To recognize their friends, mice use their amygdalas

April 5 2007

Even those who can't remember names can usually recall faces. New research from Rockefeller University suggests that a simple brain chemical, a neuropeptide called oxytocin, is a reason.

Social recognition is an important part of normal life for animals of every species. "Remembering an individual allows one animal to modify its behavior towards others based on past experiences," says Donald Pfaff, head of the Laboratory of Neurobiology and Behavior. By disrupting oxytocin signaling, Pfaff's lab has shown that in female mice, as has previously been shown in males, oxytocin acts on a portion of the brain called the amygdala, involved in emotions, memories and assessing danger.

Oxytocin is known to be important for many behaviors in female mice – nursing, maternal care, bonding – that are not as critical in males. The scientists injected the amygdalas of female mice with small particles coated with molecules of a unique type of DNA called antisense DNA, which complements the blueprint for the oxytocin receptor, interfering with the production of the receptor protein and disrupting oxytocin signaling only in that area of the brain. "This technique, which we developed in order to manipulate gene expression in very specific areas of the brain, is going to be an important tool for scientists working in other areas of the brain as well," says Pfaff.

Overall, the female mice injected with the particles showed no differences in their normal, individual behaviors. The scientists only

observed differences in social recognition behaviors – such as how frequently they approached other mice.

This research is the last piece in a signaling "four-gene micronet" proposed by Pfaff's lab that involves the two estrogen receptors, α and β, oxytocin and the oxytocin receptor. The scientists think these four genes are at the core of individual recognition in the brains of male and female mice and they hope that by studying these signaling pathways in more detail they can shed light on the neurobiological basis of human disorders involving social recognition, such as autism.

Citation: *Proceedings of the National Academy of Sciences* 104(11): 4670-4675 (March 13, 2007)

Source: Rockefeller University

Citation: To recognize their friends, mice use their amygdalas (2007, April 5) retrieved 9 April 2024 from https://phys.org/news/2007-04-friends-mice-amygdalas.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.