Scientists discover how to trap cancer cells before they spread

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At the original tumour site, cancer cells cause connective-tissue cells called fibroblasts to stiffen the surrounding tissue. This enables cancer cells to grip to it- allowing them to tunnel through to the blood stream and spread around the body.

The research team behind the results showed that adding experimental drugs can reprogramme fibroblasts and stop them from 'stiffening' the tissue around tumours. This healthy tissue trapped the cancer cells, blocking their movement away from the tumour.

In this Novo Nordisk Foundation and Cancer Research UK funded study, the team showed that targeting fibroblasts in a cancer model reduced the movement of cancer cells from the tumour to the lungs and liver through the blood stream.

Lead author Dr Janine Erler from BRIC at the University of Copenhagen, said: "It's early days but a very promising new avenue of research. If further studies show this route can benefit patients, it could help crack one of the toughest challenges in cancer research - how to stop tumours spreading."

Co-lead author of the study, Dr Erik Sahai from the Francis Crick Institute said: "This could be an exciting new way to harness the potential of the healthy tissue surrounding cancers to contain and restrain aggressive tumours - stopping cancer cells from breaking away and moving to new places in the body.

New use of anaemia drugs against cancer

"As the fibroblasts are present in all solid tumours, our findings may be relevant to many different cancer types. Therapies that are similar to the one we tested are in currently in clinical trials for anaemia and could feasibly be used to treat cancer patients." added first author Dr Chris Madsen who undertook the experiments at both BRIC and the Francis Crick Institute.

The researchers got the idea to use a drug that targets a major regulator of cell processes called PHD2. Inhibitors targeting PHD2 are currently in clinical trials for the treatment of anaemia. As development of new drugs is very time consuming and expensive, using an already approved and toxicity-tested drug may significantly speed up the use of the drug for other diseases. The researchers hope is that this study will push for PHD2 inhibitors to be used in the treatment of cancer patients and encourage the development of even better PHD2 inhibitors.

Nell Barrie, senior science information manager at Cancer Research UK said: "Most deaths from cancer are caused when cancer cells travel to new sites in the body and grow as secondary tumours. And we know that it's not just cancer cells that play a part in this process - other cells in and around tumours are involved too.

"But the good news is research like this has the potential to uncover new ways to stop cancer in its tracks. Ultimately we hope these findings could lead to better ways to control the disease - and save more lives."

More information: Hypoxia and loss if PHD2 inactivate stromal fibroblasts to decrease tumour stiffness and metastasis: *EMBO Reports*, Chris Madsen et al.

Provided by University of Copenhagen