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Researchers further understanding of how gut bacteria regulate weight gain

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Researchers at the Alimentary Pharmabiotic Centre in University College Cork have discovered how gut bacteria communicate with their host to specifically regulate weight gain and serum cholesterol levels. The research, funded by Science Foundation Ireland, has implications for the rational selection and design of probiotics for the control of obesity, high cholesterol and diabetes.

The findings are published this week in the *Proceedings of the National Academy of Sciences*.

The team led by Dr. Cormac Gahan and Dr. Susan Joyce has analysed a bacterial protein that modifies bile acids (a major component of bile secretions) in the gut. This protein, bile salt hydrolase, is commonly made by gut bacteria and functions to change the chemical properties of bile acids in the gut. The research team has shown that specifically increasing levels of this protein reduces serum cholesterol levels and weight gain in mice. The group are currently exploring the relevance of these findings to humans.

"Recent work by other groups has shown that bile acids act as signalling molecules in the host, almost like a hormonal network, with an ability to influence host metabolism. What we have done is to show that a specific mechanism exists by which bacteria in the gut can influence this process with significant consequences for the host," commented Dr Gahan.

Dr Joyce added "the findings may be used as a basis for the future

selection of probiotics or dietary interventions which target this mechanism to regulate weight gain or high cholesterol. We now have the potential for matching probiotic strains with specific end-user needs. Work is underway to determine how this system operates in humans."

More information: Susan A. Joyce, John MacSharry, Patrick G. Casey, Michael Kinsella, Eileen F. Murphy, Fergus Shanahan, Colin Hill, and Cormac G. M. Gahan. "Regulation of host weight gain and lipid metabolism by bacterial bile acid modification in the gut." *PNAS* 2014 ; published ahead of print May 5, 2014,. DOI: 10.1073/pnas.1323599111

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