IN THE NEWS

UK funds new stem-cell centre

The United Kingdom's Medical Research Council (MRC) has announced public funding of £1.5 million towards a new centre for stem-cell research. "This funding comes at a critical juncture ... as the UK builds strength and momentum to take the lead in stem cell research," said Roger Pedersen, the director of the new centre (*The Daily Telegraph*).

Based at the University of Cambridge, the centre will have a strong clinical focus, as well as carrying out basic research. "The mission is to deliver clinical benefits at the earliest possible date," said Pedersen (*Associated Press*), who is confident that these goals can be achieved quickly: "...we expect to be preparing patients' therapies within five years" (*The Guardian*).

Efforts will initially concentrate on developing treatments for conditions that can be treated using a single type of stem cell, such as juvenile diabetes and Parkinson disease. However, the MRC's chief executive, Colin Blakemore, is optimistic that research at the centre will have more wide-reaching implications: "Stem cell science offers enormous hope for the future treatment of many life-threatening illnesses," he commented (*The Guardian*).

The centre's plans to use embryonic stem cells as well as those derived from adult tissues has already caused controversy: "...under no circumstances should they go near human embryos," was the response of a spokesperson from the ProLife Party (*BBC News*). However, Pedersen believes that work on these cells is crucial, saying that "...embryonic stem cells by definition include all the other stem cells, so understanding them is a vital first step" (*The Scientist*).

Louisa Flintoft

EVO-DEVO

Welcome to the family!

A new study of expression patterns of key developmental genes in an anemone indicates that the phylum Cnidaria has been unfairly excluded from the 'family' of bilaterally symmetrical animals (Bilateria).

Similar to 'higher' animals, such as vertebrates, nematodes and insects, the sea anemone *Nematostella vectensis* is bilaterally symmetrical: that is, it has two orthogonal body axes. However, the traditional view was that bilaterally symmetrical cnidarians like *N. vectensis* had convergently evolved this key innovation: specifically, it was thought that, similar to many cnidarian species today, the most recent common cnidarian ancestor was radially symmetrical.

To assess whether the specification of the body axes in bilateral cnidarians is in fact homologous with the same process in Bilateria, John Finnerty and colleagues looked in *N. vectensis* for the key genes that underlie this process in bilaterians. They found 5 *Hox*-like genes: *anthox* 6, 7 and 8, which seem to be related to anterior bilaterian *Hox* genes, and *anthox* 1 and 1a, which are closest to posterior bilaterian *Hox* genes.

The patterns of expression of these genes during *N. vectensis* development were strikingly similar to those of the related genes during bilaterian development. Similar to their putative bilaterian counterparts, the staggered expression domains of the five *Hox*-like genes span the primary axis of the developing anemone (the oral–aboral axis in *N. vectensis*). For example, the putative anterior gene *anthox* 6 is only expressed in endodermal cells close to the oral tip of the pharynx.

So, the expression of *Hox*-like genes in *N. vectensis* is certainly consistent with these genes patterning the oral–aboral axis of the cnidarian larva, but what about the secondary 'directive' axis, equivalent to the dorsal–ventral (DV) axis in Bilateria? Finnerty *et al.* found that *anthox* 1a, 7 and 8 were only expressed on one side of this axis, a finding that implicates these genes in patterning it. Similarly, an orthologue of *dpp*, a gene that is involved in patterning the DV axis in the Bilateria, is expressed highly asymmetrically with respect to the directive axis in the pharynx. However, *dpp* is expressed on the opposite side of the axis from the three *anthox* genes and a

GDF5-like gene — another DV patterning gene homologue that the authors isolated.

The simplest explanation for the similarities in expression between these genes in cnidarians and their patterning homologues in bilaterians is that bilateral symmetry evolved in metazoans before the cnidarians split from the Bilateria. If true, this explanation indicates that many cnidarians secondarily evolved a simpler form of symmetry — radial symmetry.

Paradoxically, similar studies on radially symmetrical cnidarians could strengthen the case for bilateral symmetry in the ancestral cnidarian by revealing how the ancestral condition might have been modified to produce radial symmetry. Perhaps then cnidarians could be warmly embraced by all as fully fledged members of the bilateral family, even if the radial forms have squandered their bilateral inheritance.

Nick Campbell

References and links

ORIGINAL RESEARCH PAPER Finnerty, J. R. *et al.* Origins of bilateral symmetry: *Hox* and *Dpp* expression in a sea anemone. *Science* **304**, 1335–1337 (2004)

FURTHER READING Ball, E. E. *et al.* A simple plan: cnidarians and the origins of developmental mechanisms. *Nature Rev. Genet.* **5**, 567–577 (2004)

WEB SITES

John Finnerty's laboratory:
http://www.bu.edu/biology/Faculty_Staff/finnerty.html

Mark Martindale's laboratory:
<http://www.kewalo.hawaii.edu/labs/martindale/>