Nerve signal discovery backs Nobel winner's theory

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Scientists have proved a 60-year-old theory about how nerve signals are sent around the body at varying speeds as electrical impulses.

Researchers tested how these signals are transmitted through nerve fibres , which enables us to move and recognise sensations such as touch and smell.

The findings from the University of Edinburgh have validated an idea first proposed by Nobel laureate Sir Andrew Huxley.

It has been known for many years that an insulating layer – known as myelin – which surrounds nerve fibres is crucial in determining how quickly these signals are sent.

This insulating myelin is interrupted at regular intervals along the nerve by gaps called nodes.

Scientists, whose work was funded by the Wellcome Trust, have now proved that the longer the distance between nodes, the quicker the nerve fibres send signals down the nerves.

The theory that the distance between these gaps might affect the speed of electrical signals was first proposed by Sir Andrew Huxley, who won the Nobel Prize in 1963 for his work on electrical signalling in the nervous system, and who died earlier this year.

The study, published in the journal *Current Biology*, will help provide insight into what happens in people with nerve damage. It will also shed light on how nerves develop before and after birth.

Professor Peter Brophy, Director of the University of Edinburgh's Centre for Neuroregeneration, said: "The study gives us greater insight into how the central and peripheral nervous systems work and what happens after nerves become injured. We know that peripheral nerves have the capacity to repair, but shorter lengths of insulation around the nerve fibres after repair affect the speed with which impulses are sent around the body."

The researchers found that when the myelin reached a certain length, the speed with which nerves impulses were conducted reached a peak.

The study, carried out in mice, also confirmed that a protein – periaxin – plays a key role in regulating the length of myelin layers around nerve fibres.

Provided by University of Edinburgh