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Scientists uncover mechanism that regulates cell movement

Posted July 21st, 2008 by [Mohit Joshi](#) [Science News](#) [London](#)

London, July 21: A team of scientists from the Institute for Research in Biomedicine (IRB Barcelona) and the Instituto de Biología Molecular of the CSIC have uncovered a mechanism that controls the movement of cells in a tissue by regulating cell adhesion.

The researchers believe that the same mechanism may be defective during cancer progression and metastases, when tumour cells lose their adhesion to neighbouring cells, and migrate through the organism.

Lead researchers Daniel Shaye, Jordi Casanova, and Marta Llimargas basically studied the mechanisms that control cell movements during trachea development in the fly *Drosophila*.

They say that a key element in the regulation of these movements is the amount of adhesive protein E-Cadherin, located in the cellular membrane.

"When movement starts, the levels of this protein in the cells decrease, thereby allowing them to slide one on top of the other, and once in this position the levels of this protein are re-established in order to seal the new binding alignment," Nature magazine quoted Jordi Casanova, head of the Morphogenesis in *Drosophila* at IRB Barcelona, as saying.

The latest study has revealed that the amount of E-Cadherin on the cell surface is controlled by the trafficking of this protein inside the cell, and the identification of the elements that regulate this transport.

During the study, the researchers induced or blocked cell movement by modifying the elements that control the trafficking of adhesive protein towards the membrane.

"We demonstrate a mechanism that explains how cells can change their position within a given tissue. The sequence is clear: the greater the amount of protein, the greater the

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adhesion and the smaller the movement," says Casanova.

Since the role of E-Cadherin in the binding between epithelial cells is universal in all animals, the researchers believe that the mechanisms that regulate the levels of this protein may also be universal.

"We speculate that the regulatory mechanism that we have discovered may also be present in other developmental contexts. However, in addition, fundamental elements of the mechanism may show a dysfunction in pathological processes such as the progression of cancer and metastases," says Casanova.

In their study report, the researchers also say that the amounts of E-Cadherin, and of one of the elements required for trafficking, decrease in the progression of a kind of oesophagus cancer, and this effect is related to the gain in tumour cell motility that allows them to spread throughout the body more rapidly.

The researchers say that cancer researchers can now conduct further experiments on animals to see whether this mechanism is defective in other kinds of tumours, and also to determine whether any of its genetic components are valid as therapeutic targets. (ANI)

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