



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 (ESR10) Genetics and biologic pathways underlying fracture risk in type 2 diabetes

### 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

**Erasmus University Medical Center (Erasmus MC)** is one of the largest and one of the most authoritative scientific University Medical Centers in Europe. Its base is in Rotterdam, Netherlands. Erasmus MC is committed to a healthy population and excellence in healthcare through research and education. It is in the top ten of best medical institutes in Europe (QS World University Ranking 2014). It is the top referral center for a region of about five million inhabitants; the complete spectrum of medicine is offered, from disease to health and from individual to public healthcare. Existing infrastructure in Erasmus MC provides access to equipment and techniques using latest technologies in a state-of-the-art environment. Erasmus MC is also the largest medical school in the Netherlands with around 3,500 medical students and about 258 PhD graduates per year, offering BSc, MSc and PhD programs (<http://www.erasmusmc.nl>). **The Genetic Laboratory of the Department of Internal Medicine** has a longstanding tradition and reputation in genomics research, positioned as one of the leading centers in the field of genomics of complex diseases worldwide, with particular focus on musculoskeletal diseases. Our approach is multidisciplinary, combining epidemiology with large-scale genomic and (more recently) microbiome research. The lab is also home to the Generation R and Rotterdam Study cohorts and coordinates the EU-Funded Genetic Factors for Osteoporosis Consortium (GEFOS) consortium and the GENomics of MusculoSkeletal traits TranslatiOnal expertise Network (GEMSTONE). Dr. Ling Oei and Prof. Fernando Rivadeneira have excellent track records in genome-wide association studies (GWAS), the epidemiology of diabetic bone disease and mendelian randomization studies. We offer an interesting and challenging position in an ambitious yet friendly scientific and clinical research environment (<http://glimdna.org>).

## Task description

### Your PhD project:

You will investigate the genetics of diabetic bone disease in type 2 diabetes mellitus (T2D) in big datasets from population-based studies and clinical cohorts. The candidate will perform data-mining across genetic studies performed to date in relation to T2D, bone mineral density (BMD), fractures and osteoporosis. He/she will employ genetic scores in a Mendelian Randomization (MR) framework to assess causal relationships between potentially confounded risk factors shared by both conditions, with validation in the GWAS cohorts. To leverage the evidence derived from GWAS studies to identify possible plausible molecular pathways involved in both skeletal and glucose metabolism, with particular emphasis on the overlap of the biological underpinnings of T2D and fracture risk. We expect to identify new possible plausible molecular pathways that intersect between T2D and bone metabolism. Also, we expect the T2D allelic score to be causally related with either BMD or fracture.

### Secondments:

You will embark on secondments to other FIDELIO partners (TUD (DE)) to access experimental models or tools or receive training not available in the home laboratory. This will include providing synopsis of biological pathways and integrate elements of Wnt signaling as well as checking in pathways the genes of the prioritized mouse models in mouse models. Total secondment time is 4 months.

### Benefits of working in an ITN:

- You will be working within our international group of > 20 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 bioinformatics, (genetic) epidemiology, biomedical sciences, technical medicine, biology, chemistry or a related discipline
- Applicants must have knowledge of statistical methods as well as experience in computer programming for data analysis.
- 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 (The Netherlands) 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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**Erasmus MC**

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