Abstract:

Cognitive impairments and general physical instability induced by myelin degeneration in the brain due to Multiple Sclerosis (MS), inflicts 350,000 people in the United States alone. Depending on the progression of MS, severity of symptoms may vary due to the degeneration of the myelin sheath caused by the infiltration of immune cells. Stem cells have shown the potential to combat the effects of MS by replenishing neural cells. Mesenchymal stem cells are a sub-population of stem cells that have shown increased proficiency at combating MS. In spite of this knowledge and advances in MSC treatment it remains ambiguous as to how these stem cells induce the proliferation of progenitor cells into neural cells. Exosomes, which are micro-vesicles that bud off MSCNPs, may play a significant role in the process and provide an answer as to how these stem cells are able to induce the proliferation of progenitor cells into oligodendrocytes and other neural cells capable of replenishing the myelin sheath.

If exosomes do have a positive effect on progenitor cells, patients suffering from MS could evade other more strenuous treatments such as transplants or taking immunosuppressive drugs. The risk of rejection runs high with transplants and immunosuppressive drugs make people susceptible to other diseases, so having an alternative that may potentially help eradicate all symptoms of the disease would truly be gratifying for MS patients.