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8 Acute olfactory response of Culex mosquitoes to a human- and bird-derived attractant.

Syed Z, Leal WS
Proc Natl Acad Sci U S A. 2009 Nov 3; 106(44):18803-8

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Abstract

John Hildebrand and Carolina Reisenman, University of Arizona, AZ, USA.

F1000 Neuroscience

09 Nov 2009 | New Finding

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The authors report the presence of a dominant constituent (nonanal) in the odorant profiles of birds and humans that is detected with exceptional sensitivity by olfactory receptor cells in the antenna of *Culex quinquefasciatus*, the mosquito that transmits West Nile virus in southern United States. Thus, this odor may be involved in the host shifts between humans and birds that resulted in transmission of West Nile virus.

Currently, West Nile virus is the most important vector-borne disease of humans in the United States. The virus that causes the disease is transmitted to humans by *Culex* mosquitoes, which feed on both birds and humans. Using chemical-ecological techniques, the authors found that the odorant profiles of both humans (of several ethnic backgrounds) and birds (pigeons and chickens) are dominated by nonanal. This component elicits remarkable responses in olfactory receptor cells in the *Culex* antenna. The authors also characterized the odor-response profiles of several types of olfactory sensilla on the antenna. Nonanal and carbon dioxide have synergistic effects, leading to higher capture yields in field tests. The fact that nonanal is present in the odor profiles of both humans and birds suggests that this odorant may be involved in the host shifts that allowed transmission of West Nile virus from birds to humans.

Competing interests: None declared

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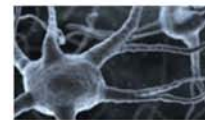
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