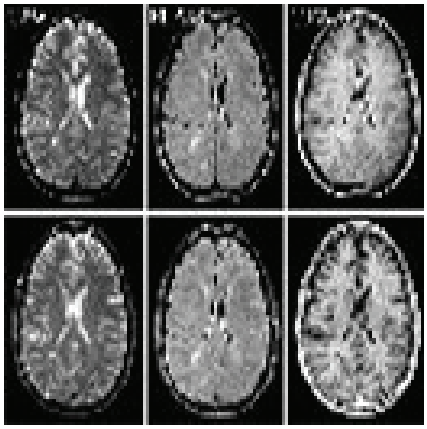
Histamine may be a possible drug target for multiple sclerosis



If you think histamines are your nemesis during allergy season, here's something that might change your perspective. New research published in the Journal of Leukocyte Biology shows that histamine could be an important molecule to developing new treatments for multiple sclerosis (MS).

In the study, the scientists analyzed the role of histamine in an animal model of multiple sclerosis and found that histamine plays a critical role in preventing MS or lessening its effects.

"We hope that our study will help design new therapies for autoimmune diseases and in particular MS, for which there is still not a definitive cure," said Rosetta Pedotti, MD, Ph.D., a researcher involved in the work from the Neuroimmunology and Neuromuscular Disorders Unit at the Neurological Institute Foundation Carlo Besta in Milan, Italy.

Histamine is a neurotransmitter involved in allergic reactions and other physiological and pathological processes. It is best known for the role it plays in hypersensitivity reactions like allergies, and it generally works by dilating blood vessels and making vessel walls permeable so immune cells can move more easily.

Scientists studied the direct effects of histamine and two similar molecules that bind specifically on histamine receptors 1 or 2. Using a mouse model of MS, researchers generated MS-causing T lymphocytes and then treated these cells with histamine or the two other molecules.

The effects of these treatments were evaluated by T cell functions analysis including proliferation, cytokine production, intracellular signaling pathways activation, and adhesion to brain vessels. Results showed that histamine reduces the proliferation of myelin autoreactive T lymphocytes and the production of interferon-gamma, a crucial cytokine involved in brain inflammation and demyelination. Additionally, histamine reduced the ability of myelin autoreactive T cells to adhere to inflamed brain vessels, a crucial step in the development of MS.

"This research is very exciting for several reasons. First, it points to unexpected connection between pathways involved in autoimmunity and allergy and suggests previously unrecognized connections between these very different types of immune responses. Second, while extending studies in animal models such as these to humans takes substantially more work, these new data point to a potentially novel drug target for MS and possibly other autoimmune or central nervous system diseases," said John Wherry, Ph.D., Deputy Editor of the Journal of Leukocyte Biology.

More information: Marilena Lapilla, Barbara Gallo, Marianna Martinello, Claudio Procaccini, Massimo Costanza, Silvia Musio, Barbara Rossi, Stefano Angiari, Cinthia Farina, Lawrence Steinman, Giuseppe Matarese, Gabriela Constantin, and Rosetta Pedotti. Histamine regulates autoreactive T cell activation and adhesiveness in inflamed brain microcirculation. *J Leukoc Biol February 2011 89:259-267; doi:10.1189/jlb.0910486*