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New treatment options for colon cancer

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Scientists from Nanyang Technological University (NTU Singapore) and Sweden's Karolinska Institutet, one of Europe's largest medical universities, have discovered that an existing chemotherapy drug used to treat leukemia could prevent and control the growth of colorectal tumours.

Existing chemo drug reduced colon tumour growth by half.

Credit: Image courtesy of Nanyang Technological University

Colorectal cancer commonly referred to as colon cancer is one of the three most common cancers worldwide and the most common in Singapore. Almost 95 per cent of colorectal cancers are from malignant tumours.

The research team found that Imatinib, an enzyme blocker widely used to treat leukemia, works by blocking a signalling pathway related to a group of cell receptors called EphB. This means that when used to treat mice with colon tumours, it was able to halve the growth of tumours in the intestines.

The finding is also significant as currently there is no drug available to prevent the recurrence of tumours in the intestine after the cancerous tumours have been removed by surgery.

One of the two principal investigators in the team of 13 international scientists was Prof Sven Pettersson, Professor of Metabolic Disease at NTU's Lee Kong Chian School of Medicine and senior principal investigator with the National Cancer Centre Singapore.

This discovery was published today in the academic journal *Science Translational Medicine*.

"Our work has important clinical implications, since Imatinib is a potentially novel drug for the treatment of tumour formation and cancer progression in patients predisposed to develop colorectal cancer," said Prof Pettersson, who is also a Professor of Host-Microbe Interactions at Karolinska Institutet.

Dr Parag Kundu, a senior research fellow with Prof Pettersson's lab and the first author of the study, said that in their tests, Imatinib was able to block tumour initiation at the stem cell level by half and significantly reduced tumour growth and proliferation.

"In mice which mimicked human colon cancer, Imatinib was shown to prolong their life span," Dr Kundu said. "The drug was also effective in increasing the survival of mice which had late-stage tumours and rectal bleeding."

The same effects were also shown when Imatinib was tested on colon tumour tissues taken from human patients.

Colon cancer usually develops first as benign tumours, which when left untreated turn aggressive, and may spread to

other parts of the body. The main treatment in the early stages of colon cancer is through resection, where the affected section of the intestine is removed through surgery.

The scientists said these findings also suggest that short term intermittent chemotherapies could be possible as a treatment model, as this would substantially reduce the side effects known to occur when Imantinib is given for longer periods.

"Our findings provide experimental evidence that Imatinib treatment did not interfere with the tumour suppressor function of EphB receptors," said Jonas Frisén, Professor of Stem Cell Research at Karolinska Institutet, who co-supervised the study."

This is beneficial as EphB receptors also function to keep the tumour intact, which prevents cancerous cells from spreading to surrounding tissue should the tumour break apart.

Story Source:

The above story is based on materials provided by **Nanyang Technological University**. *Note: Materials may be edited for content and length.*

Journal Reference:

1. P. Kundu, M. Genander, K. Straat, J. Classon, R. A. Ridgway, E. H. Tan, J. Bjork, A. Martling, J. van Es, O. J. Sansom, H. Clevers, S. Pettersson, J. Frisen. **An EphB-Abl signaling pathway is associated with intestinal tumor initiation and growth**. *Science Translational Medicine*, 2015; 7 (281): 281ra44 DOI: 10.1126/scitranslmed.3010567
