DEVELOPMENTAL BIOLOGY

I've got a problem with my hairing

The gene that controls hair and bristle development in *Drosophila melanogaster* also underlies hair patterning in mammals, a new study shows.

Members of the large *frizzled (fz)* family of genes, first identified in *D. melanogaster* as being required for correct orientation (tissue polarity) of cuticular hairs and bristles, are known to act as Wnt receptors and have been found in all animals studied so far, including mammals. Given that mammals and *D. melanogaster* have a similar tissue-polarity system, it was surprising that no mammalian *Fz* gene had been shown to be involved in this pathway.

Nini Guo and colleagues have filled this gap. As part of their continuing effort to characterize mammalian *Fz* genes, they knocked out *Fz6* in mouse embryonic stem cells through gene targeting, and subsequently generated heterozygous and homozygous knockout mice.

The reporter gene that they placed under the control of the *Fz6* promoter in these mice indicated that the gene is expressed in the skin and hair follicles: a promising sign that they might have found a mammalian *Fz* gene involved in tissue polarity. The phenotype of the $Fz6^{-/-}$ mice was even more promising: these mice had distinctive and abnormal hair patterns on the feet, torso and head. These patterns were strikingly similar to those seen in *D. melanogaster* tissue-polarity mutants: the hairs were misorientated but locally ordered, with neighbouring hairs tending to point in the same direction.

By creating chimeric $Fz6^{-/-}$:$Fz6^{+/+}$ mice, the authors went on to show a clear correlation between expression of the *Fz* reporter gene and the location and severity of the hair-patterning defects. So, it would seem that the local effects of the absence of *Fz6* on hair development causes the unusual macroscopic hair patterns seen in $Fz6^{-/-}$ mice.

Now that we have identified a role for *Fz6* in mammalian tissue polarity, it is not a big jump to speculate that variation in this gene, or others in the same pathway, might underlie differences in hair patterns within and among mammal species. But is this finding of interest to anybody but Frizzled fans and hairdressers? Recent indications that that same pathway might have a role in patterning left–right asymmetry in the brain suggest that neurogeneticists could also be interested in mutants that have problems with their hairing.

Nick Campbell

References and links

ORIGINAL RESEARCH PAPER Guo, N. *et al.* Frizzled6 controls hair patterning in mice. *Proc. Natl Acad. Sci. USA* 28 May 2004 (doi:10.1073/pnas.0402802101)

FURTHER READING Ma, D. *et al.* Fidelity in planar cell polarity signalling. *Nature* **421**, 543–547 (2004)

WEB SITE

Jeremy Nathans' laboratory: http://www.mbg.jhmi.edu/FacultyDetails.asp?PersonID=372

ETHICS WATCH

Biobanks: simplifying consent

Practical wisdom has finally arrived in the world of 'ethical' biobanking — the German National Ethics Council has released its refreshingly innovative and progressive opinion on 'Biobanks for Research'[1].

The Council does not consider that different options need to be offered in the informed consent for use of samples obtained during medical care. Furthermore, informed consent can be waived if the samples and data are made completely anonymous, unless a prior contrary wish has been expressed.

It also recommends that "donors should be able to give generalized consent to the use of their samples and data for the purposes of medical — including genetic — research". The same applies to the length of storage and use of the data. Neither is limited in advance.

Long proscribed as disrespectful of individual choice, broad consent in the context of genetic research is usually prohibited. This prohibition spilled over into the biobanking arena. But, although the transfer and use of samples and data need to be fully documented, the Council felt that a generalized consent was sufficient. Coding ('pseudonymization') or anonymization is considered to provide adequate protection. Even broad consent can be waived for research that uses coded samples if the researcher has no access to the code. Withdrawal is possible in the absence of anonymization

The Council also states that "information need only cover personal risks arising directly in connection with the use of samples and data in biobanks". So, the usual clauses about possible risks of discrimination (employment/insurance) and stigmatization are unnecessary unless the biobank promises the return of individual results. Finally, the Council predicated all of its recommendations on the dual, procedural and substantive protections offered by the approval of an ethics committee and the oversight of a data-protection officer unless the samples and data are fully anonymized.

This is perhaps the first time such a sensible position has been suggested with regard to biobanks. Although waiver, broad consent and exceptions for epidemiological research have occasionally appeared in normative documents, they constitute a minority opinion. Indeed, the result has been either complex, lengthy, legalistic and obtuse consent forms, or a rush to anonymize to avoid ethical and legal difficulties.

It can be said that since 1995, there has been a 'sacralization' of human tissues and a general failure to appreciate the nature of biobanks. Biobanks can include biopsies, pathological and tumour samples, those left over from diagnosis and therapy, or those specifically collected for research. Much research that uses biobanks differs from hypothesis-driven genetic research about candidate genes in individuals or in 'at risk' families or communities. Biobanks are often public repositories. It is therefore very difficult, perhaps impossible, to predict all possible uses, and impracticable to contact participants years later for re-consent, especially in longitudinal studies.

The Opinion on Biobanks of the German Ethics Council reveals an enlightened, pragmatic and practical approach that still respects basic ethical principles. Socio-ethical and legal concerns need not necessarily be so complicated so as to, paradoxically, undermine the process of informed consent itself.

Bartha M. Knoppers

e-mail: knoppers@droit.umontreal.ca

[1]German National Ethics Committee (Nationaler Ethikrat). *Biobanks for Research*, Opinion (German National Ethics Committee, 2004) (available in English at kontakt@ethikrat.org).