

# HIGHLIGHTS

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## HUMAN GENETICS

# Sweet smell of inheritance

Contrary to popular belief, the human sense of smell is very acute. It has been known for some time that the MHC complex (known as HLA in humans) is a source of unique odours that affect aspects of human behaviour, such as mate choice or individual recognition. In a new study, Jacob *et al.* report that women show clear preferences for odours encoded by their own paternally inherited HLA alleles, and that environmental exposure to HLA-derived odours is not enough to influence their smell preference.

Jacob and colleagues set out to explore the basis of HLA-derived odour preference and to determine how sensitive humans are at discriminating between these odours. But studying the genetic basis of such preferences is hampered by the ability of the highly polymorphic HLA region to generate millions of unique genotype combinations. Moreover, HLA-derived olfactory cues can be masked by odours encoded elsewhere in the genome and by environmental odours. So, to overcome the problems that arise from HLA variability, the authors chose 49 women from an isolated community that is known to have only 67 HLA haplotypes, and then tested their preferences for male HLA-derived body odour. T-shirts worn for two consecutive nights by men of different ethnic backgrounds were used as the source of odour and were presented to the women in a blind test. They were asked to rate the smell on the basis of its familiarity,

intensity, pleasantness and spiciness. Additionally, each woman was asked which smell she would choose if she had to smell it all the time.

Jacob *et al.* found that the women consistently preferred odours from men who shared some of their own HLA alleles. Amazingly, a difference in one HLA allele was sufficient for the women to distinguish between smells from different donors. To see if this odour preference had a genetic basis, the authors focused on five HLA loci, and determined the number of matches between the donor's alleles and those inherited by the women from each of their parents. The results were clear—the women's choices were dictated by the alleles that came from their fathers but not their mothers. Furthermore, environmental exposure to HLA-derived odours did not appear to affect

women's odour preferences—there was no association between their preferences and the paternal alleles that were not inherited.

The authors speculate that this preference might be important in choosing a mate and might have evolved to provide a balance between inbreeding and outbreeding to give an intermediate number of HLA matches to preserve optimal immunocompetence in the offspring. So, guys—if you want to win your sweetheart, you could do worse than borrowing her father's pyjamas.

Magdalena Skipper

## References and links

**ORIGINAL RESEARCH PAPER** Jacob, S. *et al.* Paternity inherited HLA alleles are associated with women's choice of male odor. *Nature Genet.* **30**, 175–179 (2002)

### WEB SITE

Martha McClintock's lab:  
<http://socialpsy.uchicago.edu/mlab/>

