

## Donated MS tissue used to identify a new target of immune attack in MS

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MS is thought to be caused by a person's own immune system mistakenly attacking components of the brain and spinal cord.

The exact target of the immune attack in MS is currently unknown and is thought to be different in every person. Identifying what the immune system is targeting in MS has been a long held focus of MS research and would lead to a better understanding of MS processes allowing more accurate therapies against this attack to be designed.

Researchers from Sweden have recently published the results of a study in the prestigious international journal Proceedings of the National Academy of Sciences which has used MS tissue to identify a completely new autoimmune target in the MS brain.

The scientists screened the blood of 2,169 people with and without MS for over 380 protein fragments (a tell-tale sign that the protein had been targeted by the immune system), to identify whether there were particular proteins in the blood of people with MS that were not present in the people without MS. They discovered one protein that was increased in the MS group. Anoctamin 2 forms part of a chloride channel (a gateway through which chloride molecules can pass in and out of cells) and also interacts with the major risk gene of MS, further underlining its potential importance in MS.

Next, the researchers looked at where anoctamin 2 was located in the brain, looking at tissue from brains affected by MS and comparing it with unaffected tissue. In a very interesting series of experiments, they found that anoctamin 2 was located both inside and very near to, areas of damage in MS and was clustered together in little groups, known as aggregates, which often occur when proteins incorrectly assembled due to disease processes.

The use of MS brain tissue in this study was critical to its success. It showed that there are differences in the blood that are truly reflective of changes in the brain tissue during MS. In the scientific paper the authors state 'Brain and spinal cord tissue, and in particular the MS lesion tissue forming the actual site of the disease, is an outstanding source to search for specific markers of disease related mechanisms'. This study highlights the value of studying human tissue to deepen our understanding of the cause of MS and identify blood based markers for use in research and to develop new treatments.