NEUROGENESIS

# Is it mine?

In mammals, the ability to recognize close relatives, including offspring, is thought to involve the recognition of their unique, genetically programmed body odour. In contrast to maternal recognition behaviour, paternal recognition behaviour and associated changes in brain plasticity are largely unknown. Now, Mak and Weiss have found that father–offspring interactions increase neurogenesis in the subventricular zone (SVZ) and the dentate gyrus and that this is important for father–offspring recognition.

CORBIS

They first established that male mice can recognize their offspring as adults only if they have previously interacted with them for at least 2 days postpartum, suggesting that paternal postnatal offspring interactions are essential for this recognition.

Males that interacted with their offspring showed enhanced levels (25–40%) of neurogenesis in the SVZ and dentate gyrus, resulting in 39% and 88% more neurons in the olfactory bulb and the dentate gyrus, respectively, compared with males that did not interact postpartum with their offspring. Furthermore, newly generated olfactory interneurons that have been implicated in olfactory learning and memory responded specifically to offspring odours.

The hormone prolactin (PRL) is known to have a role in the onset of paternal care behaviours and in enhanced olfactory neurogenesis in pregnant females. The authors found that neuronal progenitors in the SVZ and the dentate gyrus of the adult male brain express the receptor for prolactin (PRLR). In males that either lacked a functional PRLR (*Prlr*$^{-/-}$ mice) or were given a PRL-neutralizing antibody, the enhanced neurogenesis in the SVZ and the dentate gyrus induced by interaction with their offspring was abolished. *Prlr*$^{-/-}$ mice failed to recognize their adult offspring. However, administration of luteinizing hormone during early postnatal interaction increased neurogenesis in the SVZ and the dentate gyrus and fully restored the ability of males to recognize their offspring as adults. These results suggest that prolactin is a key mediator in establishing paternal offspring recognition.

In summary, this study shows that the interaction of males with their offspring postpartum induces PRL-mediated neurogenesis in the SVZ and the dentate gyrus, and suggests that ensuing changes in brain plasticity contribute to olfactory discrimination of offspring.

*Claudia Wiedemann*

**ORIGINAL RESEARCH PAPERS** Mak, G. K. & Weiss, S. Paternal recognition of adult offspring mediated by newly generated CNS neurons. *Nature Neurosci.* 9 May 2010 (doi:10.1038/nn.2550)