

Investigating the development of mechanosensitivity

May 22 2009

Researchers of the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch, Germany, have gained crucial insight into how mechanosensitivity arises. By measuring electrical impulses in the sensory neurons of mice, the neurobiologists and pain researchers Dr. Stefan G. Lechner and Professor Gary Lewin were able to directly elucidate, for the first time, the emergence of mechanosensitivity. At the same time they were able to show that neurons develop their sensitivity to touch and pain during different developmental phases but always coincidentally with the growth of the neuronal pathways. (*EMBO Journal*, 2009, doi:10.1038/emboj.2009.73).

The [sensory neurons](#), which are sensitive to touch and [pain](#), are located in the dorsal root ganglia between the intervertebral discs. The neurons receive the stimulus and convert it into electrical signals that are conveyed to the brain.

Signal transduction has been investigated very thoroughly, which has led to the development of drugs that block the transduction of pain signals to the brain. Very little, however, is known about how stimulus sensitivity actually emerges.

Using the patch-clamp technique in isolated cells of mouse embryos, the MDC researchers succeeded in measuring tiny electrical currents in the cell membranes after a mechanosensory stimulus.

"These measurements are extremely difficult," Dr. Lechner explained,

"which is why only very few laboratories in the world are specialized in this area."

The researchers in Berlin-Buch were able to show that the sensory neurons in the mouse embryo have already fully developed their mechanosensitivity competence on embryonic day 13. That corresponds to about the end of the sixth month of pregnancy in humans.

For this development the neurons do not require any nerve growth factor, which is why the researchers suspect that this process is driven by a genetic program. In contrast, the competence to sense pain in the sensory neurons can only develop with the aid of nerve growth factor (NGF). It takes place at a later stage in embryonic development and even after birth.

Source: Helmholtz Association of German Research Centres ([news](#) : [web](#))

Citation: Investigating the development of mechanosensitivity (2009, May 22) retrieved 3 May 2024 from <https://medicalxpress.com/news/2009-05-mechanosensitivity.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--