

Theme 1: Protein Chemistry – Structure, Function and Application

1. 'PRISM: Protein Interactions and Stability in Medicine and Genomics', DKK 60 million

Main applicant: Kresten Lindorff-Larsen, Professor, Department of Biology, University of Copenhagen, Denmark

Co-applicants:

Torben Hansen, Professor, Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen, Denmark

Michele Vendruscolo, Professor, Department of Chemistry, University of Cambridge, United Kingdom

Douglas M. Fowler, Associate Professor, Department of Genome Sciences, University of Washington, Seattle, USA

Brief description:

The researchers will integrate computer-based biophysics, high-throughput protein chemistry and genome analysis to understand how changes in the genome affect protein biology and how this knowledge can be used to diagnose and ultimately treat people with diseases.

2. 'Function, Structure, Regulation and Targeting of Exosome Adapter Complexes', DKK 60 million

Main applicant: Torben Heick Jensen, Professor, Department of Molecular Biology and Genetics, Aarhus University, Denmark

Co-applicants:

Elena Conti, Honorary Professor, Ludwig Maximilian University of Munich and Director, Max Planck Institute of Biochemistry, Martinsried, Germany

Jens S. Andersen, Professor, Department of Biochemistry and Molecular Biology, University of Southern Denmark, Odense

Brief description:

Our genetic material, the genome, produces RNA that forms either proteins or independent RNA molecules. However, genomic DNA is hyperactive, and only a fraction of the RNA produced ends up being functional molecules. The rest degrade. Which molecular machines detect and remove inappropriate RNA so that the cells do not drown in their own molecular waste? This is the question that the Exo-Adapt research centre will focus on for the next 6 years.

PRISM
D. S.

3. 'REPIN – Rethinking Protein Interactions', DKK 60 million

Main applicant: Birthe Brandt Kragelund, Professor, Department of Biology, University of Copenhagen, Denmark

Co-applicants:

Benjamin Schuler, Professor, Department of Biochemistry, University of Zurich, Switzerland

Rasmus Hartmann-Petersen, Professor, Department of Biology, University of Copenhagen, Denmark

Karen Skriver, Professor, Department of Biology, University of Copenhagen, Denmark

Brief description:

The project gathers internationally leading experts on intrinsically disordered proteins across a wide range of fields. They have the complementary expertise, scientific experience, flexibility and impact to create a conceptual basis for transforming protein chemistry and all related disciplines, including the health and medical sciences.

D. S. J. P. C.

Theme 2: Pathophysiology, Diagnosis and Treatment of Nonalcoholic Steatohepatitis

1. 'Therapeutic Targeting of Metabolic MicroRNAs as a New Treatment Paradigm for NASH', DKK 60 million

Main applicant: Sakari Kauppinen, Professor, Center for RNA Medicine, Department of Clinical Medicine, Aalborg University, Denmark

Co-applicants:

Anders Näär, Professor, Department of Nutritional Sciences & Toxicology, University of California, Berkeley, USA

Pier Paolo Pandolfi, Professor, the Cancer Center and Institute for RNA Medicine, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

Ryan Temel, Associate Professor, Saha Cardiovascular Research Center, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington, USA

Brief description:

Our goal is to discover drugs for effective and safe inhibition of metabolic microRNAs and assess their therapeutic potential to treat NASH in highly relevant preclinical models of NASH. Furthermore, we will evaluate hepatic and circulating microRNAs in human samples as biomarkers for NASH. We believe that successful development of combined diagnostics and microRNA-targeted therapeutics has the potential to guide new treatment options for patients with NASH.

C
r
i
s
t
i
n
e
s
D.
D.

Theme 3: Understanding Obesity at the Cellular Level

1. 'ADIPOSIGN – Center for Adipocyte Signaling', DKK 60 million

Main applicant: Susanne Mandrup, Professor, Department of Biochemistry and Molecular Biology, University of Southern Denmark, Odense

Co-applicants:

Jan-Wilhelm Kornfeld, Professor, Department of Biochemistry and Molecular Biology, University of Southern Denmark, Odense

Madan Babu, Research Director, Regulatory Genomics and Systems Biology Group, MRC Laboratory of Molecular Biology, Cambridge, United Kingdom

Zachary Gerhart-Hines, Associate Professor, Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen, Denmark

Brief description:

We will use experimental and computer-based techniques to obtain a whole new understanding based on systems biology of how fat cells receive and respond to cellular signals. The goal is to understand how this signalling function varies with sex, genetic factors and the specific fat deposits and how changes in these signalling functions as obesity develops contribute to the pathophysiological effects of obesity.

Christine
D.

2. **'Ancestral Causes of Obesity: Understanding Epigenetic Transmission by Spermatozoa', DKK 60 million**

Main application: Romain Barrès, Professor, Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen, Denmark

Co-applicants:

Stephen Simpson, Academic Director, Charles Perkins Centre, University of Sydney, Australia

Marcelo Nobrega, Professor, Department of Human Genetics, University of Chicago, IL, USA

Brief description:

The grant will enable us to establish a scientific community with the potential to build bridges between several disciplines and expertise in epigenetics, physiology, chromatin structure, metabolism, comparative biology and bioinformatics. We hope to develop innovative strategies to improve the metabolic health of the coming generations by making recommendations related to lifestyle.

D. S. Barrès