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Virus triggers allergic reaction to gluten

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Gluten allergy in coeliac disease may be provoked by virus

Virus triggers allergic reaction to gluten

A COMMON, symptomless virus could be responsible for triggering coeliac disease.

This painful autoimmune condition involves the immune system mistakenly attacking gluten - a protein found in wheat, rye and barley - and damaging the gut. Coeliac disease is generally thought to be a genetic disease, but there is some evidence that its onset may be linked to infection with cold-causing adenoviruses or hepatitis C.

Now Bana Jabri at the University of Chicago and her colleagues have obtained the first experimental evidence that a virus can cause the immune system to stop tolerating certain molecules in our food. The group found that exposing mice to a common reovirus called T1L destroys their tolerance of gluten.

When the team fed gliadin - a component of gluten - to mice, the animals produced two to three times as many antibodies against the compound over the next two days if they were also infected with reovirus (Science, doi.org/b5cq).

And mice infected with the T1L virus had between two to four times as much of an inflammatory molecule called interferon regulatory factor 1 in their bodies. This molecule is seen at high levels in the gut linings of children with coeliac disease, and has also been implicated in instigating the condition's onset.

"The reovirus changes the way the immune system sees gluten," says Jabri. "Instead of mounting a tolerant, non-aggressive response, the immune system in the presence of the reovirus views gluten as being dangerous, promoting a destructive inflammatory response."

Gluten is more likely than most other foodstuffs to trigger immunological problems, because it resists being broken down in the gut, says Jabri. Gliadin is the most difficult component of gluten to digest.

"This is a fascinating study," says David Sanders at the University of Sheffield, UK. "Investigators have studied this 'second-hit' hypothesis for some time to explain why not everyone with genetic predisposition actually develops the disease. Now the new study suggests that reoviruses might play a role."