

Scientists who discovered migraine mechanism win £1.1m Brain prize

World's largest neuroscience prize goes to researchers whose work has paved way for preventive treatments



Prof Peter Goadsby of King's College London, one of four scientists who received the prize for their work unpicking the neural basis of migraine attacks. Photograph: Ken McKay/ITV/Rex/Shutterstock

Four scientists who discovered a key mechanism that causes migraines, paving the way for new preventive treatments, have won the largest prize for neuroscience in the world, sharing £1.1m.

The Lundbeck Foundation in Denmark announced on Thursday that the British researcher Peter Goadsby, Michael Moskowitz of the US, Lars Edvinsson of Sweden and Jes Olesen of Denmark had won the Brain prize.

Speaking at a press briefing ahead of the announcement, Goadsby, a professor of neurology at King's College London, said:

"I'm excited that migraine research is getting this award and that migraine – this disabling problem that is a brain disorder – is being recognised in an appropriate way."

Formally known as the Grete Lundbeck European brain research prize, the annual award recognises highly original and influential advances in any area of brain research. The award ceremony will take place in Copenhagen on 25 October, where the prize will be presented by Crown Prince Frederik of Denmark.

The prize-winning research revolves around unpicking the neural basis of migraine, a crippling neurological condition characterised by episodes of throbbing head pain, as well as nausea, vomiting, dizziness, extreme sensitivity to sound, light, touch and smell. It affects about one in seven¹ people globally and is about three times more common in women than men. In the UK, it is estimated that migraines result in the loss of 25m work or school days each year at an economic cost of £2.3bn.

For many years, migraine was thought to be a psychosomatic condition, resulting from people being unable to deal with stress. Although treatments were available, these only helped to relieve the symptoms, rather than addressing the root cause, which was unknown.

In 1979, Moskowitz, a professor of neurology at Harvard Medical School, proposed that migraines result from an interaction between the trigeminal nerve – involved in detecting sensations from the head and face – and the thin, pain-sensitive "meninges" membranes that surround the brain. He demonstrated that migraine attacks were triggered when trigeminal nerve fibres released chemicals called neuropeptides that caused the blood vessels of the meninges to dilate, resulting in inflammation

¹ <https://www.theguardian.com/lifeandstyle/2016/nov/07/everything-you-ever-wanted-to-know-about-migraines-but-were-in-too-much-pain-to-ask>

and pain. He suggested that blocking the action of these neuropeptides could provide a new type of treatment.

Another breakthrough came when Goadsby, together with Edvinsson, a professor of internal medicine at Lund University in Sweden and the president of the International Headache Society, identified the key neuropeptide involved in triggering these attacks: *calcitonin gene-related peptide* (CGRP).

Further work by Olesen showed that when CGRP was given to migraine patients it could trigger an attack, and that drugs that blocked the neuropeptide could help treat migraine. In 2004, he and his team published the results of a large clinical trial suggesting that such “CGRP antagonist drugs” were effective in the acute treatment of migraine attacks.

This has led to the development of new treatments, including monoclonal antibody-based drugs such as *erenumab*², currently available in the UK, and the small molecule drugs *rimegepant* and *ubrogepant*, which are as yet only available in the US. Although these drugs do not cure migraine, they markedly improve the quality of life of many patients, helping to both treat and prevent migraine attacks.

Goadsby said:

“I think the important thing about this research is that it shows a neuroscience-based approach has value and that bench and bedside research married together has the ability to change clinical practice. I’m humbled by the emails that we get from patients whose lives have been changed by these medicines. We haven’t changed them all, we’ve only just started, but what this research shows is that migraine is a tractable problem.”

Read more

- [Everything you ever wanted to know about migraines \(but were in too much pain to ask\)](#)

² <https://www.theguardian.com/science/2018/jul/31/first-ever-pill-to-prevent-chronic-migraines-approved-by-eu>