

New approach to treating chronic itch

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Researchers at the University of Zurich have discovered a new approach to suppressing itch by targeting two receptors in the spinal cord with the right experimental drug. In a series of experiments in mice and dogs, they successfully alleviated different forms of acute as well as chronic itch. For the chronic itch, current treatment options are very limited.

The itch of a mosquito bite can be relieved by a number of drugs that are available on the market. However, these drugs are largely ineffective when it comes to the unrelenting and debilitating urge to scratch experienced by patients suffering from skin, kidney or liver diseases. This [chronic condition](#), which affects about 10 percent of the population, is currently treated with antidepressants or immune suppressants. Originally developed to treat other diseases, these drugs often fail to provide the desired relief or come with severe side effects.

Hanns Ulrich Zeilhofer, professor at the Institute of Pharmacology and Toxicology at the University of Zurich and his research group have now discovered a new way to alleviate itch. They used an experimental drug to boost the effect of specific neurons in the spine that prevent itch signals from being relayed to the brain. The scientists had previously located and described these neurons three years ago. Since then, they have used genetic mouse models to identify two specific receptors that control the effect of the spinal neurons. These receptors are part of a large group of receptors that is activated by the amino acid transmitter gamma-aminobutyric acid, or GABA. Benzodiazepines, a class of drugs used to treat insomnia, anxiety or epilepsy, interact with these GABA receptors.

The [experimental drug](#) used by the researchers in their study, which was originally developed as a drug for anxiety, interacts with the two identified [receptors](#). In their experiments, the pharmacologists were able to show that it not only suppresses acute itch, but is also effective against [chronic itch](#). Mice that were administered with the drug scratched themselves less often, and their skin changes healed significantly quicker than in animals that were given a placebo. The same itch-suppressant effect was also observed in tests with dogs carried out by the researchers in cooperation with the University of Zurich's Veterinary Department. Moreover, the drug did not cause obvious undesired side effects.

Hanns Ulrich Zeilhofer is optimistic about the study's results: "We are confident that the substance we've tested will also be effective in humans." At the same time, the findings should be valuable for [veterinary medicine](#): "Like humans, dogs also often suffer from chronic itch. They, too, therefore stand to benefit from the approach." The researchers see great potential in their discovery and have filed a patent application. They are cooperating with companies that develop the compound as a [drug](#) for use in human and veterinary medicine.

More information: William T. Ralvenius et al, Itch suppression in mice and dogs by modulation of spinal $\alpha 2$ and $\alpha 3$ GABAA receptors, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-05709-0](https://doi.org/10.1038/s41467-018-05709-0)

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