Laboratory of Molecular Immunology

Transmembrane adaptor proteins, membrane microdomains, Csk, immunoreceptor signalling

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In recent years the major topics of our laboratory have been (1) leukocyte membrane microdomains and (2) leukocyte membrane associated signalling molecules, namely several novel transmembrane adaptor proteins and their involvement in immunoreceptor signalling. In 2011-2012 we continued our studies on several novel raft-associated transmembrane adaptors (LST1A, PRR7, SCIMP), functional effects of targeting protein tyrosine kinase Csk into various membrane compartments, and on receptor phosphatase CD148. Furthermore, we produced a number of novel monoclonal antibodies as valuable research and potentially diagnostic tools, e.g. those to Drebrin, OPAL1, TFG, PCLO, ARH GEF, DDIT, AGPS.

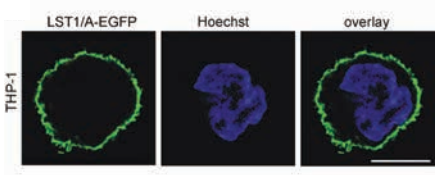

Fig. 1. Plasma membrane localization of transmembrane adaptor protein LST1/A. THP-1 cells were stably transfected with LST1-EGFP, fixed, permeabilized and nuclei were stained with Hoechst 33258. *(Draber et al. J Biol Chem 2012; 287: 22812)*

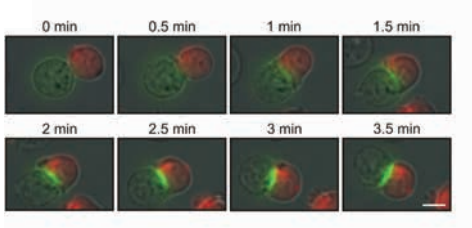

Fig. 2. Translocation of transmembrane adaptor protein SCIMP into immunological synapse. Ramos cells transfected with SCIMP-GFP (green) were loaded with superantigen and subsequently Jurkat T cells (labeled by DDAO in red) were added. Immunological synapse formation was observed by live cell imaging. . *(Draber et al. Mol Cell Biol 2011; 31: 4550)*

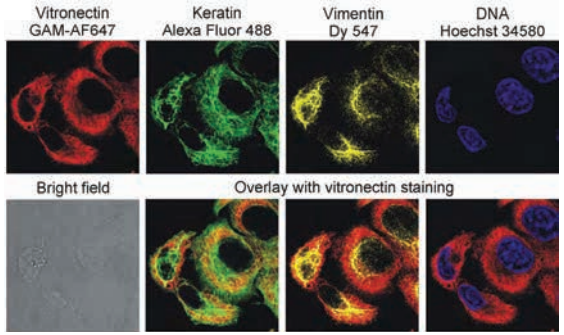

Fig. 3. Vitronectin-binding cytoplasmic components are not intermediate filaments. HeLa cells cultivated on microscope cover slips were fixed and permeabilized. The cells were incubated in 50% human serum, stained with anti-vitronectin and GAM-Alexa Fluor 647 antibodies, followed by anti-pan cytokeratin-Alexa Fluor 488 and anti-vimentin-Dy 547 antibodies in 20% mouse serum and Hoechst 34580 staining. *(Stepanek et al. PloS One 2011; 6: e19243)*

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- GA CR, GEMEM/09/E011 - Signaling and adaptor proteins of leukocyte membrane microdomains, 2009-2012, V. Hořejší
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- Ministry of Health of the Czech Republic, NT13271 - Phenotyping B- and T-cells in immunodeficiency, 2012-2015, T. Brdička
- GA CR, GAP302/12/1712 – Function of Csk binding proteins SCIMP and PSTPIP2 in leukocyte signalling and inflammatory responses, 2012-2015, T. Brdička
- GA CR,GAP302/12/G101 – Molecular mechanisms of leukocyte receptor signalling – their roles in health and disease, 2012-2018, V. Hořejší
- Ministry of Health of the Czech Republic, NT13462 - Optimization of immunotherapy and flow cytometric minimal residual disease assessment in resistant acute lymphoblastic leukaemia, 2012-2015, P. Otáhal

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