

A sticky solution for identifying effective probiotics

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Scientists have crystallised a protein that may help gut bacteria bind to the gastrointestinal tract. The protein could be used by probiotic producers to identify strains that are likely to be of real benefit to people.

"Probiotics need to interact with cells lining the gut to have a beneficial effect, and if they attach to surfaces in the gut they are more likely to stick around long enough to exert their activity," says Dr Nathalie Juge from the Institute of Food Research. IFR is an Institute of the Biotechnology and Biological Sciences Research Council, which funded the research.

The gut is the largest immune system organ in the body. The cells lining the gut are covered in a protective layer of mucus that is continuously renewed by specialised cells. As well as protecting the gut lining, mucus provides an attachment site for beneficial [bacteria](#) that help maintain normal gut function.

Mucus adhesion has been well studied for pathogenic bacteria, but precisely what enables commensal (our gut bacteria) bacteria to stick is not known. In a paper published in the [Journal of Biological Chemistry](#), IFR and University of East Anglia scientists have obtained the first [crystal structure](#) of a mucus-binding protein.

The protein was obtained from a strain of *Lactobacillus reuteri*, a lactic acid bacterium naturally found in the gastrointestinal tract. Lactic acid

bacteria are the most common microorganisms used as probiotics.

These mucus-binding proteins are more abundant in lactic acid bacteria than other types and particularly in strains that inhabit the gut. The presence of the proteins may contribute to the ability of [lactic acid](#) bacteria to interact with the host.

The team of scientists found that these mucus-binding proteins also recognise human immunoglobulin proteins. These are an integral part of the immune system. Mucus-binding proteins may therefore also play a wider role in gut health as a site of attachment for bacteria.

"The strain-specificity of these proteins demonstrates the need for the careful molecular design and selection of probiotics," says Dr Juge.

"This also opens new avenues of research to study the fundamental roles [bacteria](#) play in the gastrointestinal tract."

Source: Norwich BioScience Institutes

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