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Insights from the Network

Understanding Neurodegeneration in Multiple Sclerosis: How One Protein Pathway May Hold the Key to Slowing Disease Progression

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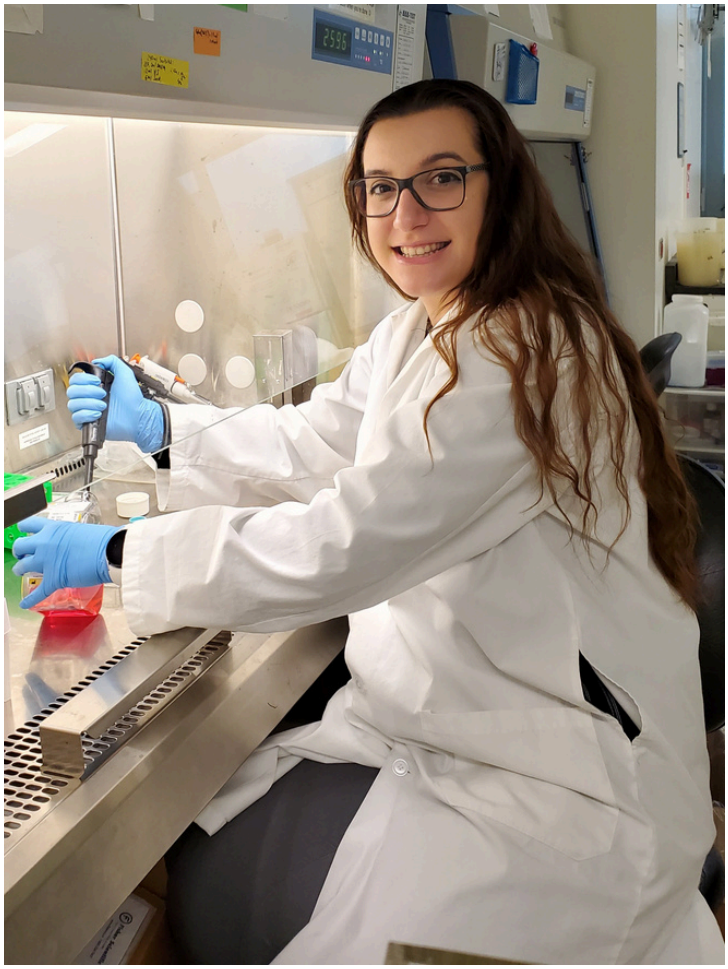
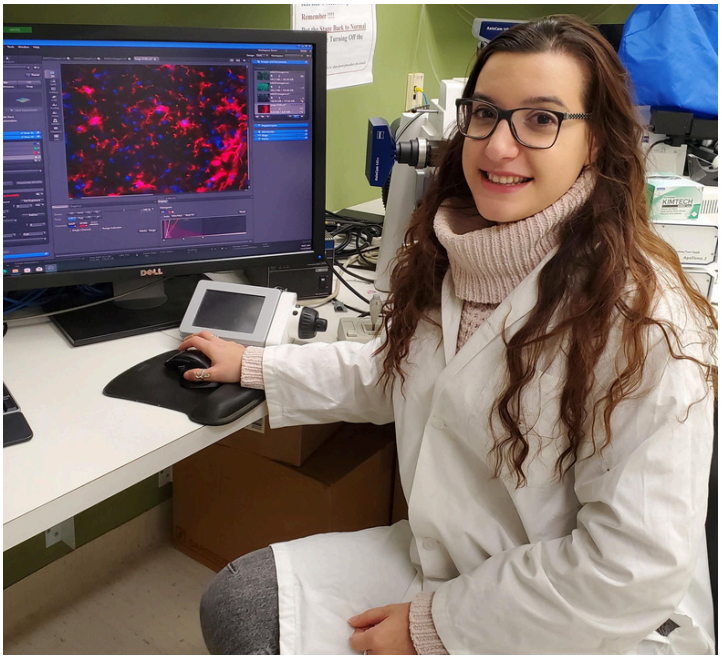


In 2023, Canada's Stem Cell Network (SCN) and MS Canada launched the SCN-MS Canada Postdoctoral Fellowship in Regenerative Medicine (RM) and Multiple Sclerosis (MS). Dr. Elisabet Jakova was the award recipient and has been actively working on her RM-MS project over the past year at the University of Manitoba. In recognition of MS Awareness Day, Dr. Jakova shares an update on her research project and Fellowship experience.

Research Project Update

Our group is interested in understanding the mechanisms that drive neurodegeneration and cognition decline in the progressive stage of multiple sclerosis (MS).

We have unravelled an association between the dysregulation of the Neuregulin-1 pathway and the reduced regenerative capacity of brain neural stem cells that seem to underlie MS progression. In this project, we use preclinical and genetic models, as well as human MS samples to investigate the impact of Neuregulin-1 dysregulation on brain repair in MS. By establishing a conditional knockout mouse model for Neuregulin-1 (i.e., mice with this pathway turned off), we have observed spontaneous demyelination and neuroinflammation in the brain. These mice display deficits in hippocampal spatial and working memory and increased anxiety levels correlated with reduced activity of neural stem cells. This is the first study to demonstrate a role for Neuregulin-1 in neural stem cell regulation and neurodegeneration in MS. Uncovering disease mechanisms will allow the development of new therapies to slow disease progression and decrease disability in MS.



Fellowship Experience and Career Journey

I am deeply honoured to have received the first SCN-MS Canada Postdoctoral Fellowship in October 2023. This fellowship has started an incredible growth journey, continued learning, and collaboration. I am very grateful to both the SCN and MS Canada for providing me with the funding opportunity to immerse myself in the field of MS and continue pursuing my research interests in the stem cells field.

With this fellowship, I was fortunate to attend the 2023 Till & McCulloch Meeting and the 2023 endMS Conference, where I met and networked with many experts in the stem cells and MS fields throughout Canada. The two conferences were an incredible experience where I participated in many workshops, listened to different academic and industry talks, and networked with other trainees and fellows. The support of the funding agencies and mentorship I have received during these past months from my supervisor Dr. Karimi have been instrumental in my scholarly endeavor. With this fellowship, I am equipped with an environment and tools to expand my knowledge and make a meaningful contribution to the MS scientific community.