

Report on research collaborations and investments in the United Kingdom

Country report on Danish-UK relations in NNF grants and NH investments

Executive summary

- The Novo Nordisk Foundation (NNF) has awarded a total of GBP 298,000 to four projects involving UK and Danish applicants.
- NNF Grant recipients collaborate with 9 of the top 10 UK universities.
- NNF grant recipients have co-authored 1589 publications with researchers located in the UK. 32% of these are among the top 10% most cited in their field.
- Since 2015, 216 young UK researchers have been awarded a grant to attend the Copenhagen Bioscience Conferences.
- Between 2015 – 2019, NNF grant recipients collaborate with 51 UK companies. 40% are in the biotechnology sector and the majority (61%) have less than 50 employees.
- Between 2015 – 2019, Novo Holdings invested GBP 1.4 billion in 15 UK companies by follow-ons, open market purchases or other transactions.
- Since 2015, Novo Holdings has funded an average of 10 UK companies each year as part of its portfolio.
- Novo Holdings' portfolio in United Kingdom includes 10 companies with an overall value of GBP 899 million.
- 33% of all Life Science investments made by Novo Holdings between 2015 and 2019 are in UK companies.

Introduction

The Novo Nordisk Foundation 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 GBP 2.7 billion in science and society.

This report is presented in two parts;

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

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

Through figures and case studies, it demonstrates the different kinds of relationships and activities between NNF grant recipients and UK 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

Case stories

A university collaboration

A collaboration between the **University of Oxford** and **Novo Nordisk Foundation Center for Protein Research** has resulted in a research article published in Nature. The collaboration discovered a new and fundamental way in which DNA structure is protected following breakage. DNA breakage can cause mutations with severe consequences - for example during development – so these mechanisms of protection and repair are crucial to understanding a range of diseases and disorders.

A university/clinical collaboration

A collaboration between **University College London Hospitals** and **Copenhagen University Hospital** has made it possible to include enough patients for Resveratrol treatment trials for the rare diseases metabolic myopathies. It is extremely challenging, and often impossible, to recruit the number of patients needed to complete a treatment study on these diseases. By transferring patients by plane from the UK to take part in trials in Copenhagen from the UK, this collaboration was vital in allowing trials for a potential treatment to progress.

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



UK academic and industry collaborations involving NNF grant recipients 2015-2019

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

The Novo Nordisk Foundation has in the last five years (2015-2019) funded **4** projects that have had **5** co-applicants from UK. Co-applicants are members of the international group applying for an NNF grant. The total funding allocated to these projects is **£298,000**

The projects fund Biomedical research. All 4 were awarded in open competition.

- **University of Aarhus** and **Cardiff University** have received funding for a project within clinical and basic biomedicine
- **Aarhus University Hospital** and **University College London** have received funding for a project within clinical and basic biomedicine
- **University of Copenhagen** has received funding to organize two symposia in the Novo Nordisk Foundation conference series, one together with **Imperial College London** and **University of Cambridge**, and another with **University of Edinburgh**.



Since 2014, **216** young UK 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 UK partners

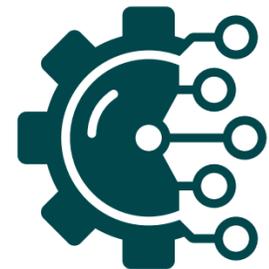
Between 2015 & 2019...



The Foundation's grant recipients have collaborated with many international projects partners on projects, including **587** collaborations between Danish and UK partners.



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



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

NNF Grant recipients' collaboration with top UK universities

9 out of 10 top UK universities collaborate with NNF grant recipients

- 1 London School of Hygiene & Tropical Medicine
- 2 University of Oxford
- 3 University of Cambridge
- 4 University College London
- 5 Imperial College London
- 6 University of Exeter
- 7 King's College London
- 8 University of Bristol
- 9 Queen Mary University of London
- 10 London School of Economics

Source: Novo Nordisk Foundation, CWTS Leiden Ranking 2019



Publication collaborations between NNF grant recipients and UK partners



Between 2015 and 2019, NNF grant recipients have co-authored **1589** publications with UK-located researchers.



The highest number of UK partners come from University of Oxford (313 publications) followed by the University College London (309 publications) and University of Cambridge (274 publications).

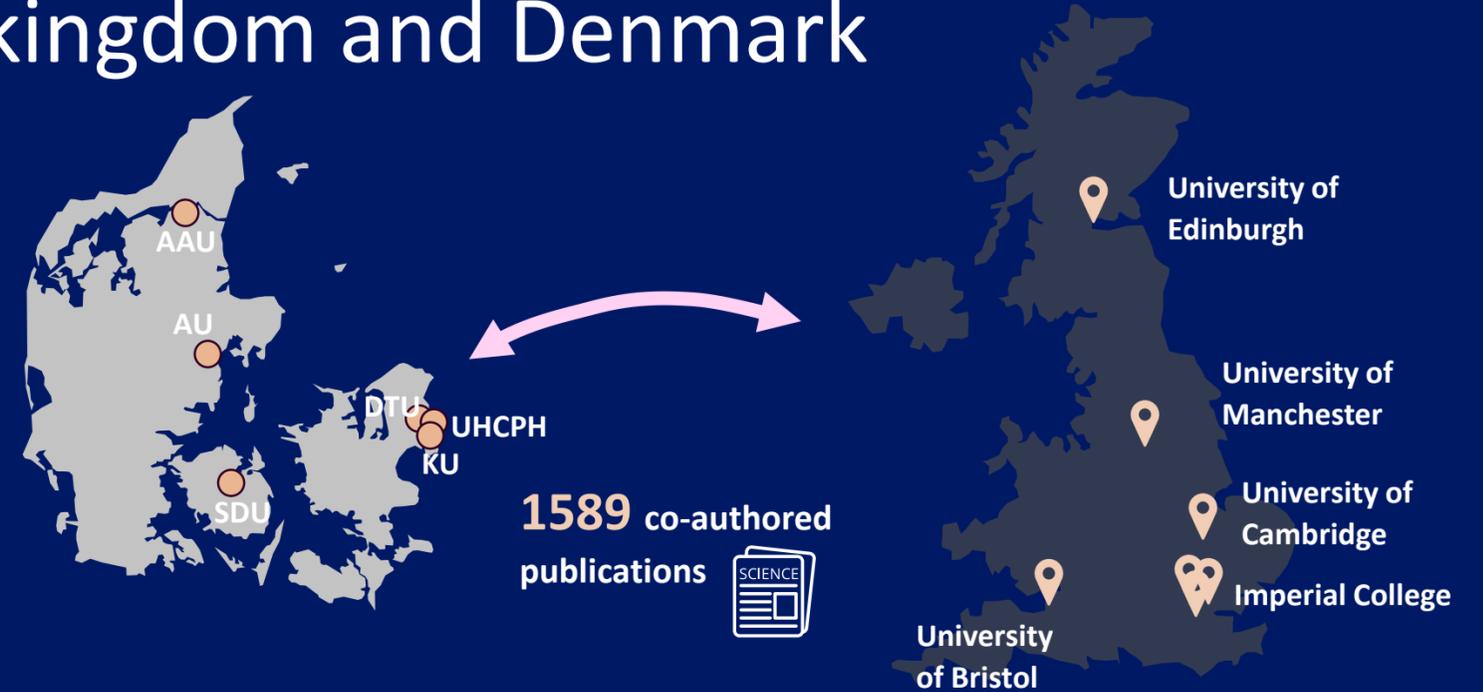


67% of the co-authored publications are within the research areas *Medicine and Biochemistry, Genetics & Molecular Biology*.



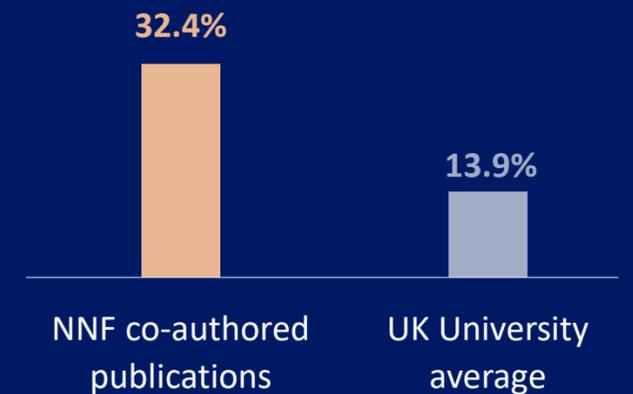
32.4% of the co-authored publications are within the top 10% most cited publication in their research field. The national average among the top UK universities is 13.9%.

Selected links between the United Kingdom 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



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

51 companies located in United Kingdom collaborate with NNF grant recipients either on formalised research projects (14) or by co-authoring scientific publications (37)

36 companies have less than 250 employees, and the majority (61%) have less than 50 employees.

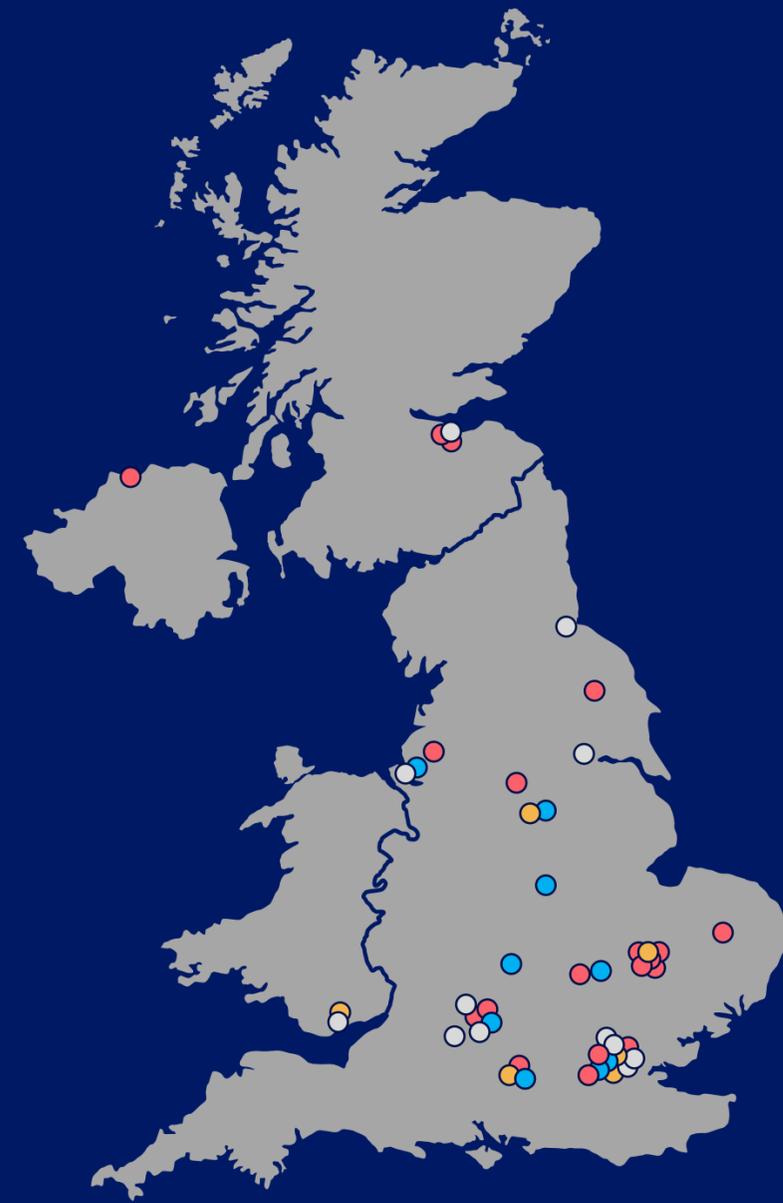
19 companies are in the biotechnology sector.

11 are categorised as pharmaceutical companies.

21 are in the medical device, Computer Science, Consultancy or Hospital & Health Care sector.

“A group at the University of Copenhagen has, in collaboration with industry partner Illumina United Kingdom., filed a patent, developed a new methodology for reproductive health and their clinical validation, as well as published a paper in Nature Genetics.”
Reporting in Researchfish, 2019

Location of NNF grantees' collaborating partners in the UK



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

● Biotechnology ● Pharmaceuticals ● Computer Science ● Other



Novo Holdings A/S in United Kingdom

Our mission

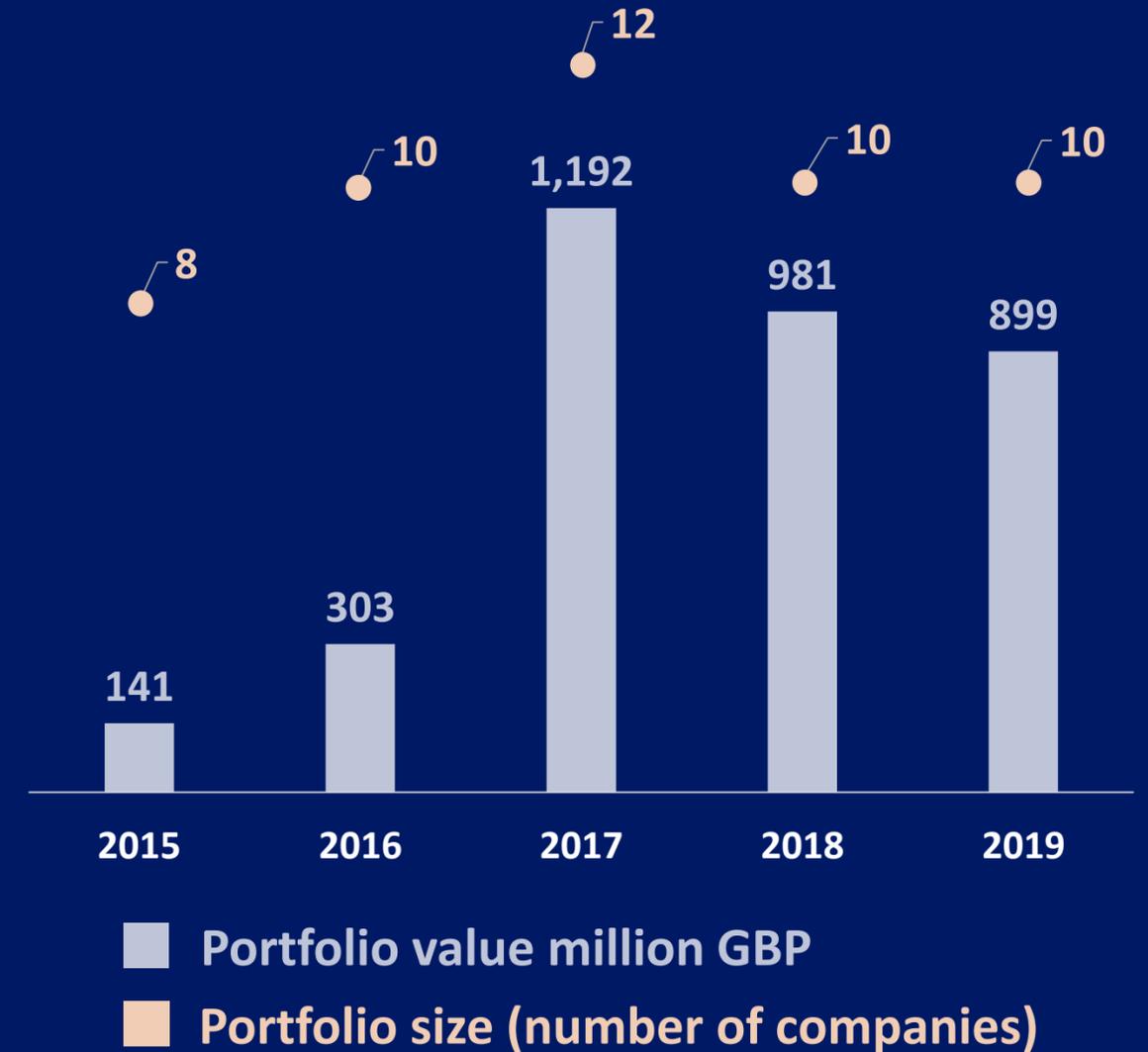
Novo Holdings is to be a supportive owner of the Novo Group companies and to make a growing and positive impact on health, science and society by generating attractive long-term returns on the assets of the Novo Nordisk Foundation.

Novo Holdings A/S Investments in United Kingdom

Novo Holdings A/S has in the period 2015-2019 invested **GBP 1.4 billion in 15 UK companies**. In 2019, the portfolio included 10 companies with an overall value of GBP 899 million.

33% of the life science investments made worldwide by Novo Holdings A/S are in UK companies.

Companies in the current portfolio

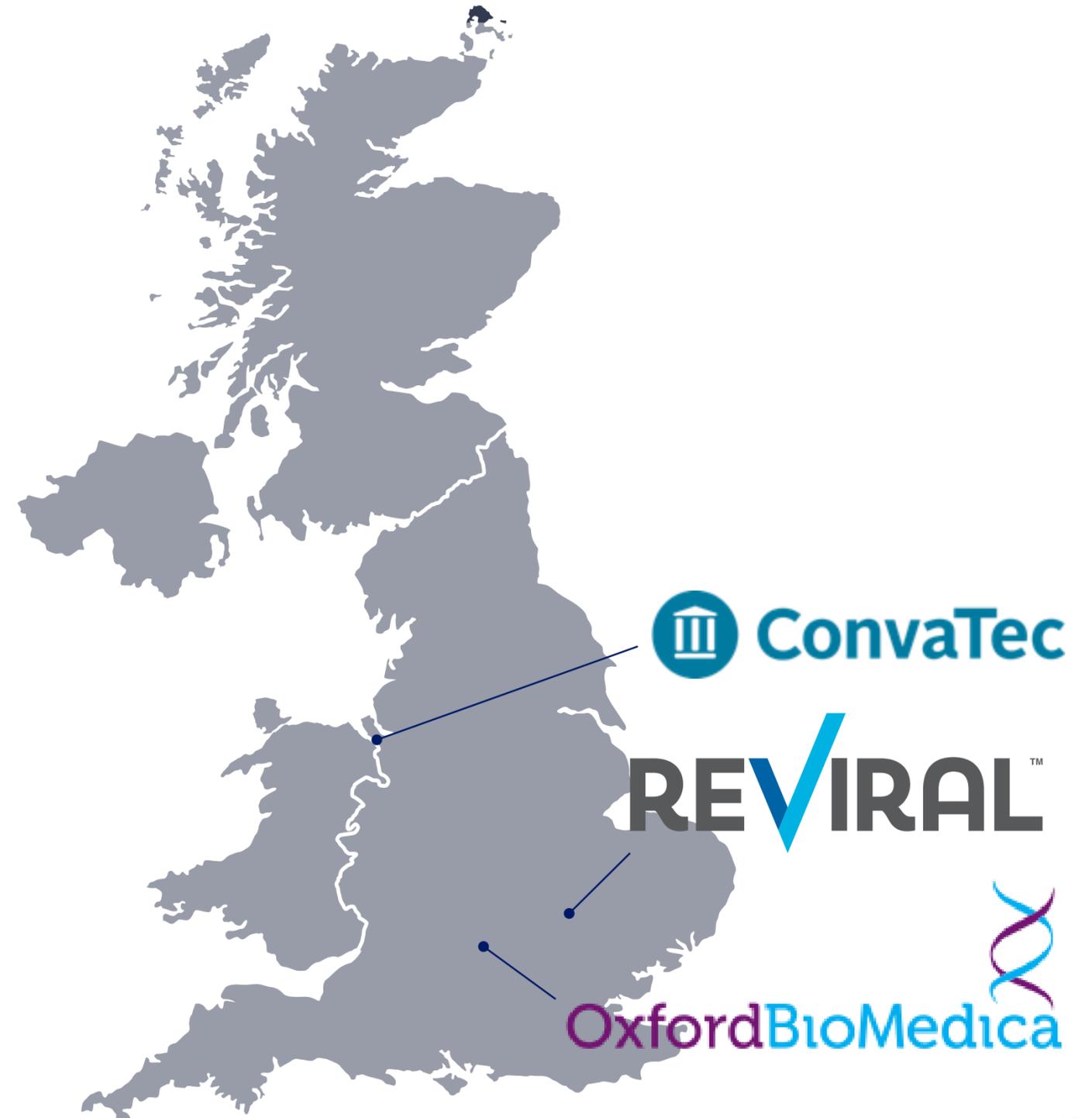


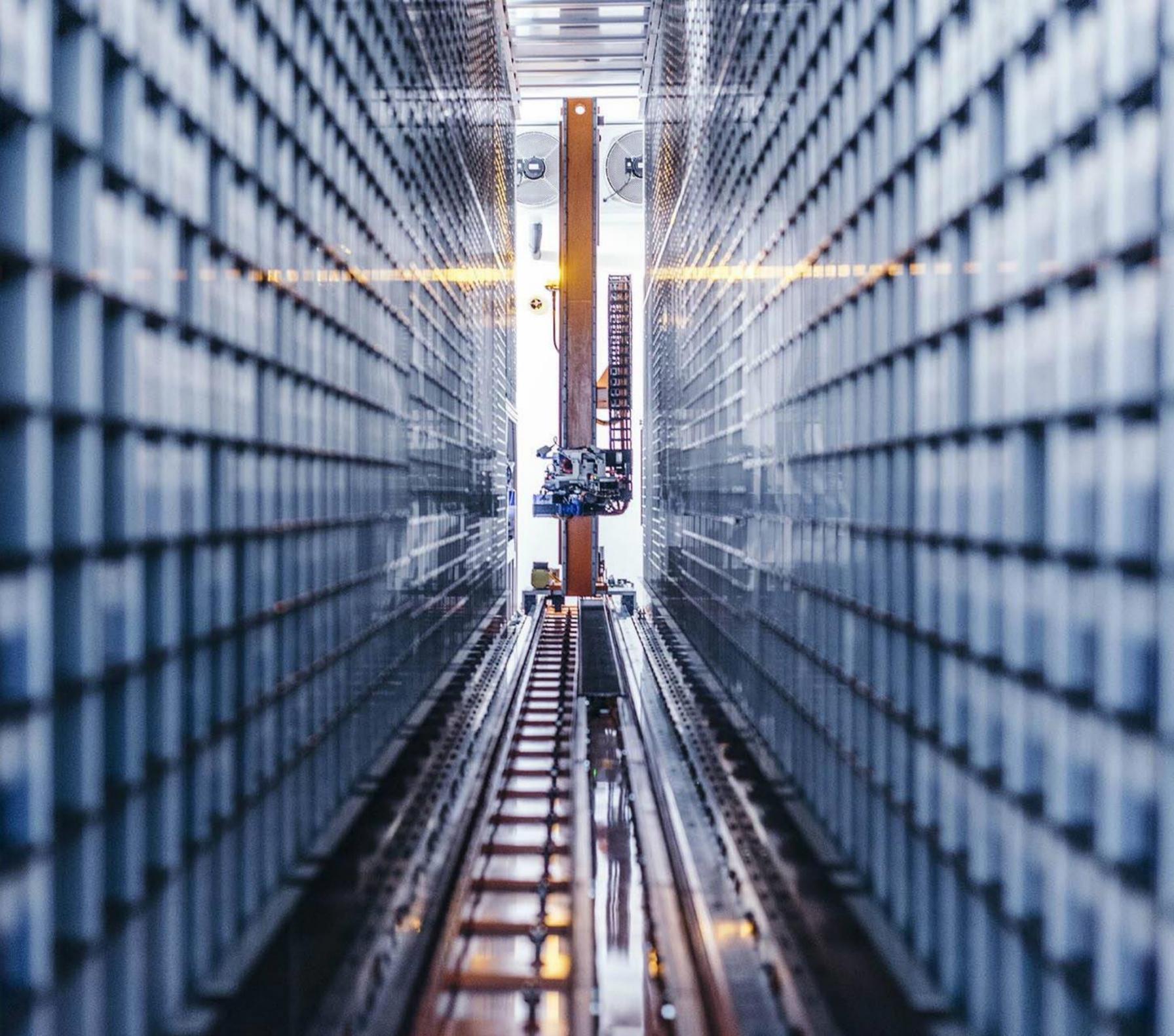
Novo Holdings A/S Investments in United Kingdom

ConvaTec Group Plc, a UK listed global medical products and technologies company with leading market positions in advanced wound care, ostomy care, continence and critical care and infusion devices. Novo Holdings A/S acquired 19.95% of shareholding in March 2017, and at completion of the transaction, Kasim Kutay, CEO of Novo Holdings A/S, joined the Board of Directors of ConvaTec Group Plc.

Oxford Biomedica is a leading gene and cell therapy company focused on developing life changing treatments for serious diseases. Novo Holdings A/S has agreed to invest up to £53.5 million in new ordinary shares in Oxford Biomedica, and will after the capital increase own up to 10.1% of the share capital.

ReViral is a UK-based biotechnology company with a portfolio of drugs to treat Respiratory Syncytial Virus (RSV) infection. RSV currently represents a major unmet medical need in children, elderly and immunocompromised. In 2018 ReViral raised US\$55 million in Series B financing, led by Novo Holdings and New Leaf Venture Partners, both of whom will have representatives on the Board of Directors.





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 UK collaborator/UK institute
- 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%)
- Publications were defined as publications with at least one UK and one Danish author
- UK industry collaborators were defined as collaborations with companies registered in the UK
- UK research partners were defined as successful NNF grant applications with at least one UK co-applicant
- The number of UK attendees at the Copenhagen Bioscience Conference series were defined as applicants and attendees registered to a UK research institute
- Novo Holdings A/S investments in the UK were defined as investments in companies with their headquarter located in the UK

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 2019
 - University rankings
 - Publication impact data
- Clinicaltrials.org
 - Clinical trials data
- Novo Holdings A/S
 - Investment data