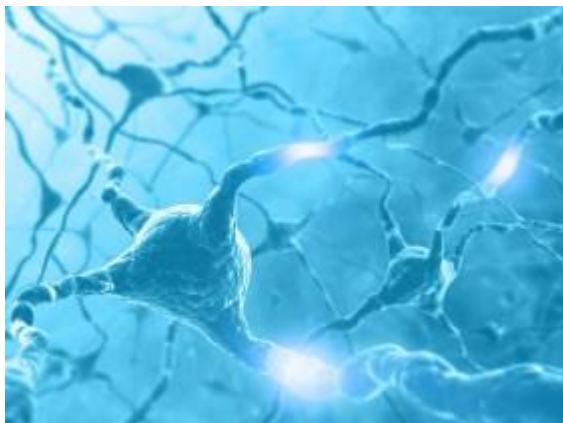


The immune system a potential “Frenemy” of myelin

4th April, 2017



The human body is a remarkable machine, there are many complex interactions with chemical, physical and electrical signals constantly whizzing around our bodies.

Given the close proximity of all the circuitry it is important to keep them all insulated. In the case of nerves, their electrical impulses are protected by a fatty protein sheath called myelin.

If there is a breakdown of this insulation the nerve cells cannot efficiently conduct their signals and the uninsulated nerves are eventually lost resulting in

the loss of function. This is what occurs in MS, where the immune system attacks the myelin.

One branch of the immune system, called T cells, has been particularly implicated in this attack. The body has some capacity to repair damaged myelin and scientists are working hard to discover ways to enhance the body's ability to remyelinate nerve cells in an effort to fight MS.

A recent study published by scientists at the Queen's University, Belfast, Ireland in the prestigious scientific journal [Nature Neuroscience](#) has revealed some interesting results. It suggests that a type of immune cell (called T-regulatory cells or T-regs) can actually aid in the repair of myelin.

T-cells are a type of white blood cell or immune cell, which get their name from the fact they originate in the thymus gland (as opposed to B cells which mainly develop in the bone marrow). T cells can be further divided into different categories, killer T cells, which destroy foreign invaders, T helper cells which produce chemical signals that help alert killer T cells when they detect an object that needs to be destroyed, and then finally T regulatory cells, which help calm down an immune response. All these cells are intrinsically linked to the immune attacks on myelin in MS.

Now, the Belfast researchers have shown that T-reg cells, in addition to dampening down the immune response, have the ability to help regeneration. They demonstrate the T-reg cells secrete a protein called CCN3 which forces immature oligodendrocyte cells (a type of brain cell) to become mature oligodendrocyte cells and to produce myelin. The mature cells then help restore the myelin sheath around the exposed nerve fibres. In effect, the T regs seem to coerce these progenitor or late stage stem cells into fixing the damage.

In an attempt to see if this effect could be replicated by a 'drug' version of CCN3, the scientists tried using man-made CCN3 to stimulate myelin repair, but without much success. However, this early attempt could potentially be due to subtle differences in the chemical makeup of naturally produced CCN3. The researchers plan to continue investigating this to refine the drug version of CCN3.