Report on research collaborations and investments in the United States
Executive summary

Novo Holdings

Between 2017 and 2021, Novo Holdings has invested in 110 companies based in the United States. The current 2022 portfolio includes 2 Seed investments, 5 Principal investments, 50 Venture investments and 11 Growth equity investments.

Between 2017 and 2021, Novo Holdings has funded an average of 14 US companies each year as part of its portfolio.

Novo Nordisk Foundation

Between 2017 and 2021, the Novo Nordisk Foundation (NNF) financed 19 projects with US applicants, totaling US$ 86 million.

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195 young US researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences.

Grant recipients

The Foundation’s grant recipients collaborate with many international project’s partners, including 257 US based universities and university hospitals.

Between 2017 and 2021, NNF grant recipients collaborated with 205 US companies. 117 within the biotechnology sector, and 72 of the companies have less than 50 employees.

Between 2017 and 2021, US grant recipients have published 2309 journal articles. 42% of these are among the top 10% most cited in their field.

10 out of 10 top US universities collaborate with NNF grantees.
Introduction

This report is presented in two parts;

• Activities that Novo Nordisk Foundation (NNF) grant recipients have with institutions or organisations in the United States.
• An overview of Novo Holdings’ investments in the United States.

This report showcases NNF’s contribution to the US academic community and industry.

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

1922 – the Nordisk Insulin Foundation was established as the owner of the Nordisk Insulinhospital in Novo Nordisk A/S.

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 Insulinhospital in Novo Nordisk A/S.

In 2021 the Novo Nordisk Foundation awarded 617 grants with a total amount of US$ 1180 million.

For more information, please see the Impact Report 2020.

For more information on the history of the Novo Nordisk Foundation, please visit www.novonordiskfonden.dk
The Novo Nordisk Foundation is an independent Danish enterprise foundation.

**Grants**

- **Awarded in 2021:** DKK 8.8 billion (US$ 1.2 billion)
- **Projected grants in 2030:** DKK +10.0 billion

**Focus areas**

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

**Investments**

- **Investment result in 2021:** DKK 37 billion* (US$ 5 billion)
- **Assets under mgmt.:** US$ ~90 billion

* 35% NN/NZ, 65% other investments

**Focus areas**

- Principal Investments
- Growth Investments
- Venture Investments
- Seed Investments
- Capital Investments

* 149 other companies
Facts about the Novo Nordisk Foundation

The world’s largest measured in assets: US$ 92 billion*

The world’s third largest measured in grants:

2021 in numbers:

- Awarded DKK 8.8 billion, US$ 1.2 billion
- Paid out DKK 4.8 billion, US$ 660 million
- 617 Grants awarded
- 2,771 Applications received
- 18% Success rate for research applications among open calls
- Investment result 2021: DKK 37 billion, US$ 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:

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

2. **Progress research and innovation in prevention and treatment of cardiometabolic and infectious diseases.**

3. **Advance knowledge and solutions to support the green transition in society.**
US academic and industry collaborations involving NNF grant recipients 2017-2021
19 projects funded by NNF include US researchers as applicants

The Novo Nordisk Foundation has in the last five years (2017-2021) funded 19 projects that have had 9 main applicant and 11 co-applicants from United States. Co-applicants are members of the international group applying for a NNF grant. The total funding allocated to these projects is US$ 86 million.

The funded projects span research areas including Biomedicine, Biotechnology and Nat-Tech. 13 projects were awarded in open competition, while 6 were awarded as standalone grants.

• **University of Copenhagen** and **University of Kentucky** have received funding for a project within single molecule spectroscopy.

• **Aarhus University Hospital** and **Yale University** have received funding for a project investigating novel principles in virus infection pathogenesis.

• **Odense University Hospital** and **University of California, San Francisco** among others have received funding for a project investigating the role of circulating and bone tissue microRNAs in the pathogenesis of type 2 diabetic bone fragility.

Since 2014, **195** young US researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences for young research talent.

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

NNF applicant, 2015
NNF Grant recipients’ project collaborations with US partners

Between 2017 & 2021...

The Foundation’s grant recipients have collaborated with many international project's partners on projects, including 780 collaborations between Danish and US partners.

257 of those partners are universities and university hospitals.

202 US companies co-authored at least one scientific article with grant recipients from the Novo Nordisk Foundation.
A university collaboration

In 2019, NNF funded an international research and education collaboration between North Carolina State University and the Technical University of Denmark. The purpose is to facilitate the creation of new bioindustrial processes through biotechnology and educational programmes for students and employees in the industry. These processes and skills will optimise bioindustrial production and accelerate the green transformation.

Burst into song: A systems approach to accurate predictions of voice motor control

Lack of insight into how sound is produced is one factor preventing treatment of voice disorders and associated diseases. In this interdisciplinary project, researchers from the University of Southern Denmark and the University of Maine and Emory University in the United States will combine knowledge and methods from physics, neuroscience and biomechanics to transform the understanding of voice motor control among both healthy and sick people.
NNF Grant recipients’ collaboration with top US universities

10 out of 10 top US universities collaborate with NNF grant recipients

<table>
<thead>
<tr>
<th>Rank</th>
<th>University</th>
<th>Project collaborations</th>
<th>Publication collaborations</th>
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Source: Novo Nordisk Foundation, CWTS Leiden Ranking 2022
Publication collaborations between NNF grant recipients and US partners

Between 2017 and 2021, NNF grant recipients have co-authored **2309** publications with US-located researchers.

The highest number of US partners come from Harvard University (388 publications) followed by University of California, San Diego (213 publications) and Stanford University (198 publications).

**57%** of the co-authored publications are within the research areas Medicine and Biochemistry, Genetics & Molecular Biology.

**42%** of the co-authored publications are within the top 10% most cited publications in their research field. The national average among the top US universities is 12%.

Selected links between the United States and Denmark

NNF grants contribute to research excellence

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

Source: Novo Nordisk Foundation (2022) based on The Leiden Ranking
Researchers receiving grants from the Novo Nordisk Foundation collaborate with US companies

In total 205 US companies collaborate with NNF grant recipients

- 202 are co-authoring scientific publications
- 117 companies are in the biotechnology sector
- 26 are categorised as pharmaceutical companies
- 72 have less than 50 employees
- 110 have less than 250 employees
- 4 are in formalised projects

“A group at the University of Aarhus has, in collaboration with industry partners including Biogen, developed a screening method for inhibitors of α-synuclein aggregation, critical in development of Parkinson’s Disease. Among the 746,000 compounds screened, they identified the 6 that interact best with α-synuclein to reduce aggregation. They also identified compounds promoting aggregation, which can be useful to model Parkinson’s Disease. The compounds have the potential to further elucidate the mechanisms underlying Parkinson’s Disease, which will provide necessary insights for future therapies.”

Reporting in Researchfish, 2019
Novo Holdings A/S in the United States

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 has in the period 2017-2021 invested **US$ 2.8 billion in 110 US companies**. In 2021, the portfolio included 68 companies with an overall value of US$ 4.2 billion.

43% of the life science investments made worldwide by Novo Holdings A/S are in US companies.
**Novo Holdings A/S Investments in Eastern USA**

**Vestaron**, a company dedicated to improving the safety, efficacy and sustainability of crop protection through its development of peptide-based biopesticides, announces USD 18 million in Series B-1 financing, led by Northpond Ventures. Northpond and additional new investor, Cavallo Ventures join continuing investors Novo Holdings, Syngenta Ventures, CGC Ventures and Anterra Capital in this round.

**Cirus Therapeutics**, a pharmaceutical company which develops innovative therapies to treat liver and metabolic diseases, based in San Diego and Michigan. It is trialling a novel treatment for NASH (nonalcoholic fatty liver disease) - a disease which currently affects 16 million Americans and projected to grow to 27 million by 2030. The Novo Holdings took lead in the Series A financing round of the company.
Novo Holdings A/S Investments in Western USA

The Novo Holdings REPAIR Impact Fund completed a USD 5.25 million investment in Curza, a small-molecule therapeutics company based in Salt Lake City, Utah, to accelerate its lead program, a new class of antibiotics focused on drug-resistant Gram-negative bacteria.

Tempus is bringing the power of artificial intelligence to healthcare by building the world's largest library of molecular and clinical data and a platform to make that data accessible and useful. Novo Holdings completed a USD 200 million Series F investment in the company.

Source: Novo Holdings & Novo Nordisk Foundation (2021)
Novo Holdings A/S investments in USA


Novo Holdings’ US-publicly listed investments can generally be characterized as:

- Innovative clinical stage and/or early-stage biopharmaceutical companies
- High growth, revenue stage medical technology companies
- Micro- and/or small-cap market capitalizations typically between $100 million and $5 billion

Morphic Therapeutics, a biopharmaceutical company discovering and developing oral small-molecule integrin therapeutics, in June 2019 raised US$ 90 million in their debut IPO on NASDAQ.

Source: Novo Holdings & Novo Nordisk Foundation (2021)
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 US collaborator/US institute
• University ranking was based on the time period 2017-2021, 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 US and one Danish author
• US industry collaborators were defined as collaborations with companies registered in the Netherlands
• US research partners were defined as successful NNF grant applications with at least one US co-applicant
• The number of US attendees at the Copenhagen Bioscience Conference series were defined as applicants and attendees registered to a US research institute
• Novo Holdings A/S investments in the United States were defined as investments in companies with their headquarter located in the United States

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 2022
• University rankings
• Publication impact data
• Novo Holdings A/S
• Investment data