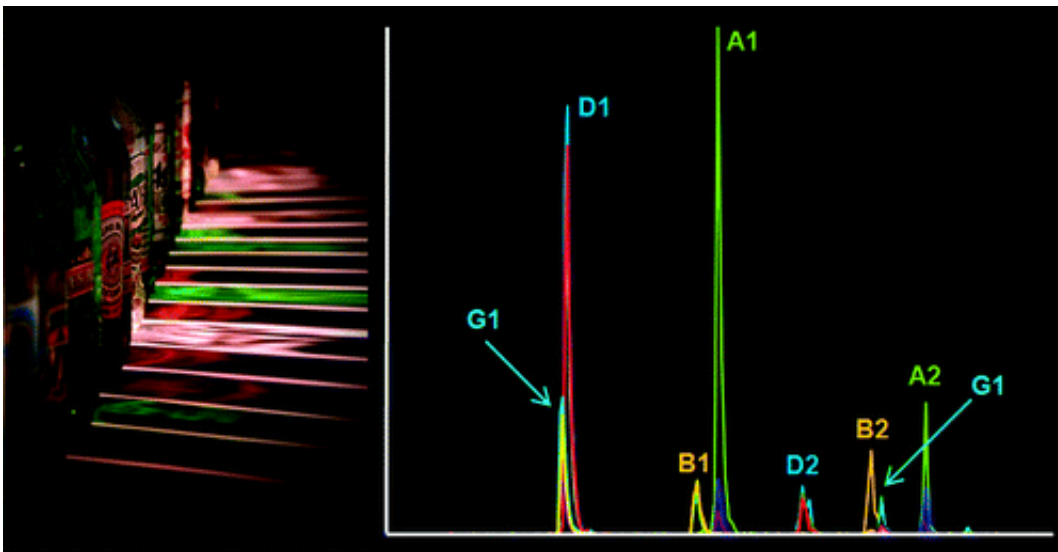


Some 'low-gluten' beer contains high levels of gluten

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Beer tested in a new study, including some brands labeled "low-gluten," contains levels of hordein, the form of gluten present in barley, that could cause symptoms in patients with celiac disease (CD), the autoimmune condition treated with a life-long gluten-free diet, scientists are reporting. The study, which weighs in on a controversy over the gluten content of beer, appears in *ACS' Journal of Proteome Research*.

Michelle Colgrave and colleagues explain that [celiac disease](#) (CD) affects more than 2 million people worldwide. Gluten, a protein found in

foods and beverages made from barley, wheat and rye triggers a reaction in CD patients that affects the small intestine, blocking the absorption of [essential nutrients](#) from food. Symptoms vary, but often include diarrhea or constipation, fatigue and abdominal pain. The cause is unknown, and there is no cure. The only treatment is to stay on a life-long gluten-free diet. Barley is used to make beer, but whether the finished product contains gluten is controversial, with some beer companies contending that the brewing process gets rid of gluten or reduces it to very low levels. Existing tests for detecting gluten in malted products are not very accurate. So the scientists developed a highly accurate new test for hordein, the gluten component in barley-based beers.

As expected, their analysis of 60 commercial beers found that eight labeled "gluten-free" did not contain gluten. But many regular, commercial beers had significant levels of gluten. Most surprising, two beers labeled as "low-gluten" had about as much gluten as regular beer.

More information:

What is in a Beer? Proteomic Characterization and Relative Quantification of Hordein (Gluten) in Beer, *J. Proteome Res.*, Article ASAP [DOI: 10.1021/pr2008434](https://doi.org/10.1021/pr2008434)

Abstract

The suite of prolamin proteins present in barley flour was characterized in this study, in which we provide spectral evidence for 3 previously characterized prolamins, 8 prolamins with only transcript evidence, and 19 genome-derived predicted prolamins. An additional 9 prolamins were identified by searching the complete spectral set against an unannotated translated EST database. Analyses of wort, the liquid extracted from the mashing process during beer production, and beer were undertaken and a similar suite of prolamins were identified. We have demonstrated by using tandem mass spectrometry that hordeins are indeed present in beer despite speculation to the contrary. Multiple reaction monitoring (MRM)

mass spectrometry was used for the rapid analyses of hordein in barley (*Hordeum vulgare* L.) beer. A selection of international beers were analyzed and compared to the results obtained with hordein deletion beers. The hordein deletion beers were brewed from grains carrying mutations that prevented the accumulation of either B-hordeins (Risø 56) or C-hordeins (Risø 1508). No intact C-hordeins were detected in beer, although fragments of C-hordeins were present in wort. Multiple reaction monitoring analysis of non-barley based gluten (hordein)-free beers targeting the major hordein protein families was performed and confirmed the absence of hordein in several gluten-free commercial beers.

Provided by American Chemical Society

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