

## MASTER THESIS PROJECT IN BIOENGINEERING!

The integrity and biomechanics of tissues is highly dependent on the production and assembly of the structural protein collagen. In skin disorders like Epidermolysis bullosa or Ehlers-Danlos Syndrome, and in bone disorders like Osteogenesis Imperfecta (brittle bone disease) alterations in collagen assembly occur as consequences of mutations in collagen or in the molecular chaperones responsible for correct collagen folding. Hsp47 (Heat shock protein 47) is a collagen specific molecular chaperone involved in intracellular assembly, transport and stabilization of collagen precursors. Alterations in this protein are found in some variants of these diseases. Our group has demonstrated that photoactivatable variants of this protein can be used to enhance collagen deposition in mammalian cell cultures (Khan.et.al, Adv. Sci. 2019, 6, 1801982). In this MSc Thesis project, we will test the ability of these molecules to enhance collagen deposition in skin explants. For this work the MSc candidate will re-synthesize the Hsp47 variants, will perform biochemical assays to assess their bioactivity, and will learn tissue culture and imaging techniques including immunostaining and collagen imaging using advanced microscopy techniques.

This work will be carried out at the Department “Dynamic Biomaterials” (Prof. Dr. Aránzazu del Campo) at INM-Leibniz Institute for New Materials, and will be integrated in a multidisciplinary and international team working on new therapeutic approaches for regenerative medicine. The Dynamic Biomaterials program area develops cell-engineering materials that can communicate with and control the behavior of cells.

### Required qualifications

We are looking for a highly motivated and skilled student currently pursuing Master Degree in Biotechnology, Biophysics or Human and Molecular Biology. The applicant should be open to interdisciplinary research. Working language is English. The MSc Thesis will also be written in English. Prior experience (at internship level) in cell culturing, immunostaining or molecular biology techniques is mandatory. Such experience could also be achieved in the group in an internship previous to MSc work.

INM is an equal-opportunity employer with a certified family-friendly policy. We promote the professional opportunities of women and strongly encourage them to apply.

Please send your application via email to Essak Khan ([essak.khan@leibniz-inm.de](mailto:essak.khan@leibniz-inm.de)) and Dr. Shrikrishnan Sankaran ([shrikrishnan.sankaran@leibniz-inm.de](mailto:shrikrishnan.sankaran@leibniz-inm.de)) including your CV, electronic copy of your university marks, and a short cover letter explaining your motivation. The attachment should be a single pdf-file <10 MB.

### Group website

<https://www.leibniz-inm.de/forschung/biogrenzflaechen/dynamische-biomaterialien/>

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### KONTAKT

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