EFSD Future Leaders Mentorship Programme for Clinical Diabetologists

supported by an unrestricted educational grant from AstraZeneca

2017 - 2019
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Goal of the Programme

Identify and promote the advancement of the next generation of leading clinical diabetologists in Europe

Research skills
Mentorship programme
Communication skills
Clinical diabetes skills
Programme

Mentor
Leading European clinical diabetologist as personal mentor

Training and educational courses
To improve research, clinical, leadership and communication skills

Mentorship e-passport
To log all programme activities and facilitate evaluation

Activities

Research project
Funding and guidance for a clinical research project

Scientific meetings
Attendance and presentation at EASD Annual Meeting, ADA Scientific Sessions and more

Annual Mentorship Programme Meeting
Visibility, networking and feedback
The relationship between one hour postload plasma glucose and cardio-metabolic status at early stages of impaired glucose tolerance

This clinical study, conducted at the mentee's institution in Sofia, aims to assess the predictive value of one hour postload plasma glucose (1h PG) for the overall cardio-metabolic risk at early stages of glucose intolerance. For this purpose, the study will assess the relation between 1h PG and glucose variability by various means including continuous glucose monitoring (CGM) data, incretin and insulin levels, and cardiac autonomic function in subjects with normal glucose tolerance (NGT) and prediabetes. The methodology for evaluating the incretin effect, which is applied at the mentor's institution at the University of Pisa, will be adopted and performed at the mentee's institution in Sofia for the needs of this project.

The role of islet innervation in human type 2 diabetes

This project aims to investigate and provide clinical, molecular and genetic pathways linking innervation and β cell dedifferentiation in human type 2 diabetes. To dissect if the noradrenergic and/or dopaminergic system is involved in the process of β cell dedifferentiation, induced pluripotent stem cells (iPSCs) from type 2 diabetes patients and healthy controls will be differentiated into β cells and the impact of α2A-adrenergic receptor agonists and dopamine D2 receptor agonists on β cell function, morphology and cell viability will be studied. Subsequently, molecular pathways underlying these processes will be defined. The iPSCs generation and experiments will be performed at the mentor's institution in Brussels whereas following morphometric analyses will be performed at the mentee's institution in Rome.
Giuseppe Daniele

University of Pisa, Italy

Mentor: Hans-Ulrich Haering
University of Tuebingen, Germany

The effect of Glucagon-like Peptide-1 (GLP-1) on cognitive and non-cognitive function in human

This clinical study, performed at the mentee’s institution in Pisa, will test the hypothesis that GLP-1 can exert favourable effects on multiple aspects of brain function including cognitive function, glucose metabolism and neuroplasticity. In addition, potential mechanism underlying the clinical results will be explored in in vitro and animal experiments. The project objectives will be further expanded employing the well-established expertise of the mentor’s research group in Tuebingen in brain insulin resistance.
Shivani Misra
Exploring phenotype and genotype of type 1 diabetes in non-caucasian populations
This project will undertake detailed phenotyping and genotyping of different cohorts with type 1 diabetes to establish whether there are any differences according to ethnic group. The project is building on the mentor’s expertise in type 1 diabetes and the mentee’s doctoral thesis that explored young-onset diabetes in different ethnic groups (MY DIABETES study). A more detailed biochemical and immunological phenotype of south Asian and African-Caribbean people from the MY DIABETES cohort with type 1 diabetes will be examined. Genotyping of single nucleotide polymorphisms (SNPs) associated with type 1 diabetes will be performed in this cohort to generate a type 1 diabetes genetic risk score and compare across ethnic groups. Further, metabonomics of serum and urine samples in people with type 1 diabetes from different ethnic groups will be undertaken to establish any potential novel biomarkers that can discriminate type 1 diabetes from other types.

Imperial College London, UK
Mentor: Chantal Mathieu
University of Leuven, Belgium
Ernesto Maddaloni
Improving the assessment of cardiovascular risk in diabetes in the contemporary era
This project aims to improve vascular risk stratification in diabetes by differentiating diabetes sub-populations, and to investigate potential novel biomarkers for diabetic vascular complications.
For this purpose, the long-term risk of macrovascular and microvascular complications in people with Latent Autoimmune Diabetes in Adults (LADA), compared with those who have type 2 diabetes (T2D) are evaluated using data from the United Kingdom Prospective Diabetes Study (UKPDS) for which the mentor is a co-director. Further, markers of bone metabolism as potential novel biomarkers for cardiovascular disease in people with T2D will be evaluated and validated within the cohort of patients with T2D who participated in the Exenatide Study of Cardiovascular Event Lowering (EXSCEL) cardiovascular outcome trial. Finally, the relationship between bone fragility and cardiovascular risk in T2D will be investigated.

Sapienza University of Rome, Italy
Mentor: Rury Holman
University of Oxford, UK
Additional grant awards related to project:
Diabetes UK Studentship (£100,000)
NIHR (£2,500)
Biomedical Research Council (£180,000)
EASD Robert Turner Clinical Research Course 2018
Immunology of Diabetes Society Conference, London 2018
Invited speaker at Diabetes UK Professional Conference, London 2018
IDF Young European Investigator of the Year 2017
Revealing function of intraislet incretin system

This project will investigate the expression of intraislet GLP1 and/or other proglucagon-derived peptides in response to different metabolic conditions (metabolic health, insulin resistance (IR) and type 2 diabetes) and their potential role in an intra-islet incretin system as regulator of insulin secretion and islet cell fate.

For this purpose, modifications of proglucagon-derived peptides will be explored in human pancreatic tissue from patients undergoing partial pancreatectomy and correlated with specific metabolic phenotypes (insulin sensitive, insulin resistant and type 2 diabetes), in order to determine their functions as potential regulators of islet plasticity. Further, the contribution of insulin and glucagon signaling on intra-islet incretin system will be investigated in an experimental mouse model of IR for a better understanding of the mechanisms underlying the observations made in humans. The in vivo experiments will be carried out at the mentee's institution in Rome, while the ex vivo experiments on pancreas tissue will be performed in collaboration with the mentor's institution in Copenhagen.
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IDF Young European Investigator of the Year 2017
EASD 53rd Annual Meeting, Lisbon, 2017
EASD 54th Annual Meeting, Berlin, 2018
EASD 55th Annual Meeting, Barcelona, 2019
78th Scientific Sessions of the American Diabetes Association, Orlando 2018
79th Scientific Sessions of the American Diabetes Association, San Francisco, 2019

Invited speaker at Diabetes UK Professional Conference, London 2018
EASD Robert Turner Clinical Research Course 2018
Immunology of Diabetes Society Conference, London 2018

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Imperial College London, UK
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University of Leuven, Belgium
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EASD 54th Annual Meeting, Berlin, 2018

EFSD/Lilly Young Investigator Research Award 2019 – obtained with mentor’s support for application

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EASD 54th Annual Meeting, Berlin, 2018
EASD 55th Annual Meeting, Barcelona, 2019
79th Scientific Sessions of the American Diabetes Association, San Francisco, 2019

5th EASD Postgraduate Course on Clinical Diabetes, Sofia, 2019
Magyar Imre EASD Clinical Postgraduate Course 2019
Jan Gojda
Charles University - Prague, Czech Republic
Mentor: Fredrik Karpe
University of Oxford, UK

Metabolic derangements in cancer cachexia: Impaired insulin-mediated suppressibility of branched chain amino acid (BCAA) forearm flux in patients with pancreatic cancer cachexia

This project will use detailed physiological models to describe the metabolic derangement of carbohydrate and amino acid metabolism in human cancer cachexia. In human in vivo studies, performed at the mentee’s institution in Prague, the hypotheses will be tested that increased circulating branched chain amino acids (BCAA) in cancer cachexia are associated with increased efflux of BCAA from skeletal muscle, measured in the forearm, and loss of insulin-mediated suppressibility of BCAA efflux, and that the high skeletal muscle BCAA flux relates to a low skeletal muscle glucose disposal (i.e. insulin resistance). In addition, the hypothesis will be tested that there is a decreased capacity of subcutaneous adipose tissue to utilize BCAA for de novo lipogenesis in cancer cachexia. Furthermore, pharmacological approaches will be used to target lipolysis in ex vivo experiments. Analyses of blood and adipose tissue samples will be done partly at mentee’s institution and partly at the mentor’s institution in Oxford.

Rocky Strollo
University Campus Bio-Medico - Rome, Italy
Mentor: Colin Dayan
Cardiff University, UK

Role of insulin modified by reactive oxygen species as autoantigen in type 1 diabetes

The mentee has previously shown that insulin autoimmunity may be due to oxidative posttranslational modifications (oxPTM-insulin) and developed an ELISA to detect antibody reactivity to oxPTM-insulin. The objective of this project is to identify and isolate oxPTM-insulin specific B-lymphocyte from people with type 1 diabetes in order to generate an oxPTM-insulin specific IgG antibody. This oxPTM-insulin antibody will be used to to develop (1) an ELISA for detection of oxPTM-insulin in serum and (2) establish the developed assay for translation to clinic by using anti oxPTM-insulin as standard in the ELISA. In parallel, clinical, genetic and biochemical features associated with oxPTM-insulin-autoantibody reactivity will be evaluated in people with type 1 diabetes. oxPTM-insulin specific B lymphocytes studies will be performed at the mentor’s institution in Cardiff. The remaining tasks of the project will be performed at the mentee’s institution in Rome.
Goal of the Programme
Identify and promote the advancement of the next generation of leading clinical diabetologists in Europe

Domenico Tricó
St Anna School of Advanced Studies - Pisa, Italy
Mentor: Stephanie Amiel
King's College London, UK

Impact of plasma lipids on β cell function and insulin sensitivity
This project aims to test the hypothesis that elevated plasma triglycerides can directly produce chronic hyperinsulinemia and insulin resistance, with impaired glucose tolerance, all of which are early precursors of diabetes. This hypothesis will be tested in two approaches: A clinical study, performed at the mentee's institution in Pisa, will determine whether an acute elevation in plasma triglycerides by lipid infusion affects tracer-derived glucose metabolic fluxes, model-derived β-cell function, insulin sensitivity, and insulin clearance in normally glucose tolerant subjects. In vitro studies, performed at the mentor's institution in London, will test the effect of triglyceride and human very low-density lipoproteins (VLDL) on basal, glucose-induced, and GLP-1-induced insulin secretion in isolated beta cells and islets.

2019 Mentee Cohort

Mohammad Alhadj Ali
Cardiff University, UK
Mentor: Chantal Mathieu, University of Leuven, Belgium

Claudia Cavelti-Weder
University Hospital Basel, Switzerland
Mentor: Marjo-Riitta Jarvelin, Imperial College London, UK

Caterina Conte
Università Vita-Salute San Raffaele, Milan, Italy
Mentor: Michael Roden, DDZ Duesseldorf, Germany

Konstantinos Toulis
AHEPA University Hospital, Thessaloniki, Greece
Mentor: Michael Nauck, Ruhr University of Bochum, Germany
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European Foundation for the Study of Diabetes

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