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Leafy greens may boost gut immunity: Study



By Nathan Gray+
05-Mar-2013

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Immune cells that play an essential role in protecting intestinal health and could be boosted by consuming leafy greens, say researchers.

The new study finds that dietary factors, and in particular consumption of cruciferous leafy greens, control the activity of vital immune cells through the activation of a particular gene known as T-bet.

These immune cells, known as innate lymphoid cells (ILCs), play a vital role in protecting the body from infection by 'bad' pathogenic bacteria in our gut - and have also been suggested to play an important role in controlling food allergies, inflammatory diseases, obesity, and even bowel cancers, say the researchers writing *Nature Immunology*.

"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 Gabrielle Belz from the Walter and Eliza Hall Institute, Australia.

"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."

Belz said that the proteins in cruciferous vegetables are known to interact with a cell surface receptor that switches on T-bet - and might therefore play a role in producing these critical immune cells.



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"Proteins in these leafy greens could be part of the same signalling pathway that is used by T-bet to produce ILCs," she said.

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"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."

Delicate balance

Belz and her team noted that ILCs are essential for maintaining the delicate balance between tolerance, immunity and inflammation – by producing a hormone called interleukin-22 (IL-22), which can protect the body from invading bacteria.

"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.

"Our research shows that, without the gene T-bet, the body is more susceptible to bacterial infections that enter through the digestive system," Belz added. "This suggests that boosting ILCs in the gut may aid in the treatment of these bacterial infections."

Source: *Nature Immunology*

Published online ahead of print, doi:10.1038/ni.2545

"The transcription factor T-bet is essential for the development of NKp46+ innate lymphocytes via the Notch pathway"

Authors: Lucille C Rankin, Joanna R Groom, Michaël Chopin, Marco J Herold, et al

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