MedicalXpress

The emotional processing of olfactory stimuli in mice described for the first time

July 19 2017

The Joint Unit of Functional Neuroanatomy of the universities of Valencia and Jaume I de Castelló has described for the first time the complete map of the neural connections of the anterior cortical nucleus of the amygdala, a key brain region for the emotional processing of olfactory stimuli of mice. The research has been published in the *Journal of Comparative Neurology*.

Researchers Bernardita Cádiz, María Abellán, Cecília Pardo, Ferran Martínez and Enrique Lanuza have characterized the nervous circuit of the anterior cortical nucleus of the amygdala, not well understood until now. The work describes the relationship between this nucleus and the other structures from which it receives information, as well as the areas of the brain to which it sends information.

Enrique Lanuza, researcher at the Department of Cell Biology, Functional Biology and Physical Anthropology at the University of València, says that olfactory information has an intrinsic emotional value. "This work shows that this information reaches directly into the anterior cortical nucleus of the amygdala, which is directly interconnected with areas that process pheromonal information, which plays a key role in rodents' sexual behaviour, and also with nuclei related to defensive and aggressive behaviour," says the expert.

In addition, the member of the Joint Unit of Functional Neuroanatomy says that this olfactory nucleus of the amygdala is connected with regions shown to be involved in Pavlovian learning, that is, associating a

neutral stimulus with a reward or a negative experience.

"Although experiments have been performed on mice, these areas of the brain are evolutionarily highly conserved, and it is therefore reasonable to expect an important similarity with the human brain," explains Lanuza. In addition, "smells are particularly evocative stimuli, and often very pleasant or unpleasant, so that we avoid being in places where it smells bad. Thus, to smell good is a good social letter of presentation," says the lecturer of the Faculty of Biological Sciences of the University of València.

The experiment was carried out with 15 female Mus musculus. The team has performed intracerebral injection of tracers (inert molecules), detectable by the emission of fluorescent light or by their chemical characteristics. In this way, thanks to the tracing of these molecules, the research team has observed the connections of this key structure in the processing of the emotional value of odours.

More information: Bernardita Cádiz-Moretti et al. Afferent and efferent projections of the anterior cortical amygdaloid nucleus in the mouse, *Journal of Comparative Neurology* (2017). DOI: 10.1002/cne.24248

Provided by Asociacion RUVID