



Training network for research into bone Fragility In Diabetes in Europe – towards a personalised medicine approach

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PhD student – Early Stage Researcher (ESR3) Investigation of effects of FEHC diet on bone health and fracture risk in T2D

About FIDELIO

The EU-funded Innovative Training Network FIDELIO (<https://www.fidelio-project.eu>) aims to train the next generation of scientists in order to tackle the challenges of diabetic bone disease from various angles and with the newest technologies available. Interdisciplinary training and implementation of innovative approaches are key. Within this consortium, we will comprehensively unravel the genetic and environmental mechanisms that contribute to bone fragility in diabetes, identify predictors and clinical markers for patient stratification, decipher the underlying molecular mechanisms of bone fragility in diabetes, and establish potential interventions through a personalised medicine approach.

The research programme will address different aspects of diabetic bone disease from the viewpoints of epidemiology, genetics, miRNAs, microbiome, bone biology, bone biomechanics and microstructure, preclinical and clinical research. It will utilise advanced imaging and computational approaches, diabetes mouse models and access to clinical cohorts and registry data to obtain a comprehensive overview of how these mechanisms combine in diabetes to cause increased fracture risk.

With this interdisciplinary approach, we can explore the impact of biological pathways in mouse models and/or humans, and interactions with diet, exercise and other exposures. Collaborations with industry will allow early identification of IP, access to state of the art technologies, and will complement the academic ESR training programme with entrepreneurship and industrial mentoring.

About the host organization

Università Campus Bio-Medico di Roma (CBM) is one of the leading Medical Schools in Italy. Focused on Medical (MD, nursing, physical therapy, imaging technologists), Biology (Nutrition, Bio-Technology) and Engineering Faculties (Chemistry, Bio-Mechanics, Environment), it offers a wide range of graduate and undergraduates courses, with a total of 2000 students. The current University campus is just 10 years old, built with modern criteria in order to facilitate students/professors relationship and networking. Student facilities are in full growth with an ambitious expansion project that has been recently granted. Research facilities include modern research laboratories, covering several medical, biological and engineering disciplines from biochemistry to metabolism, from aging to biomaterials, from robotics to chemistry. A special focus has been dedicated to translational research, with specific pathways designed to facilitate “bed to bench-side” scientific projects. CBM has been selected by foreign students as the best host Italian Institution for the Erasmus Program (<https://unicampus.it>).

The **Metabolic Diseases Laboratory (MDL)** in the Unit of Endocrinology and Diabetes has a long-standing expertise in diabetes and bone. MDL is one of the leading Centers for translational and clinical studies of bone metabolism, with several active research studies focused on bone health in Type 1 and Type 2 diabetes, obesity, insulin resistance. At the moment Professor Napoli coordinates and supervises several research lines at the MDL for National and International (like NIH, JDRF, EASD) funded studies and collaborates with other prominent Institutions with continuous exchange of PhD students and faculty members like Washington University in St Louis and University of California San Francisco.

Task description

Your PhD project:

You will investigate the regulation of Wnt signaling in type 2 diabetes mellitus (T2D) undergoing hip replacement, randomly assigned to different diet intervention. Bone turnover and inflammatory status together with parameters of BMD (DXA and HRpQCT) and bone strength (nanoindentation) will be collected before and after intervention. Fat, muscle and bone tissues will be collected during surgery and gene and protein expression of main Wnt markers, cytokines and adipokines analyzed. Micro-damage and failure strain of bone specimens will be determined at UKE. Microbiome analysis and genetic profiling and detection of individuals with relevant genetic variants will be analyzed at ERASMUS. Specific Wnt pathway pattern obtained in the study subjects will be tested in animal models at TUD.

Secondments:

You will embark on secondments to other FIDELIO partners (ERASMUS (NL), TUD (DE), UKE (DE)) to access experimental models or tools or receive training not available in the home laboratory. This will include data acquisition and processing with GWAS analysis, basic training in Mendelian Randomization and meta-analysis studies, regulation of Wnt pathway related genes in mice models of diabetes and their similarities in human diabetic samples as well as micro-damage and failure strain of bone specimens. Total secondment time is 8 months.

Benefits of working in an ITN:

- You will be working within our group of > 20 researchers and physician scientists with experience in a broad range of sciences
- You will get in contact with the other members of this international consortium and will benefit from the joint training platform to develop skills necessary for developing a thorough understanding of the mechanisms of Diabetes and the bone metabolism and for obtaining industry skills.

Profile and requirements

- Applicants must hold a MSc or equivalent in the field of biology, chemistry, medicine or a related discipline
- Applicants must have a solid knowledge of cell and molecular biology as well as biochemistry. Willingness to work with human samples is a prerequisite.
- Applicants can be of any nationality
- Applicants must have an ability to understand and express themselves in both written and spoken English to a level that is sufficiently high for them to derive the full benefit from the network training
- Applicants must be eligible to enroll on a PhD program at the host institution (or a designated university in case the host institution is a non-academic organization)

In addition:

ESR shall at the date of recruitment by the host organisation be in the first four years (full-time equivalent research experience) of their research careers and have not been awarded a scientific doctoral degree.

H2020 MSCA Mobility Rule: researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organization (Italy) for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays, and time spent as part of a procedure for obtaining refugee status are not taken into account.

Eligible researchers must not have spent more than 12 months in the 3 years immediately prior to the date of selection in the same appointing international organisation.

H2020 MSCA eligibility criteria: Early Stage Researchers (ESRs) must, at the date of recruitment by the host organization, be in the first four years (full-time equivalent research

experience) of their research careers and have not been awarded a doctoral degree. Full-Time Equivalent Research Experience is measured from the date when the researcher obtained the degree entitling him/her to embark on a doctorate (either in the country in which the degree was obtained or in the country in which the researcher is recruited, even if a doctorate was never started or envisaged).

Benefits

- You will be employed by the host organization for 36 months.
- A competitive salary plus allowances. Moreover, funding is available for technical and personal skills training and participation in international research events.
- You will benefit from the designed training program offered by the host organization and the consortium.
- You will participate in international conferences and secondments to other organizations within the FIDELIO network and in outreach activities targeted at a wide audience

Please find additional information in the [Information package for Marie Curie fellows](#)

Application

Interested candidates are invited to apply online at <https://www.fidelio-project.eu/contact/>.

Planned key dates:

25 November 2019: Recruitment event in Rome, Italy

Expected start date: January 2020

More information and other vacant positions can be found on <https://www.fidelio-project.eu>.

Additional information

We in the FIDELIO consortium value diversity and we commit to equal treatment of all applicants irrespective of gender, sexuality, health status as well as social, cultural or religious background.

For additional information about the research project and this individual position, please contact:

Prof. Nicola Napoli

E-Mail: n.napoli@unicampus.it

