

Gene discovery reveals importance of eating your greens

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Ms Lucie Rankin (left) and Dr Joanna Groom were part of a team that discovered innate lymphoid cells (ILCs) play a crucial role in controlling food allergies, inflammation, obesity and even bowel cancers.

(Medical Xpress)—Eating your greens may be even more important than previously thought, with the discovery that an immune cell population essential for intestinal health could be controlled by leafy greens in your diet.

The [immune cells](#), named innate lymphoid cells (ILCs), are found in the lining of the [digestive system](#) and protect the body from 'bad' bacteria in the intestine. They are also believed to play an important role in controlling food allergies, [inflammatory diseases](#) and obesity, and may even prevent the development of bowel cancers.

Dr Gabrielle Belz, Ms Lucie Rankin, Dr Joanna Groom and colleagues from the Walter and Eliza Hall Institute's Molecular Immunology division have discovered the gene T-bet is essential for producing a population of these critical immune cells and that the gene responds to signals in the food we eat.

Dr Belz said the research team revealed T-bet was essential for generating a subset of ILCs which is a newly discovered cell type that protects the body against infections entering through the digestive system. "In this study, we discovered that T-bet is the key gene that instructs [precursor cells](#) to develop into ILCs, which it does in response to signals in the food we eat and to bacteria in the gut," Dr Belz said. "ILCs are essential for [immune surveillance](#) of the digestive system and this is the first time that we have identified a gene responsible for the production of ILCs."

The research was published today in the journal [Nature Immunology](#).

Dr Belz said that the proteins in green leafy (cruciferous) vegetables are known to interact with a [cell surface receptor](#) that switches on T-bet, and might play a role in producing these critical immune cells. "Proteins in these [leafy greens](#) could be part of the same signalling pathway that is used by T-bet to produce ILCs," Dr Belz said. "We are very interested in looking at how the products of these vegetables are able to talk to T-bet to make ILCs, which will give us more insight into how the food we eat influences our immune system and gut bacteria."

ILCs are essential for maintaining the delicate balance between tolerance, immunity and inflammation. Ms Rankin said the discovery had given the research team further insight into external factors responsible for ILC activation. "Until recently, it has been difficult to isolate or produce ILCs," Ms Rankin said. "So we are very excited about the prospect for future research on these cells which are still poorly

understood."

ILCs produce a hormone called interleukin-22 (IL-22), which can protect the body from invading bacteria, Dr Belz said. "Our research shows that, without the gene T-bet, the body is more susceptible to bacterial infections that enter through the digestive system. This suggests that boosting ILCs in the gut may aid in the treatment of these bacterial infections," she said.

ILCs help to maintain a 'healthy' environment in the intestine by promoting good bacteria and healing small wounds and abrasions that are common in the tissues of the gut. They may also have a role in resolving cancerous lesions. "The discovery of these immune cells has thrown open a completely new way of looking at gut biology," Dr Belz said. "We are just starting to understand how important these immune cells are in regulating allergy and inflammation, and the implications for bowel cancer and other gastrointestinal disorders such as Crohn's disease," she said.

"Understanding the biology of ILCs and the genes that are essential for generating them will help us to develop methods of targeting these cells," Dr Belz said. "This might include boosting ILCs in situations where they may not be active enough, such as infections or some cancers, or depleting them in situations where they are overactive, such as chronic inflammatory disease," she said.

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More information: www.nature.com/ni/journal/vaop...ent/abs/ni.2545.html

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