

New study links protein in wheat to the inflammation of chronic health conditions

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Scientists have discovered that a protein in wheat triggers the inflammation of chronic health conditions, such as multiple sclerosis, asthma and rheumatoid arthritis, and also contributes towards the development of non-coeliac gluten sensitivity.

With past studies commonly focusing on gluten and its impact on digestive health, this new research, presented at UEG Week 2016, turns the spotlight onto a different family of proteins found in wheat called amylase-trypsin inhibitors (ATIs). The study shows that the consumption of ATIs can lead to the development of inflammation in tissues beyond the gut, including the [lymph nodes](#), kidneys, spleen and brain. Evidence suggests that ATIs can worsen the symptoms of [rheumatoid arthritis](#), [multiple sclerosis](#), [asthma](#), lupus and non-alcoholic fatty liver disease, as well as [inflammatory bowel disease](#).

ATIs make up no more than 4% of wheat proteins, but can trigger powerful immune reactions in the gut that can spread to other tissues in the body. Lead researcher, Professor Detlef Schuppan from the Johannes Gutenberg University, Germany, explains, "As well as contributing to the development of bowel-related inflammatory conditions, we believe that ATIs can promote inflammation of other immune-related chronic conditions outside of the bowel. The type of gut inflammation seen in non-coeliac gluten sensitivity differs from that caused by coeliac disease, and we do not believe that this is triggered by gluten proteins. Instead, we demonstrated that ATIs from wheat, that are also contaminating commercial gluten, activate specific types of immune

cells in the gut and other tissues, thereby potentially worsening the symptoms of pre-existing inflammatory illnesses".

Clinical studies are now due to commence to explore the role that ATIs play on [chronic health conditions](#) in more detail. "We are hoping that this research can lead us towards being able to recommend an ATI-free diet to help treat a variety of potentially serious immunological disorders" adds Professor Schuppan.

ATIs and Non-Coeliac Gluten Sensitivity

Further to inflaming chronic health conditions outside of the bowel, ATIs may contribute to the development on non-coeliac gluten sensitivity. This condition is now an accepted medical diagnosis for people who do not have coeliac disease but benefit from a gluten free diet. Intestinal symptoms, such as abdominal pain and irregular bowel movements, are frequently reported, which can make it difficult to distinguish from IBS. However, extraintestinal symptoms can assist with diagnosis, which include headaches, joint pain and eczema. These symptoms typically appear after the consumption of gluten-containing food and improve rapidly on a gluten-free diet. Yet, gluten does not appear to cause the condition.

Professor Schuppan hopes that the research will also help to redefine non-coeliac gluten sensitivity to a more appropriate term. He explains, "Rather than non-coeliac gluten sensitivity, which implies that gluten solitarily causes the [inflammation](#), a more precise name for the disease should be considered."

More information:

- Zevallos V, Weinmann-Menke J, Meineck M et al. Alpha-amylase/trypsin inhibitors (ATIs) accelerate murine systemic

lupus erythematosus. Poster presentation at the 16th International Coeliac Disease Symposium, 21–24 June 2015, Prague, Czech Republic. Poster P168.

- Zevallos V, Yogev N, Nikolaev A et al. Consumption of wheat alpha-amylase/trypsin inhibitors (ATIs) enhances experimental autoimmune encephalomyelitis in mice. Oral presentation at the 16th International Coeliac Disease Symposium, 21–24 June 2015, Prague, Czech Republic.
- Junker Y, Zeissig S, Kim S-J et al. Wheat amylase trypsin inhibitors drive intestinal inflammation via activation of toll-like receptor 4. *J Exp Med* 2012;209(13):2395-408.
- Fasano A, Sapone A, Zevallos V et al. Nonceliac gluten and wheat sensitivity. *Gastroenterology* 2015;148(6):1195-204.
- Schuppan D, Pickert G, Ashfaq-Khan M et al. Non-celiac wheat sensitivity: Differential diagnosis, triggers and implications. *Best Pract Res Clin Gastroenterol* 2015;29(3):469–76.

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