

# Writing Assignment #5

Michael Guye

01173134

Aspen Neuroscience is a company that hopes to revolutionize stem cell treatments through new findings. Stem cell research has been a very hot topic of the 21st century as the potential implications of it are thought to be impossible through any other means. Embryonic stem cells are a special type of cell that are the precursor to every kind of specialized cell in the body. Stem cell treatment has proved useful in treating certain cases such as bone marrow transplants after chemotherapy or spinal cord injuries. Isolating these cells is difficult however, as they can only be found in 3–5-day old embryos or in small amounts in bone marrow or fat. Aspen

Neuroscience, along with other various companies, are researching into a special type of cell called iPS cells. iPS stands for “induced pluripotent stem cells” which as the name implies are a type of cell that researchers have been able to induce being produced. These iPS cells behave similar to Embryonic stem cells in that they are able to develop into many different types of specialized cells. The iPS cells are special because they can be isolated from skin or blood cells which are in much greater abundance than their counterpart cells. In order to turn back into pluripotent cells, a series of complicated lab procedures must be done such as introducing specific proteins and growth factors in order to recreate the same environment as an embryo for the cell. These iPS cells would be used for being grown into tissue that can be transplanted back into the patient. Soon at Mayo Clinic, a test will be conducted where lab grown cardiac tissue sourced from the iPS cells will be injected into patients with congenital heart disease. If it is successful then the treatment could be streamlined for the medical system and used to treat other diseases seen as incurable such as Alzheimer’s, Parkinson’s, and heart disease. iPS cells can show promise as a treatment for Alzheimer’s disease by targeting specific neurons to grow as.

Using a mouse model of Alzheimer’s, researchers injected iPS cells into the mice’s hippocampus in order to treat the disease. The injection showed that the treatment increased the neural plasticity of the area and reduced the symptoms of Alzheimer’s disease in the mouse. These cells can also be used to treat eyesight disorders such as macular degeneration. In a test done by the National Institute of Health, retinal cells were grown from a patient’s blood. The team has determined a safe way to grow these cells and create retinal tissue using reagents in a precise order. The group leader states that from blood drawing to surgery for tissue transplantation, the entire process takes only 6 months. Before this test the team had problems of certain cells turning into tumor cells and other cells forming into the wrong type of cells, but after researching the problem, the team has corrected the faults in their process. Now they boast a success rate of 95% in cell growth. This test is still ongoing as more patients are required to undergo surgery and produce results from the transplants.

Sources:

Research, S. The personalized stem cells that could one day treat parkinson's and heart failure. *The Wall Street Journal* (2023). Available at: [https://www.wsj.com/articles/stem-cells-parkinsons-disease-heart-failure-60e9e21f?mod=Searchresults\\_pos1&page=1](https://www.wsj.com/articles/stem-cells-parkinsons-disease-heart-failure-60e9e21f?mod=Searchresults_pos1&page=1). (Accessed: 2nd April 2023)

Duan, Y., Lyu, L. & Zhan, S. Stem cell therapy for alzheimer's disease: A scoping review for 2017–2022. *MDPI* (2023). Available at: <https://www.mdpi.com/2227-9059/11/1/120>. (Accessed: 2nd April 2023)