

On behalf of the European Foundation for the Study of Diabetes and The Novo Nordisk Foundation, we have the pleasure of welcoming you to the third and final edition of the Future of Precision Medicine Symposium. The symposium marks major innovations in precision diabetes medicine from cutting-edge research through clinical implementation.

The discovery of insulin 102 years ago was a true breakthrough and lifesaver in the treatment of people with diabetes. However, despite being around for a century, insulin and other means of treatment, often deployed in a one-size-fits-all manner, still fail to take most people to a level of control, and diabetes-related morbidity and mortality remains high. Precision medicine, the tailoring of disease prevention, diagnosis, and treatment strategies based on an individual's lifestyle, environment, genetics and other biomarkers seeks to do just that, by helping optimise medical decisions and health recommendations. This two-day symposium on the Future of Precision Medicine will explore diverse aspects of precision diabetes medicine, featuring lectures and panel discussions.

At the symposium, the winner of the European Foundation for the Study of Diabetes and the Novo Nordisk Foundation Precision Diabetes Medicine Award 2023 will also be celebrated. The award honors innovative research in both clinical and basic science that is likely to minimize the future burden of diabetes and other chronic diseases. The European Foundation for the Study of Diabetes and the Novo Nordisk Foundation have a longstanding tradition of supporting science of the highest quality and bringing researchers and clinicians of the highest caliber together. This symposium will be no exception and the hybrid format will allow scientists and colleagues from all over the world to join in and contribute to a constructive two working days.



Chantal Mathieu President, European Foundation for the Study of Diabetes and European Association for the Study of Diabetes

Martin Ridderstråle Senior Vice President, Novo Nordisk Foundation



Next steps towards the **future of precision medicine**

Diabetes affects almost all societies worldwide, with its prevalence growing quickest in Africa, Middle East, and South Asia. The economic burden of diabetes is outmatching healthcare infrastructures in rich and poor nations alike, and precision medicine may help address this problem by providing more cost-effective healthcare solutions.

In its simplest form, precision medicine can be viewed as the process of reducing error and improving accuracy in medical decision making and health recommendations. Although precision medicine has much to offer human health and wellbeing, to do this equitably requires that its products and services are optimized and accessible to the target population. However, there is a risk precision medicine may fail in this promise because the data used in precision medicine research is typically from people of European ancestry and from high-income settings. Ensuring that the type of precision medicine deployed in a given setting is matched to resource availability will also help ensure it can benefit all those in need, regardless of who or where they are.

An important adjunct to precision medicine is 'personalised medicine': the use of a person's data to objectively gauge the efficacy, safety, and tolerability of therapeutics, and, subjectively, tailor medical decisions to the individual's preferences, circumstances, and capabilities. To fulfil its potential, precision medicine requires a wellfunctioning eco-system comprised of multiple stakeholders including health care recipients and providers, scientists, health economists, funders, innovators of medicines and technologies, regulators, and policy makers. Powerful computing infrastructures supporting appropriate analysis of large-scale, well-curated, and accessible health databases that contain high-quality, multidimensional, time-series data will be required.

When understanding the role precision diabetes medicine is likely to play, it is important to consider that although it has much promise, it is unlikely to completely replace contemporary evidence-based medicine; hence, it is best viewed as part of modern medicine's evolution, rather than a revolution.



Paul W. Franks Professor, Scientific Director Novo Nordisk Foundation



Thursday, 9 Noven	nber – – – – – – – – – – – – – – – – – – –
Tentative (CET)	Programme
09:00	Registration & breakfast
Official opening	
10:00	 Welcome and opening remarks Senior Vice President Martin Ridderstråle, Novo Nordisk Foundation
	President Chantal Mathieu, EFSD/EASD
10:10	 The lived experience Introduced by people living with diabetes: Christian Collin Sophie Hindkjær Maria Tørnes Cathrine Tørnes
	Facilitated by: Director Jeannette Söderberg, JDRF International
10:40	What the heck is "precision medicine"? Interview with Scientific Director Paul Franks, Novo Nordisk Foundation
	 Interviewed by: President Chantal Mathieu, EFSD/EASD Person living with diabetes Christian Collin
11:05	Short break
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Thursday, 9 November

Theme I: Translating Precision Medicine Evidence into Practice

11:25	Monogenic insulin resistance Professor Robert Semple, University of Edinburgh
	Ensuring correct diagnosis and treatment of monogenic diabetes across the UK Professor and Nurse specialist Maggie Shepherd, University of Exeter
	Clinical impact on cardiometabolic disease through liver-focused precision medicine Professor, Dr. Arun Sanyal, Virginia Commonwealth University
	 Q&A Facilitated by: Person living with diabetes Maria Tørnes Professor Juleen Zierath, Novo Nordisk Foundation Center for Basic Metabolic Research and Karolinska Institutet
12:45	Lunch
Theme II: Getting to t	the <i>heart</i> of precision medicine
13:30	Precision medicine decision making in cardiomyopathy Professor Perry Elliott, the Bart's Heart Centre
	Precision medicine in the future of CVD prevention Scientific Director Borja Ibanez, the Centro Nacional de Investigaciones Cardiovasculares Carlos III
	Clinical translation of discordant profiles in cardiometabolic conditions Dr. Daniel Coral, Lund University
	Q&A Facilitated by: • CEO Magnus T. Jensen, Steno Diabetes Center Copenhagen • Person living with diabetes Sophie Hindkjær

14:50



Theme III: The 2nd International Consensus Report from the ADA/EASD Precision Medicine in Diabetes Initiative

15:10	 The 2nd International Consensus Report will be presented by: Clinical Investigator PhD, MD Mario Luca Morieri, University Hospital of Padua Associate Professor Jordi Merino, Novo Nordisk Foundation Center for Basic Metabolic Research
	 Panel debate Panelists: Clinical Investigator PhD, MD Mario Luca Morieri, University Hospital of Padua Associate Professor Jordi Merino, Novo Nordisk Foundation Center for Basic Metabolic Research Professor Susanne Mandrup, University of Southern Denmark Chief Editor Joao Monteiro, Nature Medicine CEO Troels Krarup Hansen, Steno Diabetes Center Aarhus Facilitated by: Professor Juleen Zierath, Novo Nordisk Foundation Center for Basic Metabolic Research and
	 For the second second
16:10	Short break





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Thursday, 9 November		
Evening programme		
Award Ceremony The EFSD and the Novo Nordisk Foundation Precision Diabetes Medicine Award 2023		
16:30	Chair: Professor Coen D.A. Stehouwer, Chairperson EFSD Scientific Board	
	Prize lecture: Using precision medicine tools to advance understanding of type 2 diabetes risk in the South Asian population	
	Speaker: Dr. Shivani Misra, Imperial College London	
	 Q&A Facilitated by: Professor Coen D.A. Stehouwer, Chairperson EFSD Scientific Board Person living with diabetes Sophie Hindkjær 	
17:30	Transportation from the Novo Nordisk Foundation to Restaurant Ansvar, Scandic Spectrum Copenhagen	
18:00	Welcome and pre-dinner drink	
	Pre-Dinner talk by Professor Giles Yeo, University of Cambridge	
	Dinner for in-person attendees and speakers at Restaurant Ansvar, Scandic Spectrum Copenhagen, Kalvebod Brygge 10, 6 sal, DK-1560 Copenhagen	
21:30	Goodnight	

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Friday, 10 November **Tentative (CET)** Programme 08:30 **Informal network & breakfast** Theme IV: The human interface 09:30 Intervening on human health behaviour Professor Joline Beulens, Vrije University Al in medical decision making Assistant Professor Pranav Rajpurkar, Harvard Medical School Medical psychologists can help achieving precision medicine Professor Frans Pouwer, University of Southern Denmark Q&A Facilitated by: • Person living with diabetes Sophie Hindkjær Scientific Director Paul Franks, Novo Nordisk Foundation 10:50 Short break

Friday, 10 November

Theme V: Precision healthcare for the people who really need it

11:10	Leveraging African genetic diversity for novel gene discovery & genetic risk prediction Associate Professor, PhD Segun Fatumo, London School of Hygiene & Tropical Medicine
	Precision medicine in underserved populations in high-income countries Dr. Shivani Misra, Imperial College London
	Precision medicine in low- and middle-income countries Dr. Tinashe Chikowore, University of the Witwatersrand
	Moving from identifying the disparities to creating a new community-based precision medicine platform Dr. Sivan Spitzer, Bar-Ilan University, Bar-Ilan University
	 Q&A Facilitated by: Person living with diabetes Maria Tørnes Senior Vice President Martin Ridderstråle, Novo Nordisk Foundation
Official closing	
12:50	 Closing remarks Person living with diabetes Christian Collin President Chantal Mathieu, the EFSD/EASD Scientific Director Paul Franks, Novo Nordisk Foundation
13:00	Lunch & Goodbye





Introduction to the prize:

The European Foundation for the Study of Diabetes and the Novo Nordisk Foundation Precision Diabetes Medicine Award

The European Foundation for the Study of Diabetes and the Novo Nordisk Foundation have decided to celebrate the 100th anniversary of the discovery of insulin in 1921 by creating a research award: the European Foundation for the Study of Diabetes and Novo Nordisk Foundation Precision Diabetes Medicine Award.

The Award recognizes innovative research from both clinicians and basic scientists in precision diabetes medicine that can see into and seek solutions for the future. The winners will describe novel precision-profiled projects that will benefit people with diabetes, and investigators may already have an established track record within the field. The projects receiving the Award are expected to accelerate important fields of translational research and to improve the speed of implementing innovation in diabetes care.

Three research proposals will be awarded grants annually and will comprise one winner, receiving DKK 2 million, and two runners-up, receiving DKK 500,000 each. The Award will be open for applications three years running, celebrating the discovery of insulin in 1921, its first use for humans in 1922, and its first Nobel Prize in 1923. Awardees of the European Foundation for the Study of Diabetes and the Novo Nordisk Foundation Precision Diabetes Medicine Award

Winner 2023: Dr. Shivani Misra, Imperial College London

Runners-up 2023:

- Professor Eran Elinav, Weizmann Institute of Science
- Professor Cyrielle Caussy, Lyon University Hospital Center

Previous Awardees of the European Foundation for the Study of Diabetes and the Novo Nordisk Foundation Precision Diabetes Medicine Award

Winner 2022: Associate Professor Angus Jones, University of Exeter

Runners-up 2022:

- Dr. Dr. Haifa Maalmi, German Diabetes Center
- Professor Jørgen Wojtaszewski, University of Copenhagen

Winner 2021:

Professor Thomas R. Pieber, Medical University of Graz

Runners-up 2021:

- Dr. Caroline Bonner, Institute Pasteur de Lille
- Professor Charlotte Ling, Lund University

Awardees of the European Foundation for the Study of Diabetes and the Novo Nordisk Foundation Precision Diabetes Medicine Award 2023

Award Ceremony at the Future of Precision Medicine Symposium 2023

Winner 2023

Dr. Shivani Misra, Imperial College London

Using precision medicine tools to advance understanding of type 2 diabetes risk in South Asian populations

Relative to white Europeans, people of South Asian ethnicity carry increased risk of type 2 diabetes. The drivers that confer this risk have not been comprehensively established in large prospective cohorts, and smaller studies suggest that the differential risk is not accounted for by conventional cardiometabolic risk factors.

Using data from a population study of over ~30,000 South Asian and white European people in the UK, there is now an opportunity to comprehensively study the risk of progression to type 2 diabetes (and from pre-diabetes) over 20 years of follow-up. Participants in the study were systematically phenotyped at baseline using established cardiometabolic measures, metabolomic profiling and array genotyping, which offers a fantastic opportunity to address the current knowledge gaps.

The outcome of this project will quantify excess type 2 diabetes risk in South Asian people in the largest, contemporary prospective study of this population to date, and enhance understanding of the drivers of excess risk, including genetic risk and associations with omics data.

This knowledge has the potential to drive more targeted interventions by extending precision medicine tools to an under-represented South Asian ethnicity at risk of type 2 diabetes, helping address health inequalities.

Biography

Shivani Misra, MD, PhD, is a Wellcome Trust Career Development Clinician Scientist at Imperial College London and an Honorary Consultant Physician in Metabolic Medicine at Imperial College Healthcare NHS Trust. Her Wellcome-Trust funded research is centered around the genetics and epidemiology of early-onset type 2 diabetes, which disproportionately affects people from Asian and African-Caribbean ethnicities. Her projects aim to define the heterogeneity of early-onset type 2 diabetes and how this can be leveraged to improve patient outcomes. She is a co-investigator on an NIHR programme grant assessing interventions for young adults with type 2 diabetes. As a clinician she leads the clinical service for atypical forms of diabetes and early-onset type 2 diabetes and is a specialist in the classification of diabetes subtypes across diverse ancestries.

She completed her PhD at Imperial College London in 2017 and was lead investigator of the MY DIABETES study, recruiting and stratifying UK Asian and African-Caribbean individuals with early-onset diabetes using biomarkers, to identify monogenic diabetes. Her work across diverse ancestries earned her a Future Leaders Mentorship Award from the European Foundation for the Study of Diabetes in 2017 and she currently serves as Co-Chair of the ADA consensus working group on precision diagnostics in type 2 diabetes & as Co-Chair of the clinical diabetes heterogeneity working group at NIDDK.

Dr. Shivani Misra Imperial College London



Runner-up 2023

Professor Eran Elinav, Weizmann Institute of Science

Decoding the molecular microbiome-driven mechanisms of rapid post-bariatric improvement in diabetes

Bariatric surgery is considered a highly effective treatment for type 2 diabetes mellitus (T2DM). Following surgery, a significantly improved glucose

homeostasis is observed within days of the procedure. Microbiome-mediated signals are postulated to contribute to this post-operative anti-diabetic phenomenon, but the precise mechanisms involved in the rapid post-bariatric improvement in glucose control remain elusive to date.

In this study, we aim to investigate the primary molecular mechanisms leading to early postoperative improvement in glycemic responses, with an aim to harness these newly identified molecular features as novel anti-diabetic checkpoints beyond the setting of bariatric surgery. Based on preliminary results from mice studies, we propose to decipher, in a bias-free way, the molecular features involved in microbiome-dependent postoperative glucose homeostasis using a combination of multi-omics approaches. These approaches will lead to identification of novel bacterial species, metabolites and pancreatic beta cell responsiveness genes impacting insulin secretion responses, to be assessed ex vivo in primary pancreatic islets and in vivo in obese and diabetic models. Collectively, our study can uncover novel targets modulating T2DM, their molecular mechanisms, and possible activity beyond the surgical setting.

Biography

Professor Eran Elinav is a professor at the department of Immunology and heading the department of Systems Immunology at the Weizmann Institute of Science, Israel. Based on experimental biology, human trials and big data, Professor Eran Elinav's research in glycemic responses following bariatric surgery, aims to uncover novel targets modulating T2DM, their molecular mechanisms, and possible activity beyond the surgical setting.

He completed his PhD in Immunology in 2009 at the Weizmann Institute of Science, and in 2011 he received a Postdoc in Immunology from Yale University School of Medicine. At present professor Eran Elinav is Founding Director of Israeli Society for Microbiome Research, and Director of the Weizmann Institute Center for Infectious disease and host interaction. Furthermore, he is a Scientific Advisory Committee (SAC) member at the Center for Microbes, Development and Health, Institute Pasteur of Shanghai and Director of the Division of Microbiome & Cancer Research & the joint WIS DKFZ/Helmholtz microbiome research lab, Heidelberg, Germany.

Runner-up 2023

Professor Cyrielle Caussy, Lyon University Hospital Center

Type 2 DIAbeTes with NAFLD: innOvative biomarkers of disease progressioN and clInical outComes (DIATONIC)

People with type 2 diabetes (T2DM) are at high risk for advanced fibrosis (AF) due to non-alcoholic fatty liver disease (NAFLD). Thus, although systematic screening for AF is currently recommended in people with T2DM, people with T2DM are rarely included in prospective longitudinal cohorts assessing the progression of NAFLD and relevant clinical outcomes where liver screening has been undertaken using these noninvasive tests (NITs).

In the DIATONIC research we aim to investigate the ability of baseline non-invasive biomarkers to discriminate patients with a progression of NAFLD from patients without progression of NAFLD among people with T2DM and to investigate, the association between clinical outcomes related to the natural evolution of NAFLD and T2DM and baseline biomarkers.

DIATONIC provides a unique opportunity to better understand heterogeneity among people with T2DM and NAFLD and to define patient profiles linked to the longitudinal progression of the disease using currently available NITs and innovative cutting-edge multi-omics signatures. This could lead to the discovery of pathways involved in NAFLD progression and potential identify novel therapeutic targets.

Biography

Professor Cyrielle Caussy is a Professor and Hospital Practitioner at the Endocrinology Diabetes Nutrition Department at Lyon University Hospital Center. She is also the medical director adjunct of the Human Nutrition Research Center (Centre de Recherche en Nutrition Humaine - CRNH) with a strong expertise in conducting clinical research in Nutrition. Her DIATONIC research focuses on advancing the understanding of the heterogeneity among patients with T2DM and



NAFLD and to define patient's profiles linked the longitudinal progression of the disease using currently available NITs and innovative cutting-edge multi-omics signatures.

She received her PhD in Biochemistry in 2015 from the Université Claude Bernard Lyon 1, France, studying the epigenetic regulation of lipid regulation at the CarMeN laboratory (CardioMetabolism, Diabetes and Nutrition) where she continues to lead translational research program. Pr Caussy's main field of research interests are insulin-resistance, type 2 diabetes, obesity and nonalcoholic fatty liver disease (NAFLD). She completed a 2-year advanced research training at the NAFLD Research Center, University of California at San Diego directed by Dr Rohit Loomba. She now has a specific interest in non-invasive biomarkers and pathophysiology of NAFLD especially in high-risk population such as type 2 diabetes and obese patients. Furthermore she is co-leader of a clinical and research program focusing on diagnostic and pathophysiology of metabolic liver disease at the Lyon Hepatology Institute, and she is co-president of the national AFEF/SFD Liver and Diabetes study group.



The European Association for the Study of Diabetes e.V. (EASD) is a membership-based academic non-profit organisation with the mission to promote excellence in diabetes care through research, networking and education.

The EASD Annual Meeting is one of the largest diabetesrelated conferences in the world and EASD is an active player in postgraduate education, having trained thousands of healthcare professionals through training courses and online education activities.

EASD is the publisher of Diabetologia, a major monthly international diabetes journal with an impact factor of 8.2 (2022).

In 2000, EASD increased its commitment to stimulate diabetes research in Europe by creating the European Foundation for the Study of Diabetes (EFSD). Since its inception, the EFSD has committed over €120 million to diabetes research in Europe by various funding means.

For more information, please visit:

www.easd.org and www.europeandiabetesfoundation.org.

novo nordisk foundation

Established in 1924, the Novo Nordisk Foundation is an independent Danish enterprise foundation. While providing a stable basis for the companies it owns, its overall purpose is to make contributions that benefit people and society.

The overarching vision of the Foundation is to improve people's health and the sustainability of society and the planet. Thus, through its philanthropic activities, it contributes significantly to scientific research, education, treatment, innovation and humanitarian and social purposes in Denmark as well as internationally. In 2022, The Foundation awarded a total of DKK 7.4 billion (€1 bn) in grants.

Supporting biomedical and clinical science with a particular focus on diabetes and its comorbidities has been part of the Novo Nordisk Foundation legacy for the last century. Building on this legacy, the Foundation will in the coming decade expand its scope and increase its support for research on the prevention and treatment of cardiometabolic diseases and infectious diseases, which are associated with excess but preventable mortality and constitute major health challenges globally.



Practical information

Format

Hybrid symposium, online and in-person attendance.

Find more information, including a short bibliography of all speakers, on the FPM symposium 2023 platform:



novo nordisk foundation

For in-person attendees WIFI access at the Novo Nordisk Foundation

Internet Novo Guest Access Password NovoVipGuest

Dinner on Thursday 9 November 2023 For speakers and in-person attendees will be held at *Restaurant Ansvar*

The restaurant will serve a 100% vegetarian dinner with a focus on organic ingredients, sustainability and freshness.

Address: Kalvebod Brygge 10 (6.sal rooftop), 1560 København V

Bus transport: Departure from the Novo Nordisk Foundation to Restaurant Ansvar at 5:30 PM.

