WEB WATCH

Sweet talk

Do you remember what the difference is between a proteoglycan and a glycoprotein? If you don't, no need to panic — go to Glycoforum and you'll find out. If you do, go to Glycoforum anyway and learn something else, as the site contains loads of information.

The website originates in Japan, and it's available in both Japanese and English. Although some of the links are of limited usefulness if you live outside Japan, the site itself is accessible to English speakers.

Once your eyes become accustomed to the bright yellow of the homepage, you'll find all the important links grouped in one place. In fact, it's one of the few thoroughly 'clickable' pages on the site, most others being built like textbook chapters — with the net advantage that you can download the figures to make slides.

Undoubtedly, the pièce de résistance is GlycoWord, offering a comprehensive overview of all glycoscience-related topics. This section is the answer to your prayers if you are preparing a course on lectins or proteoglycans, and it even contains sections about pathology and technology.

A more specialized complement to this section is Hyaluronan Today, which features up-to-date information on all aspects of hyaluronan biology, from its structure to its involvement in morphogenesis and tissue remodelling. There are 15 chapters in this section so far, and new chapters are added regularly.

The site also provides useful information about meetings as well as a few longish interviews with leaders in the field. The last section, Topics, lacks a bit of focus, featuring for example meeting programmes right next to the product catalogue of Seikagaku Corporation — a company that has strong links with Glycoforum.

Raluca Gagescu

P53 REGULATION

Tipping the balance

Such is the mix-and-match nature of cell biology that many different modes of regulation come up time and again. Take, for example, the addition or removal of an acetyl group, which is a well-known means of regulating histones and turning gene expression on or off. But acetylation can also be used to control the activity of p53, and in the 16 November issue of *Nature* Wei Gu and colleagues describe one way in which this process might be regulated.

Acetylation by p300 stimulates the ability of p53 to bind DNA in a sequence-specific manner. Because p53 acetylation is enhanced when cells are treated with deacetylase inhibitors, there is likely to be a balance between the two processes, with the deacetylases fine-tuning the levels of acetylated p53.

If this is the case, reasoned Gu and colleagues, p53 would be expected to interact physically with a deacetylase complex. They used a glutathione *S*-transferase (GST)–p53 affinity column to test this hypothesis and, among the eluted proteins, they pulled down the human histone deacetylase HDAC1. The two proteins do not interact directly, however, as purified recombinant HDAC1 failed to bind p53.

So what mediates the interaction? Gu and co-workers purified complexes containing HDAC1, then ran these fractions down the GST–p53 column. Only one protein remained bound after dissociation of the HDAC1 complex, and the authors named this PID (for 'p53 target protein in the deacetylase complexes'). They then showed, by immunoprecipitation, that the interaction between p53 and PID is specific and direct both *in vitro* and *in vivo*.

Sequence analysis revealed that PID is homologous to human MTA1, a protein found in the so-called NuRD complexes involved in nucleosome remodelling and histone deacetylation. Confirmation that the p53/PID/HDAC1 complex, too, is a

DIFFERENTIATION

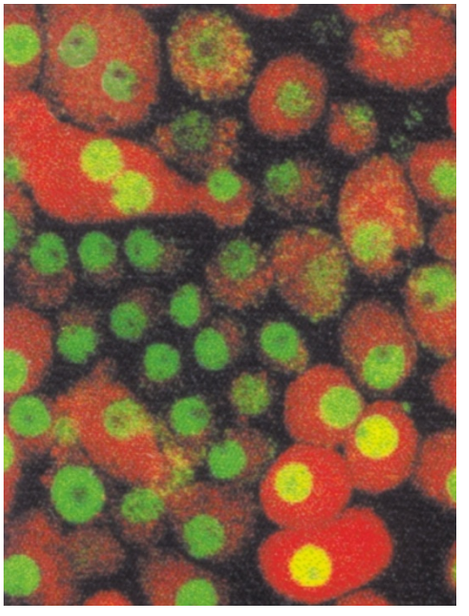
Molecular alchemy

For over 1,500 years, alchemists struggled to convert base metals into gold. But their search for the legendary 'philosopher's stone' that could make such a transformation resulted in failure and the slide of this pseudoscience into disrepute. Not so in cell biology, however. In the December issue of *Nature Cell Biology*, David Tosh and colleagues describe an equally startling transition — the conversion of pancreatic cells into hepatocytes, with no intervening cell division.

The interconversion of differentiated cells has been observed before. For example, hepatic foci appear in the rat pancreas after various experimental treatments, and Tosh and colleagues chose to study this process *in vitro*. They used a synthetic glucocorticoid called dexamethasone to convert a rat pancreatic cell line into hepatocyte foci.

Using an assay based on green-fluorescent protein, the authors conclude that this conversion occurs directly from an exocrine cell type to a hepatocyte — a process known as transdifferentiation. Although they cannot rule out the possibility that an intermediate stem cell is involved, this seems unlikely. Moreover, as the transition is not blocked by 5-bromo-2′-deoxyuridine (a thymine analogue that can be incorporated into DNA), the authors believe that it need not involve cell division.

What, then, is responsible for this transdifferentiation? To find out, Tosh and colleagues studied the expression of transcription factors associated with hepatic differentiation. One such factor, CCAAT-enhancer binding protein β (C/EBPβ), was not detectable in the pancreatic cell line but it could be induced after treatment of these cells with dexamethasone. And, as the figure shows, C/EBPβ could induce the pancreatic cells to transdifferentiate (C/EBPβ is labelled green, with the liver-cell marker glucose-6-phosphatase in red).



Tosh and co-workers confirmed many of their results using an *in vitro* system that more closely resembles the situation *in vivo* (pancreatic buds isolated from mouse embryos). Nonetheless, they point out that some findings need further clarification. For example, the authors do not claim that glucocorticoids are involved in the formation of hepatic foci *in vivo*; only that such treatment