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## How Can We Change Gut Microbiota for Healthy Lives?

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Many different theories have been suggested for how we can live long healthy lives. One of these theories suggests that the species of bacteria in our gut (gut microbiota or microbiome) are a good indicator of health.

So, how can we support and grow beneficial bacteria in our guts? Using animal models and testing different diets and probiotics on the elderly and young-healthy controls, Tran and colleagues reported that diet drives big changes in gut microbiota. They concluded that diet can be used as a potential approach for extending health-span in the elderly.

In this study, researchers colonized mice with human microbiomes from two groups; healthy young people and the elderly. For 8 weeks the mice were fed two diets (4 weeks each): one with high-fiber/low-fat and one with low-fiber/high-fat. This experiment showed that the bacteria in the gut changed depending on the diet. They found that high-fiber/low-fat drove good changes in the bacteria. After one day of this diet researches started to see more “good bacteria”. Based on the diets, they were able to predict the final microbiome at the end of the experiments.

Over the course of this experiment, the microbes of the humanized mice remained closer to those of the human donors, indicating that these results can be a good model for humans. In humans, the gut microbiota interacts with the innate immune system and changes to the diet could potentially lead to an immune system reaction. In this study, change to a low-fiber/high-fat diet led to increased levels of inflammation in the body. This inflammation could potentially lead to health problems and even decrease health-span.

In addition, this study investigated the effect of five prebiotics (wheat dextrin, resistant starch, polydextrose, soluble corn fiber, and galactooligosaccharides) on human gut microbiota. Probiotics are food, which promotes growth of bacteria. Participants also took a food frequency questionnaire (FFQ) to measure their typical food diversity, since it might affect the microbial gut diversity. The results concluded that prebiotics alone cannot drive a big change in microbiome composition and health are unlikely to extend health-span in the elderly.

This study suggests an association between gut microbiota, diet, and immune response in animal models and humans. Moreover, this study showed that supplementation with prebiotics, at least at the supplementation levels and types used by Tran and colleagues, had much weaker effects. Therefore, a switch to a high-fiber/low-fat diet could improve our gut microbiome. Changes in diet could even decrease inflammation in the body and increase health-span in the elderly.