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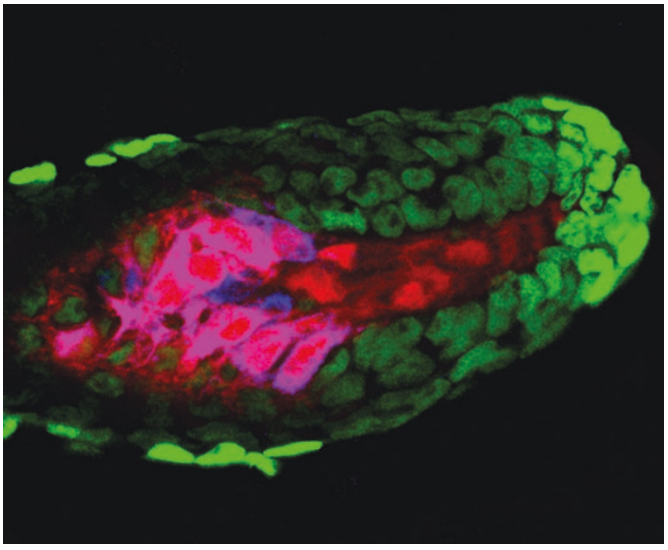

Figure 1 | Section of a hair follicle. This section was taken from a GFP$^+$ (green; epithelial cells) and RFP$^+$ (red; dermal papilla cells and melanocytes) double transgenic mouse after counterstaining with tyrosinase antibodies (blue; melanocytes). Image courtesy of Michael Rendl and *PLoS Biology*.

papilla cells special so that they can do that, compared to regular fibroblasts in the skin or other tissues… we basically want to tackle the whole idea of why it's inductive."
Michael Eisenstein

RESEARCH PAPERS
Rendl, M. *et al.* Molecular dissection of mesenchymal-epithelial interactions in the hair follicle. *PloS Biology* **3**, e331 (2005).

possibility of applying specialized aptamers, or cell-surface molecules such as glycosides. For such molecules, he adds, "that could work even better if you have a membrane-like layer as your receptor, with these essentially cell-like receptor ligands popping out of this membrane over your nanowire, because now you have the very low dielectric constant of this membrane, and you don't have this open aqueous network, which somewhat reduces your sensitivity." Lieber's group has also demonstrated more unconventional applications, such as detecting telomerase activity by monitoring the extension of oligonucleotide-modified substrates.

Lieber suggests that devices like this could represent a new generation of solutions for complex biological problems. "In the broader sense, this is kind of the natural interface between nanoelectronics and biological systems," he says. "It's one of the things I'm most excited about right now."
Michael Eisenstein

RESEARCH PAPERS
Zheng, G. *et al.* Multiplexed electrical detection of cancer markers with nanowire sensor arrays. *Nat. Biotechnol.*; published online 18 September 2005.

NEWS IN BRIEF

GENE TRANSFER

Tumor-targeted, systematic delivery of therapeutic viral vectors using hitchhiking on antigen-specific T cells

Noting that retroviral particles adsorb nonspecifically to the surface of T cells, Cole *et al.* have developed a gene delivery strategy wherein retroviruses are pre-incubated with tumor antigen-specific primary T cells. Back in the host, the virus 'hitchhikes' with these T cells to tumor sites throughout the body for systemic delivery of therapeutic genes.
Cole, C. *et al. Nat. Med.*; published online 18 September 2005.

CHEMICAL BIOLOGY

In vitro selection of RNA aptamers against a composite small molecule–protein surface

Plummer *et al.* describe the *in vitro* engineering of an orthogonal RNA–small molecule–protein complex, in which the RNA and target protein can only bind each other via ternary association with the small molecule. None of these components interact with natural cellular components, and the authors suggest this strategy could prove useful for future gene expression and regulation studies.
Plummer, K.A. *et al*. *Nucleic Acids Res.* **33**, 5602–5610 (2005).

PROTEIN BIOCHEMISTRY

An active enzyme constructed from a nine-amino-acid alphabet

Studies have demonstrated that dramatically reduced amino acid alphabets can be used to encode polypeptides that will assume native-like folds. Walter *et al.* take this process a step further, modifying a bacterial metabolic enzyme so that it is encoded by only nine different amino acids. This 'reduced' enzyme is slightly less stable, but folds properly and retains full catalytic activity.
Walter, K.U. *et al. J. Biol. Chem.*; published online 6 September 2005.

STEM CELLS

Genomic alterations in cultured human embryonic stem cells

Maitra *et al.* offer a cautionary tale for researchers working with embryonic stem cells, noting that, as with other cell lines, long-term passaging increases the risk of genomic changes. They find that after many rounds of passaging, stem cell lines are likely to exhibit alterations like those typically seen in cancers, such as aberrant chromosomal copy number or promoter methylation.
Maitra, A. *et al. Nat. Genet.* **37**, 1099–1103 (2005)

ANIMAL MODELS

An aneuploid mouse strain carrying human chromosome 21 with Down syndrome phenotypes

Down syndrome (DS) is difficult to model in mice, as trisomy of the chromosome syntenic with most of human chromosome 21 (Hsa21) leads to embryonic lethality. O'Doherty *et al.* have developed a method for generating mouse embryonic stem cell lines that contain Hsa21, generating mice whose phenotype partly mirrors DS, and offering hope for modeling other human aneuploidies.
O'Doherty, A *et al. Science* **309**, 2033–2037 (2005).