

# These scientists are 'itching' to help you stop scratching

June 5 2013

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The Hebrew University's Dr. Alex Binshtok. Credit: Dr. Binshtok

Itch and scratch, itch and scratch. It's not the most serious physical problem in our lives, but it is common and it is very annoying. Now, researchers at the Hebrew University of Jerusalem and in Boston have come up with new findings that can stop the itching through silencing the neurons that transmit itch-generating stimuli.

The research was a [collaborative effort](#) by a group led by Dr. Alex Binshtok at the Hebrew University's Department of Medical Neurobiology at the Institute for [Medical Research Israel-Canada](#), and the Edmond & Lily Safra Center for Brain Sciences; along with Dr. Clifford Woolf's group in the Boston Children's Hospital and Harvard Medical School.

The study demonstrated the presence of functionally distinct sets of [neurons](#) that detect and transmit [itch](#)-generating [stimuli](#). The researchers were further able to demonstrate that they could selectively target and silence those itch-generating neurons while active. These results provide a basis for the development of novel therapeutic approaches for selective treatment of previously unmet itching not induced by histamine (non-histaminergic itch), such as dry skin itch and allergic dermatitis.

(Histaminergic itch is brought on when histamine triggers an inflammatory immune response to foreign agents, such as occurs, for example, in hay fever.)

The findings of the Israeli-US researchers were published in the journal *Nature Neuroscience*. In addition to the senior researchers, student major contributors to the project were Sagi Gudes and Felix Blasl from the Hebrew University; and David Roberson and Jared Sprague from Harvard Medical School.

Itch is a complex, unpleasant, cutaneous sensation that in some respects resembles pain, yet is different in terms of its intrinsic sensory quality and the urge to scratch. Although some types of itch like urticaria (hives) could be effectively treated with anti-histaminergic agents, itch accompanying most chronic itch-inducing diseases, including atopic dermatitis (eczema), allergic itch and dry skin itch, is not predominantly induced by histamine. An understanding of the molecular and cellular mechanisms underlying the sensation of itch, therefore, is essential for

the development of effective and selective treatment of itch, which in some cases could become a devastating condition, say the researchers.

The researchers' findings suggest that primary itch-generating neurons that carry messages toward the central nervous system code functionally distinct histaminergic and non-histaminergic itch pathways that could be selectively blocked. This is the first time that this has been demonstrated, and means that it is possible to block itch signals in the neurons that mediate non-histamine itch.

These findings have a great clinical importance since they could be translated into novel, selective and effective therapies for previously largely untreated dry skin itch and allergic dermatitis itch.

**More information:** [www.nature.com/neuro/journal/v ...  
nt/full/nn.3404.html](http://www.nature.com/neuro/journal/v...nt/full/nn.3404.html)

Provided by Hebrew University of Jerusalem

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