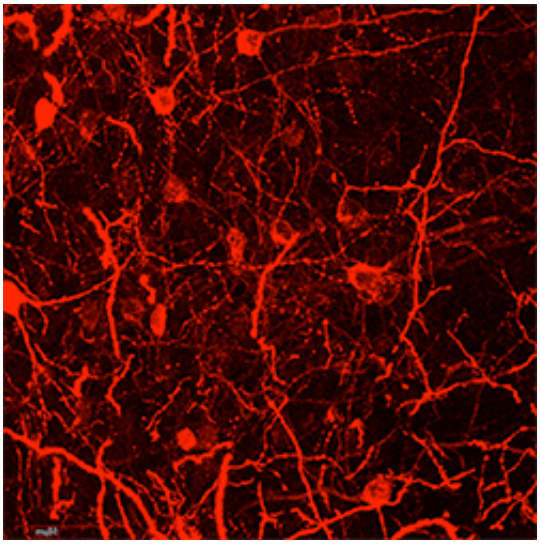
Medical Xpress

Tourette-like tics vanish in mice treated with histamine

June 6 2017, by Bill Hathaway



The activity of neurons in the striatum are regulated by neurotransmitter histamine and is associated with Tourette-like grooming behavior in mice. Credit: Yale University

Yale scientists produced increased grooming behavior in mice that may model tics in Tourette syndrome and discovered these behaviors vanish when histamine—a neurotransmitter most commonly associated with allergies—is introduced into their brains.

The research, published the week of June 5 in the *Proceedings of the National Academy of Sciences*, reaffirms previous genetic studies that linked histamine production and Tourette, an often serious

neuropsychological disorder marked by motor and vocal tics.

"The intriguing thing is we were able to reverse this behavior in adult mice," said Chris Pittenger, associate professor of psychiatry and senior author of the study. "It is easier to imagine how this insight might develop into a treatment than if the abnormalities arose during early development."

The researchers were able to trigger excessive grooming in mice by shutting down histamine neurons projecting to the basal ganglia, an area of the brain previously linked to Tourette. They could reverse the behavior by reintroducing histamine directly into the striatum, confirming that this structure is a central contributor to the pathology.

Histamine's role in immunological reactions such as allergies has been intensively studied, but in recent years the neurotransmitter histamine in the brain has been linked to a variety of conditions, such as Parkinson's, multiple sclerosis, autism and obsessive compulsive disorder, as well as Tourette syndrome.

More information: Maximiliano Rapanelli et al. Histamine modulation of the basal ganglia circuitry in the development of pathological grooming, *Proceedings of the National Academy of Sciences* (2017). DOI: 10.1073/pnas.1704547114

Provided by Yale University

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