

The importance of human gut in human health

Agence France-Presse

The human digestive track, host to an ecosystem teeming with trillions of living bacteria, comes in three variations as distinct as blood groups, according to a study released Wednesday.



These so-called "enterotypes" are found in populations worldwide and exist independent of race, country of origin, diet, age or state of health, the study reported.

The findings have major implications for detecting and predicting the risk of diseases ranging from intestinal cancers to diabetes to Crohn's disease, a painful inflammation of the bowels, the researchers said.

They also showed that certain strains of bacteria -- varying in concentration across the three intestinal types -- boost the likelihood of obesity, a discovery that could help explain why some people struggle more than others to shed excess weight.

"The more efficiently the bacteria extract energy from food, the greater the chance that the person has a high BMI," or body-mass index, said co-author Stanislav Dusko Ehrlich, a professor at France's National Agronomy Research Institute.

"Looking at the genes of the microbiota tells us with much greater precision than looking at the genes of the individual if someone is obese or not," he told AFP.

BMI measures deviation from optimal levels of body fat.

The study, published in *Nature*, could also help scientists tailor treatments for certain diseases to the intestinal profile of the patient.

"The three gut types explain why the uptake of medicines and nutrients vary from person to person," said Jeroen Raes, a researcher at VIB-Vrije Universiteit Brussel, and a co-author of the study.

"This knowledge could form the basis of personalised medicine with treatments and doses determined on the basis of gut type," he said.

Some 100 trillion bacteria -- up to 1,000 different species -- live inside our intestines, where they play a crucial role in converting food into energy and protected us from pathogens.

In exchange, our digestive track provides these single-celled guests with food and shelter.

This symbiosis is a crucial element of human health, but when disrupted can lead to disorders with consequences ranging from poor digestion to death.

"Certain species of bacteria can become overly abundant, while others can disappear. It can happen at any point in one's life," said Ehrlich in an interview.

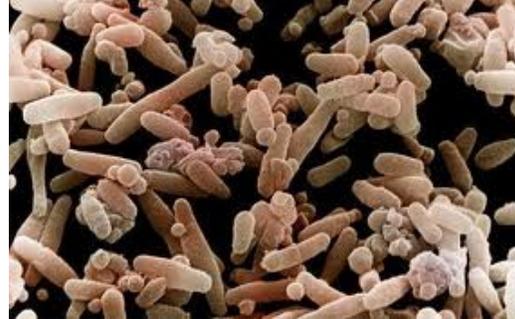
Researchers can now aim to design treatments that seek to stimulate "good" bacteria, or inhibit the growth of those that do us harm, in order to reestablish a balance, he said.

"We can even imagine one day 'transplanting' the microbiota of a healthy individual into that of a patient suffering from a serious disease," he added.

The three types -- called bacteroides, prevotella and ruminococcus -- are named for the bacteria that dominate the intestines in each case.

"Ecosystems have a tendency to evolve toward a stable equilibrium, with certain species becoming dominant while others occupy niches.

"This also appears to apply to our intestines," said Raes, comparing the microbiota in the human gut to forests, tundra or tropical jungles.



It is still unclear whether a person can switch from one group to another over the course of a lifetime, the researchers said.

The study found that vitamin production also varied sharply among the three gut types.

People in the bacteroides group were better able to generate vitamin C, B2 and B5, while those in the prevotella group showed higher levels of B1 and folic acid.

The researchers cautioned that the results, while robust, were based on samples from several hundred people, and that further research is needed to determine if there are additional types of bacterial ecosystems in the gut. For those who care to learn more about the physiology of the human digestive system you may [click here](#).

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