



Innovative Training Networks (ITN)
Call: H2020-MSCA-ITN-2018

Phys2BioMed

Biomechanics in health and disease: advanced physical tools for innovative early diagnosis

Start date of the project: 01/01/2019

Duration: 48 months

Position available for Early Stage Researchers (ESRs) at the CEA – Institut de Biologie Structurale.

The position is part of a Marie Skłodowska-Curie ITN European Training Network involving 15 ESRs as PhD students (Phys2BioMed).

Description of the ESRs' Projects

The position opened at the Institut de Biologie Structurale at Grenoble is part of an Innovative Training Network project (Phys2BioMed) aiming at the experimental investigation of the mechanical properties of cells and tissues in health and disease, under the supervision of Dr. Jean-Luc Pellequer (<http://www.ibs.fr/research/research-groups/methods-and-electron-microscopy-group/pellequer-team/>).

Project of fellow ESR3

Project Title: Nano-mechanical response in stressed and diseased living root tissues.

Start date: June 2019.

Objectives: Perform rigorous indentation measurements on plant root tissues to detect early events in growth arrest due to environmental stress

Expected Results: Nano-mechanical response of root tissues during abiotic stress for understanding the STOP1-LPR1 multi-stress signaling pathways of Arabidopsis. The ESR will perform nano-mechanical measurements of cells on live tissues (roots) using atomic force microscopy. The ESR will prepare plant samples, contribute to the development of methods for performing nano-mechanical measurement on plant roots. Measurements will be performed on wild-type and mutant plants both in normal and stress conditions. The ESR will also be involved in the methodological development of nano-indentation techniques and data management (computer files). The ESR will be engaged in all work packages and will participate to communication and dissemination.

Planned secondments: During the 3-year period, the ESR will join other teams for short term stays: 1. BioMeca, P. Milani (1 month, month 8). Testing new scripting tools for mechanical measurements; 2. UB, M. Radmacher (1 month, month 12) Comparing data analysis; 3. IBEC, D. Navajas (3 months, month 15) Mastering mechanical measurements on decellularized lung tissue; 4. INSERM, F. Rico (3 months, month 22) Participating in shaping raw data databases for cross-laboratory analysis; 5. O11, D. Iannuzzi (1 month, month 28) Compare experimental mechanical measures on tissues using industrial partner nano-indenter; 6. Vmicro, B. Walter, (1 month, month 29) Compare experimental mechanical measures on tissues using industrial partner vertical cantilevers.

Research group

The PhD students will work at the premises of the [Institut de Biologie Structurale](#) (IBS) located at the European Neutron and Photon Campus of Grenoble, under the supervision of Dr. Jean-Luc Pellequer. IBS is an institute of the [French Alternative Energies and Atomic Energy Commission](#) (CEA) which is a public body established in 1945 and is leader in research, development and innovation. The total CEA workforce is 15 838 employees. Across the whole of the CEA (including both civilian and military research), there were 1556 PhD students and 293 post-docs. The IBS is an interdisciplinary research center at the interface of biology, physics and chemistry. The IBS employs approximately 270 people and comprises eighteen groups. One of the three main themes of IBS is the development of methods known as Frontiers in Biophysics and Chemistry for Structural Biology. [The Pellequer's lab](#) possesses 50 m² lab facilities, which included two atomic force microscopes. The team is part of a group that maintains a 100 m² electronic microscopes platform (3 instruments) as well as biochemical and eukaryotic BSL2 cell culture lab. The IBS department has ample shared equipment facilities (cold storage, centrifuge...) as well as available individual desk spaces. The recruited ESRs will be enrolled in the PhD programme of École doctorale Chimie et Sciences du vivant – CSV, of Grenoble-Alpes University. ESR supervision includes [Dr. Thierry Desnos](#) from CEA Cadarache ([BIAM, Biosciences and Biotechnologies Institute](#)) who will provide scientific support for plant tissue experiments.

Candidate profiles

We are looking for excellent and highly motivated candidate with a degree in Biology, Biophysics, or Chemistry and strong interest or experience in plant biology, computational sciences, and related disciplines. Consolidated expertise in atomic force microscopy will be appreciated but not necessary. We expect dedication and enthusiasm for experimental research, combined with openness and curiosity, and the ability and willingness to team work in an interdisciplinary environment. Skills in instrument development, data analysis and in scientific numerical environments (for example Unix shell, C programming, ...) will be appreciated.

Appointment and enrolment in a PhD programme

The successful candidates will be employees of the CEA-IBS, and will be paid in accordance with the MSCA rules. The contract period will be for 36 months. The candidate will be enrolled in the PhD programme of the Chemistry and Life Sciences doctoral school at Grenoble. Phys2BioMed aims at having the positions filled before the end of June 2019, but there is flexibility of an earlier or potentially slightly later start, if required by personal circumstances.

Admission criteria

- Students must have a second-level degree or an equivalent qualification (Master's Degree) from a University. Out of EU diploma will require establishment of an equivalent degree (delivered by the UGA university)
- Candidates can be of any nationality but need to demonstrate **transnational mobility**, i.e. must not have resided or carried out their main activity (work, studies, etc.) in the country of their host organisation (France in this case) for more than 12 months in the 3 years immediately before the reference date. Compulsory national service and/or short stays such as holidays are not taken into account.
- The candidates must be in the first four years (full-time equivalent research experience) of their research careers, and have not been awarded a doctoral degree.
- Good proficiency in written and spoken English is required (level B2).

The suitability of the foreign academic qualifications in terms of content is appraised by the Evaluation Board constituted for admission to each PhD programme, in compliance with the regulations in force in France and in the country in which the academic qualification was issued, and the international treaties or agreements pertaining to the conferment of qualifications for the continuation of studies.

How to apply

The applicant must send the following documents (in pdf format, included in a single zipped file attachment) to [Dr. Jean-Luc Pellequer](mailto:Dr.Jean-Luc.Pellequer) as well as a copy to the coordinator Prof. Alessandro Podestà (alessandro.podesta@mi.infn.it) **by April 1st, 2019**:

- 1) an updated CV;
- 2) a personal motivation letter;
- 3) at least 2 reference letters (in English), at least one of them from one former supervisor and/or lecturer;
- 4) a scanned copy of the degree (usually the Master Degree), which would formally entitle 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 will be recruited.
- 5) a document indicating his/her ranking and marks within his/her last year at his/her Master Degree, with a list of the courses/modules they have attended.
- 6) a copy, or a summary, of the Master Degree thesis, or a brief description of the past scientific activity.

Phys2BioMed is devoted to promote gender equality and diversity and encourages female researchers to apply.

Assessment criteria

Applications must be in English and will be evaluated against the following criteria:

- educational record;
- scientific quality of the applicant's CV;
- expected individual impact and benefit to the fellow and to the project.
- previous experience in the subject of Phys2BioMed research programme.

Eligible candidates will be interviewed, possibly by means of web-conferencing tools.

For more information, contact [Jean-Luc Pellequer](mailto:Jean-Luc.Pellequer) or the Project coordinator [Alessandro Podestà](mailto:Alessandro.Podesta).