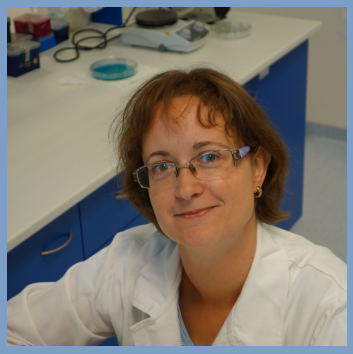


KATARÍNA LOPUŠNÁ

Biomedical Research Center
Slovak Academy of Sciences

Project number
1136/01/02

Project duration
9/2022 - 8/2025

I applied for the SASPRO2 fellowship in order to secure the best possible conditions in one of the top research institutions in Slovakia. The training and open opportunities within the SASPRO2 program will help me to create a team that will achieve excellent scientific results at the international level. The SASPRO2 program will also allow me to strengthen and enhance the international cooperation.

S A S P R O 2

BIOGRAPHY

Katarína Lopušná studied virology at Comenius University in Bratislava. Already during doctoral studies, she completed fellowship at Aarhus university in Denmark, during which she obtained valuable results on the innate immune response during herpesvirus infection. After completing her doctoral studies, she received a prestigious postdoctoral position at the University of Florida in Gainesville, USA, where she specialized in research of hematological malignancies under the supervision of Dr. Opavsky. She contributed to new discoveries about de novo DNA methylation during embryogenesis, as well as to the identification of Dnmt3b as a tumor suppressor during lymphomagenesis. Her works were published in top-ranked scientific journals. She currently works as a researcher at the Department of Viral Immunology at Biomedical Center of the Slovak Academy of Sciences and continues in her research of hematologic malignancies.

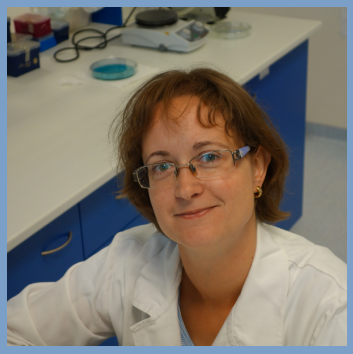
PROJECT SUMMARY

Checkpoint molecules and viral immunomodulators in cancer therapy

This multidisciplinary project aims to push the current boundaries between immunotherapy, virology and nanomedicine. By combining these emerging scientific fields we will be able to develop revolutionized protocol with subsequent use in clinical practice for diagnosis and efficient treatment of various types of cancers. Immune checkpoints are molecules normally expressed upon activation on T- and B-cells and regulate inhibitory and stimulatory pathways that maintain self-tolerance and immune response. However, tumor cells often overexpress ligands of these immune checkpoint receptors to inhibit the anti-tumor immune response mediated by effector T cells. Therefore, blocking immune checkpoint receptors for the treatment of cancer is recently gaining a great attention as a strategy for immunotherapy in several types of autoimmune diseases and cancers. On the other hand, we and others found that inhibitory checkpoint receptors, such as PD-1 and BTLA are often overexpressed by tumor cell as well, suggesting on their immunotherapeutic potential.

In this project, we aim to identify expression level and new somatic mutations of inhibitory checkpoint receptors in large pool of patients with hematologic malignancies; to test the effect of virus encoded UL144 gene product on proliferation of hematologic malignancies; to identify new virus-encoded proteins targeting inhibitory checkpoint receptors and subsequently design and test the biological peptides interacting with tumor-specific inhibitory checkpoint receptors. Based on these results we will be able to develop new panel of biomarkers used by clinicians for diagnosis and prognosis of cancer; to develop new modification method of viral immunomodulators by introduced aminoacid changes and use it for design of peptides targeting specifically only tumor cells and potentially identify the crystal structures of unmodified and modified viral immunomodulators bound to inhibitory checkpoint receptors.

All obtained data might serve as background for following preclinical and clinical studies.



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PUBLICATIONS

1. LOPUSNA K* - NOWIALIS, P* - OPAVSKA J - ABRAHAM A - RIVA A - OPAVSKY R. Dnmt3b catalytic activity is critical for its tumour suppressor function in lymphomagenesis and is associated with c-Met oncogenic signalling. In EBioMedicine, 2021, 63:103191.
DOI: https://doi.org/10.1016/j.ebiom.2020.103191

2. LOPUSNA K* - NOWIALIS, P* - OPAVSKA J - ABRAHAM A - RIVA A – HANEY SL -OPAVSKY R. Decreases in different Dnmt3b activities drive distinct development of hematologic malignancies in mice. In J Biol Chem, 2021, 296:100285.
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SAS PRO 2

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COMENIUS UNIVERSITY BRATISLAVA

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