

Novel drug attenuates inflammation and disease activity in animal model of multiple sclerosis

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MS is a chronic progressive autoimmune disease of central nervous system, which leads to neurological impairment and permanent clinical disability. There are effective treatments available for the most common form of MS, relapsing-remitting MS, but there are no efficacious therapies for progressive forms of MS. Several patients also need to discontinue their treatment due to adverse events. Researchers have discovered that a folate receptor is expressed on phagocytosing cells, which will eat the targets identified as foreign substances. In autoimmune diseases this identification process is impaired and the immune cells start to target body's own tissue. Therefore, folate receptor can be used to guide the effect of a drug to achieve better treatment responses.

The Swiss pharmaceutical company owned Endocyte, has previously developed a [folate](#)-targeted aminopterin therapy, which targets folate receptors on phagocytosing cells. This treatment has shown to shut down active inflammation in

multiple [disease models](#), but this study was the first to demonstrate efficacy in a chronic progressive model of MS induced by intra-cerebral injection in rats. The efficacy was apparent during chronic phase of the disease when the inflammatory activity and the size of lesion was significantly reduced, says researcher Petri Elo.

Folate receptor targeting PET tracers for MS

Folate-based PET radiopharmaceuticals have been used to detect metastatic malignancies.

"The research in my lab suggests that the same principle could also apply to visualize inflammatory demyelinating central nervous system lesions. It would be ideal to discover a suitable PET tracer with sensitive detection that enables real-time lesion detection in patients and monitoring of therapeutic responses," Professor Anne Roivainen from the Turku PET Centre says.

New treatment might be useful in treating chronic progressive forms of MS

This study also provides confirmation that folate receptor is present in human phagocytosing cells of MS patients with chronic inflammatory lesions.

This suggests that folate receptor targeting therapies may be effective in mitigating active inflammation worsened by phagocytosing cells due to chronic progressive MS in affected individuals.

"The results are fascinating, but after all we have to remember the challenges and unpredictability of drug development. Only a small portion of promising new treatments in [animal experiments](#) will translate into clinic practice," says June Lu, Director of Translational Medicine Expert (NIBR).

More information: Petri Elo et al. Efficacy and tolerability of folate-aminopterin therapy in a rat focal model of multiple sclerosis, *Journal of Neuroinflammation* (2021). DOI: [10.1186/s12974-021-02073-7](https://doi.org/10.1186/s12974-021-02073-7)

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