COULD STEM CELLS REVERSE AUTISM

By modeling the interaction between neurons and glial cells taken from children with Autism Spectrum Disorder (ASD), scientists at the University of California in San Diego's Medical School have made the discovery that inflammation bears, at least, some responsibility for neuronal disorder in many cases.

Publishing their findings in a recent edition of the Biological Psychiatry journal, the scientists are the first to demonstrate that these glial brain cells, known as astrocytes, could well play a role in some types of ASD. Most importantly, the discovery could lead to new anti-inflammatory treatment techniques which have the potential to greatly alleviate and, possibly, reverse the condition.

ASD

Autism Spectrum Disorder is the term used to cover a grouping of developmental disorders. They include a wide range of symptoms, disabilities- but they also include a range of specific skills. Typically, those with ASD suffer from issues around communication with others and other such socially-related problems. They have problems playing, chatting or just hanging-out with others. Sometimes symptoms are more extreme, but that is less common.

THE 'TOOTH FAIRY PROJECT'

The study revolved around taking infant teeth, donated via the 'Tooth Fairy Project'. The scientists re-programmed cells, taken from the teeth, to become either astrocytes or neurons. Each of the donor children had already been diagnosed with non-syndromic autism. The cells were then cultured and examined.

Each child had displayed classic ASD symptoms, including limited verbal skills and an inability to react socially, prior to their inclusion in the study. When the cultured cells were examined, each child's cultures displayed neurons that had fewer connections to other neurons than would be the norm, along with other neuronal defects. Further, some of the astrocytes were showing high levels of a hormone that can be fatal to neurons.

The researchers then took the astrocytes from the ASD children and cultured them with neurons from non-ASD subjects. The neurons became compromised and took on the attributes of those from the ASD children. However, there was a silver lining in the cloud. As Alysson R. Muotri, PhD, professor in the UC San Diego School of Medicine departments of Pediatrics and Cellular and Molecular Medicine, a member of the Sanford Consortium for Regenerative Medicine, and director of the UC San Diego Stem Cell Program states:

'' …the opposite was true. When we co-cultured ASD neurons with normal astrocytes, we could rescue the cellular defects. The neurons reverted to normal functioning and behavior."

The malfunctioning neurons appear to be reparable. The suggestion of an inflammatory reaction, among certain cases, may hold out the prospect of new treatments for certain , types of ASD, involving nothing more than anti-inflammatory drugs.