A specially tailored gut microbiome alleviates hyperammonemia in mice

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The microbiome of the human intestine consists of a variety of bacteria that assist in digestion, immune regulation, and other processes that are critical for human health. A subset of these bacteria produces urease, an enzyme that converts the waste product urea into ammonia. Ammonia supports a variety of physiological process. However, individuals with liver disease have excess ammonia in the blood, a condition referred to as hyperammonemia, that can cause neurotoxicity and hepatic encephalopathy. Current treatments for hyperammonemia-associated symptoms are limited and have several negative side effects.

A new study in the *Journal of Clinical Investigation* demonstrates that alteration of the gut microbiome in mice can alleviate symptoms of hyperammonemia. Gary Wu and colleagues at the University of Pennsylvania engineered and transplanted a bacterial population with low urease expression into the guts of mice with liver disease. These altered bacteria steadily populated the gut, and were able to reduce circulating ammonia levels, mortality, and neurobehavioral abnormalities in animals with liver disease.

The results of this study suggest that the microbiome can be engineered to reduce symptoms of certain diseases.

More information: Engineering the gut microbiota to treat hyperammonemia, *J Clin Invest.* 2015;125(7):2841–2850. DOI: 10.1172/JCI79214

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