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SENSORY SYSTEMS

TRPping over those subtle signs

In my book, one trick to successful dating is learning how to interpret the subtle signs — those tiny give-away gestures that can tell you so much about a person. Although some people have an uncanny ability to pick up these signs, many of us don't have the benefit of this *savoir-faire* and need as many clues as we can get. A recent paper published in *Science* reminded me of such human peculiarity by showing that the lack of an ion channel interferes with pheromone detection in mice, leading to a loss of sex discrimination.

Stowers *et al.* wanted to identify the signal-transduction mechanisms that mediate pheromone detection and focused their efforts on TRP2, a member of the transient receptor potential family of ion channels. TRP2 is expressed exclusively in neurons of the vomeronasal organ (VNO), the structure in which pheromones first interact with the nervous system, indicating that this channel might participate in signal transduction after pheromone binding. To test this idea, the authors generated TRP2 knockout mice and determined whether urine (a powerful source of pheromones) elicited a normal VNO response. They observed a very profound reduction in neuronal VNO activity in the knockout mice, which was accompanied by a reduction in the number of fibres from the VNO to the accessory olfactory bulb, their normal site of termination.

Does the mutation affect sexual behaviour? Pheromones have been thought of as specific signals to

identify and attract a mate. So, Stowers *et al.* looked for a behavioural correlate of the TRP2 absence by testing whether mating was normal in mutant male mice. Although the ability of TRP2 knockout males to copulate with females was not affected, the authors found that mutant mice failed to distinguish between the two sexes. So, mutant males did not attack male intruders, a common behavioural reaction that also seems to be elicited by pheromones, and actually tried to mate with them. In fact, if a TRP knockout male was simultaneously confronted with a female and a male, the mutant mouse did not show any preference and tried to mount both with equal frequency.

These data contradict the idea that pheromones are crucial for triggering sexual behaviour. Instead, the authors argue that VNO activity is involved in sex discrimination and that other, unknown signals elicit mating. So, the mutant mice fail to tell males apart from females on the basis of these signals or they cannot use them to control their behaviour. How exactly does the VNO interact with those 'subtle' signs? The TRP2 knockout mice will be valuable in answering this question.

Juan Carlos López

References and links

ORIGINAL RESEARCH PAPER Stowers, L. *et al.* Loss of sex discrimination and male-male aggression in mice deficient for TRP2. *Science* 31 January 2002 (10.1126/science.1069259)

FURTHER READING Dulac, C. Sensory coding of pheromone signals in mammals. *Curr. Opin. Neurobiol.* **10**, 511–518 (2000) | Clapham, D. E. *et al.* The TRP ion channel family. *Nature Rev. Neurosci.* **2**, 387–396 (2001)



WEB SITES

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