novo nordisk foundation

# Benefitting people and society

Strategy towards 2030

# **Focus** areas

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 highyield 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

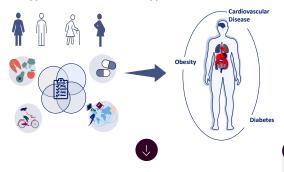


# Theme 1: Preventing cardiometabolic disease

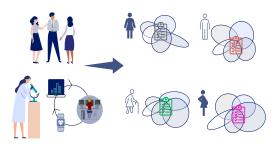


Prevent cardiometabolic disease through research and evidence-based action

#### 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**





Preventive solutions are based on lifestyle changes focused on the individual, which have not led to expected outcomes

#### **Key objectives**

- Strengthen research-based understanding of disease mechanisms and prevention
- Promote, develop and facilitate access to and use of data
- Ensure that preventative measures are equitable and benefit all population groups
- 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)







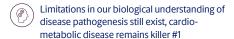


# Theme 2: Understanding and managing cardiometabolic disease



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

#### Challenges



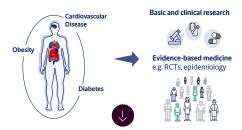




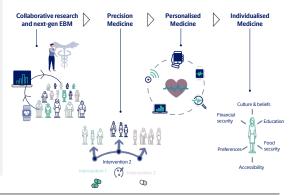
#### **Key objectives**

- Support research that advances current biomedical CMD understanding allowing for development of novel therapies and treatment paradigms
- Promote research and development of diagnostics and disease monitoring analytics supporting precision medicine
- 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 patientcentric discovery and delivery of CMD therapies



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















#### ... and support new platforms



- Focus on translational initiatives and clinical trials, industry engagement and centres
- Build capabilities on data analytics (e.g., Al, Ml) to link data with lifestyle and health outcomes







universities



Other research institutes





- 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
- Adapt responses to diverse patient needs targeting groups in vulnerable positions

#### **Local focus**

Currently, one-sizefits-all approach





Employing more tailored and cross-







#### **Global focus**

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



these live in LMI countries



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



 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

Collaborators



authorities









NGOs



- HCP education in LMI-countries
- New international strategic partnerships to fight cardiometabolic disease (CMD)
- Stimulate advocacy for CMD to engage other global partners

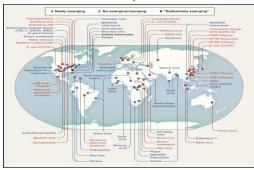


# Theme 4: Strengthening epidemic preparedness



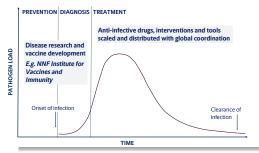
Bolster epidemic preparedness through research into prevention and therapeutics to better understand, protect against and respond to outbreaks

#### 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

Projects







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







Gov't and local authorities



International orgs and agencies



in pandemics

NGOs



Research institutes



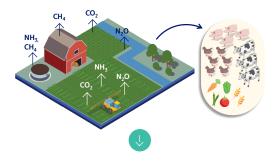
Industry and publicprivate consortia

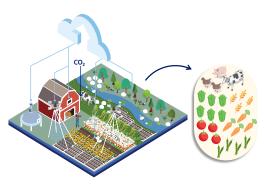


# Theme 1: Sustainable and high-yield agriculture



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





#### **Challenges**



of all green house gas (GHG) emissions are derived from food systems



expected increase in food demand towards 2050 with no more land available

80%

of biodiversity loss is caused by agriculture

#### **Key objectives**

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

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



#### ... and support new platforms



Pioneer centre climate and agriculture



Collaborative Crop Resilience Programme



Plant science and agriculture project portfolio



Manipulation of and digital integration



Breeding for complex bio. systems resilient and highprotein crops



Link plant-microbesoil interactions to improve yield

Collaborators



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







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 noncommunicable diseases





- Reduce food loss in production and distribution
- Promote dietary changes and reduce food waste
- Promote the development of pertinent incentives, regulations and policies accelerating changes in our food system



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



#### ... and support new platforms









Center for BioSustainability



Biotech and food project portfolio







bioman. of plant- and microbial-based food





universities





Scandinavian and Industry clusters and councils international



Government



International research strongholds



FAO, WEF, OECD and EU initiatives



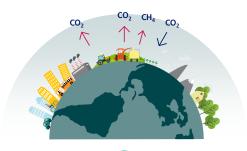
Agricultural and Food sector

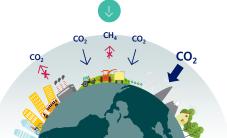


# Theme 3: High-impact climate change mitigation technologies



Eliminate greenhouse gas emissions from high-carbon production and remove atmospheric CO<sub>2</sub> 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 CO<sub>2</sub> is currently emitted (burning of fossil fuels, agriculture, land use change etc.)



Gigaton CO<sub>2</sub> 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...





CO<sub>2</sub> 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





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

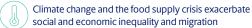


#### **Challenges**









#### **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
- 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





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





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
- Create a diverse and inclusive academic culture at the Danish research institutions to lay the foundation for delivering toplevel, competitive and creative science
- 4 Spur international collaboration to make world class research
- Drive multi- and interdisciplinary collaborations to pave the way for novel solutions to complex challenges

**Change** (Exemplified)

From primarily funding individuals and outcome-





...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



**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 •

#### 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

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



**Change** (Exemplified)

Data is not managed in a manner that renders it accessible and value creating

#### **Key objectives**



- Facilitate access and increase use of existing infrastructures
- Create a strong ecosystem for technology development
- Attract, train and retain skilled innovators, technical specialists, and users
- Ensure proper and secure data and sample management and access

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

Projects



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





Danish universities and educational institutions



International organisations and agencies



Government



Research institutes and incubators



Industry and publicprivate 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**



Lack of innovation culture in academia and capacity to translate and scale discoveries



Sub-optimal patent and business development processes towards having collaboration with the private sector



Absence of early-stage funding and venture capital results in subpar commercialisation of Danish biotech and pharma innovation

#### **Key objectives**

- Drive change towards improved regulatory processes
- Ensure funding earmarked for translational and applied research
- Ensure accessibility to competencies and industry expertise
- Support establishment and access to innovation infrastructure



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



#### ... and support new platforms



Open Discovery Innovation Network BioInnovation Institute

BETA HEALTH Beta Health











International investors



Government



Commission



bioindustrial solutions

Intergovernmental institutions



# Theme 4: Education and science capital



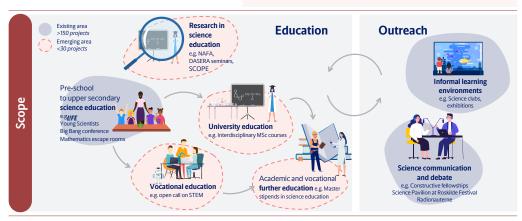
Strengthen scientific and technical aspirations, knowledge and competencies in Denmark through education and outreach

#### 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**

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



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









resources for







Novel, creative collaboration for and risky ideas teachers

Higher education programs for interdisciplinary challenges

Strong science education research with international outlook





Other organisations and foundations disseminating science



zoos, aquaria, etc.)





Danish and international education research environments

Educational institutions

Science exhibitions (museums, festivals,

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.

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