

Unlocking secrets of the immune system could help combat colitis

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Abdominal pain is common in colitis sufferers. Credit: The University of Queensland

Researchers have unlocked secrets of our ancient immune system, a

major scientific advance which could help scientists and clinicians in the global fight against disease.

An international team, including researchers from The University of Queensland, identified interactions between [immune system](#) pathways which could improve the treatment of diseases such as [inflammatory bowel disease](#) (IBD), which affects millions of people worldwide.

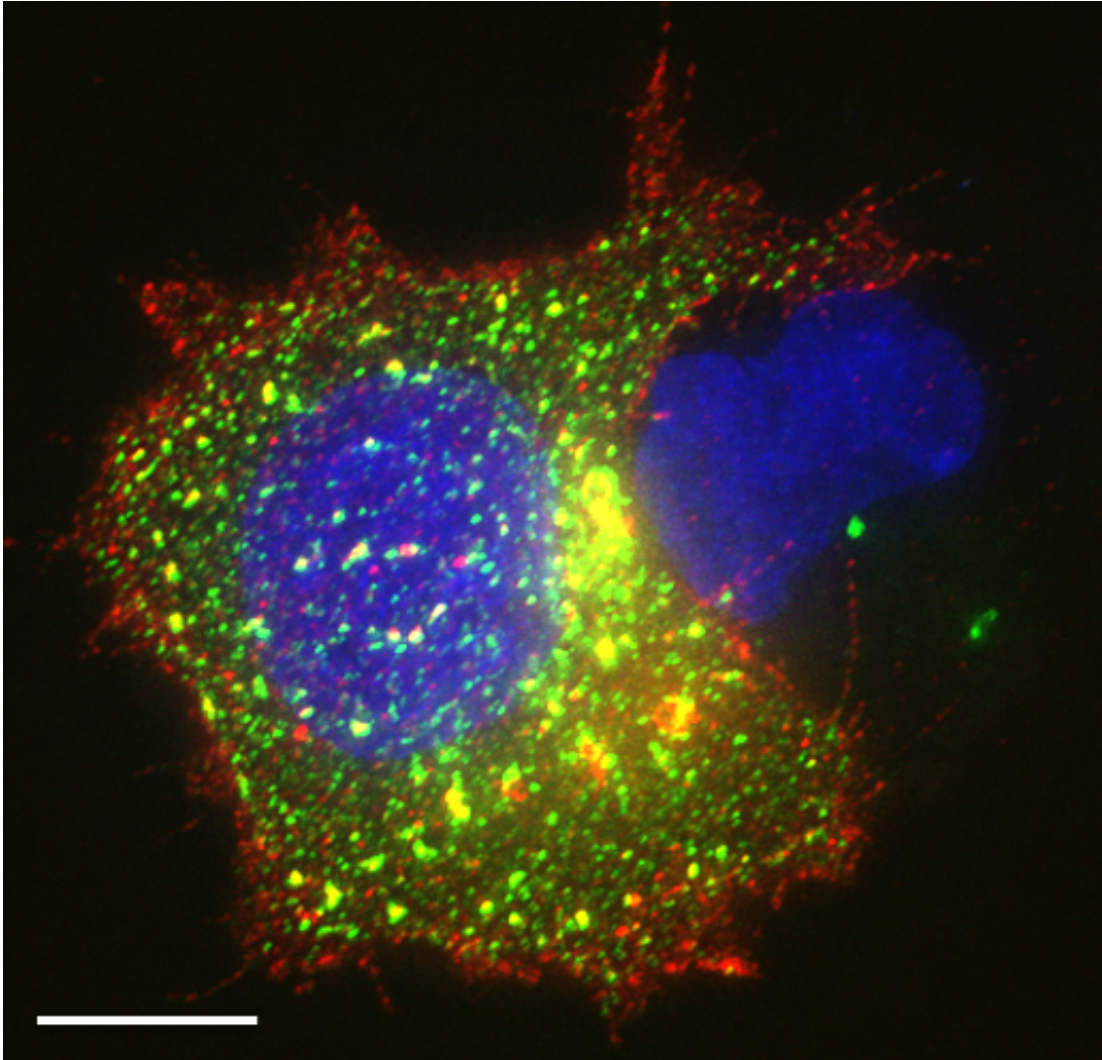
Professor Matt Cooper from UQ's Institute for Molecular Bioscience (IMB) said the immune system is basically comprised of two parts: the adaptive immune system, which produces antibodies against an infection, and a very ancient pathway, known as the innate immune system.

"Innate immunity is so old it goes all the way down to frogs, fish and even insects," Professor Cooper said.

"It stops us getting infections, but it also drives a lot of inflammatory diseases.

"So, in one case it's keeping us alive by stopping the bugs getting us, but if it goes wrong, we start to get diseases like arthritis, multiple sclerosis and IBDs such as colitis.

"Researchers always thought key components of these pathways acted alone, but our teams have discovered they can communicate and work together."



Activated immune cells. Credit: The University of Queensland

The discovery may have significant implications for treating a range of autoimmune and [inflammatory diseases](#).

"Inflammation in diseases such as colitis occurs when the immune system is activated inappropriately, and causes symptoms including pain, diarrhoea, fever and weight loss," Professor Cooper said.

"Current treatments are not always effective, possibly because they are

only blocking one of the key pathways and inflammation still occurs through the other pathway."

Professor Cooper and the international team have developed two small molecules that each block one pathway.

"We have tested these molecules and the results show that they both reduce inflammation when administered separately," he said.

"This work is still in the early stages but we are hopeful our ongoing research will lead to more effective treatments for the millions of IBD sufferers."

The research teams were led by Professor Claudia Kemper from Kings College London, UK and the National Institutes of Health, USA. The teams included Associate Professor Trent Woodruff from UQ's School of Biomedical Sciences, Dr Avril Robertson and Dr Rebecca Coll from IMB, and groups from Ireland and Germany.

This discovery was published in the leading research journal, *Science*, overnight.

More information: T helper 1 immunity requires complement-driven NLRP3 inflammasome activity in CD4+ T cells, *Science*, [DOI: 10.1126/science.aad1210](https://doi.org/10.1126/science.aad1210)

Provided by University of Queensland

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