# Nerve study shows how cells adapt to help repair damage

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Genetic processes that allow cells to transform so they can mend damaged nerves have been identified by scientists.

Their insights on tissue repair could advance the search for drug therapies to improve regeneration after injury, experts say.

Researchers focused on injury to cells in the peripheral nervous system (PNS) - the crucial network of nerves outside the brain and spinal cord.

The study could inform new treatments for a set of conditions known as peripheral neuropathies, which are caused by damage to the cells in the PNS and can lead to extreme sensitivity to touch as well as numbness and muscle weakness.

Scientists identified molecules that potentially allow nerve-supporting cells - known as Schwann cells - to transform into a specialised version that enable them to help nerves regenerate.

As well as identifying vital genes that orchestrate this transformation, the scientists discovered molecular markers that flag these Schwann cells as specialist repairers.

Genes identified by the research team - led by the Universities of Edinburgh, Cambridge and University College London - were also found to be similar to those seen in tumour formation, which could shed light on cell growth in cancers.

Peripheral neuropathy affects around one in 10 people in the UK aged over 55 and can have a severe impact on quality of life, leaving some people paralysed.

Prof Timothy Aitman, Director of the University of Edinburgh's Centre for Genomic and Experimental Medicine, who co-led the study, said: "Our findings give us insight into how cells in the body adapts to injury. This knowledge will help identify drug targets for much-needed therapies to help patients with peripheral neuropathy and traumatic nerve injuries."

Dr Peter Arthur-Farraj, Wellcome Trust Clinical Fellow at the University of Cambridge, who co-led the study, said: "We have shown that a number of genes expressed by repair Schwann cells are similar to genes involved in the processes that lead to a number of cancers. This suggests that molecular mechanisms that have evolved to promote tissue repair are closely related to those involved in tumour formation, which could help us understand cancers."

**More information:** Peter J. Arthur-Farraj et al, Changes in the Coding and Non-coding Transcriptome and DNA Methylome that Define the Schwann Cell Repair Phenotype after Nerve Injury, *Cell Reports* (2017). DOI: 10.1016/j.celrep.2017.08.064

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