Abstract

Because of the profound effects of signal transduction on cell behaviour, the activity of signalling pathways must be carefully regulated. Otherwise, dysregulation of signalling might harm the organism by not responding to danger or by an excessively strong reaction. Therefore, various regulatory mechanisms became essential parts of signal transduction pathways. They affect these pathways at all levels, including ligands, receptors, signalling enzymes, adaptor proteins and other signalling mediators, as well as transcription factors further downstream. In this thesis, I present the results of the research on the role of transmembrane and membrane associated adaptor proteins LST1, SCIMP, PSTPIP2 and WBP1L in the regulation of leukocyte signalling and homeostasis.

Transmembrane adaptor protein LST1 is a short protein expressed in the cells of the myeloid lineage. Observation of *LST1*$^{-/-}$ mice revealed that these animals are overall healthy without visible phenotype, with the exception of mild reductions in myeloid, NK and NKT cell populations at the steady state. On the other hand, LST1 deficiency had significant protective effect during acute colitis induced by dextran sodium sulphate, suggesting the role of LST1 in the regulation of gut inflammation.

Studies on PSTPIP2 and SCIMP presented in this thesis are also focused on inflammation. They show the role of PSTPIP2 in the regulation of reactive oxygen species production and associated inflammatory bone damage and the function of SCIMP in the regulation of macrophage and dendritic cell responses to fungal cell wall components. Finally, this thesis describes novel transmembrane adaptor WBP1L and its role in the regulation of CXCR4 signalling and haematopoiesis.