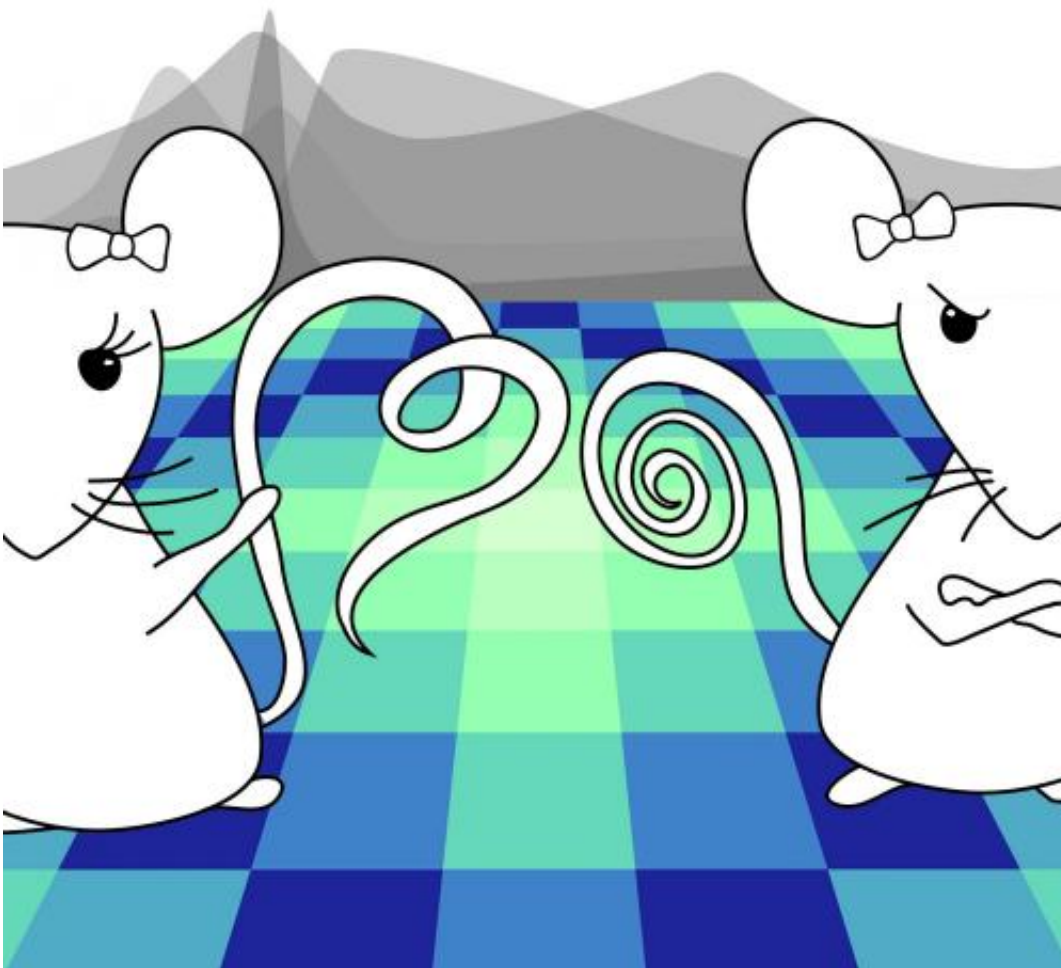


# The neural basis of 'being in the mood'

February 12 2015

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Researchers discover neurons that combine social information with hormonal state in female mice. What determines receptivity or rejection towards potential sexual partners? For people, there are many factors that play a part, appearance, culture, age, are all taken into account. But what part does the internal state of

the individual play? Credit: Gil Costa

What determines receptivity or rejection towards potential sexual partners? For people, there are many factors that play a part, appearance, culture, age, are all taken into account. But what part does the internal state of the individual play? The functioning of our bodies is maintained through a complicated system of hormonal signals. Some of these signals vary along different physiological rhythms, such as the menstrual cycle. How do changes in hormone-levels affect the activity of individuals' brains and their behaviour?

"It is well known that the behaviour of female mice changes dramatically during the different phases of their reproductive cycle, called the Estrous cycle", says Susana Lima, a principal investigator at the Champalimaud Centre for the Unknown in Lisbon. "Responses to brief social interactions with males can result in radically different outcomes ranging from receptivity to aggression. In this study, we investigated the question - what is the neural basis that underlies these polar behaviours?"

The researchers chose to focus their research on the hypothalamus. "The hypothalamus regulates many instinctive behaviours, including feeding, sleep and sexual behaviour", says Kensaku Nomoto, a postdoctoral researcher in the lab of Susana Lima. "We recorded the activity of neurons in an area within the [hypothalamus](#) dedicated to socio-[sexual behaviour](#). The activity of the neurons was observed while the females interacted with males or with other females."

The researchers found that the activity of these neurons changed dramatically depending on the reproductive state of the female. "When the female was not in a receptive state, the activity of the neurons was similar for social encounters with males and females. However, when the

female was in the receptive state, the activity of the neurons was enhanced only when interacting with males", says Dr. Nomoto.

"This is the first time that the activity of these [neurons](#) is recorded in naturally cycling females, where we investigated the effect of the [reproductive cycle](#) on neuronal physiology. It establishes that there is in fact a brain region where hormonal state and social interaction are integrated. In humans, the effect of hormonal state on attraction and rejection is quite controversial, studies such as this one, may help shed light on the neural circuits that mediate these behaviours." Concludes Dr. Lima.

This study was published today (February 12, 2015) in the scientific journal *Current Biology*.

Provided by JLM&A, SA

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