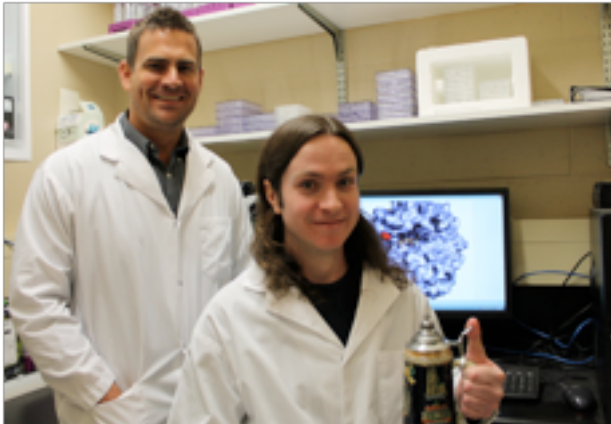




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Beer and bread yeast-eating bacteria could open door to better health in both humans and livestock

It turns out that eating fermented food and drink, including beer, for the past 7,000 years has led to the evolution of bacteria that may hold the key to strengthening the immune system in both humans and livestock.



A team of international researchers, led by Harry Gilbert of Newcastle University, Eric Martens of the University of Michigan, and University of Lethbridge adjunct professor Wade Abbott of Agriculture and Agri-Food Canada (AAFC), has discovered that certain strains of bacteria in the human gut – *Bacteroides thetaiotaomicron* (Bt) – have developed a taste for yeast.

Publishing their findings in *Nature* the world's most cited interdisciplinary science journal, the team of researchers say that the discovery of Bt's ability to break down complex carbohydrates could accelerate the development of prebiotic medicines to help humans suffering from bowel problems and autoimmune diseases and potentially improve animal health and production.

A prebiotic is a nutrient that feeds beneficial bacteria and is typically a carbohydrate that we cannot metabolize. The ability of these microbes to degrade the almost impenetrable wall of complex carbohydrates surrounding yeast cells, known as mannan, is significant.

“Conversion of indigestible carbohydrates, such as yeast mannan, into beneficial molecules for their host has been associated with combating intestinal diseases, promoting correct immune responses and helping to maintain healthy tissues,” says Abbott, who teaches chemistry and biochemistry at the U of L.

By identifying the complex machinery that targets yeast carbohydrates, researchers now have a better understanding of how our intestinal tract can obtain nutrients from our diet. For humans, this discovery could mean the development of new prebiotic medicines and treatments against yeast infections and bowel diseases such as Crohn’s.

“People are very interested in developing dietary regimes where good bacteria are of benefit,” says Gilbert, in a Newcastle University news release. “When you have certain bacteria dominant in the gut, these microorganisms can produce molecules which have health promoting effects.”

Understanding the role of intestinal bacteria in livestock could result in next-generation innovations – such as alternatives to antibiotic growth promoters – potentially improving animal health and production, and thus positively impacting the safety, sustainability and profitability of Canada’s agricultural sector, says an AAFC release.

The study also involved U of L master's student Richard McLean, who was given the opportunity to work on the project as an undergraduate student while taking an Applied Studies course with Abbott.

“We needed to crystalize an enzyme in order to solve its structure,” says Abbott of McLean’s research focus. “Three other researchers had been working previously at trying to crystalize this protein, including myself, and for some reason, he had the knack and was able to pull it off and we were subsequently able to get a structure out of it.”

The entire research team contributing to the study represents the following institutions: Newcastle University (UK); University of Georgia; University of Lethbridge; University of Michigan; University of York; University of Melbourne; University of Kansas; Oxyrane (Belgium); University of Victoria; United States Department of Agriculture; and Agriculture and Agri-Food Canada.

To view a feature story on master’s student Richard McLean, visit: <http://www.uleth.ca/unews/article/journey-academic-success-doesnt-always-follow-same-path>

To view the Nature article, visit: <http://www.nature.com/nature/journal/v517/n7533/full/nature13995.html>

To view the Newcastle University news release, visit: <http://www.ncl.ac.uk/press.office/press.release/item/beer-and-bread-yeast-eating->

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