Cell 'glue' opens new pathways to understanding cancer

March 11 2011

Australian researchers have found a novel way in which the proteins that 'glue' cells together to form healthy tissues can come unstuck, opening new avenues to understanding how these proteins are disturbed in diseases such as cancer.

Professor Alpha Yap and Sabine Mangold from UQ's Institute for Molecular Bioscience have been studying how cells stick together and the diseases that occur when cells detach when they shouldn't. In particular, the progression of tumours to advanced stages commonly occurs when cancer cells separate from their tissue of origin.

“We examined a protein called HGF that is often found in cancer,” Ms Mangold said.

“HGF regulates cell growth, shape and movement and aids cancer cells in migrating to other tissues and spreading through the body.

“Scientists have long known that HGF disrupts the junctions where cells join together, but the exact mechanism of how this occurs hasn't been understood until now.”

The team made by their discovery by examining the molecular machinery that binds cells. One key component is a protein called E-cadherin, which forms the adhesive to hold cells together.

E-cadherin associates with a scaffold found inside the cells, made of a

protein called actin. Normally, actin links into a meshwork with cadherin to make strong contacts between cells.

Ms Mangold and Professor Yap found that the actin scaffolding seemed to be lost just as the cell contacts became disrupted. They discovered this occurred because HGF caused another protein, Myosin VI – which normally acts to link cadherin and actin together – to be lost from cadherin.

“So HGF was causing this interlinked meshwork of proteins to come apart, breaking up the system and causing cells to drift apart,” Professor Yap said.

“The discovery of this pathway may open new avenues to understand exactly how proteins that bind cells together are affected in disease, which could lead to new targets for treatments of such disease, including cancer.”

The study was published in the latest edition of the international journal *Current Biology*.

Provided by University of Queensland