Clarissa Becher

Project title: *Regulation of Activin signaling by shear stress in pulmonary arterial hypertension*

Duration	6 months
Short Bio	I am a PhD student at the Leiden University Medical Center in the Cell-and Chemical Biology department. In my current research I am investigating the role of the Transforming Growth Factor (TGF)-β signaling pathway and endothelial dysfunction in pulmonary arterial hypertension (PAH). The aim of my project is to simulate a physiological environment that closely mimics the conditions seen in PAH patients by integrating different determinants of endothelial dysfunction (e.g. hypoxia, inflammation, and shear stress). A good model to study PAH will open new opportunities to identify new therapeutic strategies.
Home Institution	Leiden University Medical Center
Host institution	Technical University of Vienna
Project description	Pulmonary Arterial Hypertension (PAH) is a rare and progressive disease characterized by vascular resistance and remodelling of the pulmonary arteries. Disease pathogenesis involves disrupted Bone Morphogenetic Protein (BMP) signaling, often associated with loss-of-function mutations in members of the pathway. At the host institution in Vienna, I designed a custom-made microfluidic chip device as a relevant model to study PAH, with the focus of addressing a remaining challenge in the field: increasing shear stress levels up to 40 dyne/cm2. Furthermore, I investigated the regulation of Activin A signaling in endothelial cells carrying a BMPR2 mutation (PAH model) compared to control cells under static, low and high shear stress conditions using molecular techniques. In detail, I monitored fluorescent reporter cell lines using live-cell imaging and performed gene expression analysis RT-qPCR. I was able to design the microfluidic chip device in a way that I can continue the project here at my home institution.

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Personal statement	Thanks to the EJPRD fellowship I had a valuable, interdisciplinary exchange that had a great impact on my professional development as a researcher. The fellowship gave me the opportunity to work with experts in the field and learn bio-engineering applications that improved my scientific thinking. Going abroad to work in another laboratory improved greatly my communication, transdisciplinary and adaptation skills. In addition, my stay at the host institution allowed a valuable exchange of knowledge between molecular biology and bioengineering/material sciences, expanding the awareness of rare diseases and the European Reference Networks. This time has been a great experience and I am looking forward to implement my newly acquired skills in my home institution.

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