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Breakthrough on causes of inflammatory bowel disease

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New research by the University of Adelaide could help explain why some people are more prone to Crohn's disease, ulcerative colitis and other autoimmune diseases.

A critical imbalance of the regulatory cells required to control the immune system has been revealed among people suffering inflammatory bowel disease.

In a paper published in the *Journal of Clinical Immunology* this month, Pathology researcher Dr Nicola Eastaff-Leung reveals that people suffering Crohn's disease and ulcerative colitis have fewer numbers of regulatory cells and more "attack" cells that cause inflammation.

"All the food that we eat is foreign to our body," Dr Eastaff-Leung says. "In healthy people the immune system has a mechanism to tolerate these foods and not react. But some people do not have enough of these regulatory cells and their body overreacts and goes into attack mode. That is where the inflammation occurs," she says.

Dr Eastaff-Leung says the results of her recently completed PhD at the University of Adelaide could help provide a diagnostic tool for gastrointestinal diseases, reducing the need for colonoscopies in future.

"If we can establish that all people suffering Crohn's disease and ulcerative colitis have an imbalance of these regulatory cells, we may be able to develop a blood test that confirms suspected cases of these

diseases.

"The second, bigger challenge is to work out a treatment that can restore the balance of these cells and also to find out why this imbalance is happening in the first place."

Dr Eastaff-Leung, who has qualifications in both Pathology and Chinese medicine, says there is evidence to show that diet and lifestyle play a significant role in the development of gastrointestinal disease.

"Inflammatory bowel diseases and a lot of other autoimmune diseases are common in Western cultures but are rarely found in the developing or Third World countries.

"We need to look at our diet and also the obsession in Western countries with cleanliness and antibacterial disinfectants, which has gone overboard. Children need to be exposed to bacteria as they are developing in order to build their immune system naturally," Dr Eastaff-Leung says.

PhD supervisors Associate Professor Simon Barry, from the Discipline of Paediatrics at the University of Adelaide, and Dr Adrian Cummins from the Department of Gastroenterology at the Queen Elizabeth Hospital, believe the ongoing study of regulatory immune cells could help pinpoint the causes of a range of diseases, including multiple sclerosis, rheumatoid arthritis, Type 1 diabetes and even asthma.

"In all autoimmune diseases, the immune system accidentally starts to attack tissues and organs that it should normally leave alone. The regulatory cells are obviously not doing their job and we need to understand why," Dr Barry says.

Dr Eastaff-Leung will spend the next 12 months working with Assoc.

Prof. Barry developing a novel biomarker for these regulatory immune cells in collaboration with Professor Heddy Zola from the Cooperative Research Centre for Biomarker Translation.

"We are going to see if we can add a new layer of sophistication to this research," Assoc. Prof. Barry says. "If the new biomarker is a protein that plays an important functional role we can work on that to restore the balance in the immune system."

More than 700,000 individuals are living with inflammatory bowel disease in the US, UK and Australia.

Provided by University of Adelaide