

Program: Biomedicínské vědy / Biomedical Sciences

Specializace: Biochemie a molekulární biologie / Biochemistry e Molecular Biology

Forma studia: prezenční

Školitel: Dr. Giancarlo Forte

Research area: disease modelling

Research topic: Patient-specific models of cardiac fibrosis

Summary: Two fully funded PhD positions are offered in the context of the Marie Skłodowska-Curie European Training Network (ETN) project entitled “Advanced technologies for drug discovery and precision medicine: in vitro modelling human physiology and disease (SINERGIA)”.

The project is focused on developing and improving novel “organs on chips” technology for high throughput drug screening or basic research. The scientific partnership consists of five universities (Politecnico di Milano, Italy; Universities of Basel, Switzerland; Maastricht, Belgium; Aachen, Germany; Masaryk University, Czech Republic) and five non-academic partners: 1 large enterprise (ACCELERIA), 4 SMEs (LIFETEC, BIOMIMX, MTLAB and ST-UK), 2 hospitals (St. Anne’s University Hospital, Czech Republic and Ente Ospedaliero Cantonale, Switzerland).

The project is funded for 4 years, is highly interdisciplinary and is meant to provide continuous training at the partner Institutions.

Requirements on applicants:

- Excellent communication in English, curiosity and enthusiasm for science.
- Master’s degree in cellular or molecular biology, biotechnology, bioengineering, biochemistry or in a related discipline.
- Commitment to work in an international, interdisciplinary environment and visit European Countries.
- Basic knowledge in cell biology, bioinformatics or in microfabrication.

Info on supervisor:

Giancarlo Forte is the head of the Center for Translational Medicine (CTM) within the International Clinical Research Center of St. Anne’s University Hospital (FNUSA-ICRC). His laboratory is interested in unveiling the basic molecular processes behind aging pathologies, mainly by studying the processes of cell adhesion and migration, and the role of mechanically activated pathways in diseases. The approaches adopted by his group include the use of patient-derived induced pluripotent stem cells, single cell patterning, cell-matrix interaction, RNA- and ChIP-seq, confocal and super-resolution microscopy.

Selected publications:

- Oliver-De La Cruz J, Nardone G, Vrbsky J, Pompeiano A, Perestrelo AR, Capradossi F, Melajová K, Filipensky P, **Forte G**. *Substrate mechanics controls adipogenesis through yap phosphorylation by dictating cell spreading*. **Biomaterials** 2019, doi: 10.1016/j.biomaterials.2019.03.009
- Nardone G, Oliver De La Cruz J, Vrbsky J, Martini C, Pribyl J, Skládal P, Pešl M, Caluori G, Pagliari S, Martino F, Maceckova Z, Hajduch M, Sanz-García A, Pugno NM, Stokin GB, **Forte G**. *YAP regulates cell mechanics by controlling focal adhesion assembly*. **Nat Commun** 2017. doi:10.1038/ncomms15321.
- Mosqueira D, Pagliari S, Uto K, Ebara M, Romanazzo S, Escobedo-Lucea C, Nakanishi J, Taniguchi A, Franzese O, Di Nardo P, Goumans MJ, Pinto-do-Ó P, Aoyagi T, **Forte G**. *Hippo pathway effectors control cardiac progenitor cell fate by acting as dynamic sensors of substrate mechanics and nanostructure*. **ACS Nano** 2014; 8: 2033-2047.
- Martino F, Perestrelo AR, Vinarský V, Pagliari S, **Forte G**. *Cellular Mechanotransduction: from tension to function*. **Front Physiol** 2018. doi: 10.3389/fphys.2018.00824