

# Gut Flora? Great!

**Maintaining a balance of microorganisms can help strengthen your overall health.**

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You may use antibacterial dish soap and wash your hands every time you sneeze, but Jeffrey Gordon wants you to know that you're crawling with germs. Gordon, the director of the Center for Genome Sciences at Washington University in St. Louis, studies bacteria and ancient forms of single-celled life called archaea--and no matter how clean you think you are, your gut would make him a pretty good laboratory. It's oozing with 750 trillion bacteria and archaea, and there's very little you can do about it.

Then again, you probably wouldn't want to do anything about it, because those little guys are good for you. The microbes in your gut have genes of their own, and, as scientists are now learning, those genes are essential to the body's functioning. Gut flora help the immune system ward off more-dangerous bugs; they break down nutrients; they may even manipulate how the body stores fat. If doctors could control the flora, they might be able to stave off disease with a completely new toolbox. Meanwhile, maintaining a good balance of microorganisms through diet turns out to be an easy way to strengthen your overall health.

To some degree, people already manipulate their own gut flora in their everyday lives. "The gut is the central sensor for the outside world. Everything that comes from outside ultimately is going to end up there," says University of Michigan immunologist Gary Huffnagle. Some of the gut flora breeze into the body through the nose, while others take the more direct route to the colon, along with food.

Scientists have decoded only about 10 percent of the bacteria, but the ones they know about are exceedingly important to health. Most obviously, the gut flora help the body digest food it otherwise couldn't. Like all organisms, they break down nutrients in order to survive. Three years ago Mark Schell, a microbiologist at the University of Georgia, found that *Bifidobacterium longum* has several hundred genes for breaking apart sugars found in many common human foods, including breast milk. Without the gut flora, those sugars would pass through the human digestive tract; with the flora's help, humans can reap calories and energy from them. The gut flora also interact with the immune system, "teaching" it not to overreact to intruders that should be harmless, like allergens. So-called germ-free mice, stripped of their gut flora, are vulnerable to infections and react badly to potential allergens that don't cause problems in regular mice. Once their gut flora are restored by researchers, their tolerance returns.

Culture may promote unhealthiness. Gordon has argued that the fast-food-heavy Western diet predisposes people to obesity by promoting some gut microorganisms over others. Schell's studies have suggested that a veggie-heavy diet is linked with high levels of *B. longum*, which breaks down plant materials, while diets heavy on meat might suppress the bacterium. Some foods that encourage gut-flora growth--fiber, fruit and veggie skins, some spices and herbs--are now rare in many people's daily diets. Overuse of antibiotics may also be destroying gut flora.

Luckily, there are several ways to restore the microbial balance. Lately, docs have been taking an interest in probiotic supplements, which may help control infections. In a recent German study, subjects taking three probiotics found that their colds were shorter and less severe. Probiotics may even help ward off some of the most dangerous germs, like *Clostridium difficile*, a nasty bug that sometimes infects the colon after hospital patients are given strong antibiotics. To avert off *Clostridium*, some docs are experimentally dosing their patients with gut flora. Probiotic supplements are becoming more common in health-food stores, too. Some may not contain enough of the bacteria to lodge permanently in the body, so choose one that provides at least a

billion colony-forming units per serving. The most natural option? Doctors often tell patients to eat yogurt after a course of antibiotics because fermented foods promote growth of *Lactobacillus* and Bifidobacterium, the most fully studied beneficial bacteria. And remember: getting enough fiber, fruits and vegetables is good for your flora--and your entire body.

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