PRESS RELEASE
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Gut stem cells offer clues for preventing tumours in inherited bowel cancer

Glasgow, UK: Treating pre-cancerous stem cells at an early stage could be key to preventing bowel cancer in people born with a very high risk of the disease, according to a study in mice presented at the 2018 NCRI Cancer Conference.

Previous research has suggested that stem cells play a key role in the development of cancer, but they have proved very difficult to treat with cancer drugs in established tumours.

The new research indicates that these stem cells could be sensitive to existing cancer drugs, but only if they are treated very early on, suggesting that it may be possible to prevent bowel cancer in people who have inherited a very high risk of developing the disease.

The study was presented by Michael Hodder, a researcher at the Cancer Research UK Beatson Institute, Glasgow, UK. He said: "Stem cells play an important role in our bodies because they are capable of dividing and growing into lots of different types of cells. They are also found in tumours where this ability to multiply makes it more difficult to stop cancers from growing and spreading.

"I wanted to study cancer stem cells more closely to see if I could discover a vulnerability that could be targeted to treat cancer more successfully."

Working with Professor Owen Sansom, Director of the Cancer Research UK Beatson Institute, Hodder studied the role of stem cells in the guts of mice that had been bred to mimic a human hereditary condition called familial adenomatous polyposis or FAP.

People with FAP have a greater than 95% chance of developing bowel cancer, with an average age at diagnosis of 40 years. They carry a fault in a gene called adenomatous polyposis coli (APC).

The mice also carried a faulty equivalent of the APC gene so, if left untreated, they would go on to develop tumours in their guts. Researchers used existing cancer treatments at a very early stage to see if any could halt the development of tumours. They found that one, called cisplatin, could prevent cancer in the mice. This drug is known to interfere with cell growth and division.

The researchers also found that pre-cancerous stem cells were more sensitive to cisplatin than normal stem cells in the gut of the mice. This suggests that it is possible to treat cancer stem cells but only if it is done at an early stage, before a tumour has developed, whereas trying to tackle cancer stem cells with drugs like cisplatin once a tumour is established is probably too late.

Hodder explained: “For people with FAP who inherit an extremely high risk of bowel cancer, there is a clear benefit to being able to prevent tumours. There has been some research on using aspirin to prevent bowel cancer, suggesting prevention is possible.

“This research is in mice, not in humans, but it does present the possibility that targeting stem cells could be a route to preventing tumours in people with a very high risk of bowel cancer.

“Cisplatin is a powerful cancer drug that can cause serious side-effects, so we will need to discover whether it can work on pre-cancerous stem cells at very low doses, or whether we can find other drugs that have the same effect but with fewer side-effects.”

Hodder and his colleagues are continuing to test a range of drugs to see if any less harmful alternatives work in the same way as cisplatin, only then could the approach be trialled in people.

Professor Simon Gollins is a Consultant Clinical Oncologist based at The North Wales Cancer Treatment Centre, Glan Clwyd, UK, and Chair of NCRI’s Colorectal Clinical Studies Group, and was not involved with the research. He said: “Studying the faults in genes and cells that precede cancer helps us to understand how cancer develops and therefore how we can treat or even prevent the disease.

“We know that stem cells are found in tumours and that they can be the hardest cancer cells to eradicate. This study of inherited bowel cancer is interesting because it suggests that the way to deal with cancer stem cells may be to treat them much earlier on in the process, perhaps even before cancer has taken hold.”

ENDS

Notes to editors

Abstract number 2024, ‘Effective chemoprevention strategies in APC driven mouse models of intestinal tumourigenesis’, Michael Hodder *et al*, **Proffered papers, 13:00 hrs, Tuesday 6 November 2018, Carron room.**

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About the NCRI Cancer Conference

The NCRI Cancer Conference is the UK’s largest forum showcasing the latest advances in cancer research. The Conference provides a platform for researchers, clinicians, people affected by cancer and industry representatives to come together to discuss, present and showcase high-quality research. Informative and interactive educational sessions attract over 1,500 delegates each year and create the ideal setting to establish new collaborations with key stakeholders in cancer research. The NCRI Cancer Conference is taking place from 4-6 November 2018 at the Scottish Event Campus, Glasgow, UK.

For more information visit https://conference.ncri.org.uk/

About the NCRI

The National Cancer Research Institute (NCRI) is a UK-wide partnership of cancer

research funders, established in 2001. Its 19 member organisations work together to accelerate progress in cancer-related research through collaboration, to improve health and quality of life.

NCRI works to coordinate research related to cancer, to improve the quality and relevance of research and to accelerate translation of research into clinical practice for the benefit of patients.

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