

Signalling protein plays different roles in breast cancer and normal cells

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A key step in developing effective cancer therapies is identifying differences between normal, healthy cells and cancer cells – these differences can then be exploited to specifically kill tumour cells.

A new study by Manchester scientists has shown for the first time that a particular protein has contrasting effects in normal and cancerous breast [stem cells](#) – meaning it could prove useful in the development of more targeted treatments for [breast cancer](#). This protein – known as CXCR4 – has previously been detected in 23 different types of cancer and has been linked to poor prognosis.

Now researchers have investigated the role of CXCR4 in both normal and cancerous breast stem cells – cells that are used for tissue growth and replenishment. The group from The University of Manchester – part of the Manchester Cancer Research Centre – found that the protein controls repeated replication of breast cancer stem cells and has a potential role in cancer spread.

Dr Rob Clarke, who led the research, said: "We know that CXCR4 controls stem cells in lung, pancreatic and prostate cancer. It is also linked to poor prognosis in breast cancer. However, we wanted to better understand the role that CXCR4 plays in breast stem cells."

In a study published in the journal *Oncotarget*, the team show that there were increased levels of CXCR4 in breast stem cells. However, only in [cancerous cells](#) did the protein control the growth of new cells.

"The differing role of this molecule in healthy and cancerous tissue is potentially very interesting and could be used to specifically target cancer stem cells but we still need to learn more about the underlying basis for these observed differences," added Dr Clarke.

More information: "A differential role for CXCR4 in the regulation of normal versus malignant breast stem cell activity." Ablett et al. *Oncotarget*. 2014 Feb 15;5(3):599-612.

Provided by University of Manchester

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