

BIOGRAPHY



DOMINIKA FRIČOVÁ

Institute of
Neuroimmunology
Slovak Academy of
Sciences
10/2021 - 12/2023

Faculty of Medicine
Comenius University
2/2024 - 10/2024

Project number
1085/01/02

Project duration
10/2021- 10/2024

Dominika Fricova is a professional in two fields Biochemistry and Medicine. She obtained both degrees at Comenius University in Bratislava, Slovakia, and currently she is starting her own research group in the laboratory of Parkinson's disease research at the Institute of Neuroimmunology, Slovak Academy of Sciences. She has previously worked at the Mayo Clinic in the United States. Her main specialization is the use of modern gene targeting methods such as the CRISPR/Cas9 system in the laboratory and she focuses on neurodegenerative diseases.

"In line with Dr. Fricova's long-term goals, receiving the SASPRO 2 fellowship represents a unique opportunity to ensure the establishment of her own laboratory and to create an environment for young students in Slovakia on their path to become scientists. Moreover, funding of the proposed research will contribute to generation of a completely novel approach pioneering the link between senescence and neurodegeneration and might bring answers to several intriguing and fundamental questions regarding neurodegeneration. Excitingly, results obtained in proposed screening strategies in this project might lead to development of compounds with neuroprotective capacities and translate our findings to drug discovery efforts and therapeutic approaches towards age-related and neurodegenerative diseases."

PROJECT SUMMARY

The role of senescence in neurodegeneration: from the molecular connection to the application and novel treatment strategies

Cells are constantly exposed to various stress conditions. Therefore the organism needs to be armed with defense mechanisms preventing the growth of cells with severe damage, which could result in cancer. One of these mechanisms is senescence. Interestingly, recent research papers have shown that senescence is not only protecting against cancer, but is also the main contributor to aging-related tissue dysfunction and age-related diseases. The selective clearance of senescent cells started to emerge as a very promising therapeutic approach for the future treatment of age-related diseases.

Hence, it is extremely important to understand this complex cellular response in greater detail. Here, we aim to address two imminent questions regarding senescence. First, is the role of senescence in nervous system and second is the role of this cellular response in pathobiology of neurodegenerative disorders. Our aims are to describe and explain mechanisms inside the neural cells, which lead to the switch of the cellular status to senescent. To shed a light on this phenomena we propose to create novel unique reporters allowing precise quantification of the senescence response activation in neuronal model system. In addition, we plan to use these reporters in screening strategies, which will allow us to identify potential modifiers of the pathway and provide us the basis for novel therapeutic avenues for age-related diseases. Finally, we will focus on the validation of our findings in the brains of mouse models of neurodegeneration and in samples of patients suffering with neurodegenerative diseases.



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PUBLICATIONS

1. Brain <https://pubmed.ncbi.nlm.nih.gov/27807026/>
2. Autophagy <https://pubmed.ncbi.nlm.nih.gov/29947276/>
3. <https://pubmed.ncbi.nlm.nih.gov/33112198/>
4. Journal of Parkinson's disease, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5302033/>
5. Nature regenerative medicine, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7641157/>