

# Report on research collaborations in India

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

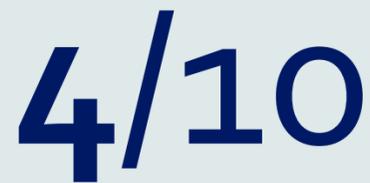
# Executive summary



NNF grant recipients have co-authored 63 publications with researchers located in India. 65% of these are among the top 10% most cited in their field.



Since 2015, 17 young Indian researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences.



NNF grant recipients collaborate with four of the top 10 highest ranked universities in India.



Between 2015 and 2019, NNF grant recipients have collaborated with 4 Indian companies. One is in the biotechnology sector and 2 of the companies have more than 10,000 employees.

# 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 2015, the Foundation has invested \$ 3.3 billion in science and society. NNF is listed as the wealthiest among the 42 largest [charitable foundations worldwide](#).

This report is present, activities that NNF grant recipients have with institutions or organizations in India.

It showcases NNF's contribution to the Indian academic community and industry.

Through figures and case studies, the report demonstrates the different kinds of relationships and activities between NNF grant recipients and Indian academic and industry partners. Data in the presentation are based on activities between 2015 and 2019 (inclusive).

# An independent Danish foundation with corporate interests

## novo nordisk fonden

### Grants

#### Grants awarded in 2019:

US\$ 732 million  
(DKK 4.9 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\*  
76.1% VOTES



25.5% SHARES\*  
72.0% VOTES



### Investments

#### Investment result in 2019:

US\$ 3.9 billion  
(DKK 26.0 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



# Indian academic and industry collaborations involving NNF grant recipients 2015-2019

# NNF Grant recipients' project collaborations with Indian partners



Between 2015 & 2019:

The Foundation's grant recipients have collaborated with many international project partners on projects, including **114** collaborations between Danish and Indian partners.



**65** of those partners are universities, university hospitals and non-profit research institutes.



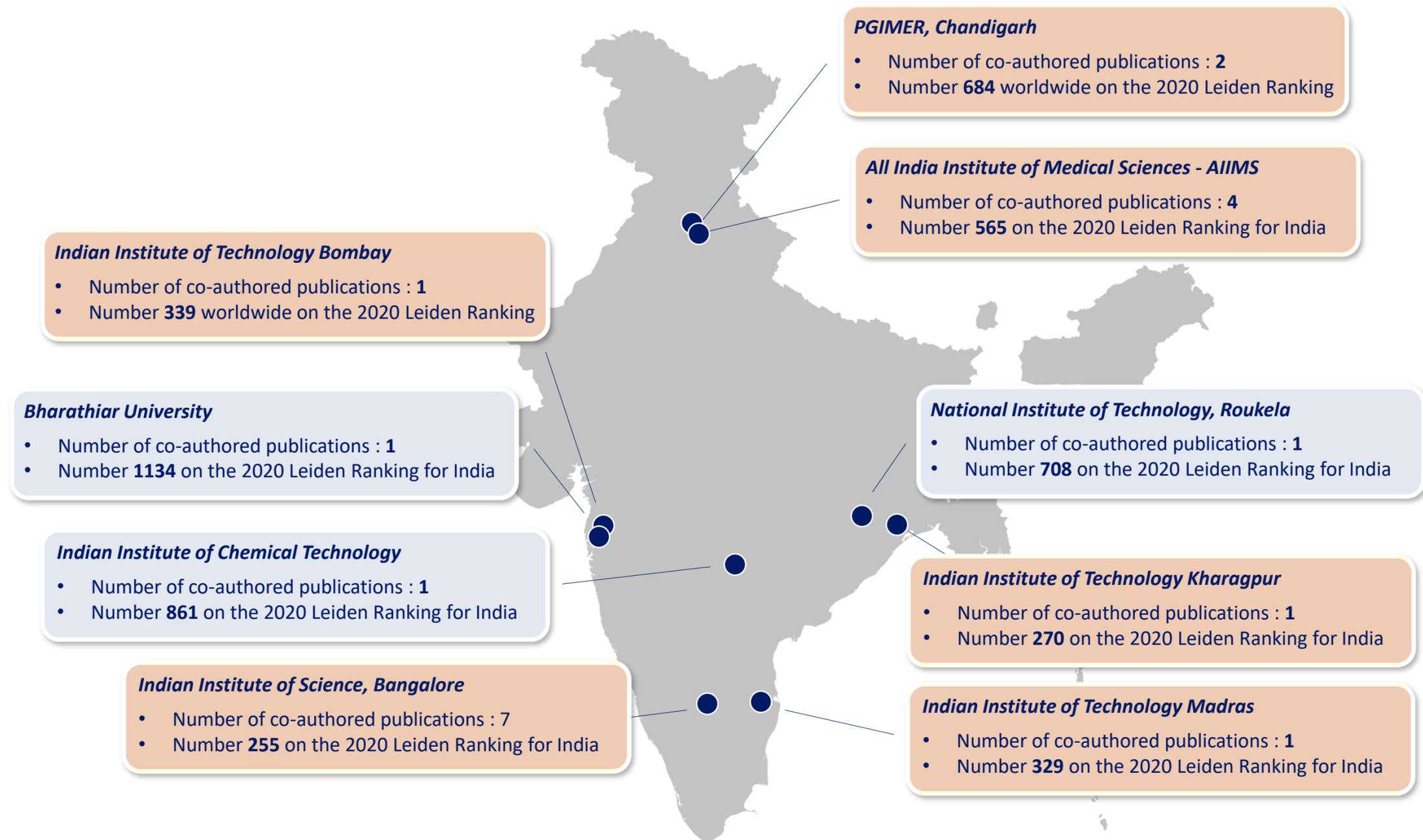
**4** Indian companies co-authored at least one scientific article with grant recipients from the Novo Nordisk Foundation.

# NNF Grant recipients' collaboration with the most prominent universities in India

## Top 10 universities in India

1	Indian Institute of Science
2	Indian Institute of Technology
3	Banaras Hindu University
4	University of Delhi
5	Vellore Institute of Technology
6	Jadavpur University
7	Anna University
8	All India Inst Med Sci - AIIMS
9	PGIMER, Chandigarh
10	IIT – Indian School of Mines

Source: Novo Nordisk Foundation, CWTS Leiden Ranking 2019



Source: Novo Nordisk Foundation, CWTS Leiden Ranking 2020

# Case stories

## An institute collaboration

**Indian Institute of Science Education and Research, Pune** and **the NNF Center for Stem Cell Biology (Danstem)** collaborate on screening the entire fruit fly *Drosophila* genome for tumour suppressors during tumour formation and metastasis. Fruit flies are commonly used for genetic screenings with the goal of identifying genes that could be targeted by drugs, and this collaboration seeks to identify drug targets that could help advance cancer treatment. The screening is carried out in India by a team comprising researchers from Copenhagen and India, with follow-up work to be done at both sites.

## A university collaboration

A collaboration between **Bhagwan Mahavir Medical Research Centre** and **Technical University of Denmark** has discovered one pathway that can explain why live attenuated vaccines provide better protection against infection than inactivated vaccines. Vaccinating with attenuated vaccines induces a much larger response from a specific type of immune cells, called T-cells. The research team identified a specific receptor that activates these cells. The receptor is a promising target for future inactivated vaccines, as it will help to optimize them, which will be critical not just for humans but also for livestock.

## Publication collaborations between NNF grant recipients and Indian partners



Between 2015 and 2019, NNF grant recipients have co-authored **63** publications with researchers located in India.

The highest number of Indian collaborating partners come from Indian Institute of Science (7 publications), followed by Madras Diabetes Research Foundation (6 publications).

**60%** of the co-authored publications are within the three research areas *Chemistry, Medicine* and *Biochemistry, Genetics & Molecular Biology*.

**65.1%** of the co-authored publications are within the top 10% most cited publication in their research field. The national average among the top Indian universities is **7.5%**.

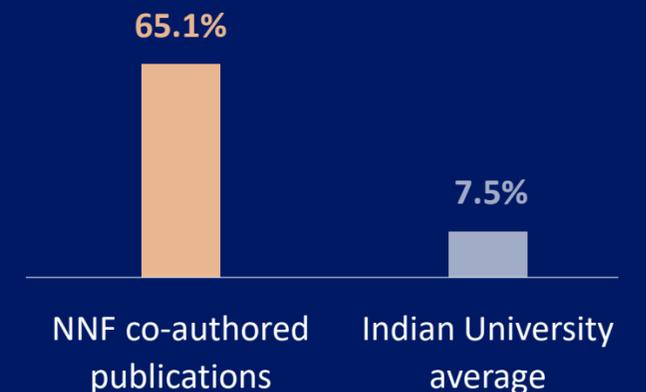


## Selected links between India and Denmark



## 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



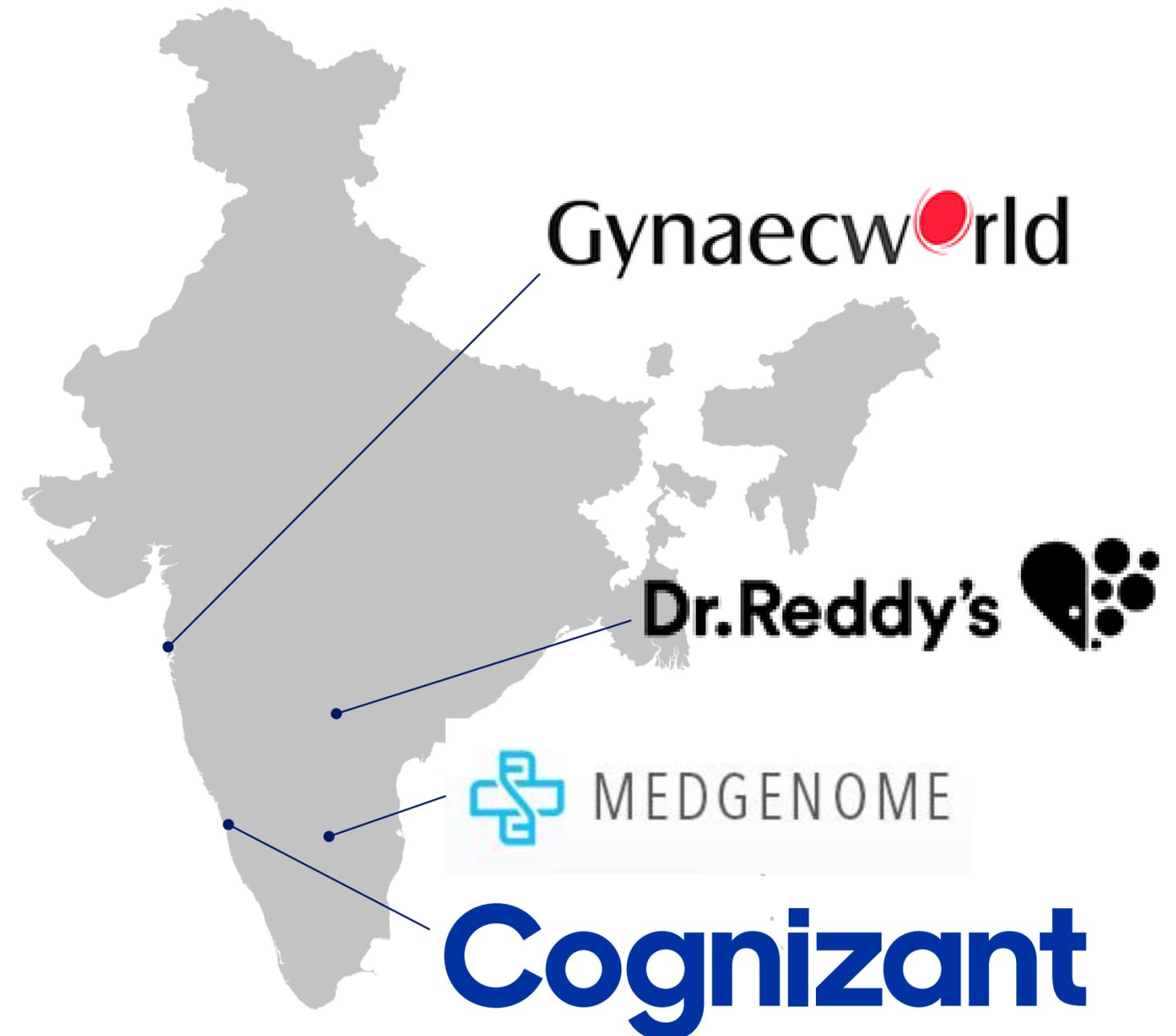
## Researchers receiving grants from the Novo Nordisk Foundation collaborate with Indian companies

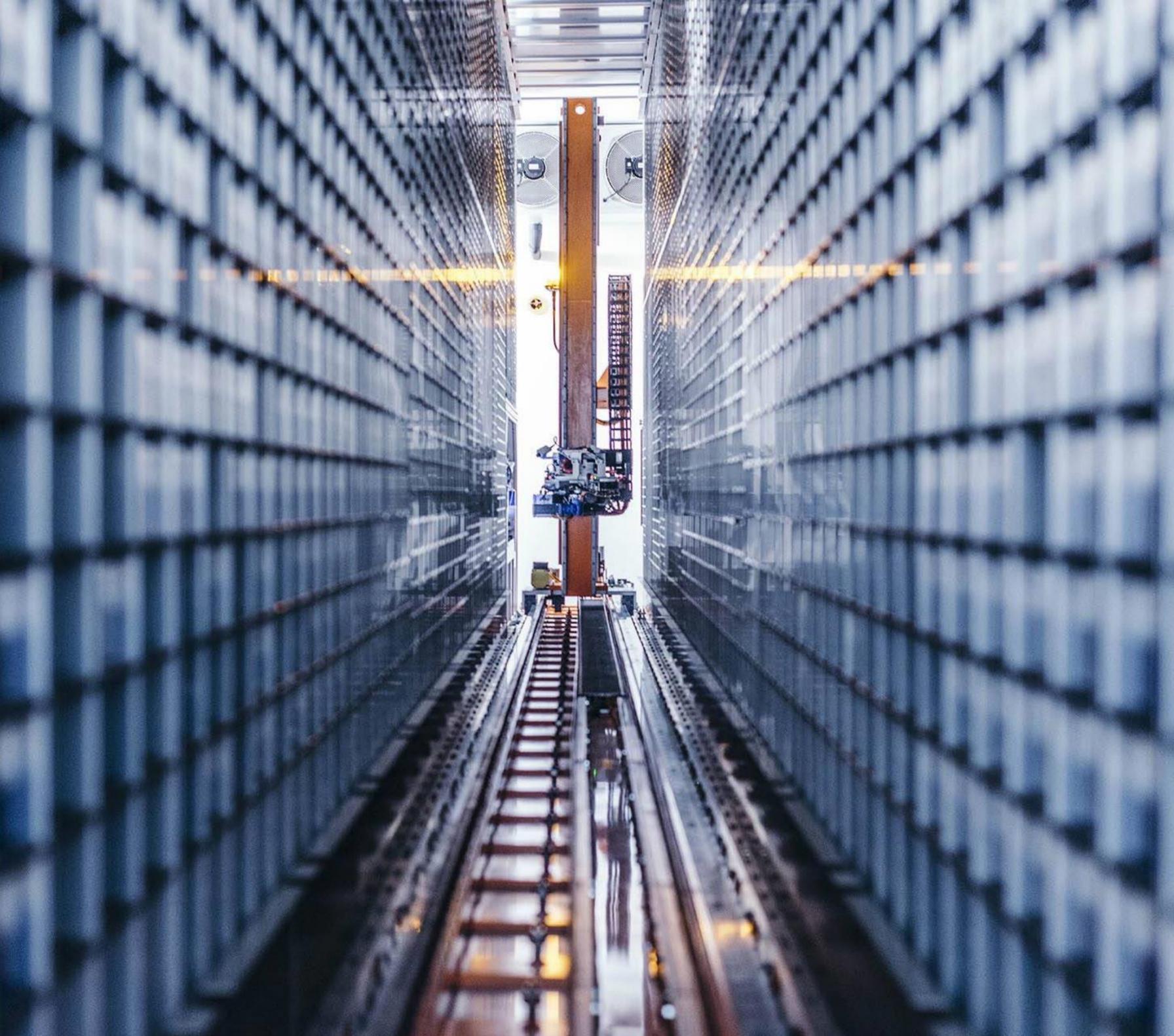
- 4** companies located in India collaborate with the NNF grant recipients, either on formalized research projects or by co-authoring scientific publications
- 2** companies are multinational, with more than 10,000 employees, and a single company has less than 50 employees.
- 1** company is in the biotechnology sector.
- 2** are categorized as pharmaceutical companies.
- 1** is in the Hospital & Health care.

*“A collaboration between researchers at the University of Copenhagen and Discovery Research, Dr Reddy’s Laboratory in India has discovered and characterized a novel target for medicating for pain. Pain is very difficult to target medically, and discoveries like this are essential in improving pain management clinically.*

*Reporting in Researchfish, 2019*

## Location of NNF recipients’ industrial collaborating partners





# 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 India.
- University ranking was based on the time period 2014-2017, across all sciences, with institutions with at least 100 publications, and based on the PP(top10%).
- Collaborative publications were defined as publications with at least one Indian and one Danish author.
- Indian industry collaborators were defined as collaborations with companies registered in India.
- Indian research partners were defined as successful NNF grant applications with at least one Indian co-applicant.
- The number of Indian attendees at the Copenhagen Bioscience Conference series were defined as applicants and attendees registered with an Indian research institute.

## Sources:

- Researchfish (NNF grant data)
  - Research publication collaborations
  - Company project collaborations
  - Publications
- Data Warehouse, NORMA and OMADA (NNF grant application data)
  - Applicants with **Norwegian** origin
  - Co-applicants
  - Copenhagen Bioscience PhD programme applicants
- The Leiden Ranking 2019
  - University rankings
  - Publication impact data
- Clinicaltrials.org
  - Clinical trials data