

LABORATORY OF

ADAPTIVE IMMUNITY

Tcells, signaling, immunity, disease, TCR

Ondřej Štěpánek

The Group of the Adaptive Immunity uncovers fundamental principles of how T cells elicit the protective immune response against pathogens and tumors, but maintain self-tolerance at the same time. One strong aspect of our research is the focus on the T-cell receptor signaling pathway and other signaling pathways that contribute to the fate decisions in T cells. To test physiological relevance of our hypotheses, we employ a battery of disease models including the models of autoimmune diabetes, cancer, or infection.

Besides the major direction, a part of the group focuses on the understanding of the biology of the BBSome, a protein complex, whose dysfunction can cause a multiorgan disease of Bardet-Biedl Syndrome.

Selected publications:

1. Horkova V, Drobek A, Mueller D, Gubser C, Niederlova V, Wyss L, King CG, Zehn D, Stepanek O⁺ (2020) Dynamics of the Coreceptor-LCK Interactions during T Cell Development Shape the Self-Reactivity of Peripheral CD4 and CD8 T Cells. *Cell Reports*, **30**:1504–1514.
2. Niederlova V, Modrak M, Tsiklauri O, Huranova M⁺, Stepanek O⁺ (2019) Meta-analysis of genotype-phenotype associations in Bardet-Biedl syndrome uncovers differences among causative genes. *Hum Mut*, **40**:2068–2087.
3. Drobek A, Mouhra A, Mueller D, Huranova M, Horkova V, Pribikova M, Ivanek R, Oberle S, Zehn D, McCoy KD, Draber P, Stepanek O⁺ (2018) Strong homeostatic TCR signals induce formation of self-tolerant virtual memory CD8 T cells. *EMBO J*, **37**(14), pii: e98518.
4. Lo WL, Shah NH, Rubin SA, Zhang W, Horkova V, Fallahiee IR, Stepanek O, Zon LI, Kuriyan J, Weiss A (2019) Slow phosphorylation of a tyrosine residue in LAT optimizes T cell ligand discrimination. *Nat Immunol*, **20**:1481–1493.
5. Lo WL, Shah NH, Ahsan N, Horkova V, Stepanek O, Salomon AR, Kuriyan J, Weiss A (2018) Lck promotes Zap70-dependent LAT phosphorylation by bridging Zap70 to LAT. *Nat Immunol*, **19**:733–741.

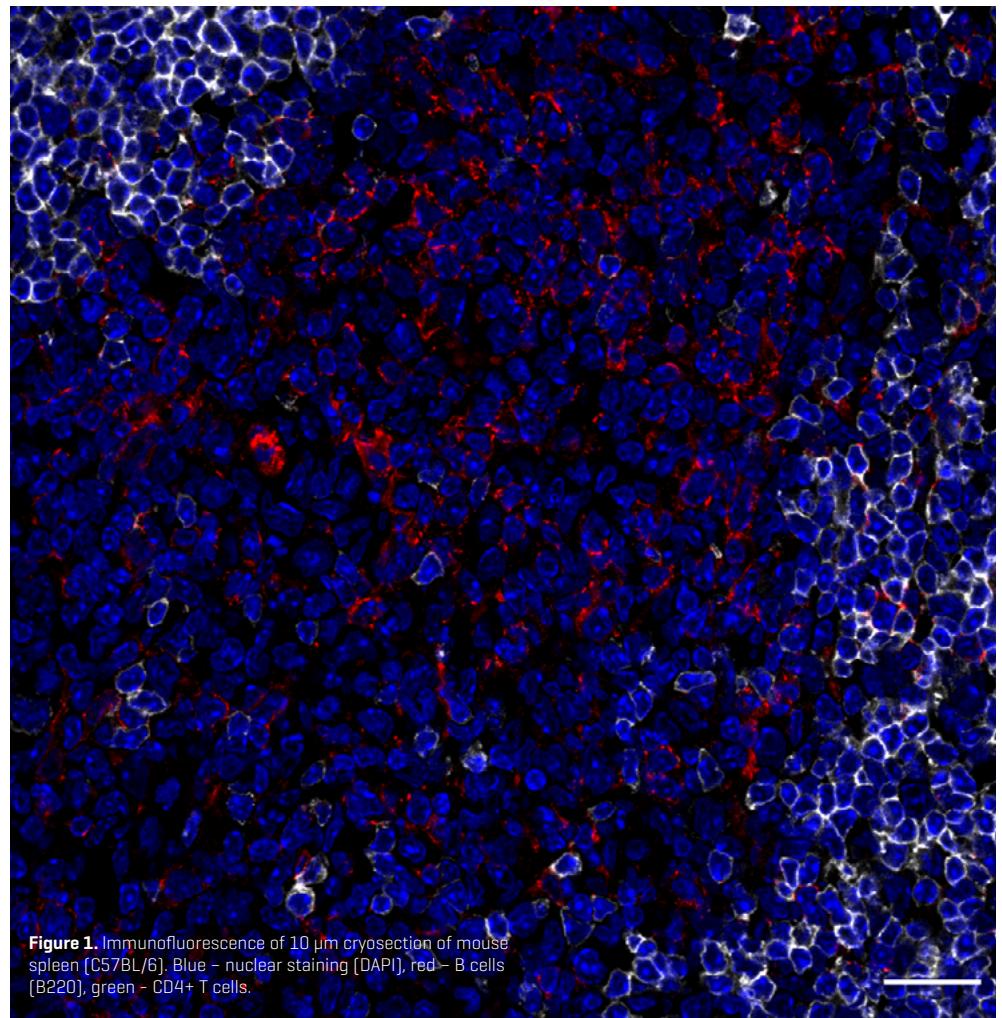


Figure 1. Immunofluorescence of 10 μ m cryosection of mouse spleen [CS7BL/6]. Blue – nuclear staining [DAPI], red – B cells [B220], green - CD4+ T cells.



In the picture: 1. Michálik Juraj | 2. Štěpánek Ondřej | 3. Přibíková Michaela | 4. Knížková Daniela | 5. Křížová Kateřina | 6. Drobek Aleš | 7. Horková Veronika | 8. Dráber Peter | 9. Tsyklauri Oksana | 10. Neuwirth Aleš | 11. Cupák Ladislav | 12. Janušová Šárka | 13. Paprčková Darina | 14. Prasai Avishek