

Discovery demonstrates potential MS therapy could kill brain cells

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Researchers with the Faculty of Medicine & Dentistry at the University of Alberta have discovered that some "protective" T-cells can kill neurons. This finding is significant because a specific type of T-cell therapy is being touted in the medical community as a potential treatment for MS and other autoimmune conditions.

Dr. Fabrizio Giuliani and his post-doctoral fellow, Yohannes Haile, both from the Division of Neurology, collaborated on this research which was recently published in the [Journal of Leukocyte Biology](#), a peer-reviewed medical journal.

"Using T-cells has been seen as a potential treatment for [autoimmune diseases](#)," says Dr. Giuliani. "But these cells that are supposed to be regulatory, when activated, they can kill. In our hands, at least, they were able to kill [neurons](#). So this is very important. In MS literature, they were starting to talk about using the infusion of these cells as treatment. This area needs to be studied more before these cells are used as a therapy for MS patients."

The finding was serendipitous, says Giuliani.

"We were using some of the cells that we have described here as a control in our project. And then the T-cells did something interesting, something we weren't expecting. In fact, we were expecting the exact opposite response with these cells.

"We were looking at how a specific type of T-cell could prevent neuronal death and then we found out they were doing the killing... These are the best findings – when you are expecting something different and then you observe an amazing phenomenon."

T-cells are very important – their primary role is to attack foreign viruses or bacteria and to regulate or maintain immune system tolerance. However, when T-cell tolerance is disrupted, they can cause autoimmune diseases.

Researchers in the medical community have thought if they could carefully collect regulatory T-cells and inject them into patients with autoimmune diseases, these T-cells could keep autoimmune diseases under control. Work with lab models that had MS and were treated with T-cells was promising. However, recent studies of human cells have shown humans have different subpopulations of T-cells – some of which do not have a regulatory function.

Giuliani and Haile worked with different subpopulations of T-cells and discovered some were toxic to neurons. Giuliani and his colleague are the first medical researchers to demonstrate that activating a specific type of T-cell can kill brain [cells](#).

They want to continue their work in this area to determine what causes some T-cells to behave this way.

"We want to take the research further. We want to continue this story in an attempt to try and solve the mystery."

Provided by University of Alberta

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