

Scientists uncover four different types of bowel cancer

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Bowel cancer can be divided up into four distinct diseases, each with its own set of biological characteristics, a major new study reports.

The research could allow doctors to treat each type of bowel cancer differently - and drive the design of distinct sets of targeted drugs for each type.

Scientists at The Institute of Cancer Research, London, alongside colleagues at research institutes in the US and Europe, brought together the world's largest set of data on bowel cancer in order to classify tumours into the four groups.

The study is published today (Monday) in the journal *Nature Medicine*, and was funded by The Institute of Cancer Research (ICR) itself, along with the NIHR Biomedical Research Centre at The Royal Marsden and the ICR.

Researchers believe that the most immediate implication of their findings will be to help identify patients at risk of developing more serious, fast-growing disease that requires more intensive treatment.

The study combined data from 3,443 patients with bowel cancer from all over the world to form the largest collection of molecular and clinical data on the disease ever assembled - including genetic mutations, gene activity, immune system activation, cell metabolism, cancer cell type and ability to invade neighbouring tissues.

They aimed to group bowel cancers using mathematical algorithms that combined all these parameters, in order to improve on various existing attempts to classify types of the disease based on smaller datasets.

Scientists at the ICR and their colleagues found that 87 per cent of bowel cancers could be robustly assigned to one of the four groups. Tumours within the four 'consensus molecular subtypes', or CMSs, each had a pattern of irregularities that could leave them vulnerable to the same treatment strategy.

Patients with one particular type of bowel tumour - CMS4 - were often diagnosed late (stage III and IV), had high levels of spread to other sites in the body, and had significantly worse [survival rates](#) than the other types.

Patients with another type, CMS2, had much better survival rates even if the cancer had relapsed.

Study co-leader Dr Anguraj Sadanandam, Team Leader in Precision Cancer Medicine at The Institute of Cancer Research, London, said:

"Our study has identified four distinct types of bowel cancer, each with a definite set of genetic and biological characteristics, and some of which are more aggressive and more likely to be fatal than others.

"This could allow doctors to pick out those patients with more aggressive disease and treat them accordingly. Ultimately, it could lead to development of new molecular diagnostic tests to diagnose patients by their particular type of bowel cancer, and give them the most effective treatments for that type.

"Our work is a perfect example of the team science approach that is increasingly being used to tackle the biggest research problems - with collaborators compiling data from around the world to arrive at these new disease classifications."

Professor Paul Workman, Chief Executive of The Institute of Cancer Research, London, said:

"Over the last decade there has been a major change in the way we look at cancer, with an increasing understanding that tumour types such as breast cancer, prostate cancer and now bowel cancer are actually multiple different diseases.

"Our researchers and colleagues around the world have analysed huge amounts of data on the genomics and biology of bowel cancers in order to arrive at this new classification. The findings will allow us to understand the behaviours and weaknesses common to each type of [bowel cancer](#), and to use that information to predict how patients are likely to respond to current treatments and to design tailored approaches to therapy."

More information: The consensus molecular subtypes of colorectal cancer, [DOI: 10.1038/nm.3967](https://doi.org/10.1038/nm.3967)

Provided by Institute of Cancer Research

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