

## Has science unearthed the Holy Grail of pain relief?

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Scientists studying one of nature's simplest organisms have helped to unravel the structure of a key molecule that controls pain in humans.

The findings - published in the top scientific journal *Nature* - could rapidly advance research into the next generation of painkillers for relief of chronic conditions such as migraine and backache.

Chronic pain, unlike the acute pain associated with trauma, has no apparent physiological benefit, often being referred to as the 'disease of pain'.

Complete and lasting relief of chronic pain is rare and often the clinical goal is pain management through one or more medications.

But now researchers at The University of Manchester have examined microscopic amoeboid organisms commonly called slime moulds in a bid to gain greater insight into these pain molecules, known as 'P2X receptors'.

"In humans, P2X receptors look identical to one another and so scientists have had difficulty understanding how they function," said Dr Chris Thompson, who carried out the research with Professor Alan North and Dr Sam Fountain in the Faculty of Life Sciences.

"By looking at slime mould we were effectively able to turn the evolutionary clock back a billion years to see how a more primitive P2X



molecule functions."

The team discovered that there was only a 10% similarity between human P2X and the slime mould equivalent. They were therefore able to deduce from evolutionary theory that it was these similar parts of the molecule that probably regulate pain in humans.

"It's a big step forward in understanding how the molecule works and should make it possible to develop drugs that block the receptors' actions," said Dr Thompson.

"Inhibiting P2X as a potential pain-relief therapy would be the Holy Grail of rational drug design and could revolutionise the way we manage chronic pain conditions like back pain and migraine."

Source: University of Manchester

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