



the spastic centre



For Immediate Release

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National Cerebral Palsy Awareness Week - August 6 - 13, 2006

Imagine being able to reverse Spastic Diplegia?

One of the highlights of CP Week 2006 will be the upcoming visit by leading CP authority Professor Stephen Back from the Oregon Health & Sciences University.

Professor Stephen Back will discuss his team's exciting research breakthroughs that could have implications for repairing brain injury that leads to Spastic Diplegia.

New CP prevention research was unveiled at the recent prestigious American Academy of Cerebral Palsy and Developmental Medicine Conference held in Orlando, Florida.

Oregon Health & Sciences University (OHSU) researchers have identified some of the key factors that prevent the repair of brain damage caused by complications of premature birth and other diseases and conditions.

The results of this research provide an explanation for the failures of the nervous system to repair itself after injury. These findings have also suggested ways that some forms of brain damage such as cerebral palsy 'Spastic Diplegia', could be partially 'reversed' in the near future.

Researchers had known for some time that survivors of premature birth are at particularly high risk of developing unique patterns of brain injury that involve the white matter. The white matter is rich in the nerve fibers that interconnect different portions of the brain. White matter injury is characterized by a spectrum of damage that ranges from severe cystic lesions (Perventricular Leukomalacia (PVL)) to localised or diffuse non-cystic injury that affects myelin formation.

Myelin is the insulation around nerves that allow the nervous system to rapidly and effectively transmit information. White matter injury results in diplegic CP, which affects leg movement and walking. By school age, at least half of all children with diplegic CP also have significant cognitive and learning disabilities. Injury to the developing brain appears to be caused by lack of blood flow and oxygen and leads to persistent white matter damage that is present throughout life.

Previous research by Stephen Back, M.D.,Ph.D. (Associate Professor in Paediatric Neurology in the OHSU School of Medicine) had already established a link between damage to the myelin in the brain associated with premature birth and damage to immature cells that are highly enriched in the developing white matter.

Dr Back's research focuses on the cause of cerebral palsy, in particular the cellular basis of white matter damage in premature infants.

However, as these damaged immature cells were located in a part of the brain known also for the presence of stem cells, this link still failed to explain why these damaged cells could not repair the damaged white matter.

Dr. Back and his colleague at OHSU, Lawrence Sherman, PhD., conducted various experiments on mice that revealed the accumulation of high levels of Hyaluronic Acid (HA) associated with the damaged myelin, resulting in the mice suffering tremors similar to those seen in individuals with multiple sclerosis (MS).

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Impact on cerebral palsy

The OHSU researchers have discovered that when HA accumulates, the nervous system fails to repair damaged myelin. Conversely, by reducing HA levels, they discovered that the immature cells would develop into the cells that can make myelin.

Their experiments concluded that Hyaluronic Acid build-up appears to explain the failure of the damaged white matter to repair itself. Consistent with this idea, Dr. Back has found that an excessive build-up of HA also occurs in the brains of premature babies that have suffered white matter injury. If applied to humans, the theory is that brain tissue repair and recovery of function could be promoted by preventing the Hyaluronic Acid buildup.

Such strategies could subsequently partially 'reverse' the damage in the brains of people with Spastic Diplegia. Human trials are yet to begin.

Since preterm birth can interrupt the normal myelination process, these findings are an extremely exciting development in piecing together the puzzle of cerebral palsy.

ENDS

Cerebral palsy is a physical condition that affects movement – not intellect.
In Australia, it is estimated that a child is born with CP every 18 hours.
There is no pre-birth test and no known cure and severity is on the increase.
For most the cause of CP is unknown.
A child under 18 years of age is 3 times more likely to be diagnosed with CP than with cancer.
CP can be as mild as just a weakness in one hand ranging to almost complete lack of movement.
Cerebral palsy is not a disease and it is not contagious.

For further information

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