

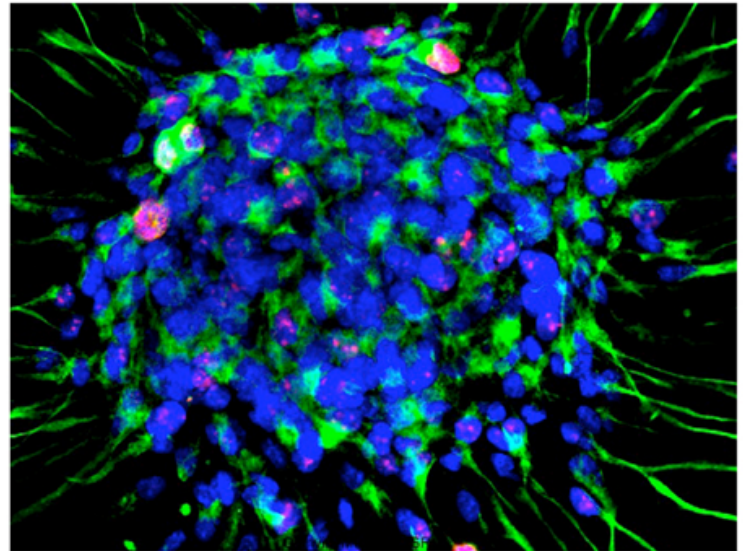
Multiple sclerosis: how could stem cells help?

What do we know?

Multiple sclerosis (MS) is an autoimmune disease where a person's immune system starts attacking and destroying myelin sheaths.

When neurons lose their myelin, signals can't be sent properly and the neurons begin to die. This leads to the symptoms of MS. Stem cells in the brain naturally try to repair and replace myelin as damage occurs, but the immune system in MS patients will attack the myelin again.

There are currently no cell replacement treatments for MS, however research into using stem cells to 'reset' a patient's immune system have shown promising results.



Mouse neural stem cells.

Image: Gianvito Martino, Director of the Division of Neuroscience, San Raffaele Hospital

What are researchers investigating?

Researchers are interested in using stem cells to study MS and find ways to prevent and/or repair myelin damage.

Some studies are looking at using chemotherapy to destroy a person's immune system and then use stem cells to build a new immune system that won't attack myelin. This has had positive results in clinical trials.

Researchers are examining treatments and drugs that can harness and possibly enhance the ability of brain stem cells to naturally repair myelin.

Scientists are also trying to develop stem cell treatments to replace neurons destroyed by various neurological diseases, including MS.

What are the challenges?

Autoimmune diseases of all kinds are challenging to treat because the immune system attacks a patient's own cells. Completely blocking the immune system is not a viable treatment option.

Another challenge to developing MS treatments is that there is no single pattern to what causes the immune system of a person to start attacking the myelin sheath; the trigger causing the disease could be totally different in each patient.

Scientists still don't fully understand how myelin sheaths are created by the nervous system. This makes trying to develop treatments to repair myelin sheaths very difficult.