

Elucidating the neural basis for expression of estrous female odor preference in male mice

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Credit: AI-generated image ([disclaimer](#))

Social behaviors, such as sexual and aggressive behaviors, are important for successful reproduction and territorial defense in mice as a social species. For adaptive and efficient exhibition of these behaviors, accurate sex, reproductive state, and other opponent characteristics-related information processing is essential.

Male mice reportedly prefer the odor of estrous females over that of non-estrous females (receptivity-based preference) and males (sex-based preference). However, the neural circuit control of these preferences has not been unraveled yet.

In this study, published in *Proceedings of the National Academy of Sciences*, the researchers focused on the medial amygdala, reportedly involved in [social information processing](#), and investigated the role of estrogen receptor beta-positive (MeA-ER β +) neurons that are widely distributed in this region.

Using genetically-engineered [male mice](#) (ER β -iCre) in which MeA-ER β +) neurons are selectively manipulatable, the researchers performed three main sets of experiments to compare receptivity- and sex-based preferences: fiber photometry recording of MeA-ER β +) neuronal activity during social preference tests, assessment of how pharmacogenetic MeA-ER β +) neuronal activity suppression affected preference behavior, and neuronal activity recording of the bed nucleus of stria terminalis (BNST), a primary MeA-ER β +) neuronal projection site, during preference tests under pharmacogenetic suppression of MeA-ER β +) neuronal activity.

The results revealed that MeA-ER β +) neurons exhibit different roles for the two preference types. Specifically, an excitatory MeA-ER β +) [neuronal activity](#) input to the BNST is required for receptivity-based preference, whereas the BNST neurons control sex-based preference independently of the MeA-ER β +) neuronal excitation.

More information: Satoshi Takenawa et al, Activity of estrogen receptor β expressing neurons in the medial amygdala regulates preference toward receptive females in male mice, *Proceedings of the National Academy of Sciences* (2023). [DOI: 10.1073/pnas.2305950120](https://doi.org/10.1073/pnas.2305950120)

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