COLLOQUIA IN PHYSIOLOGY AND VASCULAR BIOLOGY

Venue: Medical University Vienna, Center for Physiology and Pharmacology, Institute of Pharmacology, Waehringerstrasse 13a, 1090 Vienna, "**Leseraum**"

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Friday 23.10.2015 10:00 s.t. **Ben Nichols** (host: D. Pollak)

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"Flotillin membrane microdomains recruit sphingosine to control sphingosine-1-phosphate signalling"

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Abstract:

Sphingosine-1-phosphate (S1P) is an important lipid signalling molecule. It acts on multiple targets to regulate inflammation, metabolism, vascular permeability, and memory. S1P is produced via intracellular phosphorylation of sphingosine (Sph) by two kinases, SPHK1 and SPHK2. SPHKs use membrane-associated Sph as substrate. Because of its biophysical properties as a lyso-lipid with a single acyl chain, Sph should diffuse rapidly between cellular membranes and through the aqueous phase. How specific sub-cellular membrane pools of Sph and hence S1P production are maintained has not been clear. We have carried out proteomic, lipidomic and functional characterisation of mice lacking membrane microdomains defined by flotillin proteins. Multiple experiments link flotillin microdomains to binding and recruitment of sphingosine, and hence regulation of S1P signalling. This role for flotillin microdomains in recruitment of lyso-lipids from the aqueous phase provides a new paradigm for membrane organisation.