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 (ESR1) Investigating the role of Wnt signaling in type 2 diabetes induced bone disease

About FIDELIO

The EU-funded Innovative Training Network FIDELIO (https://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

Technische Universität Dresden (TUD) is one of the largest technical universities in Germany and one of the leading and most dynamic institutions in the country. With 18 faculties in five schools, it offers a wide range of degree courses and covers a broad research spectrum with a focus on Health Sciences, Biomedicine & Bioengineering, Information Technology & Microelectronics, Smart Materials & Structures, Energy, Mobility & Environment as well as Culture & Societal Change, a combination of disciplines which is considered to be exemplary in Germany and throughout Europe. The TUD has about 32,400 students, one seventh of which come from abroad and 8,300 staff hailing from 70 countries. TUD ranks among the Top 100 of Europe's Most Innovative Universities and in 2012 became one of the German "Universities of Excellence" (https://tu-dresden.de/).

The **Bone Lab Dresden**, headed by **Prof. Dr. Martina Rauner** and **Prof. Dr. Lorenz Hofbauer** is one of the leading facilities in the field of bone research with strong links to national and international partners and an excellent track record in **Diabetes & bone**, **osteoimmunology**, **osteooncology**, **osteohematology** and **matrix biology**. We are a dynamic and enthusiastic team of young researchers striving to unravel the mechanisms underlying osteoporosis, bone metastases and other bone diseases. The state-of-the-art scientific infrastructure at TUD and UKD fosters active scientific networking and dialogue, thereby providing the best conditions for conducting excellent research (https://www.bone-lab.de/).

Task description

Your PhD project:
You will investigate the regulation of Wnt signaling in type 2 diabetes mellitus (T2D) in the monogenetic db/db mouse as well as the polygenetic TallyHo mouse. The mouse model will be characterized in terms of bone, fat, and vasculature using state-of-the-art techniques.. To determine whether Wnt signaling plays a role in the development of diabetic bone disease, Wnt activators will be applied to cells and mice to determine whether the reduction of bone quality can be restored. Finally, in collaboration with TamiRNA, miRNA profiles will be investigated to determine which miRNAs are associated with diabetic bone disease and target Wnt signaling and whether modulating specific miRNAs may qualify as a therapeutic strategy to treat diabetic bone disease. Candidate miRNAs will be validated in human cohorts from FIDELIO partners.

Secondments:
You will embark on secondments to other FIDELIO partners (SCANCO (CH), UKE (GER), ETH (CH)) to access experimental models or tools or receive training not available in the home laboratory. This will include the acquisition, processing and visualization of microCT measurements at higher resolution than available in the Bone Lab, imaging of the osteocyte network, FE-based analysis of bone strength, and bone biomechanics in diabetic mice, investigation of the bone vasculature in diabetic mice using corrosion casts and ultra-resolution micro-CT imaging. Total secondment time is 5 months.

Benefits of working in an ITN:

- You will be working within our international group of > 30 researchers 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 or a related discipline
- Applicants must have a solid knowledge of cell and molecular biology as well as biochemistry. Experience with animal experimentation is desired. Willingness to work with animals 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:
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 (Germany) 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:

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TECHNISCHE UNIVERSITÄT DRESDEN

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