

Institute of Biochemistry II, Molecular Signaling group

is looking for 2 **Diploma students**

Some of the major focuses of our current work are studying ubiquitin-proteasome system, as well as posttranslational modifications of proteins by ubiquitin and SUMO.

1. Project - The 26S proteasome is a huge macromolecular complex composed of proteolytically active 20S core particle (CP) capped at one or both ends by a 19S regulatory particle (RP). The RP recognizes ubiquitinated substrates, deconjugates ubiquitin chains, and unfolds substrates before their translocation into the CP. Proteasome subunit Rpn10/S5a and newly discovered Rpn13/ADRM1 bind ubiquitin chains via ubiquitin-binding domains. Additionally, shuttling receptors, that contain UBL and UBA domains, such as Rad23 (hHR23a/b in humans), Dsk2 (hPLIC-1/2 in humans) and Ddi1, deliver ubiquitinated cargo to the proteasome. Their UBA domains bind ubiquitin, while their UBL domains interact reversibly with the proteasome.

At the moment we are working on several novel Rpn13 interacting proteins, which should give us new intriguing clues about the function of Rpn13, and proteasome as a complex, in various processes in the cell.

2. Project - Small Ubiquitin-like Modifier or SUMO proteins are a family of small proteins that are covalently attached to and detached from other proteins in cells to modify their function. SUMO proteins are similar to ubiquitin, and sumoylation is directed by an enzymatic cascade analogous to that involved in ubiquitination. In contrast to ubiquitin, SUMO is not used to label proteins for degradation. Sumoylation is involved in various cellular processes, such as nuclear-cytosolic transport, transcriptional regulation, apoptosis, protein stability, response to stress, and progression through the cell cycle.

At the moment we would like to characterize novel SUMO-like proteins and SUMO-binding domains in various proteins and determine their physiological role in the cell.

Please contact Koraljka Husnjak (Husnjak@biochem2.de) for detailed information.