

POSTDOCTORAL POSITION ON MECHANOBIOLOGY OF BIOENGINEERED MICROVASCULAR NETWORKS



The MAtrix / Mechanobiology & Tissue Engineering research group (www.mech.kuleuven.be/mechanobiology) is a bioengineering group that is pioneering the role of cellular forces for microvascular formation and function in health and disease. The group is led by prof. Hans Van Oosterwyck and is one of the few groups worldwide that has established 3D Traction Force Microscopy (TFM) routines and workflows for quantifying cellular force exertion in 3D, and routinely applies them to in vitro models of angiogenesis (endothelial invasion). Together with its research partners, it is currently developing novel in vitro models, compatible with TFM and other

methods of cellular force inference, to study the interplay between cellular force exertion, matrix mechanics and fluid flow, and how this interplay contributes to endothelial cell phenotypic changes in the context of endothelial heterogeneity and specific (genetic) diseases that lead to microvascular malformations.

The group is looking for a postdoc with strong expertise in the in vitro bioengineering of microvascular networks to strengthen the research team. The ideal candidate must have:

- a PhD in bioengineering or related fields.
- strong bioengineering skills relevant for 3D in vitro models of vascular biology, such as micro- or mesofluidics, micro- / biofabrication (e.g. 3D printing), 3D endothelial (co-) culture systems, hydrogel synthesis and functionalization, mechanical design.
- experience with optical microscopy, preferably live cell imaging in 3D (confocal microscopy, fluorescence microscopy, genetically-engineered fluorescent reporter systems).
- some experience with or exposure to scientific computing (such as finite element modelling) and programming (such as Matlab).
- a strong interest in mechanobiology and mechanotransduction, with a desire to learn TFM and related methods.
- a strong CV and willingness to apply for a personal postdoc fellowship (together with the PI).
- a collaborative attitude; we are looking for a real team player who is willing to help and co-supervise master and PhD students.

You will join a KU Leuven-funded project that is in close collaboration with profs. Liz Jones and Aernout Luttun (Centre for Molecular and Vascular Biology at KU Leuven) and that explores how organ-specific endothelial cell heterogeneity arises from the combination of genetic and mechanical signals. Your role is to explore the role of cellular force exertion in the establishment of organ-specific endothelial phenotypes in combination with extrinsic mechanical signals related to organ-specific matrix mechanics and fluid flow. Apart from using and optimizing recently established monolayer models available in our group, you are expected to develop novel 3D in vitro models of perfused vascular networks compatible with cellular force inference. Apart from the application to the study of endothelial cell heterogeneity, these models must also target the study of microvascular disease, in particular Cerebral Cavernous Malformations (CCMs)

which are malformations of the brain microcapillaries. As to the latter, the Van Oosterwyck group has a strong partnership with the research group of dr. Eva Faurobert at the Institute for Advanced Biosciences (University of Grenoble, France), with whom you are expected to closely collaborate as well.

We are offering you an exciting postdoc position in a multidisciplinary, international and collaborative research environment. The MAtrix / Mechanobiology & Tissue Engineering group is working on cutting-edge methods for cellular force inference and is addressing important questions in vascular (mechano)biology in close collaboration with its biomedical partners. The group is based at the Leuven Chem&Tech / Leuven Nanocentre (https://set.kuleuven.be/chemtech_nanocentre) that forms the perfect environment for technology development and that houses unique equipment related to e.g. optical microscopy and nanoscopy, micro-, nano- and biofabrication and biosensing. KU Leuven is one of the oldest universities in Europe, with a very rich tradition in research and higher education. Today, it is among the best 100 universities in the world according to both Times Higher Education World Rankings and QS World University Rankings, and was ranked by Reuters as most innovative university of Europe since 2016. Leuven is a vibrant student town at the heart of Belgium and Europe, offering a great quality of life.

While the initial appointment is for one year, the group is looking for candidates interested in a more long-term engagement (typically 3 years, depending also on the candidate's fellowship application).

More information and online application procedure can be found at <https://www.kuleuven.be/personeel/jobsite/jobs/60108819>.

Application deadline is June 21, 2022.

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