e! Science News

A research work on molluscs nacre opens new doors for its possible use in biomedicine

Published: Thursday, February 12, 2009 - 14:38

Related images

University of Granada (Spain)

Researchers from the University of Granada, the Spanish National Research Council (CSIC) and the University of Aveiro (Portugal) have studied for the first time nacre's growing mechanism of gastropods, a previous step for the artificial reproduction of this material in laboratories which could make possible its use in biomedicine, with applications such as the regeneration of human bones. This pioneer new work has been recently published in the renowned journal *PNAS*, and its authors are **Antonio Checa**, Professor of the department of Stratigraphy and Paleontology of the University of Granada; **Julyan Cartwright**, researcher of the Andalusian Institute of Earth Sciences (CSIC-UGR), and **Marc-Georg Willinger** (University of Aveiro, Portugal).

Many molluscs present an iridiscent nacre layer on the internal surface of their shells, which lends them an enormous strength against fractures. Oddly, although molluscs have been producing nacre for million years, men had not been able to reproduce it artificially. Apart from their beauty –this is the material pearls are made of-, scientists have also done research into nacre due to its biomedical applications and its excellent biomechanic properties. If it was possible to reproduce this natural compost in an artificial way, it would have multiple and relevant applications.

Gastropods' nacre

The authors of the work have analysed gastropods' nacre in detail (pleurotomariidae, turbos, trochus, abalones and others). Such nacre grows forming block towers, as piles of coins, unlike bivalves (nuculas, mussels, nacras, pearl oysters), which grow just like terraces of tablets. Nacre is made up of blocks of aragonite separated by membrans of polysaccharides and proteins, just like bricks and mortar in a wall.

The scientist whi ve studied gastropods' nacre in detail, revealing that it grows in terraces because it is limited by a membrane (superficial membrane) which covers and protects it from sea water when the animal goes into its shell. Such superficial membrane must carry out different tasks in order to permit the prodcution of nacre and therefore it is "a wonderfully complex structure", according to the authors of this work. This article has showed how the superficial membrane organizes nacre in towers and how mineral blocks are conected through a central column.

Source: Universidad de Granada