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| 3. | No more bad backs or migraines! Scientists crack the secret of why some people can't feel pain - and the breakthrough could lead to 'super painkillers' MailOnline , December 4, 2015 Friday 3:56 PM EST, 599 words, Sarah Kaplan |

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Metro (UK)

**December** 10, 2015 Thursday

Edition 1;

Scotland

**So much to gain now woman can feel pain**

**SECTION:** FEATURES; Pg. 26

**LENGTH:** 208 words

A WOMAN has felt **pain** for the first time in an experiment which could lead to ways to treat conditions such as arthritis.

The 39-year-old was born with a condition caused by a rare genetic mutation resulting in a lack of ion channels that transport sodium across sensory nerves. Without these Nav1.7 channels, nerve cells cannot communicate **pain**.

However, a drug used to treat morphine and heroin overdoses allowed her to feel the **pain** of a laser beam on her skin - a sensation scientists say she enjoyed.

Researchers led by John Wood at University College London studied genetically-modified **mice** lacking Nav1.7 which showed no reaction when their tails were exposed to hot and cold. An analysis of their nerves showed they were making many more opioid peptides, the body's natural painkiller.

Wood worked out that **naloxone** - a drug that stops opioid peptides working - would reverse the disorder, and used it to good effect on the female volunteer.

Babies with the condition tend to chew their fingers, toes and lips until they bleed. Toddlers can sustain more knocks, tumbles and mishaps with sharp or hot objects than normal, with many sufferers dying at a young age.

The woman hopes the drug could be used if she had children who inherited the condition.

**LOAD-DATE:** December 10, 2015

**LANGUAGE:** ENGLISH

**PUBLICATION-TYPE:** Newspaper

**JOURNAL-CODE:** MTR

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Washington Post Blogs

**December** 7, 2015 Monday 11:58 AM EST

**How a woman who never felt pain helped researchers find a potential way to develop better painkillers**

**BYLINE:** Sarah Kaplan

**LENGTH:** 652 words

The woman was 39 years old and had never felt **pain**.

She is one of a handful of people with congenital insensitivity to **pain** (CIP), an extremely rare genetic disorder that prevents messages of physical suffering - a sting, a bite, a bruise, a burn - from reaching the brain.

For many, the condition is less a superpower than a curse. **Pain**, after all, serves a purpose. It's the body's way of preventing us from doing things that harm it, like barreling into furniture or touching a hot stove. Babies with the condition will chew their fingers and toes until they bleed. Adults are more likely to die prematurely.

So when neurobiologist John Wood helped the 39-year-old woman (who is unnamed in his report) experience **pain** for the first time - with a laser beam and a dose of the opioid antagonist **naloxone** - it seemed like a gift.

"I think she quite enjoyed the experiment," Wood, a professor at University College London, told the New Scientist.

Wood's finding, published Friday in the journal Nature Communications, is a breakthrough not just for people who can't feel **pain**, but for those who feel far too much of it. Working backwards from experiments with the 39-year-old and on **mice** that had been genetically modified to exhibit the CIP mutation, he and his UCL colleagues found what he calls the long-sought "secret ingredient" in painlessness.

By combining compounds called opioid peptides with drugs that block communication channels between the body and the brain, Wood was able to replicate in ordinary **mice** the painlessness that those with CIP feel intrinsically.

Individuals with CIP have a mutation in the gene responsible for producing what's known as Nav1.7 channels, which transmit signals from **pain**-sensing nerves. Those channels have long been viewed by researchers and drug companies as the secret to finding an ultimate antidote to **pain**. If scientists could find a way to block Nav1.7 channels, they believed they'd be able to stop **pain** messages in their tracks.

But surprisingly, it didn't work out that way.

"Many potent selective antagonists for Nav1.7 are weak analgesics," Wood and his colleagues write in their study.

In other words, blocking Nav1.7 alone wasn't enough to prevent **pain**. Something else must be going on.

To figure out what, Wood looked at the nerves of **mice** that had been genetically modified to exhibit CIP. He noticed that the genes responsible for producing opioid peptides, the body's natural painkillers (in case it wasn't clear from their name, these compounds have much the same effect as opiates), were a lot more prominent in these animals. If **mice** that lacked the Nav1.7 were also producing compounds that act like oxycodone and morphine, that could explain their total insensitivity to injury.

To test the theory, he gave the **mice** **naloxone**, the drug used to treat overdoses of oxycodone and morphine. And it worked - the previously inherently anesthetized **mice** were able to feel **pain** again. The same was true when Wood tested **naloxone** on the 39-year-old woman, who volunteered to participate in the experiment.

It was the combination of opioid peptides and Nav.1.7 blocking that produced painlessness in CIP patients, Wood concluded, not just one alone. He and his colleagues have filed a patent for combining low dose opioids with Nav1.7 blockers, he said in a UCL press release.

He writes in his study that the therapy could provide relief to the millions of people who suffer from debilitating chronic **pain**.

Speaking to the New Scientist, Imperial College London professor Kenji Okuse said that the findings may deepen doctors' understanding of **pain**, but opioids and Nav1.7 blockers will not be a silver bullet.

"Opioids and Nav1.7 blockers could provide much stronger analgesics, but they will not necessarily be better for patients," he said. "If we take the combination therapy route, people would have to take opioids throughout the lifetime, which is not a welcome thing."

**LOAD-DATE:** December 7, 2015

**LANGUAGE:** ENGLISH

**PUBLICATION-TYPE:** Web Blog

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