Researchers at the University of South Florida have developed a method of treatment to enhance the regeneration and survival of injured neurons using human adipose-derived stem cells (hASC) and insulin.

Research shows that the central nervous system is unable to regenerate efficiently after injuries such as trauma, stroke and neurodegenerative diseases. This shortcoming is detrimental to millions of people, including the estimated 42 million people who suffer from mild brain injuries annually, and the nearly 10 million people diagnosed with dementia each year. These alarming statistics highlight the need for an effective treatment for neuronal damage.

USF researchers have demonstrate that hASC secrete factors which enhance the regeneration and survival of neurons. Exosomes from the hASC showed increased levels of MALAT1, which enhance Protein Kinase C delta (PKCδII) expression. Increased PKCδII then increases survival and proliferation mechanisms in neurons via the Bcl2 protein. Furthermore, USF researchers also determined that when the hASC treatment is combined with insulin, neuronal survival and proliferation after injury dramatically increase.

An additional benefit is their ease of isolation in large quantities and minimal immune response, making hASC very advantageous for use in personalized medicine. These results demonstrate that combined hASC and insulin treatment shows the potential to be developed as a therapeutic for brain injury treatment.

**ADVANTAGES:**
- Promotes neuronal survival and regeneration
- Easy isolation in large quantities
- Minimal immune response
- Potential therapeutic application to treat brain injuries

**Enhance the Regeneration and Survival of Injured Neurons**

**Exosomes From hASC Increase PKCδII and Bcl2 Expression in HT22 Cells**

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