

## A bigger and better heart, thanks to this crab

**Anuradha Mascarenhas** Posted: Dec 12, 2008 at 0125 hrs

**Pune** The horseshoe crab, described as the world's oldest living fossil, could hold the key to the repair of damaged hearts. Scientists from Pune have found that the crab has a molecule with the potential to convert stem cells into the heart's beating cells.

Horseshoe crabs, which have blue blood and are found along the Orissa coast, are used frequently in scientific experiments. They are believed to have existed before the arrival of dinosaurs.

Scientists at Pune-based Agharkar Research Institute (ARI) and National Centre for Cell Science (NCCS) got together and have found a mechanism by which a molecule called lectin can convert stem cells into the heart's beating cells. The experiments were carried out on mice and a chicks.

Dr Surendra Ghaskadbi, scientist in charge of the zoology group at ARI, told The Indian Express that it was an important finding. The heart and the brain have a low count of adult stem cells, not enough for repair in the event of an infarct. Researchers may now have got vital leads in that direction, though it may still take another decade to utilise stem cell therapy for these two critical organs.

The Department of Biotechnology has undertaken an initiative that motivates researchers to look out for molecules of therapeutic use from aquatic animals. Ghaskadbi said scientists coordinated with researchers at the Goa-based National Institute of Oceanography (NIO) and the horseshoe crab facility there.

Work began five years ago. The research eventually led to the finding that the perivitelline fluid, found in the embryo of horseshoe crabs, influenced cardiac development in a dramatic manner - the size of the heart increased.

Scientists identified lectin as the molecule responsible for promoting cardiac development.

They then put the molecule into the hearts of a chick and a mouse and stimulated the growth of stem cells. The most prominent of the observed effects was an extremely enlarged heart, says Ghaskadbi.

The heart enlargement was due to a larger number of cells. The inference was that the same molecule was at work in both chicks and mice.

The research has been reported in a recent issue of Cellular and Molecular Life Sciences Journal. Plans are under way to take up further animal studies to examine whether the molecule also has angiogenic activity and if it can form new blood vessels from old ones.

### HEART OF THE MATTER

**The goose that lays...** The blue-blooded horseshoe crab, widely found along the coast of Orissa, believed to have existed before the arrival of dinosaurs. Its blue blood gives it a variety of uses in biomedical sciences.

**... the golden egg:** The molecule lectin, present in the perivitelline fluid found in the horseshoe crab's embryo. Scientists found it influenced cardiac development dramatically

**The experiment:** Scientists identified and isolated the molecule that makes it happen. They injected it into mice and chicks

**The result:** The heart grew in size, a result of a manifold increase in the number of cells. The inference was that the molecule had helped transform stem cells into the beating cells of the heart

**What next:** Does the molecule also have angiogenic activity? Can it form new blood vessels from old ones?

Further animal studies and experiments will check this