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
Project Coordinator: Alessandro Podestà

15 positions available for Early Stage Researchers

Phys2BioMed opens 15 positions of Early Stage Researchers (ESRs) for three year research projects at the premises of 11 European partners. Applications of highly qualified and motivated young researchers will be sought. All ESRs will be enrolled in PhD programmes.

This project has received funding from the European Union's Horizon 2020 research and Innovation programme under the H2020-MSCA-ITN-2018 grant agreement N. 812772.

The Phys2BioMed network

The network "Biomechanics in health and disease: advanced physical tools for innovative early diagnosis" (Phys2BioMed) will involve sixteen partners (eleven beneficiaries, hiring young researchers, and five partner organisations, supporting training and research), merging diverse competences at European level, from different fields like nanoscience and nanotechnology, physics, biology, and medicine. Phys2BioMed will offer excellent interdisciplinary and cross-sectoral training to a team of motivated early stage researchers (ESRs) on the **application of cutting-edge physical tools for the mechanical phenotyping of cells and tissues of clinical relevance, aiming at developing novel early-diagnostic tools**. A key element of the project is the peer-to-peer collaboration of research academic institutions with industries and world-leading medical and clinical centers; they will highlight unmet clinical needs, and actively cooperate with academic colleagues for developing novel diagnostic strategies. ESRs will be trained-through-research by world-leading junior and senior PIs, and will benefit of lecture courses, dedicated international schools and workshops, and topical conferences. Secondments to other nodes of the network will represent the main and more effective channel of dissemination and cross-fertilization of competences, ideas, and knowledge within the network.

Phys2BioMed will provide scientific and technological outcomes on biomechanics, and the mechanical determinants of diseases. Technology-wise, it will define standardized procedures for nanomechanical measurements, and the definition of the main features of new generation instrumentation optimized for the mechanical phenotyping of clinical specimens. In the longer-term, Phys2BioMed will provide the platform and know-how to build a data bank of mechanical fingerprints of diseases, setting the ground for the development of effective early-diagnostic tools.

Candidates

We are looking for excellent and highly motivated candidates with a master degree in physics, biology, chemistry, bioengineering, medicine or related subjects, and strong interest and experience in cellular biology, biophysics, bioengineering, biomedicine, physiology, and related disciplines, including advanced microscopy, statistics and computer science. We expect dedication and enthusiasm for experimental research, combined with openness and curiosity, and the ability and willingness to team working in an interdisciplinary environment.

Training

The ESRs' projects will be part of a vibrant and stimulating international and inter-sectorial collaboration. The research training provided will comprise a broad portfolio of technical and transferable skills on local and network level. Strong participation of non-academic partners, including fully private companies and medical institutions, and the interaction of academic and non-academic partners, are meant to foster career opportunities, in particular to drive the emerging role of technically and scientifically skilled workers in the biomedical environment. Several secondments at the premises of partners of the network are planned.

Employment

The successful candidates will be employees of the beneficiary's institutions, and will be paid in accordance with the MSCA rules[1]. The contract period will be for 36 months. All candidates will be enrolled in PhD programmes under the supervision of local PIs. The different ESR positions will be filled within the first half of year 2019 at different months, depending on the node of the network (see the list below); there is flexibility of a later start, if required by personal or other circumstances. Different ESR projects have therefore different application deadlines, as reported in the project description.

Candidates can apply for a maximum of five positions; for each position, they must send an application, according to the rules reported in each project description, to both the host PI and the project Coordinator. In the event of multiple applications, the applicant must indicate a priority list, which will be considered in the hiring process. The selection of candidates will begin after the project starts, in January 2019.

[1] See for instance at page 80 of the Horizon 2020 Work Programme 2018-2020, http://www0.mi.infn.it/~podesta/h2020-wp1820-msca_en.pdf. For details, contact the local Beneficiary's offices.

Admission criteria
Applicants for an ESR position in Phys2BioMed must have a master degree from a University before the end of the call. Candidates can be of any nationality but need to demonstrate **transnational mobility,** i.e. move from one country to another when taking up their appointment (they must not have resided or carried out their main activity - work, studies, etc. - in the country of their host organisation for more than 12 months in the 3 years immediately before the reference date).
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 (at least level B2).

General Data Protection Regulation (GDPR)
Phys2BioMed will process data collected from the applicants for recruitment purposes only, according to the GDPR policies (details can be found following this link). Phys2BioMed will not share data outside the network, unless upon authorisation from the interested applicant. The data will be kept for a period of five years after the end of the project for the purpose of an audit by the EU.

List of Phys2BioMed beneficiaries, open positions, and contact details

The list will be updated with links as long as detailed application information emerges. Please contact local PIs and the coordinator Prof. A. Podestà (alessandro.podesta@mi.infn.it) for further information.

1. UMIL - Università degli Studi di Milano, Milano, Italy (Project Coordinator).
Main contact: Prof. Alessandro Podestà, alessandro.podesta@mi.infn.it (webpage).
ESR1: The influence of the microenvironment of healthy and tumoural cells.
ESR2: Nano-mechanical fingerprints of extracellular matrices from healthy and tumoural tissues.

2. CEA - Commissariat à l'Energie Atomique et aux Energies Alternatives, Grenoble, France.
Main contact: Dr. Jean-Luc Pellequer, jean-luc.pellequer@ibs.fr (webpage)
ESR3: Nano-mechanical response in stressed and diseased living root tissues.

3. CNRS - Centre national de la recherche scientifique, Lille, France.
Main contact: Dr. Frank Lafont, frank.lafont@cnrs.fr.
ESR4: Towards automation for nano-mechanics characterization of biological samples in diseases. *ESR4 is a joint PhD project (CNRS/IBEC).*
ESR5: Nano-mechanics response measurements of cells and tissues in cancer.

4. CHUGR - Centre hospitalier universitaire de Grenoble, Grenoble, France.
Main contact: Dr. Arnaud Millet, arnaud.millet@inserm.fr.
ESR6: Nano-mechanical signature of cancerous tissues and its relation to the associated immune response.

5. IBEC - Fundacio institut de bioenginyeria de Catalunya, Barcelona, Spain.
Main contact: Prof. D. Navajas, dnavajas@ub.edu (webpage).
ESR7: Tissue and extracellular matrix rheology in lung diseases assessed by AFM. *ESR7 is a joint PhD project (IBEC/INSERM).*
ESR8: Tissue and ECM mechanical fingerprints of lung cancer.

6. INSERM - Institut national de la sante et de la recherche medicale, Marseille, France.
Main contact: Dr. Felix Rico, felix.rico@inserm.fr.
ESR9: Fast phenotyping of cell mechanics.

7. WWU - Westfaelische Wilhelms-Universitaet Muenster, Munster, Germany.
Main contact: Prof. Hermann Schillers, schille@uni-muenster.de.

ESR10: Dynamics of cell mechanics in healthy and diseased cells.
8. IFJPAN - The Henryk Niewodniczanski Institute of Nuclear Physics, Polish Academy of Science, Krakow, Poland.
Main contact: Prof. Malgorzata Lekka, malgorzata.lekka@ifj.edu.pl (webpage).
ESR 11: Mechanical phenotyping of human bladder cancers.

9. OSR - Ospedale San Raffaele srl, Milano, Italy.
Main contact: Dr. Massimo Alfano, alfano.massimo@hsr.it (webpage).
ESR 12: Mechanical and Rheological phenotype of tissues and ECMs.

10. UB - Universitaet Bremen, Bremen, Germany.
Main contact: Prof. Manfred Radmacher, radmacher@uni-bremen.de.
ESR 13: Creep Response of Cells in Diseases.
ESR 14: Viscoelastic Properties of Cells on soft Supports. *ESR14 is a joint PhD project (UB/IFJPAN).*

11. O11 - Optics11 BV, Amsterdam, Netherlands.
Main contact: Dr. Niek Rijnveld, niek.rijnveld@optics11.com.
ESR 15: Nano-mechanical analysis of biological samples beyond AFM.