

A common thread: No pain, no smell

March 25 2011, by Deborah Braconnier

(PhysOrg.com) -- In a recent study published in *Nature* by Jan Weiss and Frank Zufall of the University of Saarland, School of Medicine, a connection has been made between the inability to feel pain and anosmia - the inability to smell. The connection discovered involves the sodium ion channel called $Na_v1.7$.

The researchers examined three people with a rare condition known as congenital analgesia. This condition leaves patients with the inability to feel [pain](#). The researchers were already aware that the cause of this disorder is a lack of the sodium ion channel $Na_v1.7$ in the dorsal root ganglion and ganglia of the [autonomic nervous system](#), but they wanted to learn if patients also experienced any other sensory issues.

The three participants were able to see and hear as well as any other healthy individual, but when it came to the sense of smell, they were unable to distinguish the odors of vinegar, orange, mint, perfume, or coffee. The study had scents so strong that others with normal senses of smell were unable to tolerate it.

To determine if it was in fact the same [ion channel](#) responsible for the sense of smell, Weiss and his team examined tissue samples from the nose and olfactory system of normal people and this revealed the $Na_v1.7$ channels in the neuron's cell membranes.

Weiss bred a group of mice lacking the $Na_v1.7$ ion in their olfactory neurons and witnessed the same results. Mice generally search out and react to certain scents, but these mice showed no interest. When a

mother mouse was separated from her young, she was unable to locate and gather them together.

The connection between $\text{Na}_v1.7$ and sensory systems also shows earlier evidence that taste may also be included. The idea that our main senses are in some way linked to pain can now be better explored.

Other implications of this study could result in the ability to eventually treat people who have lost their [sense of smell](#). This study could also have implications on the required side effects listings on many popular painkillers. These particular sodium ion channels are what are targeted by many painkillers, and a new side effect of anosmia may need to be listed.

More information: Loss-of-function mutations in sodium channel $\text{Na}_v1.7$ cause anosmia, *Nature* (2011) [doi:10.1038/nature09975](https://doi.org/10.1038/nature09975) , www.nature.com/nature/journal/...ull/nature09975.html

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