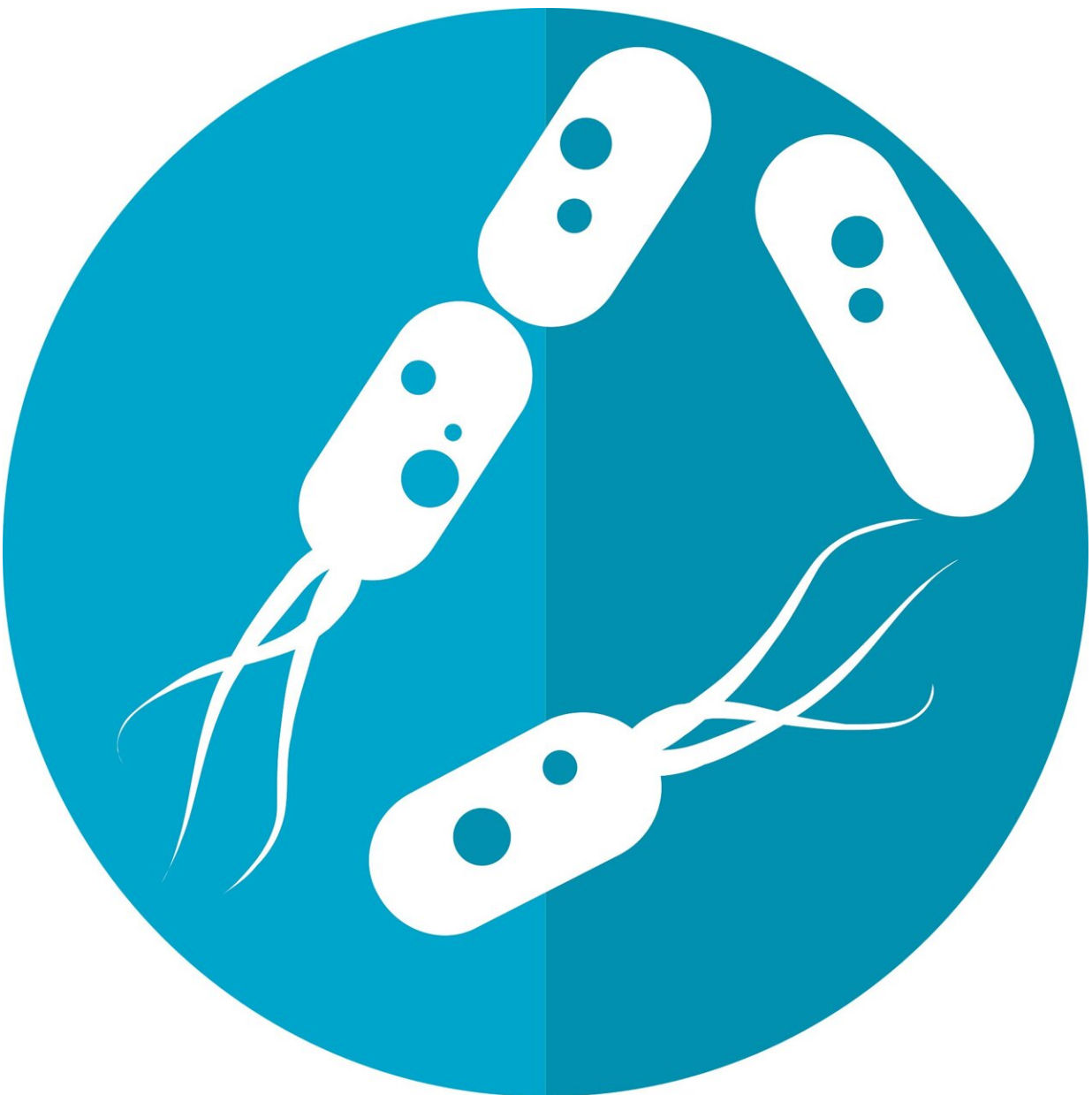


Colorectal cancer surgery: Modifying gut microbiota could reduce postoperative complications

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In a promising study, Canadian researchers have shown for the first time in mice that modifying intestinal flora before surgery could reduce postoperative complications in colorectal cancer patients.

Published in the journal *Gut*, the study by scientists at the CHUM Research Center (CRCHUM) in Montreal identified two [bacterial strains](#) that directly affect whether or not anastomotic leakage, more commonly known as intestinal leakage, occurs.

Up to 30% of patients have serious complications from poor healing of their intestinal barrier after colorectal surgery. Anastomotic complications are responsible for inflammation, serious infection and [cancer](#) recurrence.

It is well known that certain bacteria contribute to the development of [colorectal cancer](#) by producing toxins that damage colon cells or by promoting an accumulation of DNA mutations or intestinal inflammation.

"In our study, we show that two bacterial strains detected in the stools of patients with this type of cancer have opposite effects on intestinal healing and therefore on recovery," said principal author Manuela Santos, a professor at Université de Montréal and immunologist who runs the CRCHUM's Nutrition and Microbiome Laboratory.

"*Alistipes onderdonkii* kh 33, mostly pro-inflammatory, increases the risk of leakage, while the anti-inflammatory effect of *Parabacteroides*

goldsteinii kh 35 fosters healing," said Santos, who conducted her study with her CRCHUM medical colleagues Drs. Carole Richard and Roy Hajjar.

A promising start

The discovery marks a promising start to [scientific exploration](#) in an area of research spearheaded by the three researchers.

"The analysis of patients' [intestinal microbiota](#) showed us that bacterial composition differed depending on the occurrence or not of intestinal leakage," explained Hajjar, a [resident physician](#) and the study's first author.

"Once we transplanted these different microbiota profiles to mice, we found that their risks of [postoperative complications](#) varied greatly. Simply put, the composition of the microbiota had a direct impact on their chances of recovery."

Modifying patients' [intestinal flora](#) a few days before a surgery through a mix of prebiotics and probiotics in an appropriate but yet to be determined formula could therefore form the basis of a new therapeutic approach, he said.

Continuing such a treatment for several days after the operation would also help hasten patients' return to a healthy intestinal microbiota, reduce the length of their stay in hospital, increase their chances of survival and improve their quality of life.

A rich biorepository

To identify these two bacterial strains and facilitate modeling on large volumes of data, the CRCHUM team developed the Biorepository for

Inflammatory and Neoplastic Diseases of the Digestive Tract.

This research biobank contains stool specimens of patients admitted for colorectal cancer who consent to their use for research purposes. At the CHUM, more than 500 patients' cases are followed every year.

"The two bacterial strains identified provide excellent proof-of-concept for the role of specific bacterial species in intestinal healing," said Richard, a surgeon in the CHUM's Service of Digestive Surgery and chief of UdeM's Division of General Surgery.

"Our study, conducted in collaboration with colleagues at McGill University, UQAM and Université de Montréal, also shows that a balance between these two types of bacteria is essential for promoting the restoration of the intestinal barrier," she noted.

Additional research work is now being carried out at the CRCHUM to identify other bacteria associated with intestinal leakage or healing.

Colorectal cancer kills more than 9,500 people every year in Canada. It's the third most frequently diagnosed cancer and the second leading cause of cancer death among Canadian adults.

More information: Roy Hajjar et al, Gut microbiota influence anastomotic healing in colorectal cancer surgery through modulation of mucosal proinflammatory cytokines, *Gut* (2022). [DOI: 10.1136/gutjnl-2022-328389](https://doi.org/10.1136/gutjnl-2022-328389)

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