

How probiotic Bifidobacteria could help celiac disease patients

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Gluten is enemy No. 1 for those with celiac disease, and it's hard to avoid. Episodes of this chronic autoimmune illness can be triggered by ingesting gluten, a key protein in wheat and some other grains.

Researchers have been exploring how gut bacteria, especially *Bifidobacteria*, could be used as a treatment. Now, scientists publishing the results of laboratory experiments in ACS' *Journal of Agricultural and Food Chemistry* report how specific types of *Bifidobacteria* work.

Humans have many types of bacteria living in their digestive systems, but those with [celiac disease](#) have altered levels of "beneficial" and "harmful" [gut bacteria](#). And even if they stick to a strict gluten-free diet, celiac disease patients typically cannot reestablish an ideal gut microbiome on their own. In particular, the levels of bacteria in the *Bifidobacteria* family are lower in those with the condition than in healthy individuals. These bacteria can chop up gluten proteins into smaller fragments that are not as triggering or damaging in patients, which has led researchers to try using the microbes as a probiotic to treat gastrointestinal diseases. So Edson Rodrigues-Filho, Natália E. C. de Almeida and colleagues set out to see exactly how various *Bifidobacteria* strains break down gluten peptides and what effect these smaller gluten-derived peptides would have on the [immune response](#).

The researchers extracted gluten proteins from wheat flour and cultivated four strains of the *Bifidobacteria* family, both separately and in one large group. In an artificial intestinal environment, *B. longum* chopped up gluten proteins into the most fragments, compared to the other strains and the mixture of all four strains. From there, the team analyzed the cytotoxic and [inflammatory responses](#) to the various peptides, and found that those from the *B. longum* strain caused the least harm to intestinal cells in petri dishes. These results mark the first identification of specific gluten-derived peptides generated directly from intact gluten proteins by *Bifidobacteria* activity and the immunological responses to them by human cells, paving the way for new treatments and better patient outcomes, say the researchers.

More information: Natália Ellen Castilho de Almeida et al. Digestion

of Intact Gluten Proteins by Bifidobacterium Species: Reduction of Cytotoxicity and Proinflammatory Responses, *Journal of Agricultural and Food Chemistry* (2020). [DOI: 10.1021/acs.jafc.0c01421](https://doi.org/10.1021/acs.jafc.0c01421)

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