

Report on research collaborations in China

Impact

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Country report on Danish-Chinese relations in
Novo Nordisk Foundation (NNF) grants

Executive summary

- Since 2016 The Novo Nordisk Foundation (NNF) has awarded a total of USD 9.1 million to projects involving Chinese and Danish applicants.
- NNF grant recipients collaborate with 2 out of the 10 top universities in China.
- NNF grant recipients have co-authored 518 publications with Chinese researchers. 29% of these are among the top 10% most cited in their field.
- NNF grant recipients collaborate with 18 Chinese-based companies, 9 of which are Chinese by origin. 50% of the companies have more than 500 employees.
- Between 2014 and 2020, 20 young Chinese researchers have been awarded a grant from the Novo Nordisk Foundation to attend the Copenhagen Bioscience Conferences.

Introduction

The Novo Nordisk Foundation (NNF) is an independent Danish foundation with corporate interests.

The Foundation has two objectives:

- to provide a stable basis for the commercial and research activities of the companies in the Novo Group (Novo Holdings A/S, Novo Nordisk A/S and Novozymes A/S); and
- to support scientific, humanitarian and social causes.

Since 2016, NNF has invested US\$ 4.4 billion in science and society.

This report presents activities that NNF grant recipients have with institutions or organizations in China.

It showcases NNF's contribution to the Chinese academic community.

Through data and case studies, it demonstrates the different kinds of relationships and activities between NNF grant recipients and Chinese academic partners. Data in the presentation are based on activities between 2016 and 2020 (inclusive).

An independent Danish foundation with corporate interests

novo nordisk fonden

Grants

Grants awarded in 2020:
USD 881 million
(DKK 5.54 billion)

- Biomedical and health science research and applications
- Patient-centred and research-based care
- Life science research and industrial applications promoting sustainability
- Natural and technical science research and interdisciplinarity
- Innovation
- Education & outreach
- Social, humanitarian and development aid

Dividends

100% SHARES

novo holdings

Investors in life science

Dividends

28.1% SHARES*
76.5% VOTES



25.5% SHARES*
72.4% VOTES



Investments

Investment result in 2020:
USD 4.6 billion
(DKK 29.0 billion)

- Principal investments
- Growth equity
- 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 vision

The Novo Nordisk Foundation's **vision** is to contribute significantly to research and development that improves the lives of people and the sustainability 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

Case stories

Data sharing

A collaboration was established with the Hong Kong Institute of Diabetes and Obesity to make use of data on an “original and unique cohort of patients”.

Data collaboration

A collaboration with Beijing Genomics Institute (BGI) is singled out as “significantly expanding the capacity to understand and handle sequencing data”. “BGI were instrumental in providing a dataset containing information to evaluate the deletion effect of each genetic variant”.

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



Chinese academic collaborations involving NNF grant recipients

One project funded by NNF includes Danish and Chinese researchers as co-applicants

The Novo Nordisk Foundation has in the last five years (2016-2020) funded **1** project that had **1** co-applicants from China. Co-applicants are members of the international group applying for an NNF grant. The total funding allocated to this project is US\$ **9.1 million**.

The funded project is in the research area plant science and crop resiliency. The project was awarded in open competition.



Since 2014, **20** young Chinese researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences.

“An opportunity that will facilitate transatlantic training for PhD students and postdocs”

NNF - Applicant 2015

NNF grant recipients' project collaboration with Chinese partners

Between 2016 & 2020:



The Foundation's grant recipients have collaborated with many international project partners on projects, including **239** collaborations between Danish and Chinese partners.



147 of those partners are universities and university hospitals.



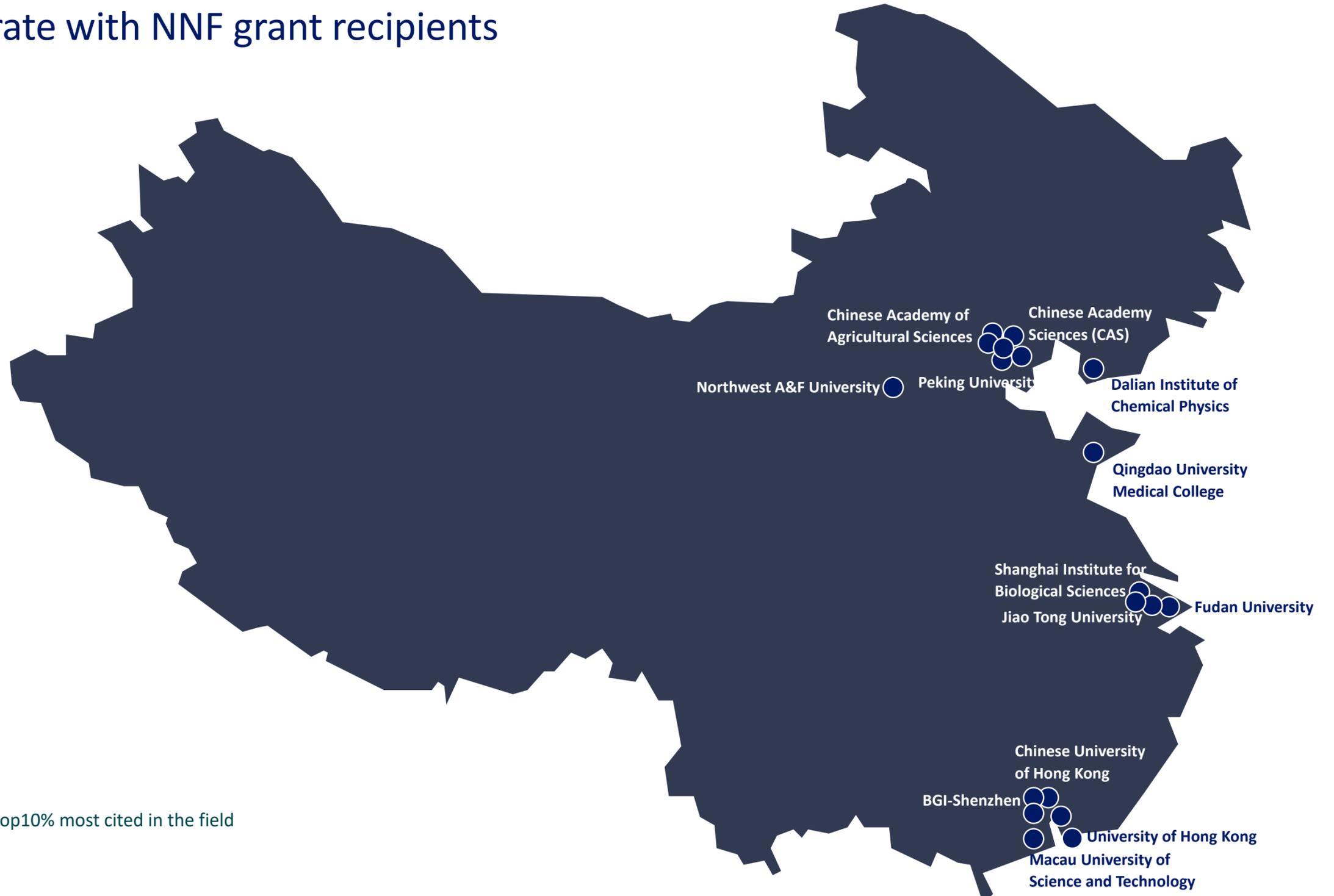
7 Chinese companies co-authored at least one scientific article with grant recipients from the Novo Nordisk Foundation.

NNF grant recipients' collaboration with top Chinese universities

2 out of 10 top universities collaborate with NNF grant recipients

Top ranked universities in China

- 1 Hunan University
- 2 Shandong University of Science and Technology
- 3 Hong Kong University of Science and Technology
- 4 Hong Kong Polytechnic University
- 5 City University of Hong Kong
- 6 Southern University of Science and Technology
- 7 Tsinghua University
- 8 Qufu Normal University
- 9 Changsha University of Science and Technology
- 10 Central China Normal University



Source: Novo Nordisk Foundation, Leiden Ranking 2021,

Note: Universities are ranked on their share of publications among the top10% most cited in the field

Publication collaborations between NNF grant recipients and Chinese partners



Between 2016 and 2020, NNF grant recipients have co-authored **518** publications with researchers located in China.



The highest number of Chinese partners come from the Chinese Academy of Sciences (48 co-authored publications), Shenzhen Institute of Advanced Technologies (41 co-authored publications), and Shanghai Jiao Tong University (40 co-authored publications).



61% of the co-authored publications are within the research areas Biochemistry, Genetics, Molecular Biology, Medicine and Immunology.



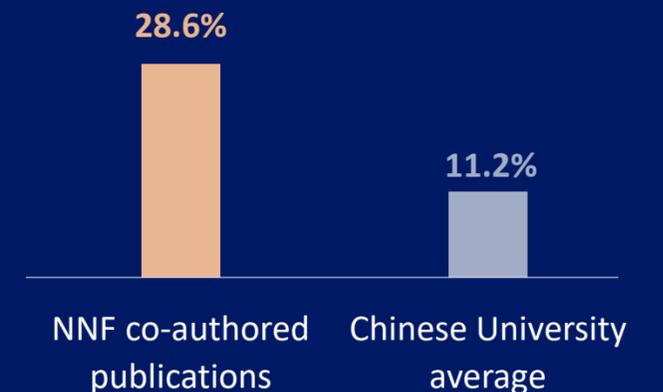
29% of the co-authored publications are within the top 10% most cited publications in their research field. The national average among the top Chinese universities is 11.2%.

Selected links between China and Denmark

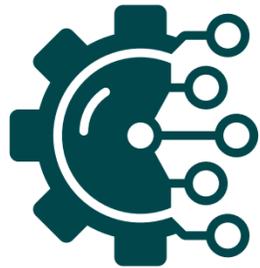


NNF grants contribute to research excellence

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

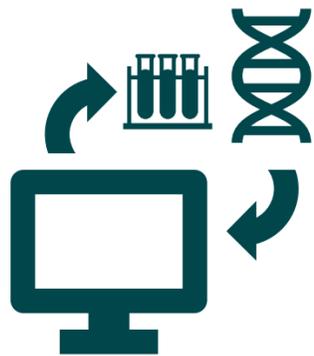


NNF grant recipients' collaboration with Chinese companies



18 companies located in China collaborate with NNF grant recipients on formalized research projects (11) or by co-authoring scientific publications (7).

9 of these companies are Chinese by origin, while the remaining firms are international companies co-located in China.



50% of the companies have more than 500 employees.

6 of the companies are within the biotechnology sector.

Location of NNF grant recipients' collaborating partners in China



Source: Novo Nordisk Foundation (2021) based on ResearchFish® reporting

Methods and sources

Methods:

- Collaborations were defined as either project collaborations or publication collaborations funded by NNF, with at least one Chinese collaborator/Chinese institute.
- 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(Top 10%).
- Publications were defined as publications with at least one Chinese and one Danish author.
- Chinese industry collaborators were defined as collaborations with companies registered in China.
- Chinese research partners were defined as successful NNF grant applications with at least one Chinese co-applicant.
- The number of Chinese attendees at the Copenhagen Bioscience Conference series were defined as applicants and attendees registered with a Chinese research institute.

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
- Novo Holdings A/S
 - Investment data