

In A Nutshell
February 2019

ol-i-go-den-dro-cyte

This is a mouthful. Difficult to pronounce. Maybe we can at least understand what it is and how it works.

Oligodendrocytes are highly specialized neural cells whose function is to myelinate central nervous system axons. Myelin sheaths are extraordinarily large extensions of the oligodendrocyte cell membrane and are highly complex structures. The main constituents of myelin are lipids, which provide its insulating properties, and proteins, which are largely specific to myelin and function to stabilize its structure. In addition to myelinating oligodendrocytes, oligodendrocyte progenitor cells persist in the adult brain and are capable of regenerating myelinating oligodendrocytes. The key issues are to determine the factors that regulate oligodendrocyte differentiation and myelination, which are relevant to basic neurobiology and demyelinating diseases, such as multiple sclerosis.

Oligodendrocytes belong to a class of cells in the central nervous system known as glial cells. Oligodendrocytes are responsible for producing a fatty protein, called myelin, which insulates axons, the long extensions of nerve cells (neurons). Myelinated axons transmit nerve signals much faster than unmyelinated ones. Each oligodendrocyte can supply myelin for several axons and each axon can be supplied by several oligodendrocytes. Oligodendrocytes wrap the myelin around the axons in thin sheets like rolled up paper.

- When parts of the myelin sheath is lost, oligodendrocytes attempt to replace it. However, in multiple sclerosis, it appears that the oligodendrocytes, themselves, are often destroyed thus compromising the repair process.

In MS, an abnormal immune system response produces inflammation in the central nervous system. This process:

- Damages/destroys myelin and oligodendrocytes
- Causes damage to the underlying nerve fiber
- Produces damaged areas (lesions or scars) along the nerve, which can be detected on magnetic resonance imaging (MRI)
- Slows or halts nerve conduction – producing the neurologic signs and symptoms of MS.

Scientists have discovered that the body heals some lesions naturally by stimulating oligodendrocytes in the area — or by recruiting young oligodendrocytes from further away — to begin making new myelin at the damaged site. However, this natural repair process is slow and incomplete. Scientists are investigating several different strategies for stimulating the repair of myelin, including testing existing drugs, finding ways to stimulate oligodendrocytes to produce myelin, and ways to protect oligodendrocytes and myelin from further damage.

Just For Fun

Repeat after me : ol·i·go·den·dro·cyte

The average person needs to hear something twenty times before they truly learn it. To make a word part of your vocabulary, you should use it as often as you can - look for ways to use it in conversations, write it down, look for it on a sign or listen for it in conversations around you. You don't have to actually count how many times you have used it, because then you are thinking about the number and not the word

[http://www.answers.com/Q/How many times do you need to say a word for it to be part of your vocabulary](http://www.answers.com/Q/How_many_times_do_you_need_to_say_a_word_for_it_to_be_part_of_your_vocabulary)

<https://www.nationalmssociety.org/What-is-MS/Definition-of-MS/Myelin>

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<https://www.sciencedirect.com/topics/neuroscience/oligodendrocyte>

<https://en.wikipedia.org/wiki/Oligodendrocyte>

<https://medical-dictionary.thefreedictionary.com/oligodendrocyte>