Institute of Aerospace Medicine
Institute Seminar, September 25, 2018, *Abstract*

Univ.-Prof. Dr. Stefan Gründer
Institute of Physiology, RWTH Aachen University, Aachen Germany

A small peptide from cone snail venom enhances muscle pain by slowing desensitization of Acid-Sensing Ion Channel 3 (ASIC3)

Acid-sensing ion channels (ASICs) are proton-gated Na+ channels with exquisite sensitivity to extracellular protons. They are expressed in many, if not all, neurons. Slight acidification rapidly opens ASICs; in the continued presence of protons, ASICs desensitize. In humans, four genes code for ASICs. ASIC1a is broadly expressed in the central nervous system and contributes to synaptic transmission. ASIC3 is expressed in many sensory neurons of the peripheral nervous system, in particular in primary afferent fibers innervating heart and skeletal muscle. Most likely, ASIC3 senses muscle ischemia, initiating an axon reflex and ischemic muscle pain.

In my talk, I will present the identification from the venom of the cone snail Conus textile of a small peptide, RPRFamide, that enhances ASIC3 currents and increases muscle pain after acidification. Moreover, I will report the molecular identification of the binding site of RPRFamide on ASIC3, which suggests a molecular mechanism for the modulation of ASIC3 by RPRFamide.