

Report on research collaborations and investments in the United States



Executive summary

Novo Holdings



Between 2018 and 2022, Novo Holdings has invested in 122 US based. The current portfolio includes 2 Seed investments, 11 Principal investments, 45 Venture investments and 13 Growth equity investments



Between 2018 and 2022, Novo Holdings has invested into an average of 24 US companies each year.

Novo Nordisk Foundation



Between 2018 and 2022, the Novo Nordisk Foundation (NNF) financed 31 projects with US applicants, totaling US\$ 111 million.



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



In 2022 the Novo Nordisk Foundation funded 13 senior researchers and 52 young researchers, PhDs and Postdocs, in projects involving US applicants.

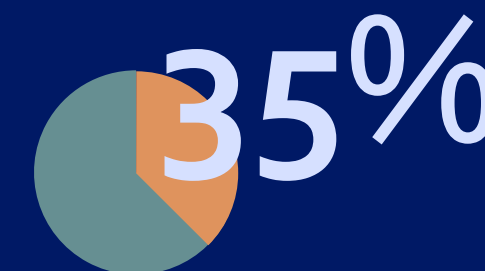
Grant recipients

277

The Foundation's grant recipients collaborates with many international project's partners, including 277 US based universities and university hospitals.



Between 2018 and 2022, NNF grant recipients collaborated with 214 US companies. 117 within the biotechnology sector, and 77 of the companies have less than 50 employees.



Between 2018 and 2022, US grant recipients have published 2508 journal articles. 35% of these are among the top 10% most cited in their field.

10/10

10 out of 10 top US universities collaborate with NNF grantees

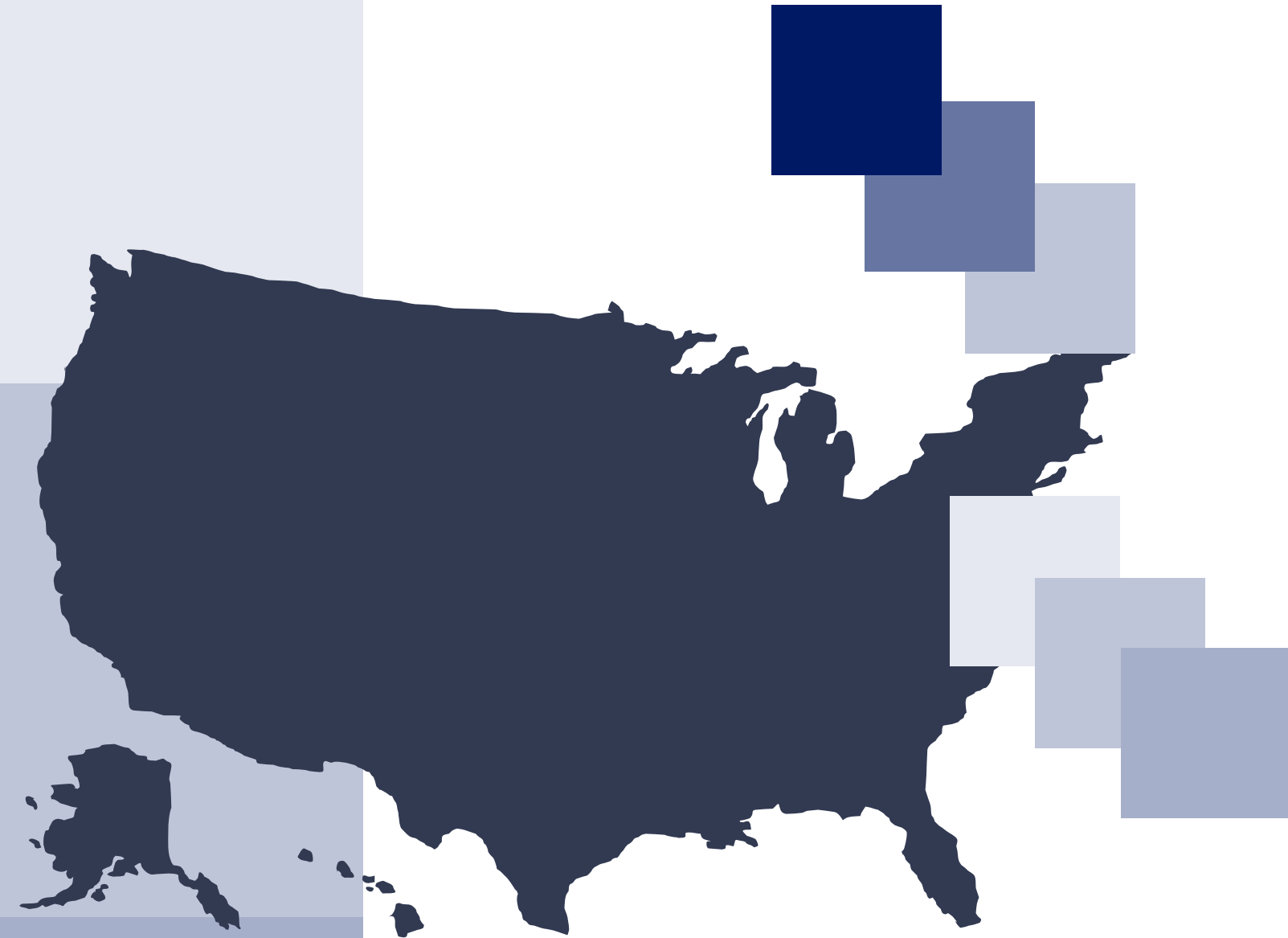
Introduction

This report is presented in three parts;

- Activities that Novo Nordisk Foundation (NNF) grant recipients have with institutions or organisations in the United States.
- An overview of the Bio Innovation Institute – BII activities in connection to US
- 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 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 US\$ 1.1 billion.

For more information, please see the [Impact Report 2021](#)

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:

US\$ 92 billion*

2022 in numbers

Awarded DKK
7.5 billion
US\$ 1.1 billion

Paid out DKK
5.2 billion
US\$ 743 million

695
Grants awarded

3,070
Applications
received

18%
Success rate for
research applications
among open calls

Investment result 2022
3.1 DKK billion
US\$ 443 million

*Preliminary numbers year-end 2022

Our vision is 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



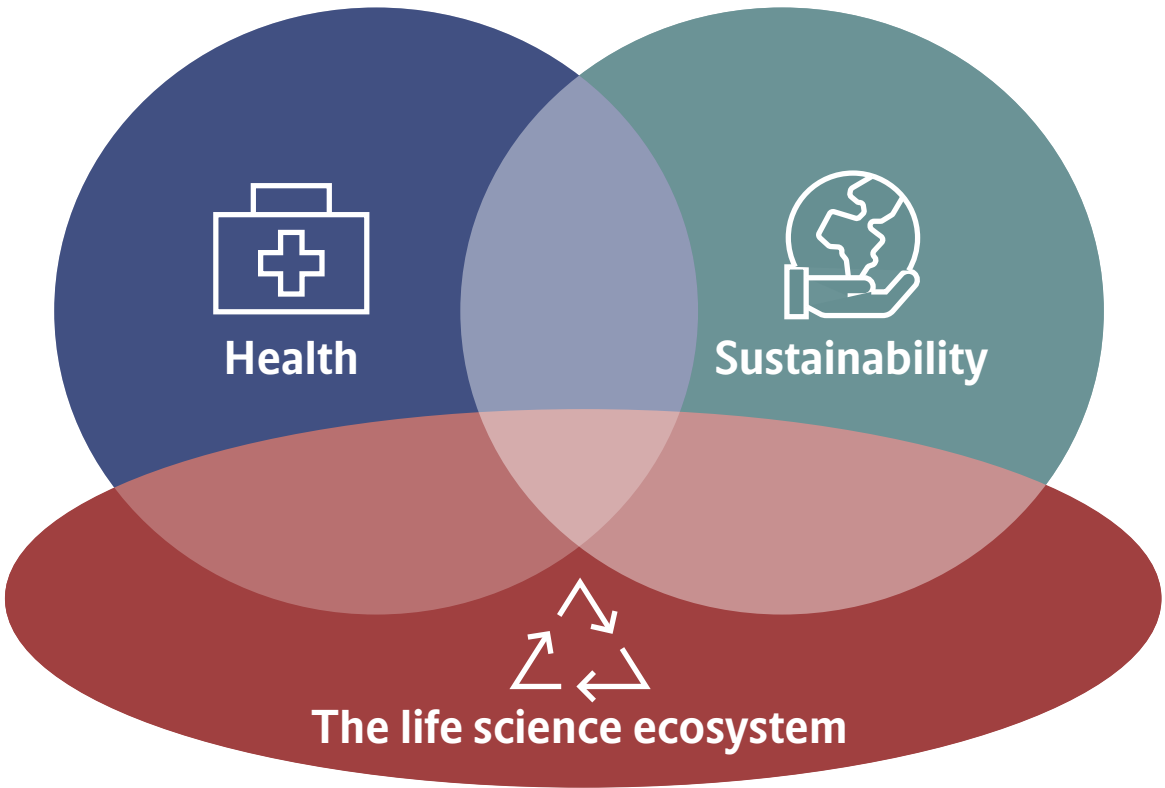
Theme 2: Understanding and managing cardiometabolic disease



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



US academic and
industry collaborations
involving NNF grant
recipients 2018-2022

31 projects funded by NNF include US researchers as applicants

The Novo Nordisk Foundation has in the last five years (2018-2022) funded 31 projects that have had 19 main applicants and 12 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\$ 111 million.

The funded projects span research areas including Innovation, Medical Science, Biotechnology and Natural-Technical Science. 14 projects were awarded in open competition, while 17 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.



Fostering the development of research talent at all levels

In 2022 the Novo Nordisk foundation supported 13 researchers, 25 PhDs and 27 Postdoc positions at US based research institutions through projects involving US applicants.

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.



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

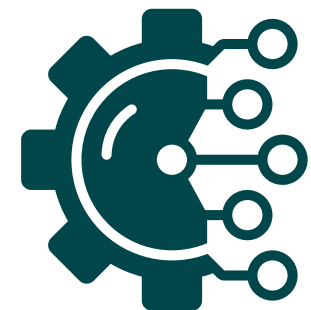
Between 2018 & 2022...



The Foundation's grant recipients have collaborated with many international project's partners on projects, including **857** collaborations between Danish and US partners.



277 of those partners are from universities and university hospitals.



218 US based companies co-authored at least one scientific article with grant recipients from the Novo Nordisk Foundation.

Stories about collaborations

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



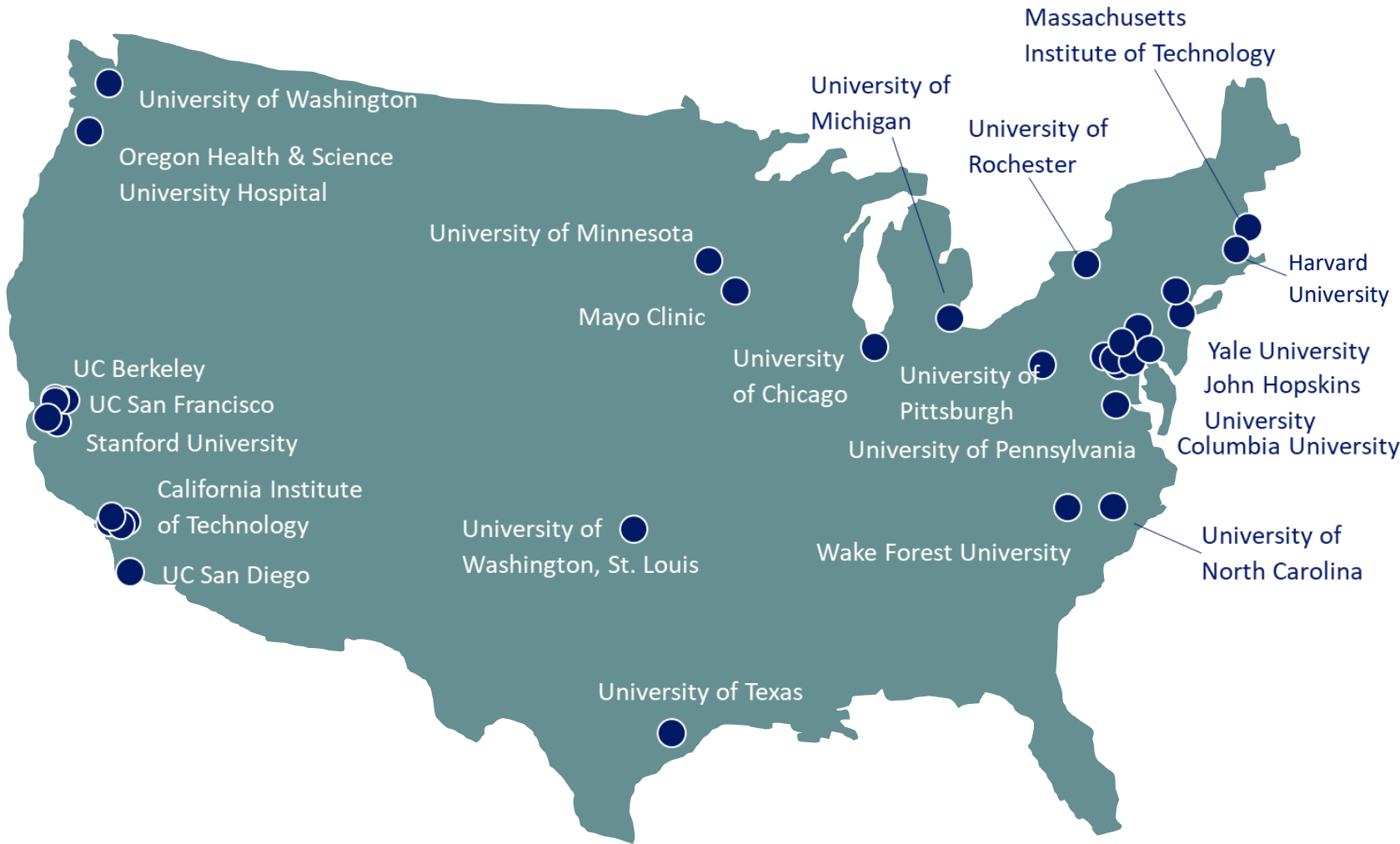
Lack of insight into how sound is produced is one factor preventing treatment of voice disorders and associated diseases. In this interdisciplinary project, researchers from the **University of Southern Denmark** and the **University of Maine** and **Emory University** in the United States will combine 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

		Project collaborations	Publication collaborations
1	Rockefeller University	0	25
2	Massachusetts Institute of Technology	2	68
3	Princeton University	0	10
4	California Institute of Technology	0	7
5	Stanford University	4	216
6	Harvard University	2	386
7	University of California, Berkeley	0	126
8	University of California, San Francisco	1	76
9	University of Chicago	0	59
10	Yale University	0	100

Source: Novo Nordisk Foundation, CWTS Leiden Ranking 2022



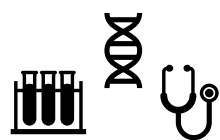
Publication collaborations between NNF grant recipients and US partners



Between 2018 and 2022, NNF grant recipients have co-authored **2508** publications with US-located researchers.



The highest number of US partners come from Harvard University (386 publications) followed by Stanford University (212 publications) and University of California, San Diego (208 publications).

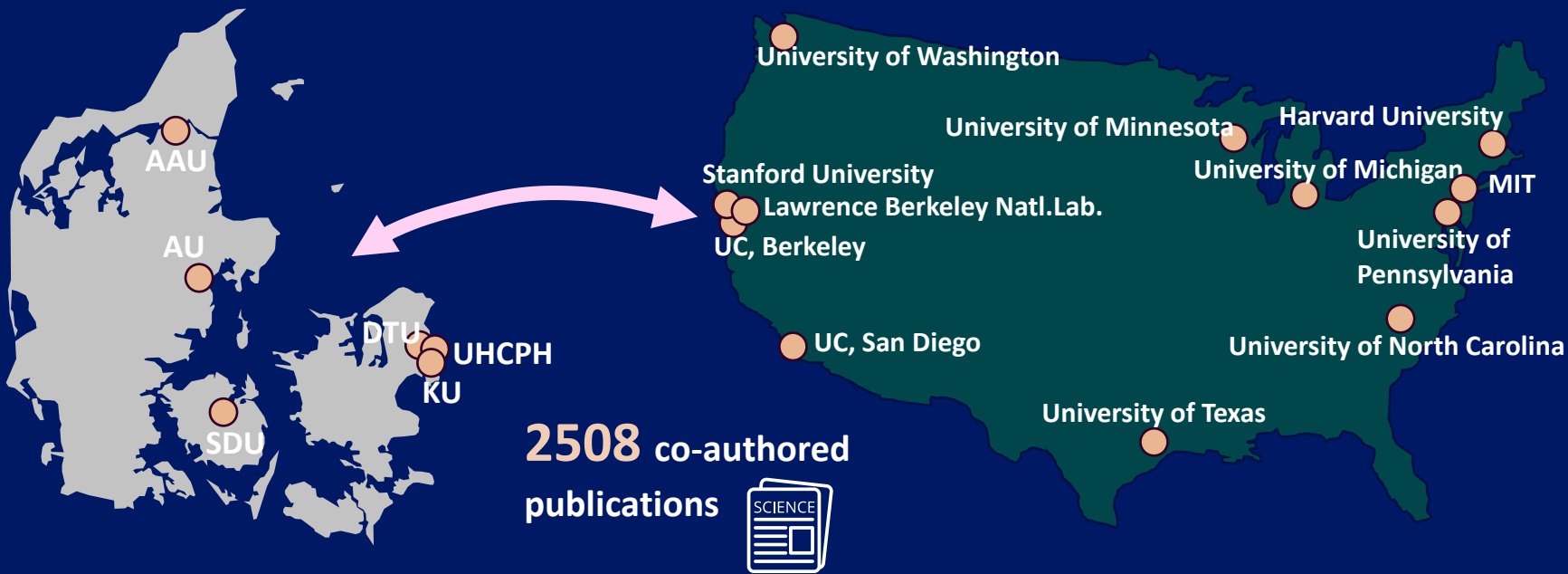


56% of the co-authored publications are within the research areas *Medicine* and *Biochemistry, Genetics & Molecular Biology*.



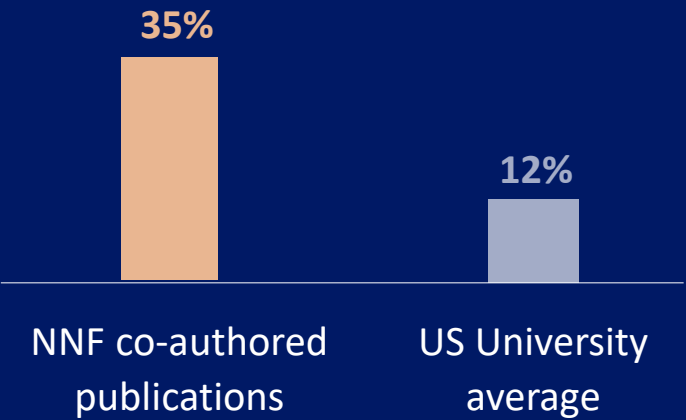
35% of the co-authored publications are within the top 10% most cited publications in their research field. The national average among the top US universities is 12%.

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 world-wide in the same research field and year



Patents from projects involving US applicants

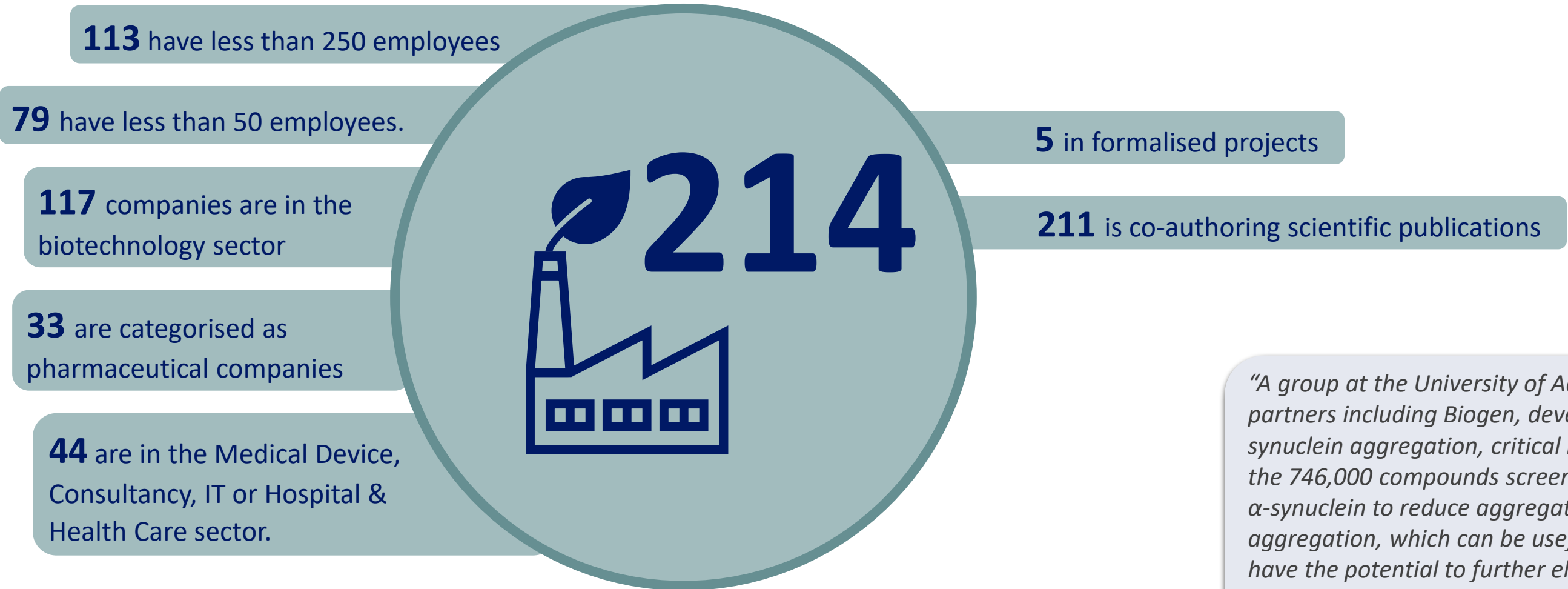
The Foundation's US grant recipients have in the last five years (2018-2022) reported total of 5 patents and patent applications. The patents and applications span research areas including Biotechnology and Medical Science.

In 2022, **North Carolina State University** researchers was granted a patent about re-engineering of mycorrhizal symbiosis in plants. the patent is attributed to a project that received funding from NNF in 2019.



Researchers receiving grants from the Novo Nordisk Foundation collaborate with US companies

In total 214 US companies collaborate with NNF grant recipients



“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



The **BioInnovation Institute Foundation** (BII) is an international enterprise foundation with a non-profit objective. BII operates an incubator to accelerate world-class life science innovation.

The Novo Nordisk Foundation will provide up to US\$ 500 million to BII over 10 years.

University of Washington



Researchers from Institute of Protein Design at **University of Washington** onboarded Bio Studio to develop drugs in a new biotech start-up. Bio Studio assist in translating world-class research into a company within 3 years by establishing a satellite group at BII that will form the basis of the future start-up company.

Bill and Melinda Gates Foundation



Since the start of the partnership with the **Bill & Melinda Gates Foundation** in 2021, BII has been actively undertaking activities to strengthen the ecosystem within the women's health field. Women's Health Innovation Panel consisting of world-leading academics, VCs, entrepreneurial experts, and key industry representatives was established to accelerate the mission of getting more solutions to address women's health needs and assess first WH startups and projects entering Venture Lab and Bio Studio.



Novo Holdings A/S in the United States

Our mission

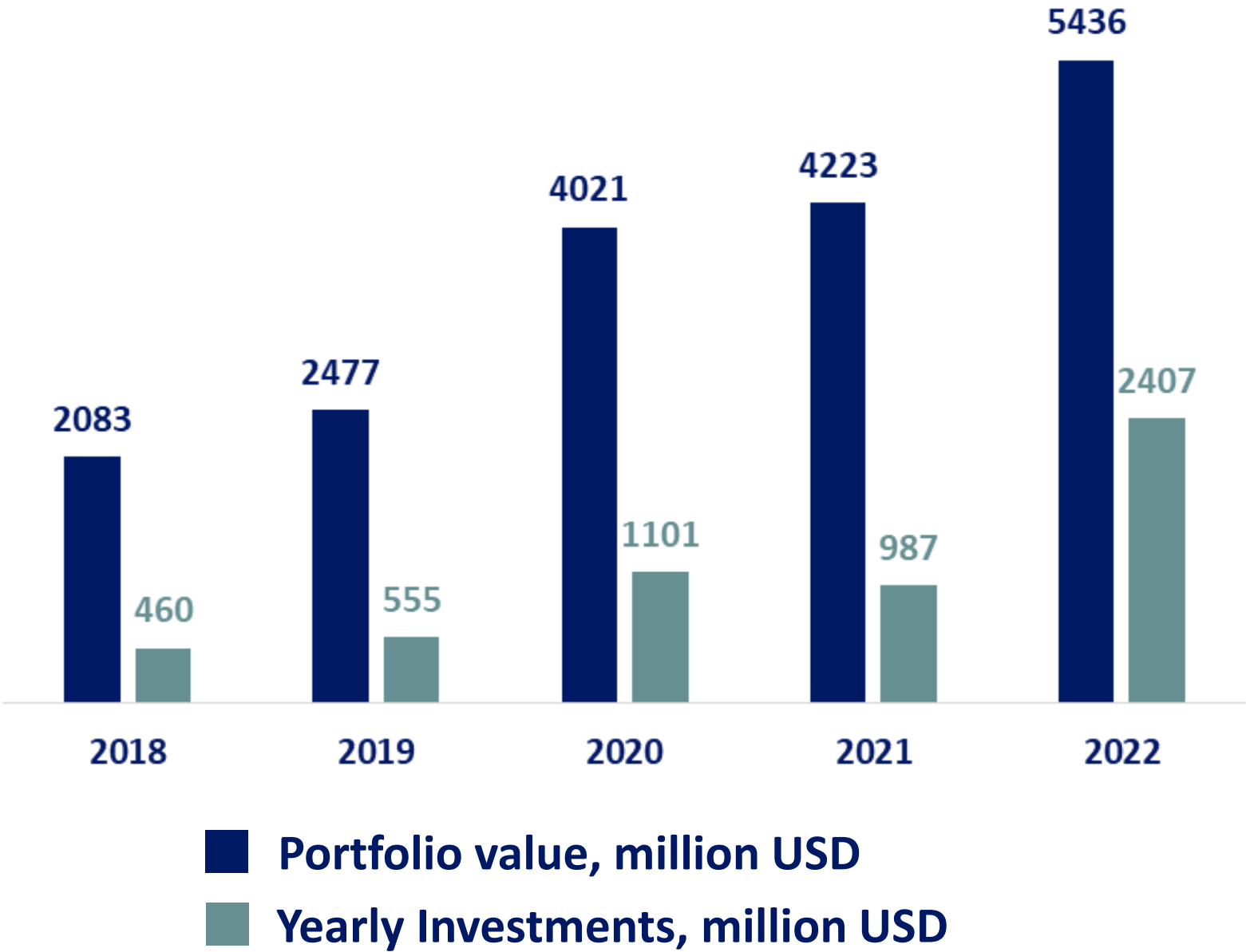
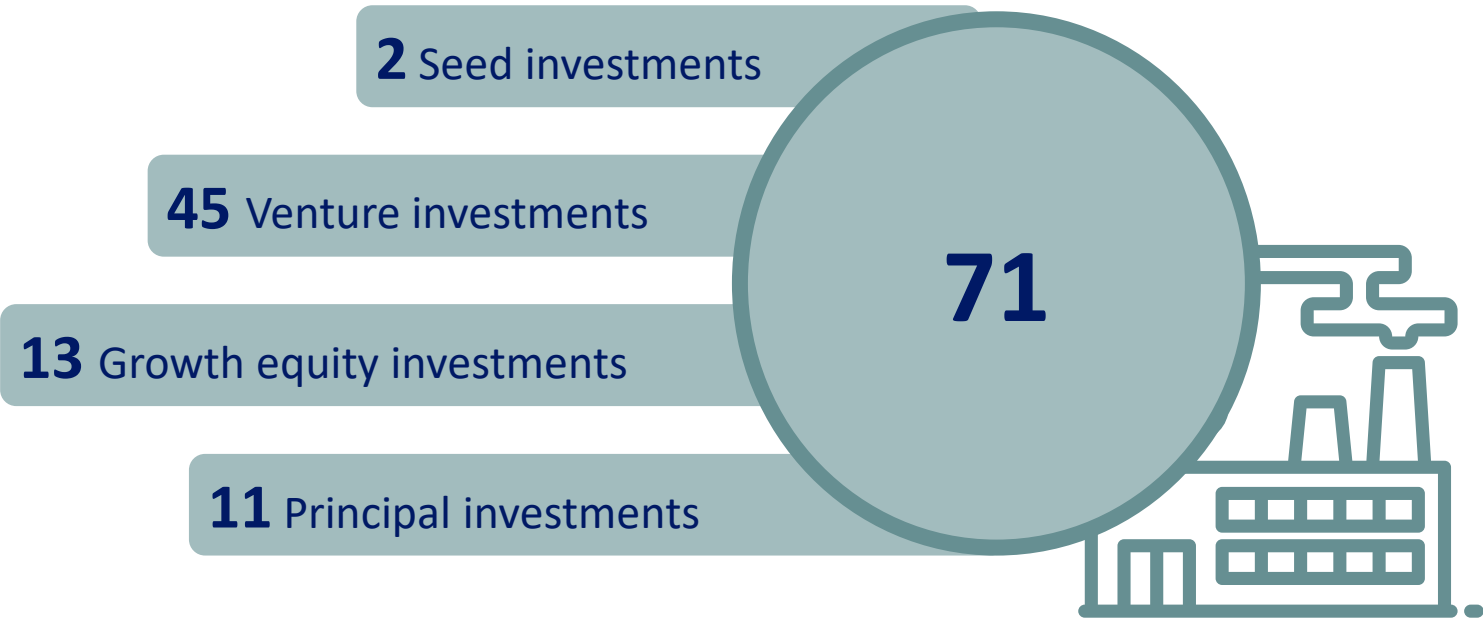
Novo Holdings is to be a supportive owner of the Novo Group companies and to make a growing and positive impact on health, science and society by generating attractive long-term returns on the assets of the Novo Nordisk Foundation.

Novo Holdings A/S Investments in United States

Novo Holdings A/S has in the period 2018-2022 invested **US\$ 5.5 billion in 122 US companies**. In 2022, the portfolio included 71 companies with an overall value of US\$ 5.4 billion.

65% of the life science investments made worldwide by Novo Holdings A/S are in US companies.

Companies in the current portfolio



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 US\$ 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 US\$ 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 US\$ 200 million Series F investment in the company.

Novo Holdings A/S investments in USA

Between 2018 – 2022, Novo Holdings A/S invested in IPOs alone US\$ 922 million in 113US listed companies.

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 US\$ 100 million and US\$ 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.



Number of jobs supported through Novo Holdings A/S investments in USA

Novo Holdings A/S supports 8828 full-time employees through investments in USA. This number applies exclusively to companies in which Novo Holdings A/S possesses an ownership share greater than 5%.



The REPAIR Impact Fund:

In 2018, Novo Holdings established the **REPAIR Impact Fund** to replenish the anti-infective pipeline and to combat antimicrobial resistance.

The REPAIR (Replenishing and Enabling the Pipeline for Anti-Infective Resistance) Impact Fund invests in companies involved in discovering and early-stage development of therapies targeting resistant microorganisms.

Revagenix



The REPAIR Impact Fund invested USD 4m plus potential additional US\$ 2m in the preclinical stage biopharmaceutical company **Revagenix**, California, USA. The company is dedicated to the discovery and development of life-changing and life-saving medicines for underserved patients. The company is advancing its portfolio of novel antibiotics, leveraging innovative and proprietary chemistry capabilities to design therapeutics to treat serious bacterial infections.

Entasis Therapeutics



The REPAIR Impact Fund invested US\$ 10m in the Initial Public Offering of **Entasis Therapeutics**, Boston, USA. The company is developing a portfolio of innovative product candidates to treat serious Gram-negative multi-drug resistant bacterial infections. Entasis' anti-infective discovery platform has produced a pipeline of meaningfully differentiated programs which target serious bacterial infections

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 2018-2022, 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