

Delicate magnolia scent activates human pheromone receptor

April 9 2015

The question if humans can communicate via pheromones in the same way as animals is under debate. Cell physiologists at the Ruhr-Universität Bochum have demonstrated that the odorous substance Hedione activates the putative pheromone receptor VN1R1, which occurs in the human olfactory epithelium. Together with colleagues from Dresden, the Bochum-based researchers showed that the scent of Hedione generates sex-specific activation patterns in the brain, which do not occur with traditional fragrances.

"These results constitute compelling evidence that a pheromone effect different from normal olfactory perception indeed exists in humans," says scent researcher Prof Dr Dr Dr Hanns Hatt. The team published the results in the journal *NeuroImage*.

Hedione activates pheromone receptor in olfactory epithelium

Using genetic-analysis approaches, the researchers from Bochum confirmed the pheromone receptor's existence in human olfactory mucosa. Subsequently, they transferred the genetic code for the receptor into cell cultures and, using these cells, demonstrated that Hedione activates the receptor. Hedione – derived from the Greek word "hedone", for fun, pleasure, lust – has a pleasant fresh jasmine-magnolia scent and is utilised in many perfumes. It is also called the scent of success.

Sex-specific brain activation may be related to the release of sex hormones

Together with the team headed by Prof Dr med Thomas Hummel from the University Hospital Dresden, the group from Bochum analysed what happens in the brain when a person smells Hedione. They compared the results with the effects triggered by phenylethyl alcohol, a traditional floral fragrance. Hedione activated brain areas in the limbic system significantly more strongly than phenylethyl alcohol. The limbic system is associated with emotions, memory and motivation. In addition, Hedione activated a specific hypothalamic region, in women more strongly than in men. This activation pattern is typical for controlling sexual behaviour via the endocrine system.

Next steps are in progress

"In the next stage, we want to find out which physiological and psychological parameters are affected when Hedione activates the pheromone receptor," explains Hanns Hatt. "We have already launched the relevant studies. But we also have to search for scent molecules in bodily secretions, which resemble Hedione and activate the receptor. With its help, humans could actually communicate with each other."

Pheromone receptors in humans and animals

Pheromones are substances that facilitate chemical communication between members of the same species. They trigger a homogenous, repeatable reaction. In the animal kingdom, this kind of communication is very widespread. Mice have approx. 300 different genes for pheromone receptors; in humans, probably only five of them are still functional. Most mammals have a special organ located at the base of the nasal septum, i.e. the vomeronasal organ. According to contemporary

research this organ fulfils no function in humans anymore. However, researchers at RUB and other institutes have demonstrated in the recent years that [pheromone receptors](#) may also occur in the [olfactory epithelium](#) in humans and in mice.

More information: "The smelling of Hedione results in sex-differentiated human brain activity," *Neuroimage*, [DOI: 10.1016/j.neuroimage.2015.03.029](#)

Provided by Ruhr-Universitaet-Bochum

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