Alzheimer’s disease: how could stem cells help?

What do we know?

Alzheimer’s disease (AD) is the leading cause of dementia. People affected by AD commonly experience memory loss, confusion and mood swings.

The cause of AD is still unknown, but several theories focus on two proteins, called ‘amyloid beta’ and ‘tau’, which are found in deteriorating areas of an AD brain. Clumps of amyloid beta proteins form plaques that may prevent neurons from sending signals properly.

Tau protein is important for normal cell function, but researchers think that when tau gets gnarled up into ‘tau tangles’ it prevents neurons from getting nutrition.

There is currently no cure for AD.

What are researchers investigating?

AD brains make smaller amounts of neurotrophins, proteins that help neurons grow and survive. Studies are examining ways to produce more neurotrophins in AD patient brains.

No stem cell treatments are currently approved for AD. Positive effects have been seen with neural stem cell transplants given to mice with a disease similar to AD, but researchers are still studying what these stem cells are doing and how they might help repair the brain.

Researchers are using induced pluripotent stem cells to grow neurons that have the same genetic background as people affected by AD so they can study the disease.

What are the challenges?

There are many different neurons throughout the brain that are destroyed by AD, making each case unique and very difficult to treat.

Successful stem cell treatments will need to distribute cells to damaged areas throughout the brain, make the correct types of neurons and other brain cells, correctly ‘wire’ new neurons into existing neuron networks, and, above all, be safe (e.g. not cause cancer or other complications).

If stem cells treatments are eventually developed for AD, these treatments do not stop the cause of AD. Meaning treatments may not last and people could suffer relapses.

For more information visit: www.eurostemcell.org/alzheimers