PROJECT FACT SHEET

New Study Analyzes Histamine Function in Fruit Flies to Better Understand Human Physiology

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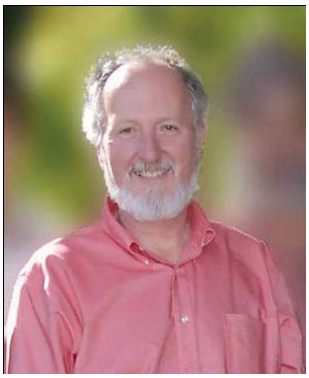

Histamine plays an important role for all vertebrates, particularly humans. It acts as a neurotransmitter, a chemical that relays electrical signals between a neuron and another cell, and a neuromodulator, conveying information to adjacent or distant neurons. It also chemically mediates a variety of other bodily activities, including gastric secretion, inflammation, and the immune response. As a result, studying how the body uses histamine provides a window into human physiology and modifying histamine levels influences human heath.

With help from the Nova Scotia Health Research Foundation, Ian Meinertzhagen is contributing to the significant field of histamine research. “I am primarily interested in discovering how neurotransmitter action is terminated in nervous systems in order to better understand the ways that the brain regulates the actions of the body,” explains Dr. Meinertzhagen. His research team looked at a synapse that uses histamine as a transmitter, and their results cast light on the processes surrounding histamine and synaptic activity.

Interestingly, Dr. Meinertzhagen used the fruit fly to conduct his research. “Not only does the fruit fly use histamine, which is released from photoreceptor neurons in the eye,” notes Dr. Meinertzhagen, “but it is a better object for study because the species can be manipulated genetically, allowing us to look at the role of genetics in regulating neurotransmitter activity.”

The study found that as flies release histamine the action of the histamine ended by coming into contact with an amino acid regulated by a specific gene. Once terminated, histamine is returned to the releasing photoreceptor neuron under regulation by the product of the tan gene.
The study has many significant findings. Dr. Meinertzhagen has identified a new metabolic pathway for histamine and identified and characterized the gene tan, which helps to release free histamine. He has determined the localization of this function to photoreceptors during the recycling of histamine.

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