

KORNÉL MOLNÁR



National Academy of Scientist Education, 6th year

Semmelweis University
Faculty of Medicine, 6th year

YEAR OF BIRTH

2001

FORMER SZENT-GYÖRGYI PUPIL

no

RESEARCH UNIT

Semmelweis University

SZENT-GYÖRGYI MENTOR

Jakus Zoltán Péter

JUNIOR MENTOR

–

SPECIALIZATION

vascular biology

SECONDARY SCHOOL

Szinyei Merse Pál High School, Budapest, District VI

NAME OF TEACHER

István Takács

LANGUAGES

English/intermediate

IMPORTANCE, AIMS AND POSSIBLE OUTCOME OF RESEARCH

Vaccines using messenger RNA (mRNA-LNP) technology packaged in lipid nanoparticles have recently attracted considerable scientific interest, as two vaccines against SARSCoV-2 approved for emergency use are also based on this technology. However, processes in the immune response elicited by mRNA-LNP-based vaccines are still not fully understood. The aim of our research was to investigate the role of immune cells involved in the immune response induced by mRNA-LNP-based vaccines as well as the role of the lymphatic system in transgenic mouse models. To facilitate the success of our studies, a more detailed understanding of the processes elicited by mRNA-LNP-based vaccines may be offered in the future to increase the efficacy of these vaccines and to alleviate possible side effects. We are also investigating the functions of skin lymphatics, particularly in the pathomechanism of contact hypersensitivity, we are also conducting experiments to characterise the role of lymphatics in myocardial infarction.

AMBITIONS AND CAREER GOALS

My goal is to help people at the best of my ability during my future medical and research careers. To do this, it is essential to be up to date with the latest research findings in my field. The National Academy of Scientist Education Training program is a great opportunity for me to start developing both my theoretical and practical knowledge to the highest possible level during my university years.

HONORS AND PRIZES

2024/25 Rektor's Thesis – 1st place
2025 Semmelweis University Students' Scientific Conference – 3rd place
2024 Semmelweis University Students' Scientific Conference – 1st place
2023 Semmelweis University Students' Scientific Conference – 2st place
2022 Semmelweis University Students' Scientific Conference – 1st place

PUBLICATIONS

Aradi, P., Kovács, G., Kemecsei, É., **Molnár, K.**, Sági, SM., Horváth, Z., Mehrara, BJ., Kataru, RP., Jakus, Z. (2024) Lymphatics-dependent modulation of the sensitization and elicitation phases of contact hypersensitivity. **J Invest Dermatol** 144(10): 2240–2254.e9.