

Brain inflammation linked to depression in multiple sclerosis

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Patients with multiple sclerosis have higher rates of depression than the general population, including people with other life-long disabling diseases. Symptoms of multiple sclerosis arise from an abnormal response of the body's immune system. Immune response has also been linked to depression, leading researchers to think it could be a shared pathological mechanism that leads to the increased rates of depressive symptoms in patients with multiple sclerosis.

A new study in *Biological Psychiatry* supports this hypothesis, providing evidence that inflammation of the hippocampus, a region of the brain implicated in the genesis and maintenance of [depression](#) and in the pathology of multiple sclerosis, alters its function and contributes to symptoms of depression.

"This study elegantly links hippocampal inflammation to depression," said Dr. John Krystal, editor of *Biological Psychiatry*.

The research was a collaboration between King's College London, Imperial College London, and Imanova Center for Imaging Sciences. Led by senior authors Paul Matthews and Eugenii Rabiner, the research team combined two complementary brain imaging techniques to study the relationship between hippocampal immune response, functional connections, and [depressive symptoms](#) in 13 patients with multiple sclerosis and 22 healthy control subjects. Positron emission tomography (PET) allowed for quantification of activated microglia, a measure of [immune response](#). Functional magnetic resonance imaging (fMRI)

assessed the strength of hippocampal connections to an extensive network of brain regions involved in emotion.

First author Dr. Alessandro Colasanti, of King's College London, explained that PET imaging revealed immune activation in the hippocampus of patients with multiple sclerosis. "We also discovered that more inflammation was associated to more severe symptoms of depression," said Colasanti.

Measurements of functional brain connections with fMRI during rest showed that [immune activation](#) in the hippocampus altered its connections with other brain regions. "This study, combining two advanced complementary brain imaging methods, suggests that the inflammation of the hippocampus affects the brain function and causes depression," said Colasanti.

The findings suggest that hippocampal inflammation could be the contributing cause of high rates of depression in multiple sclerosis. The authors predict that an effective and targeted treatment of brain inflammation would help to restore brain function and protect against depression in [multiple sclerosis](#).

More information: Alessandro Colasanti et al. Hippocampal Neuroinflammation, Functional Connectivity, and Depressive Symptoms in Multiple Sclerosis, *Biological Psychiatry* (2016). [DOI: 10.1016/j.biopsych.2015.11.022](#)

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