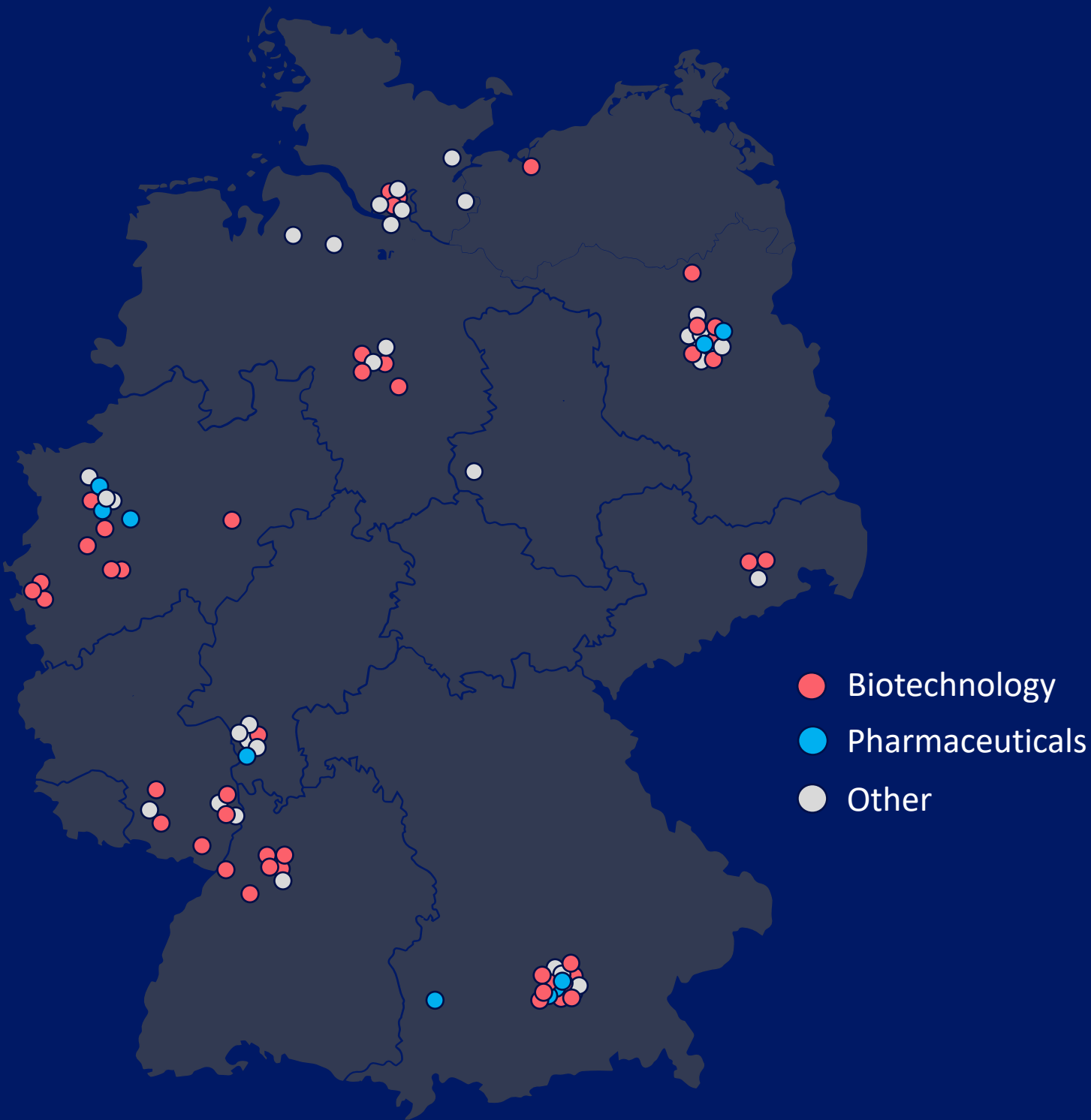
**University-Industry collaborative research projects:**

“A group at the Aarhus University Hospital has, in collaboration with industry partner Siemens Healthcare, has implemented new reconstruction algorithms for PET-images, which allows for direct quantification of glucose uptake in malignant and non-malignant tissue. The new algorithms have been used as part of routine clinical work-up of referred patients.”

“A group at the University of Copenhagen has, in collaboration with Nanion Technologies GmbH, identifies a potential new therapeutic target in pancreatic ductal adenocarcinoma, one of the most lethal cancers.”

Reporting in Researchfish, 2019

# Location of NNF grantees’ collaborating partners in Germany







# Novo Holdings A/S in Germany

## Our mission

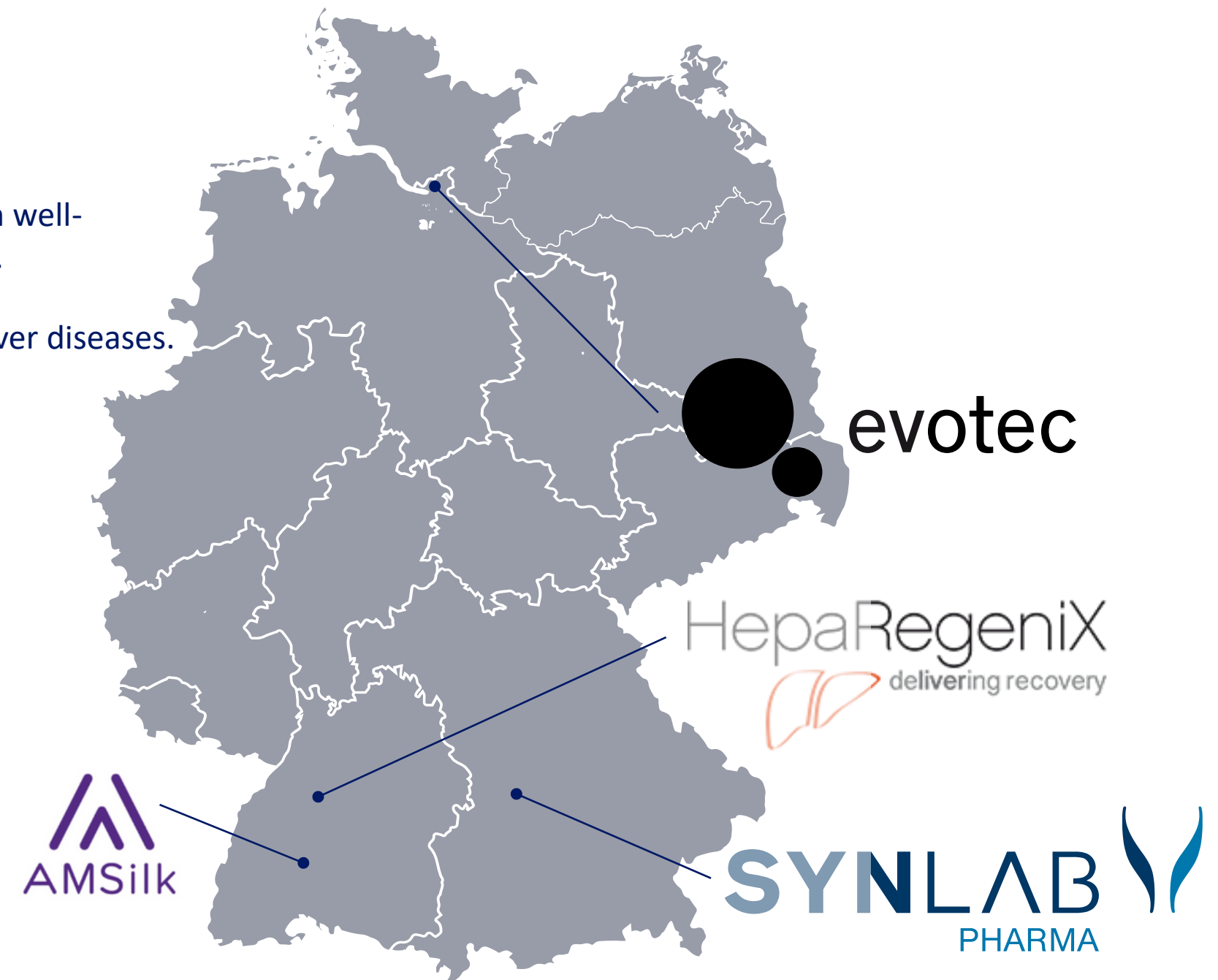
Novo Holdings is to be a supportive owner of the Novo Group companies and to make a growing and positive impact on health, science and society by generating attractive long-term returns on the assets of the Novo Nordisk Foundation.

# Novo Holdings A/S Investments in Germany

Novo Holdings A/S has in the period 2017-2021 invested in 4 companies based in Germany.

- **AMSilk**, is the world's leading supplier of biotech silk materials.
- **Evotec**, is a drug discovery company. By combining cutting edge research technologies with well-established drug-discovery tools the company progresses product ideas from target to clinic.
- **HepaRegeniX GmbH**, is developing a novel therapy for the treatment of acute and chronic liver diseases.
- **SynLab Pharma**, is the largest laboratory service provider in Europe offering a full range of medical laboratory services for both clinical practice and hospital sector.

## Companies in the current portfolio







# Appendix and additional slides



# Methods and sources

## Methods:

- Collaborations were defined as either a project collaboration or a publication collaboration funded by NNF with at least one collaborator/institute with origin in Germany
- University ranking was based on the time period 2016-2019, across all sciences, with institutions with at least 100 publications, and based on the PP(top10%)
- Publications were defined as publications with at least one German and one Danish author
- German industry collaborators were defined as collaborations with companies registered in the Germany
- German research partners were defined as successful NNF grant applications with at least one German co-applicant
- The number of German attendees at the Copenhagen Bioscience Conference series were defined as applicants and attendees registered to a German research institute
- Novo Holdings A/S investments in Germany were defined as investments in companies with their headquarter located in the Germany

## Sources:

- Researchfish (NNF grant data)
  - Research publication collaborations
  - Company project collaborations
  - Publications
- Data Warehouse, NORMA and OMADA (NNF grant application data)
  - Co-applicants
  - Copenhagen Bioscience PhD programme applicants
- The Leiden Ranking 2021
  - University rankings
  - Publication impact data
- Clinicaltrials.org
  - Clinical trials data
- Novo Holdings A/S
  - Investment data