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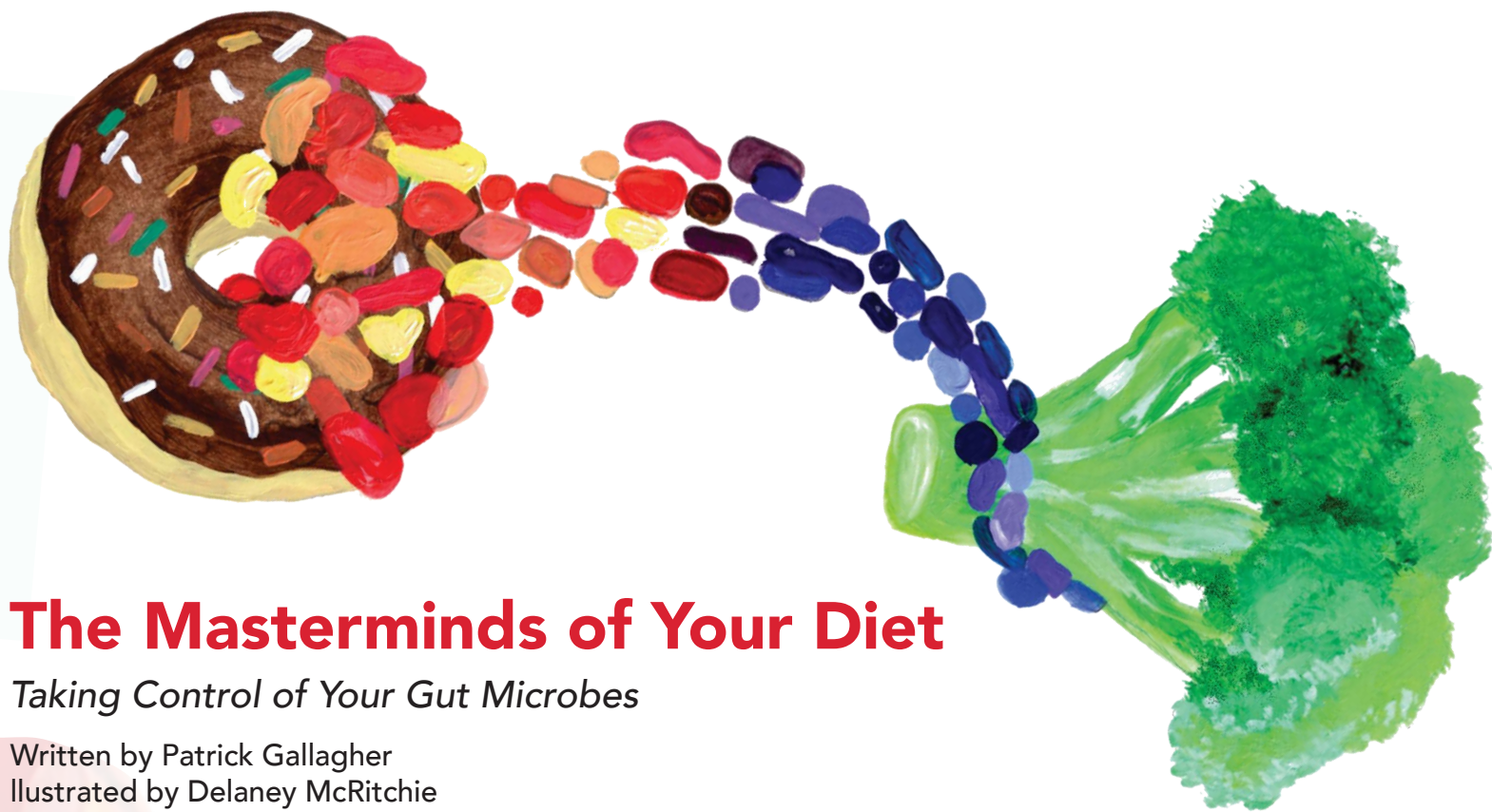
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The Masterminds of Your Diet

Taking Control of Your Gut Microbes

Written by Patrick Gallagher

Illustrated by Delaney McRitchie

Your gut bacteria may be craving chocolate—not your brain! A compilation of recent scientific studies suggests that the bacteria living inside your gastrointestinal tract communicate with your brain, influencing when, what, and how much you eat. We've known for many years that the microbes in your digestive track play an important role in breaking down the foods you eat, ensuring the body can absorb the nutrients necessary for life. Now we are learning they do much, much more.

Fruit flies placed on a special diet lacking a single, essential amino acid will eat food containing the missing amino acid when given the choice between a variety of foods. How does this happen? Gut microbes synthesize many important compounds such as vitamin K, B vitamins, short-chain fatty acids, and a number of proteins. These compounds have a number of different effects, acting on the many cell types present in your gut. For example, some compounds act on neurons in the gut that then send signals to the brain. These signals then influence your behavior. This is known as the microbiome-gut-brain axis. In this axis, your gut bacteria release signals, similar to hormones, that travel to your brain via the long vagus nerve to tell your brain when to start or stop eating or what foods to eat.

In the fruit flies on the special diet lacking an essential amino acid, removal of specific gut bacteria eliminated the preference for the diet containing the critical amino acid, showing the importance of the microbiome in the axis. In a separate study, when a specific bacteria was present in the gut of mice, they exhibited fewer symptoms of anxiety and depression compared to control mice. These behaviors were dependent on an intact vagus nerve, demonstrating the microbiome-gut-brain axis was responsible for the "mellow" behaviors.

Sometimes gut microbes don't always send the healthiest signals to our brains. Mice fed a high sugar, high fat diet developed obesity, prediabetes, and heart disease. Gut bacteria from these obese mice were transplanted into germ free, lean mice. These mice

developed obesity, prediabetes and heart disease just like the obese mice, clearly demonstrating the importance of gut microbes. Thus some microbes may even signal you to eat more chocolate or foods

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high in sugar and animal fat! Different things we do, like eating specific diets or taking antibiotics or other medicines can lead to selection for some types of gut bacteria. When you eat chocolate cake and other foods high in sugar and fat, specific populations of gut microbes thrive, growing out of proportion to other gut microbes. Then, these selected populations of gut microbes send signals to the brain that get translated as "happy feelings." This causes you to crave more unhealthy food.

Your diet strongly influences your gut microbes. Several studies in humans have shown healthy diets encourage growth of populations of "good" microbes in your gut. Can we make ourselves more healthy by controlling our gut microbiomes? Scientists are working to determine what are the best foods you should eat to encourage a "good" microbiome. They are also studying to see if swallowing supplements containing gut bacteria, called probiotics, will be beneficial for our health. So, while we wait for the scientists to give us the answers, what can we do to rule over the microbes in our gut and control unwanted microbial-driven cravings for sweet, fatty unhealthy foods? One, eat a healthy diet. Two, avoid high sugar, high fat foods that encourage the growth of "offending" populations of microbes. Three, consider taking a probiotic every day. Your gut will thank you for it. ● ● ●