

## › NEWS UPDATES

### Chimpanzee genome sequenced

With the publication of a draft sequence of the chimpanzee genome in the 1 September issue of *Nature*, science took a significant step toward answering the age-old question of what makes us human.

The Chimpanzee Sequencing and Analysis Consortium mapped the 3 billion nucleotides that compose the genetic material of the common chimpanzee (*Pan troglodytes*), the only nonhuman primate to have its genome sequenced. A comparative analysis with the human genome revealed the two genomes to be 96% similar; 29% of proteins are identical, and the average protein differs by only two amino acids. Since the human lineage diverged from chimpanzees 6 million years ago, the genomes have accumulated 35 million single-nucleotide changes, 5 million insertion/deletion events, and several chromosomal rearrangements.

Which of these account for the many phenotypic differences between humans and chimpanzees remains to be determined. The genomes of other nonhuman primate species—including the orangutan and marmoset—are due to be revealed shortly and should be invaluable in understanding the differences between the human and chimpanzee genomes.

### Pisces take on cancer

The zebrafish is a popular model for the conduct of genetic and developmental biology experiments, and has also shown promise for cancer research. Leonard Zon, of the Massachusetts Institute of Technology (Cambridge, MA), and his colleagues recently advanced the usefulness of this model, describing a new mutagenesis screen for the identification of novel cell cycle regulators and oncogenes (*Proc. Natl. Acad. Sci. USA*, 13 September).

Zon and his colleagues used antibodies specific to a mitotic marker to identify zebrafish embryos showing clear defects in mitotic entry and cell proliferation. They identified at least eight homozygous mutations resulting in lethal cell proliferation defects, one of which—*crash&burn* (*crb*)—they proceeded to characterize in detail.

The *crb* mutation was localized to the gene for the transcription factor *B-myb*, which has previously been implicated as interacting with cell cycle factors; *crb* seems to seriously impede mitotic progression, triggering problems with spindle formation, with subsequent abnormalities in chromosome number. Later experiments suggested that *crb* can contribute to cancer susceptibility in adult fish, and gene expression data from a collection of human tumor cell lines also suggest that reductions in *B-myb* levels could contribute to tumor formation. The authors conclude that zebrafish could provide an ideal model for identifying novel oncogenes or tumor suppressors, and the mechanisms by which they act.

### Vaccine fights fungus

Italian researchers have developed a vaccine that protects rodents from infection by pathogenic fungi. A safe and effective vaccine could revolutionize the way these conditions are treated in people.

Fungal pathogens generally pose little risk to healthy individuals; in the immunocompromised, however, fungal infections such as candidiasis or aspergillosis can prove fatal. Current treatments often carry toxic side effects and lose effectiveness as the fungi develop resistance. Thus far no antifungal prophylactic or therapeutic vaccine has appeared.

Now, a group led by Antonio Cassone at the Istituto Superiore de Sanita (Rome, Italy) report the development of an antifungal vaccine. They conjugated  $\beta$ -glucan, a poorly immunogenic sugarlike molecule present on the cell wall of all fungal cells, with the highly immunogenic diphtheria toxin (*J. Exp. Med.*, 5 September). Mice immunized with this conjugate developed antibodies to  $\beta$ -glucan and, when challenged with a normally lethal systemic dose of *Candida albicans*, had significant protection compared with controls. Surprisingly, the vaccinated mice also showed protection from challenge with *Aspergillus fumigatus*, suggesting that the vaccine may induce an immune response that confers protection against a wide spectrum of fungal pathogens.