Breast stem cell fate is regulated by 'notch'

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A normal developmental protein that sometimes goes awry has been implicated in breast cancer. This discovery indicates the mechanism by which inappropriate expression of the Notch pathway may contribute to breast cancer.

The breast cancer team at WEHI, led by Drs Jane Visvader and Geoff Lindeman from the Victorian Breast Cancer Research Consortium, have identified important roles for Notch genes in regulating breast development and function.

This discovery has important implications for breast cancer, since elevated levels of Notch have been linked to breast cancer. The advance builds on the group's 2006 discovery of the breast stem cell in mice.

Research carried out by Drs Toula Bouras and Bhupinder Pal has uncovered dual functions for Notch in breast tissue.

First, Notch helps restrict breast stem cell number, so that when Notch is 'switched off', there is a resultant expansion in breast stem cells.

Second, Notch is important for ensuring that stem cells produce the sleeve of cells that normally line breast ducts. These 'luminal' cells may be the cells that give rise to common types of breast cancer.

Thus, Notch helps to orchestrate the formation of breast tissue: it plays an important role in controlling stem cell number and instructs stem cells to produce luminal cells.

Significantly, Dr Bouras and colleagues found that errant activation of Notch resulted in uncontrolled growth of luminal precursors, leading to the formation of breast tumours.

The work has spotlighted the potential importance of deregulated Notch in ductal precursor cells as a forerunner to breast cancer.

The researchers say that it is too early to speculate on whether the design of anti-Notch therapies could help patients facing breast cancer.

Source: Research Australia