Benefitting people and society

Strategy towards 2030
The Foundation has defined three focus areas for its philanthropic activities towards 2030:

**Health**, **Sustainability** and the **Life Science Ecosystem**, each of which contains four strategic themes.
Health

**Mission:**
Progress research and innovation in the 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

Sustainability

**Mission:**
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

The Life Science Ecosystem

**Mission:**
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
Theme 1: Preventing cardiometabolic disease

Prevent cardiometabolic disease through research and evidence-based action

Today, preventive interventions for cardiometabolic disease are applied as a ‘one-size-fits-all’ approach...

... it needs to shift to a tailored prevention strategy

Challenges

- The prevalence of CMD's is increasing rapidly on a global scale
- Gaps in our current understanding of CMD pathogenesis limits preventive measures
- Preventive solutions are based on lifestyle changes focused on the individual, which have not led to expected outcomes

Key objectives

1. Strengthen research-based understanding of disease mechanisms and prevention
2. Promote, develop and facilitate access to and use of data
3. Ensure that preventative measures are equitable and benefit all population groups
4. Improve societal and political understanding of the role and potential impact of preventative measures

We will leverage existing platforms... ... and support new platforms

- Establish Center for Sund Vægt og Trivsel with the Ministry of Health
- Establish a transcontinental network of deep-phenotyped cohorts to enhance CMD understanding and intl. presence
- Engage with EU stakeholders and relevant international organisations (e.g. OECD, WEF)

Projects

- STED
- rkkp
- Center for Basic Metabolic Research

Collaborators

- Scandinavian and international universities
- Patient advocacy groups
- Gov’t and local authorities
**Theme 2: Understanding and managing cardiometabolic disease**

*Enable disease understanding and health care development to improve treatment outcomes and reduce the global burden of cardiometabolic disease*

**Challenges**

- Limitations in our biological understanding of disease pathogenesis still exist, cardiometabolic disease remains killer #1
- Many efficacious CMD interventions exist, yet many patients still fail to effectively benefit, partly due to an untailored approach to healthcare
- Improving the quality and equity of CMD management is a complex global challenge

**Key objectives**

1. Support research that advances current biomedical CMD understanding allowing for development of novel therapies and treatment paradigms
2. Promote research and development of diagnostics and disease monitoring analytics supporting precision medicine
3. Enable patient-centric and systematic development approaches to CMD management

**Clinical trials often result in a ‘one-size-fits-all’ approach to treatment…**

*... we wish to support research towards more patient-centric discovery and delivery of CMD therapies*

**We will leverage existing platforms...**

**Projects**

- Steno Center for Basic Metabolic Research
- BiInnovation Institute
- Novo Nordisk Foundation Challenge Programme

**Collaborators**

- Scandinavian and international universities
- Other research institutes
- Gov’t and local authorities

**... and support new platforms**

- Focus on translational initiatives and clinical trials, industry engagement and centres
- Build capabilities on data analytics (e.g., AI, MI) to link data with lifestyle and health outcomes
- Inspire development of Healthcare and disease mgmt. based on science
- Leverage the transcontinental network of deep-phenotyped cohorts to enhance CMD understanding and intl. presence
Theme 3: Fighting inequities in health

Fight inequities in health with a focus on people in vulnerable positions

Challenges

- Health is a fundamental human right, yet significant global health inequities persist
- Growing disease burden of CMD adds to existing disease patterns creating a double burden
- Addressing inequity in health is a complex challenge that extends beyond the healthcare sector and requires a high degree of collaboration and a multi-component approach

Key objectives

1. Improve and promote preventive measures targeted to groups in vulnerable positions
2. Improve availability and equitable access to quality healthcare
3. Adapt responses to diverse patient needs targeting groups in vulnerable positions

Local focus

Currently, one-size-fits-all approach
Employing more tailored and cross-sectorial approaches to healthcare

Global focus

Prioritised focus on countries where prevalence rates of CMDs are projected to increase

- ~537 million adults globally are living with diabetes – 75% of these live in LMI countries

We will leverage existing platforms...

- Center for Sund Vægt og Trivsel
- Ongoing work with World Diabetes Foundation and other intl. partners in e.g. Jordan, Tanzania and Kenya

... and support new platforms

- Skills-building of human resources of health (e.g., CMD prevention and mgmt.)
- Data-driven design of interventions for ‘at risk’ groups, e.g. youth and refugees
- HCP education in LMI-countries
- New international strategic partnerships to fight cardiometabolic disease (CMD)
- Stimulate advocacy for CMD to engage other global partners

Collaborators

- Gov’t and local authorities
- International orgs and agencies
- NGOs
Theme 4: Strengthening epidemic preparedness

Bolster epidemic preparedness through research into prevention and therapeutics to better understand, protect against and respond to outbreaks

Infectious diseases are an ever-present threat...

... A range of mission-driven activities to fight infectious diseases at every stage are key to tackling the threat

Challenges

- Pandemics, local epidemic outbreaks and antibiotic resistant bacteria will be major future challenges
- Climate change, intensive farming, poverty, overpopulation and international travel accelerate the emergence and spread of new infections
- Need for agility, new preventative and intervention tools as well as intensified global coordination

Key objectives

1. Drive research on immunity to infectious diseases, new vaccines and anti-infective drugs
2. Establish a critical mass in Denmark that:
   - Conducts discovery, translational research, and clinical trials on new vaccines
   - Develops new vaccines against diverse respiratory pathogens
   - Develops strategies for broad and durable immune protection in the airways
3. Develop innovative interventions and tools to ensure that the world is better equipped to tackle infectious diseases

We will leverage existing platforms...

+ ... and support new platforms

- New vaccines against airway infection: Translational vaccine research, NNF Institute for Vaccines and Immunity (NIVI)
- New antivirals for emergency use in pandemics

Projects

- NNF Institute for Vaccines and Immunity
- AMR action fund
- repair impact fund novo buildings
- pandemic antiviral discovery

Collaborators

- Gov’t and local authorities
- International orgs and agencies
- NGOs
- Research institutes
- Industry and public-private consortia
Theme 1: Sustainable and high-yield agriculture

Advance research and innovation in agricultural production by understanding, controlling and utilising ecosystems

Challenges

- 30% of all green house gas (GHG) emissions are derived from food systems
- 70% expected increase in food demand towards 2050 with no more land available
- 80% of biodiversity loss is caused by agriculture

Key objectives

1. Generate a paradigm for climate intelligent land-use that benefits biodiversity and has minimal environmental impact
2. Develop and implement cropping systems and management practices that are environmentally benign, resilient and high-yielding
3. Advance plant breeding and crop performance to support the green transition by combining crop genomics, microbiomes and new technologies
4. Support research and demonstrational activities to accelerate adoption of sustainable agricultural practices

We will leverage existing platforms...

- Pioneer centre - climate and agriculture
- Collaborative Crop Resilience Programme
- Plant science and agriculture project portfolio
- Manipulation of complex bio. systems and digital integration
- Breeding for resilient and high-protein crops
- Link plant-microbe-soil interactions to improve yield

... and support new platforms

- Scandinavian and international universities
- Organisations and think tanks; biotech industry and farmers
- Government
- International research strongholds
- FAO, CGIAR, EU, international foundations
- Public-private partnerships
Theme 2: Sustainable food for healthy diets

Support the transformation of our food systems towards improved planetary and human health through research and translation within sustainable production and consumption.

Challenges

- Current global food systems cannot provide the world’s increasing population with a sustainable, healthy and nutritious diet.
- Pressing need to reduce land use, pointing to a dietary shift replacing animal-based proteins.
- Diet closely connects to health and non-communicable diseases.

Key objectives

1. Drive research and advance technologies for production of sustainable and healthy plant- and microbial-based foods.
2. Reduce food loss in production and distribution.
3. Promote dietary changes and reduce food waste.
4. Promote the development of pertinent incentives, regulations and policies accelerating changes in our food system.

We will leverage existing platforms...

- Plant2Food; AMR Initiative
- Center for BioSustainability
- Biotech and food project portfolio

... and support new platforms

- Lead science and technology on plant-based food
- Enable large scale biomass of plant- and microbial-based food
- Advance protein sources for substitution of livestock

Collaborators

- Scandinavian and international universities
- Industry clusters and councils
- Government

- International research strongholds
- FAO, WEF, OECD and EU initiatives
- Danish Agricultural and Food sector
Theme 3: High-impact climate change mitigation technologies

Eliminate greenhouse gas emissions from high-carbon production and remove atmospheric CO₂ by supporting and driving research for scalable climate change mitigation technologies.

Challenges

- Above pre-industrial levels is the temperature increase we are facing in 2100 if unabated, with large local variations.
- Gigaton CO₂ is currently emitted (burning of fossil fuels, agriculture, land use change etc.).
- Gigaton CO₂ per year must be captured to compensate for residual emissions.

Key objectives

1. Drive research and technology development for carbon capture, utilisation and storage.
2. Advance research on reducing greenhouse gas emissions.
3. Strengthen the innovation value chain for climate change mitigation technologies.
4. Progress the understanding of the global impact of climate change mitigation solutions.

We will leverage existing platforms...

- CO₂ Research Center (CORC)
- Center for BioSustainability
- Industrial biotech project portfolio

... and support new platforms

- Gas-phase catalysis and fermentation
- Develop and interface chemical, biol. and phys. systems, and modelling
- Develop and translate climate mitigation technologies

Collaborators

- Danish and International Universities
- Danish Industry and organisations
- Government

- International organisations (WEF, OECD)
- Strengthen public affairs initiatives
- EU green deal agenda and initiatives
Theme 4: Supporting society in the green transition

Build knowledge, networks and systems to help support the green transition in society

**Society needs more than research and technology to successfully go through the green transition...**

... namely ensuring an appropriate regulatory framework, a skilled workforce and behavioural change to support themes 1, 2 and 3

**Challenges**

- Research and insights on technical sustainability solutions have not led to the pivotal societal changes
- Society is not sufficiently prepared to develop, adopt and implement solutions in the green transition
- Regulatory framework presents obstacles to the necessary transition
- Climate change and the food supply crisis exacerbate social and economic inequality and migration

**Key objectives**

1. Strengthen and qualify decision-making processes to ensure legislation and regulation that will speed up the green transition in society
2. Improve the agility and interdisciplinary skills of the workforce needed for the green transition
3. Support and promote transformation of new knowledge about sustainable solutions into adequate behavioural change
4. Enhance global access to knowledge by strengthening the transfer and co-development of technologies

**We will build on these platforms to achieve our ambition**

**Projects**

- Bridge knowledge on green solutions from academia and industry
- Support green jobs by connecting research, industry and education
- Facilitate communication and debate on sustainability
- Promote systemic thinking across science and humanities
- Improve advocacy on sustainability issues

**Collaborators**

- Industry, orgs. and think tanks
- Scandinavian and intl. universities and educational institutions
- Gov't and local authorities
- International orgs and agencies
- Other research institutions
THE LIFE SCIENCE ECOSYSTEM

Theme 1: Fundamental research

Support fundamental research in the life, natural and technical sciences with the purpose of reaching the highest international standards and to make room for unforeseen discoveries

Challenges

- Lack of curiosity-driven research starves the breeding ground for new knowledge and ground-breaking discoveries
- Solutions to (unknown) future global challenges rely on international collaboration, interdisciplinarity and discoveries made through fundamental research
- Lack of diversity, the hour-glass effect, and the ‘Matthew effect’ jeopardise Denmark’s long-term competitiveness

Key objectives

1. Enable fundamental, disruptive and unforeseen research
2. Build capacity and critical mass of expertise and optimal conditions within relevant areas
3. Create a diverse and inclusive academic culture at the Danish research institutions to lay the foundation for delivering top-level, competitive and creative science
4. Spur international collaboration to make world class research
5. Drive multi- and interdisciplinary collaborations to pave the way for novel solutions to complex challenges

Change (Exemplified)

- From primarily funding individuals and outcome-oriented research...
  → ...To supporting both mission-driven and creative research
- From an (ex)clusive and conservative research environment and traditional academic culture...
  → ...To a diverse, creative, inclusive and vibrant academic culture
- From disciplines working in silos and without much collaboration...
  → ...To proactively catalysing interdisciplinary and international collaborations

Open competition programmes supporting:
- Curiosity-driven & disruptive research
- Recruitment & career progression
- High-risk/high-gain interdisciplinary research
- International collaboration & sabbaticals
- Research strategically aimed at solving major challenges

Projects

- Academies e.g. Danish data science academy
- Research centres with intl. satellites e.g. Pioneer, within quantum, sustainability, etc
- Improvement of funding allocation mechanisms e.g. through partial randomisation

Partners

- Danish universities
- Government
- Danish and international foundations and organisations
- International research institutions
Theme 2: Enabling research infrastructures and technologies

Develop novel technologies and provide access to state-of-the-art research infrastructure catalysing research and innovation

**Challenges**

- Danish investments in research infrastructure and development of novel technologies are insufficient
- Valuable ideation and research is not sufficiently harvested into useful technology
- Efficient planning and use of infrastructures requires coordination, technical know-how and open access
- Data is not managed in a manner that renders it accessible and value creating

**Key objectives**

1. Ensure timely, up-to-date, sustainable infrastructure, driven by scientific excellence
2. Facilitate access and increase use of existing infrastructures
3. Create a strong ecosystem for technology development
4. Attract, train and retain skilled innovators, technical specialists, and users
5. Ensure proper and secure data and sample management and access

**Change (Exemplified)**

- From classical computing and data science being only an expert’s tool…
  - To quantum computing and applications in the life sciences, with data science becoming a natural component of all activities

- From stem cell research primarily within mouse embryos…
  - To international R&D collaboration driving regenerative medicine and building GMP capabilities in Denmark

- From narrow protein research focused on cancer and in one geographical location…
  - To comprehensive protein research relating broadly to health and sustainability and spread over multiple geographical areas

**We will build on existing and explore new platforms to achieve our ambition**

- Academies e.g. Danish data science academy
- Open competition funding for research infrastructure
- Large strategic infrastructure investment e.g. MicroMAX – MAX IV, Proteomics Research Infrastructure
- Large-scale strategic tech development initiatives with other partners
- Development of novel technologies

**Partners**

- Danish universities and educational institutions
- International organisations and agencies
- Government
- Research institutes and incubators
- Industry and public-private consortia
### Theme 3: Translational capacity and societal impact

*Create a world class innovation environment in Denmark to drive transformation of science-based discoveries within life science and the green transition in society*

#### Challenges

1. **Lack of innovation culture in academia and capacity to translate and scale discoveries**
2. **Sub-optimal patent and business development processes towards having collaboration with the private sector**
3. **Absence of early-stage funding and venture capital results in subpar commercialisation of Danish biotech and pharma innovation**

#### Key objectives

1. **Drive change towards improved regulatory processes**
2. **Ensure funding earmarked for translational and applied research**
3. **Ensure accessibility to competencies and industry expertise**
4. **Support establishment and access to innovation infrastructure**

#### Scientific innovation is focused on translating discoveries in into products...

- **Potential therapeutics** for different indications
- **Green biotech solutions** in e.g. food, agriculture and renewable energy

#### ... we wish to support more innovative solutions improving health of people and sustainability

- **Effective solutions** for CMDs
- **Epidemic preparedness and novel vaccines / AMR**
- **Green house gas mitigating technologies**
- **Innovation capacity at hospitals**
- **Artificial intelligence tools; quantum computing**

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#### We will leverage existing platforms...

- **ODIN**
  - Open Discovery Innovation Network
- **BII**
  - BioInnovation Institute
- **BETA.HEALTH**
  - Beta Health

#### ... and support new platforms

- **Accelerator platforms**
- **Expand into bioindustrial solutions**

#### Partners

- **Danish and international universities**
- **International investors**
- **Government**
- **European Commission**
- **Intergovernmental institutions**
**Theme 4: Education and science capital**

*Strengthen scientific and technical aspirations, knowledge and competencies in Denmark through education and outreach*

### Challenges

- Future generations need high science capital to face global challenges within health and sustainability
- Inequality, misinformation and distrust in science and research pose a threat to democracy and social coherence
- Competency gap and labour shortage in occupations within health, science and technology challenge wealth and welfare in Denmark
- There is a need to stimulate curiosity and aspirations in STEM of children and youth, and to build an inclusive and inviting STEM environment

### Key objectives

1. Support research in science education to strengthen teaching and learning at all levels
2. Enhance quality of higher and further education within health, natural science and technology
3. Empower teachers and underpin excellent science education in day care, basic school and youth education
4. Motivate children and youth from all backgrounds to aspire for academic and vocational careers within STEM
5. Facilitate societal debate and informal learning activities to foster public engagement and democratic citizenship

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**We will build on these platforms to achieve our ambition**

**Projects**

- Strong science education research with international outlook
- Networks and knowledge-sharing
- Well-established resources for children and youth
- Novel, creative and risky ideas
- Development and collaboration for teachers
- Higher education programs for interdisciplinary challenges

**Partners**

- Associations for students, parents and teachers
- Danish and international education research environments
- Educational institutions
- Other organisations and foundations disseminating science
- Science exhibitions (museums, festivals, zoos, aquaria, etc.)
- Gov’t and local authorities
About the Novo Nordisk Foundation

The Novo Nordisk Foundation is an enterprise foundation with philanthropic objectives established in Denmark in 1924. The Foundation’s mission is to progress research and innovation in the prevention and treatment of cardiometabolic and infectious diseases as well as to advance knowledge and solutions to support a green transformation of society.