

Dr Rachel Purcell

Gut bacteria and Colorectal Cancer

I am originally from Ireland, so I began my studies there and then continued them in France. I moved to NZ in 2004 and completed my PhD at the University of Otago in Christchurch and carried out my first Post-Doc research there. I returned to France to work for the World Health Organisation at their cancer research centre in 2012 and I've been back in Christchurch at the University of Otago since 2015.

Colorectal cancer is a huge problem in New Zealand, particularly in the Canterbury region. There's been a lot of recent research that points to a link between the bacteria in our gut and the development of colorectal cancer. Our research group is involved in taking an in-depth look at some of these key bacteria and how they work.

Our colon (or gut) is full of bacteria. Most of these bacteria are good and help with digestion, making vitamins that our bodies need and stopping bad bacteria from growing. Sometimes some of these bad bacteria avoid our bodies' defences and are able to grow in our colons. My research project will study one type of bad bacteria, called ETBF (Enterotoxigenic Bacteroides Fragilis). Some other research groups have already shown that when ETBF grows in our gut, it can make changes in colon cells that may lead to colon cancer. I am studying what genes and proteins are affected by ETBF and how they cause colon cancer.

Understanding how individual bacteria play a role in colorectal cancer development may allow us to develop tests for early-stage disease; the earlier that colorectal cancer is detected, the better the outcome for the patient. Understanding which bacteria are key players in the development of cancer will also help us to develop effective vaccines and preventative strategies for colorectal cancer.



The link between changes in gut bacteria and the development of various diseases, including colorectal cancer, is a hot topic globally and there is a lot of research showing that changes in the overall composition of bacterial communities is important.



We are taking a targeted approach and looking at a particular species of bacteria and the mechanism by which it can cause cancer through inflammation in the gut cells. This is a unique approach.

Demonstrating how this particular bacteria is involved in initiating colorectal cancer may lead to improved screening and preventative options for colorectal cancer.

New Zealand has one of the highest rates of colorectal cancer in the world. The incidence of the disease is increasing, particularly amongst younger people. It's really important that we understand why we have such a high rate in the country, how it happens and what we can do to prevent it. The work we are doing in our lab here in Christchurch will hopefully contribute to more effective screening and prevention of this devastating disease.



In the future, dependent on funding, I'd like to secure a permanent research position, with a goal of one day of heading up my own research group. The support I have received from the Canterbury Medical Research Foundation has been invaluable. I'm very appreciative to all the donors that support this cause.



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