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Zhiyu Zhang

Washington University in St. Louis

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EXPLORING NEURO-IMMUNE INTERACTION IN CHRONIC MIGRAINE

Zhiyu Zhang

Mentor: Yuqin Cao

Migraine is one of the most common neurological disorders. The major symptoms involve severe recurring headache, nausea, and photophobia. Migraine is remarkably common, affecting more than 10% of general population. It can be episodic or chronic. Symptoms of chronic migraine occur at least 15 days in each month for at least three consecutive months. It has been proposed that the nervous and immune systems communicate in the establishment of chronic migraine. My research investigated the relationship between regulatory cells (Treg) and mouse's nociceptive wiping behavior. This sets foundation for the possible engineering of Treg cells in order to prevent or delay the chronification of migraine. Mice were divided into two groups in the experiment. Both were injected with nitroglycerin (NTG, a well-known migraine inducer in human) every other day for 15 days to simulate the frequency of chronic migraine. Group 1 also received injection of interleukin 2 (IL-2), which can boost Treg cell number, every day. While Group 2 only received vehicle. To measure the mice's nociceptive behavior, I ran the Acetone-Induced Hypersensitivity Assay, in which the mouse's cheeks should be shaved beforehand to exposed the skin. Behavior tests were recorded with a video camera and the mouse's behavior was demonstrated in all angles with the help of mirrors. The duration of nociceptive wiping was then quantified using a stopwatch. The result turned out to be a boost in Treg cells which can help suppress migraine chronification. This experiment set a foundation for further research on engineering Treg cells to delay or even treat chronic migraine. Since the acetone hypersensitivity assay was only performed on female mice in our lab, we will also verify the result on male mice in the future.