Research makes significant cancer breakthrough

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(Medical Xpress) -- A major breakthrough by scientists at Queen's University Belfast could lead to more effective treatments for throat and cervical cancer. The discovery could see the development of new therapies, which would target the non-cancerous cells surrounding a tumour, as well as treating the tumour itself.

Researchers at Queen's Centre for Cancer Research and Cell Biology have found that the non-cancerous tissue, or 'stroma', surrounding cancers of the throat and cervix, plays an important role in regulating the spread of cancer cells.

The discovery opens the door for the development of new treatments which, by targeting this non-cancerous tissue, could prevent it being invaded by neighbouring cancer cells.

The research, led by Professor Dennis McCance, has just been published in the *European Molecular Biology Organization Journal*. Professor McCance said: "Cancer spreads as the result of two-way communication between the cancer cells in a tumour and the non-cancerous cells in the surrounding tissue.

"We already know that cancer cells are intrinsically programmed to invade neighbouring healthy tissue. But the cells in the non-cancerous tissue are also programmed to send messages to the cancer cells, actively encouraging them to invade. If these messages – sent from the healthy tissue to the tumour - can be switched-off, then the spread of the cancer

will be inhibited.

"What we have discovered is that a particular protein in non-cancerous tissue has the ability to either open or close the communication pathway between the healthy tissue and the tumour. When the Retinoblastoma protein (Rb) in non-cancerous tissue is activated, this leads to a decrease in factors that encourage invasion by cancer cells. And so, the cancer doesn't spread."

The Rb protein is found in both cancer and non-cancerous tissue. Its importance in regulating the growth of cancer cells from within tumours is already well-documented, but this is the first time scientists have identified the role of the Rb found in healthy tissue, in encouraging or discouraging the spread of cancer.

The research was conducted using three-dimensional tissue samples, grown in Professor McCance's lab, to replicate the stroma tissue found around cancers of the throat and cervix.

Speaking about the potential implications for cancer treatment, Professor McCance continued: "Current treatments for cancer focus on targeting the tumour itself, in order to kill the cancer cells before they spread. This discovery opens the door for us to develop new treatments that would target the normal tissue surrounding a tumour, as opposed to the tumour itself. By specifically targeting pathways controlled by the Rb protein, it would be possible to switch-off the messages that encourage cancer cells to invade, and inhibit the spread of the tumour.

"Our research has focussed on cancers of the throat and cervix. But it is possible that Rb or other proteins in the healthy tissue surrounding other types of cancer, may play a similar role in regulating the spread of tumour cells. Therefore, the implications of this discovery could go far beyond throat and cervical cancer, and that is something we plan to

investigate further."

More information: The research paper, entitled 'Inactivation of Rb in stromal fibroblasts promotes epithelial cell invasion' can be found online at www.nature.com/emboj/journal/v … l/emboj2012153a.html

Provided by Queen's University Belfast