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QUESTION CORNER

Relevant for: Science & Technology | Topic: Biotechnology, Genetics & Health related developments

Researchers at the Case Western Reserve University School of Medicine think they've found that a neural circuit involving spinal neurons and a signalling pathway are responsible for how burning pain is sensed.

They believe their discovery (*Neuron*), could lead to more effective treatment for chronic, pathological pain — such as shooting, stabbing and burning pain—because it may involve the same signalling pathway.

The neurons encoding the heat signals in the spinal cord were unclear. The study identified a group of interneurons in the spinal cord required for heat sensation.

The research team looked at neurons in the spinal cord and their role in thermal pain by analysing mouse models and their response to heated plates. During this process, the team identified the activation of a "novel," or newly discovered, class of spinal cord neurons (called ErbB4+) that process heat signals to the spinal cord, says a release.

They wanted to look further into whether these neurons specifically are responsible for thermal pain. There are several ways to test this, including destroying the ErbB4+ neurons.

The researchers expressed a toxin specifically targeting the ErbB4+ neurons. Once the neurons were destroyed, the response to heat pain was impaired. This demonstrated that ErbB4+ neurons are specifically tied to how thermal pain is sensed and, when destroyed, pain is not felt less.

The team also examined the role of neuregulin 1 (NRG1), a protein involved in many cellular functions. They found that NRG1 and its receptor tyrosine kinase ErbB4 (often referred to as the NRG1 signalling) is also involved in the sensation of thermal pain.

The study showed that pathological pain can be reduced by injecting an ErbB4+ inhibitor or an NRG1 neutralizing peptide. The application of these discoveries may go beyond the therapeutic treatment of pathological pain.

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