



MSc Thesis in Molecular Biology and Biochemistry

Expression of Artificial Human Serum Albumin Variants

We are looking for a motivated **MSc Student** to join our two laboratories of **Albumin** and **Computer-Aided Molecular Design** (Division of Physiological Chemistry, Otto-Loewi Research Center) at the Medical University of Graz. The successful MSc Student candidate will participate in the **experimental part** of the project entitled “**Deconvoluting Human Serum Albumin**”.

Background: Human Serum Albumin (HSA) is one of the key transport proteins in human plasma. Its ability to bind different metabolites and xenobiotics is remarkable. Although the generation of structural models in the last years have helped to understand how HSA recognizes its cargos, its promiscuity in terms of the binding to different chemical species is far to be totally understood. Thus, we have started a project for the deconvolution of 3D structural features in HSA and their role on ligand binding specificity. In particular, we are committed to deliver artificial HSA variants with differential selectivity for the two physiologically relevant bilirubin isomers, and HSA variants where its sequence has been modified to accommodate the very new chemical NOS bond. First, we'll modify the HSA structure based on computer-aided studies by site-directed mutagenesis. Second, we'll express these variants in bacteria and yeast, and after subsequent purification, we'll characterize the novel HSA variants by biophysical and biochemical methods.

Goal: The MSc Project will consist of the design and delivery of novel HSA variants with differential selectivity for the two physiologically relevant bilirubin isomers, and HSA variants to accommodate the very new chemical NOS bond. The MSc Student will focus her/his efforts in the cloning and expression of the wild-type HSA and HSA variants in bacteria (*E. coli*), their purification using chromatographic methods, and their *in vitro* characterization by means of chromatographic and biochemical methods. We are also committed for the obtention of experimental structural models of the new variants via cooperation with the Institute of Molecular Biosciences (University of Graz).

Timing and facilities: The estimated time scale for the practical work of this MSc project is 6 months. Our division harbors molecular biology labs for molecular cloning and protein expression, as well as facilities for protein purification and characterization. The MSc Student will be fully supported by our teams.

Questions?

Feel free to visit CAMDgraz.com or to send an Email to: pedro.murcia@medunigraz.at or margret.paar@medunigraz.at

