



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 (ESR9) Role of microRNA in diabetic bone disease

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

The **University of Sheffield** is one of the UK's leading research-led Universities with an international reputation. A member of the Russell Group, it is ranked in the top 100 World Universities by the Times Higher Education (2019) and top 80 in the QS rankings (2019). In the 2014 UK Research Excellence Framework, 99% of research submitted was rated as internationally recognised or better. It has 7772 postgraduate students of which 3373 are from outside the EU. The **Mellanby Centre for Bone Research** (<https://mellanbycentre.org>), based in the Medical School, was established in 2009 and provides a focus for interdisciplinary bone research at the university, develops links with industry, and collaborative research programmes in basic and clinical bone research. In these respects The Mellanby Centre for Bone Research is unique in the UK, and one of only a small number of similar institutes worldwide. Prof Eastell (RE) leads the Bone Metabolism Unit at the Mellanby Centre that includes 3 professors, 2 senior lecturers (including Dr Walsh), 1 lecturer, 2 research associates, 8 PhD students (including 3 clinical fellows), 4 technicians, and 2 research nurses. The unit studies the pathogenesis, diagnosis and treatment of osteoporosis; of particular note is the contribution to the clinical utility of biochemical markers of bone turnover and the development of treatments for osteoporosis. Their publications put them in the top 4 internationally in osteoporosis (ISI Thompson).

Task description

Your PhD project:

Project Title: Role of microRNA in diabetic bone disease

Objectives: To identify those miRNAs that are differentially expressed between diabetes types 1 and 2 (T1D, T2D) and healthy adult control groups. To test the osteogenic, adipogenic, and proliferative potential of these most promising miRNAs via in vitro functional studies.

Expected Results: In T1D we expect to find a decrease in BMD of approximately 1 standard deviation, bone turnover markers to be normal and we may find increased cortical porosity. In T2D we expect to find an increase in BMD of approximately 1 standard deviation, bone turnover markers to be low and we may find increased cortical porosity. We expect to find a signature of at least 4 miRNA for each of T1D and T2D that are different from normal, which may have potential as a diagnostic test.

Planned secondment(s): M6 Southern Denmark University, working with clinical group on T2D, becoming familiar with database and analysis approaches M12-14 TamiRNA (Vienna) measure miRNA in samples from Sheffield and Odense. M18-20 Eidgenoessische Technische Hochschule Zurich, detailed and consistent analysis of HRpQCT scans from Sheffield and Odense. Total secondment time: 7 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

| Criteria | Essential | Desirable |
|--|-----------|-----------|
| 1. A good undergraduate degree in a relevant subject | X | |
| 5. Knowledge of Microsoft Office packages, including Word, Excel, PowerPoint, Endnote | X | |
| 6. Effective English language communication skills, both written and verbal, report writing skills, | X | |
| 7. Ability to follow technical protocols accurately | X | |
| 8. Ability to analyse and solve problems with an appreciation of longer-term implications. | X | |
| 11.. Ability to work to deadlines | X | |
| 13. A post-graduate Master's degree in a relevant subject or equivalent experience | | X |
| 14. Good general laboratory skills | | X |
| 16. Shows evidence of an interest in research, with some previous experience. Demonstration of a commitment to further research. | | X |
| 17. Strong evidence of academic potential from qualifications, honours, prizes, awards etc | | X |
| 18. The ability to use initiative and work independently, but also as part of a multidisciplinary team. | | X |
| 19. Experience of adapting own skills to new circumstances | | X |

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 (United Kingdom) 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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The
University
Of
Sheffield.