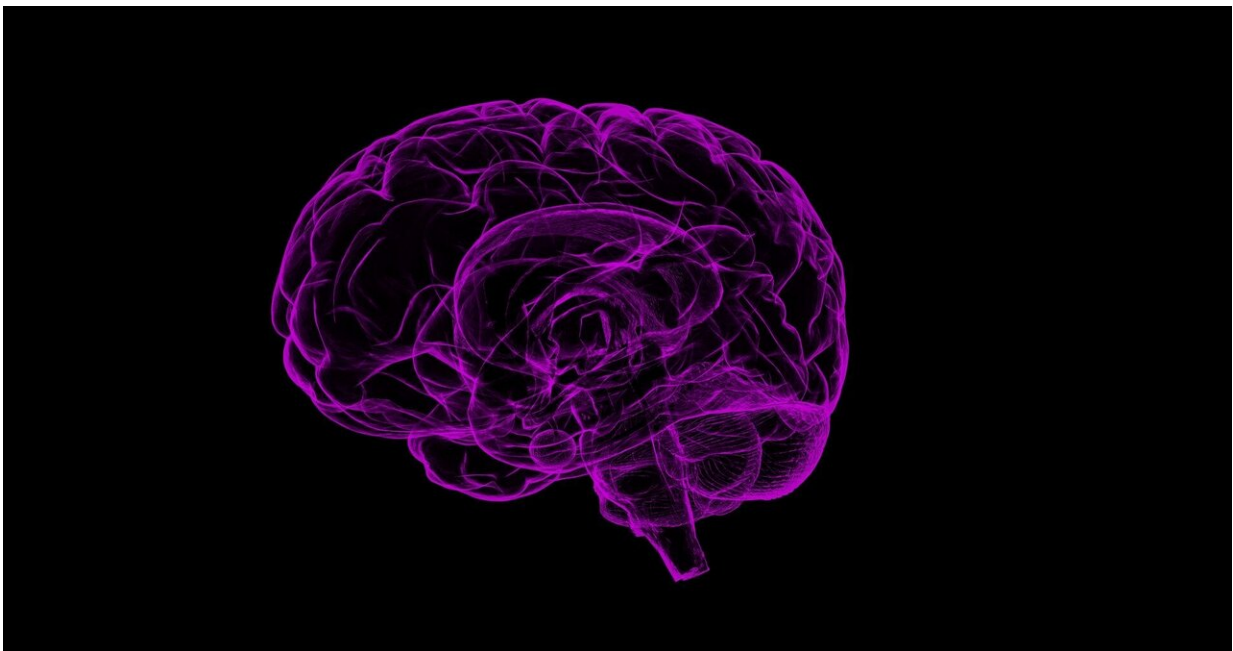


Brain molecule helps 'wake up' cells that could help tackle MS and similar diseases, study shows

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An immunological molecule called fractalkine can boost the production of brain cells that produce myelin, a key factor in diseases such as multiple sclerosis, according to recent research from the University of Alberta.

Myelin is an insulating layer around nerves that is gradually worn away by inflammation in multiple sclerosis and similar diseases. Without this layer, the nerve impulses that travel through the body are slowed, causing neurological problems.

Though there are therapies that manage symptoms or attempt to slow the progression of neurodegenerative diseases, effective treatments would require restoring lost [myelin](#). Finding methods to kick the myelination process into high gear is a crucial step in the quest for treatment.

Anastassia Voronova, assistant professor in the Department of Medical Genetics and Canada Research Chair in Neural Stem Cell Biology, explains that [neural stem cells](#) produce a variety of brain cells, including oligodendrocytes, a type of cell in the central nervous system and peripheral nervous system. Oligodendrocytes are the only brain cells that produce myelin.

"During development, these neural stem cells build the brain. In the adult brain, part of the reason they exist is to replenish damaged or lost cells, including oligodendrocytes," said Voronova, who is also a member of the Neuroscience and Mental Health Institute.

"However, especially in humans, replacement of oligodendrocytes is very inefficient. The goal of my lab is to identify molecules that are capable of 'waking up' those neural stem cells we all have in our [brain](#) to replenish those oligodendrocytes."

Voronova's study showed that fractalkine—a molecule previously thought to have a role only in the [immune system](#)—noticeably stimulated the transformation of neural stem cells into oligodendrocytes.

"The [fractalkine] molecule and receptor work together to elicit a signalling cascade inside of the cell," said Voronova.

"This is a really interesting era to be doing this science in," noted Voronova. "I think we're just starting to appreciate the full spectrum of what these oligodendrocytes can do."

Voronova's team is now investigating the remyelination capacity of fractalkine in a mouse model of MS. Voronova also plans to examine whether fractalkine could affect myelination in other neurodegenerative disorders. She added that the immunological nature of fractalkine could also be important for future drug development, as MS and neurodegenerative disorders have a strong immune component.

"Myelin is diminished in a variety of neurodegenerative disorders, which makes the idea of enhancing [oligodendrocyte](#) production, and therefore repair of the myelin, so exciting."

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The study, "Fractalkine signalling regulates oligodendroglial cell genesis from SVZ precursor [cells](#)," was published in *Stem Cell Reports*.

More information: Adrienne E.S. Watson et al, Fractalkine signaling regulates oligodendroglial cell genesis from SVZ precursor cells, *Stem Cell Reports* (2021). [DOI: 10.1016/j.stemcr.2021.06.010](https://doi.org/10.1016/j.stemcr.2021.06.010)

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