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LABORATORY OF

SIGNAL TRANSDUCTION

plasma membrane signalosomes, immunoreceptor signalling, ORM family regulators, mast cell

In the picture:

1. Magda Tůrnová | 2. Ivana Hálová | 3. Viktor Bugajev | 4. Pavol Utekal | 5. Tomáš Paulenda | 6. Petr Dráber | 7. Lucie Potůčková | 8. Lubica Dráberová | 9. Romana Budvičová

Not in the picture:

Oleksij Redčenko

Understanding the molecular mechanisms governing signal transduction from the plasma membrane receptors to the cytoplasm remains an important research goal. High-affinity immunoglobulin E receptor (FcεRI), cKIT, and G protein-coupled receptors (GPCRs) are plasma membrane receptors involved in degranulation and/or chemotaxis of mast cells, powerful immune system modulators. Within seconds of antigen-mediated activation, mast cells release a variety of preformed biologically active compounds, followed by a wave of mediator synthesis and secretion. Increasing evidence suggests an intricate network of inhibitory and activating receptors, specific signalling pathways, and adaptor proteins whose overall signalling balance governs mast cell responsiveness to a given stimuli. In our recent studies we focused on understanding the role of plasma membrane signalosomes and selected cytoplasmic proteins during mast cells activation through FcεRI, cKit and GPCRs. To reach our goal, we used various techniques of molecular biology, immunology, immunochemistry, and immunohistochemistry. We found and described new functions of the ORMDL3 protein, galectin 3 and ethanol-sensitive plasma membrane signalosomes in mast cell activation. Our studies deepen the knowledge of the cellular and molecular mechanisms of cells involved in allergic and inflammatory diseases, a prerequisite for development of anti-allergic and anti-inflammatory drugs.

Selected recent papers:

[Bambouskova M, Polakovicova I, Halova J, Goel G, Draberova L, Bugajev V, Doan A, Utekal P, Gardet A, Xavier R J, Draber P](#); (2016) New regulatory roles of galectin-3 in the high-affinity IgE receptor signaling. **Mol. Cell Biol.** 36: 1366-1382.

[Bugajev V, Halova J, Draberova L, Bambouskova M, Potuckova L, Draberova H, Paulenda T, Junyent S, Draber P](#); (2016) Negative regulatory roles of ORMDL3 in the FcεRI-triggered expression of proinflammatory mediators and chemotactic response in murine mast cells. **Cell Mol. Life Sci.** 73: 1265-1285.

[Draberova L, Paulenda T, Halova J, Potuckova L, Bugajev V, Bambouskova M, Tumorova M, Draber P](#); (2015) Ethanol inhibits high-affinity immunoglobulin E receptor (FcεRI) signaling in mast cells by suppressing the function of FcεRI-cholesterol signalosome. **PLoS One** 10: e0144596.

