

Protein key to neuro-regeneration

May 20 2008

Researchers at the Peninsula Medical School in the South West of England, University College London, the San Raffaele Scientific Institute in Milan and Cancer Research UK, have for the first time identified a protein that is key to the regeneration of damage in the peripheral nervous system and which could with further research lead to understanding diseases of our peripheral nervous systems and provide clues to methods of repairing damage in the central nervous system, according to a paper published this week in the *Journal of Cell Biology*.

The team looked at a protein called c-Jun, a transcription factor that regulates the expression of other genes. They found that the c-Jun protein plays a vital role in the regulating the plasticity of Schwann cells which is vital for the way in which the peripheral nervous system regenerates and repairs itself after injury.

Schwann cells produce the sheaths that surround and insulate neurons. When there is damage to the peripheral nervous system Schwann cells unwrap themselves from the degenerating axon. During this process of repair, Schwann cells then provide the correct environment for the neurons to re-grow and complete the process of repair.

By identifying this transcription factor, the research team believes that there is scope to produce eventual cures for damage and diseases of the peripheral nervous system, such as the inherited condition Charcot-Marie-Tooth disease and the autoimmune disorder Guillain-Barre disease.

Unlike the peripheral nervous system, the central nervous system does not regenerate when damaged. With further research, the team hopes to work towards identifying ways in which Schwann cells and c-Jun could be used to repair the spinal cord, leading to possible cures and relief for millions of people around the world suffering from damage of the central nervous system.

Further research could also identify whether abnormal activation of the c-Jun protein may be involved in causing Schwann cell tumours, for instance in the condition of neurofibromatosis type 2, leading to a better understanding of this condition and the development of therapies for this condition.

Dr. David Parkinson from the Peninsula Medical School, who was lead researcher on the paper, commented: “This is a very exciting first step towards understanding how the peripheral nervous system repairs itself, how that process could be used to produce cures for diseases of and damage to the peripheral nervous system, and how it could ultimately encourage the central nervous system to behave like the peripheral nervous system and repair itself.”

He added: “We knew that Schwann cells, unlike other cells in the body, are constantly able to rejuvenate themselves. We now have a better understanding of how this happens, and that understanding could be used to create treatments and therapies for a wide range of degenerative diseases.”

Source: The Peninsula College of Medicine and Dentistry

Citation: Protein key to neuro-regeneration (2008, May 20) retrieved 19 April 2024 from <https://phys.org/news/2008-05-protein-key-neuro-regeneration.html>

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