

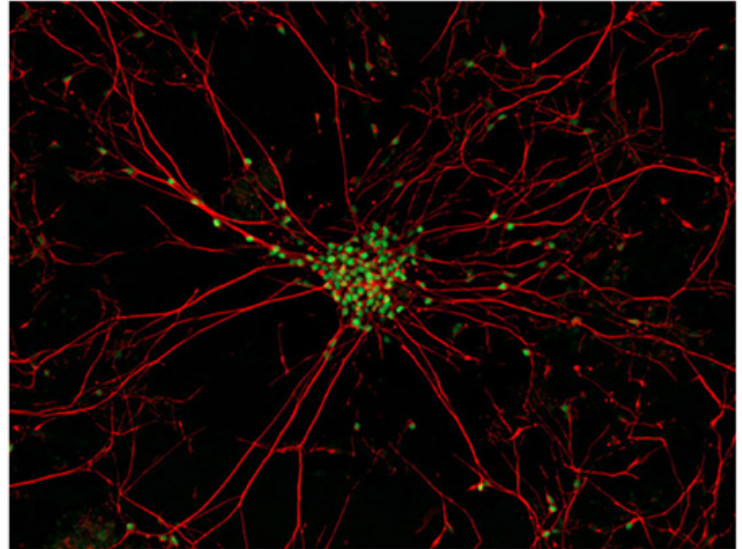
Motor neurone disease: how could stem cells help?

What do we know?

Several different conditions caused by damage to nerve cells (neurons) controlling our muscles are collectively classified as Motor Neurone Disease (MND). Currently there is no cure for MND, so most treatments focus on relieving symptoms to improve individuals' quality of life.

Approximately 10% of MND cases are inherited from parents to children. The cause of most MND cases (90%) are not currently known.

There are many cells in the brain that support neurons and help them function. Increasing evidence suggests that if these supporting cells become dysfunctional, motor neurons are susceptible to damage.



Motor neurons made from iPS cells generated from ALS patients.

Photo: Gist Croft and Mackenzie Weygandt. Winner of the 2009 Olympus BioScapes Digital Imaging Competition®

What are researchers investigating?

Researchers are using stem cells to develop methods for growing neurons and other cells in a dish as a way to recreate (or 'model') MND. This greatly helps researchers study and discover the causes of neuron damage and what might prevent it. Stem cell model systems are also very useful for screening new drugs and testing the safety and effectiveness of new treatments.

Stem cells are also being developed as treatments for individuals with MND. Stem cells may be able to help regulate harmful immune responses or even produce growth factors that help neurons survive and repair themselves.

What are the challenges?

Researchers know relatively little about MND because of how complex and multi-faceted this condition is. This complexity also means that MND treatments must simultaneously rectify many changes in the body to be effective at stopping further damage to the nervous system.

Repairing damage caused by MND will be an even greater challenge. Researchers are examining ways stem cells might be used to repair the nervous system by growing new neurons and supporting cells. To fully restore function, these new cells must also properly integrate into the network of cells that make up the nervous system.