



BonePainII - Marie Skłodowska-Curie Innovative Training Network

Internal Code: NMI2019_004

Application Deadline: March 15, 2019 (23h59 GMT)

We have one (1) open position for a PhD fellow for 3-years, in the EU-funded Innovative Training Network BonePainII (www.bonepain.eu), at the NMI Natural and Medical Sciences Institute at the University of Tübingen, located in Reutlingen (Germany). The PhD student position is to develop an organ-on-a-chip for *in vitro* 3D functional analysis of sensory innervation of bone tissues.

Expected starting date June 1, 2019.

The application deadline is March 15, 2019.

About the BonePainII Network

BonePainII is a European Innovative Training Network to promote frontline research, innovation and education within bone pain. Millions in Europe and beyond suffer from bone pain, which is a debilitating complication of many musculoskeletal disorders such as arthritis and bone metastasis. The BonePainII network has participants from 6 European countries and encompasses 8 academic groups and 4 industries all committed to creating an outstanding training program for 15 early stage researchers (ESRs) to elucidate the mechanisms of bone pain and develop new medicines.

This project is part of the EU-funded project BonePainII, www.bonepain.eu.

The project is funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 814244.

Project title: A novel bone-and-neuron chip for *in vitro* 3D phenotypic analysis. A major difficulty in studying bone pain in its native environment is due to the inaccessibility of the nerve endings. To provide an integrated solution to these problems, within the project the student will develop a novel microfluidic-based bioreactor which enables three-dimensional (3D) culturing of isolated sensory neurons embedded in hydrogel scaffolds. In combination with the formation of 3D bone-like structures and their innervation by individual sensory nerve terminals, high-density microelectrode arrays (MEA) will be employed to continuously measure excitability along nerve fibers non-invasively under a range of physiological and pathological conditions mimicking bone pain.

Multiple types of bone cells and / or growing conditions and factors relevant in the context of the pathophysiology of osteoarthritis and cancer bone pain will then be evaluated for their capacity to impact sensory neuron excitability.

The overall goal of the project is to deliver an innovative technology and assay that:

- supports the 3D growth of a mixed population of bone and sensory neurons under highly controlled conditions
- permits the collection of morphological and structural information by high-resolution / high-content analysis
- employs integrated microelectrodes to record the electrical activity of hundreds of neurons embedded in 3D circuits
- is potentially open to automation across different electrophysiological and imaging platforms

About NMI:

NMI is a fully independent, non-profit research organization operating at the interface between life and material sciences. Staff is composed by more than 200 people with around 40 PhD students coming from a variety of fields such as biology, biophysics, chemistry and engineering.

The Neuro Microphysiological Systems Lab, where the project will take place, works towards the development of novel technologies and assays for the implementation of more physiological-relevant, 3D in vitro systems for basic research and drug discovery in neuroscience. This is achieved by integrating advanced cellular models, microelectronics and microfluidics into high-throughput technologies.

Supervision:

The principal supervisor will be Dr. Paolo Cesare, email: paolo.cesare@nmi.de, direct phone: +49 7121 51530 826.

Required qualifications

The successful candidate must hold an MSc degree in biomedicine or bioengineering with specialization in neuroscience/regenerative medicine or equivalent. Experience with primary cell culture and cell biology is required. Some previous experience in organ-on-a-chip, microfluidics or electrophysiology will also be appreciated. Fluency in English is required.

General job description

Your key tasks as a PhD fellow are to:

- Manage and carry through your research project
- Participate in the BonePainII training and network activities
- Take PhD courses
- Write scientific articles and your PhD thesis
- Participate in national and international congresses and scientific meetings

- Research stay at an external research laboratory within the BonePainII network
- Disseminate your research

Key criteria for the assessment of applicants

- Relevant skills and knowledge
- Previous publications
- Relevant work experience
- The grades achieved during bachelor/master studies
- Other professional activities
- Language skills
- Assessment of the candidate's motivation letter

Formal requirements: Mobility and eligibility criteria

The candidate must not have resided or carried out his/her main activity (work, studies, etc.) in Germany for more than 12 months in the last 3 years immediately prior to his/her recruitment – unless as part of a procedure for obtaining refugee status under the Geneva Convention.

The candidate must be an Early-Stage Researcher (ESR): at the date of recruitment he/she must be in the first four years (full-time equivalent research experience) of his/her research career and must not have not been awarded a doctoral degree.

Terms of employment

The employment as PhD fellow is full time and for 3 years .The terms of employment and salary are in accordance with the local and national rules and in accordance to the rules and regulations laid down by the European Union's Horizon2020 Marie Skłodowska-Curie Action European Training Network. Exact salary will be confirmed upon appointment.

Questions

For further information, applicants may contact the principal supervisor: Dr. Paolo Cesare.

How to apply

Candidates must submit their application by email to Bewerbung@nmi.de, specifying job number NMI2019_004.

This must include the following attachments (in word or pdf):

- Cover letter: Letter stating the interest in and qualifications for the project (max. one page).
- Full CV.
- List of publications.
- Diploma and transcripts of records: Master's degree diploma (including grade

transcripts for bachelor's and master's degrees). Applicants with a Master's degree from abroad should also enclose a short description of the grading scale used.

- 2 letters of recommendation including contact details for references.
- For those applicants whose principal language of instruction during their BSc/MSc was not English it will be an advantage if they enclose IELTS or TOEFL test scores or equivalent proof of English skills.

Deadline for applications: March 15, 2019.

Applications will be evaluated by an assessment committee consisting of the principal supervisor and 1-2 other members of the BonePainII network or the Department. Short-listed candidates will be invited for an interview (e.g. via Skype). In case of highly qualified, but unsuccessful applications, applicants may have the choice of having their application forwarded to another suitable BonePainII network member for consideration.