



**SCHOLASTIC FANTASTIC**

# GUT PUNCH

Microscopic organisms living in our digestive tract could help unlock therapies to treat chronic diseases, like MS

BY CHEY SCOTT

Imagine if the key to treating – or maybe even curing – a host of chronic diseases and disorders, like Alzheimer’s, autism, mental illnesses, obesity, diabetes, multiple sclerosis and Parkinson’s, was living inside of us all along.

It may be, and a microbiologist at Eastern Washington University is one of many researchers around the world currently studying the complex effects that the trillions of microbes living in our digestive tracts may have on our overall health, including the onset of chronic illness.

Since 2007, and at EWU for the past two years, Javier Ochoa-Repáraz has examined anomalies in the overall makeup of microbes – referred to as the microbiome or microbiota – in the gastrointestinal tracts of people diagnosed with multiple sclerosis, a chronic and progressive autoimmune disease that attacks the central nervous system and disrupts communication in the brain. This can cause paralysis, blindness and a range of other symptoms. MS is thought to affect more than 2.3 million worldwide; there is no cure or definitive known cause.

Based on the findings of Ochoa-Repáraz and others in his field, so far it’s been determined that the overall composition of the gut microbiome in MS patients differs significantly from that of otherwise healthy individuals. There are also notable differences in the microbiome in MS patients who are in stages of symptom remission or relapse, Ochoa-Repáraz says. He theorizes that these changes in the microbiome at any stage of MS in turn impact the body’s immunological responses because of a link between the gut and the brain, and that the microbes living in our GI tract are able to affect how our immune cells function.

“Until not so long ago, we pretty much ignored the microbes in our gut,” he explains. “We knew that the gut was the port of entrance for many pathogens, and we knew that microbes were important in fighting or competing against these pathogens... We now know that they’re important in the immune system... We also know that gut microbes are important in neurological development, and that they’re important in regulating metabolism.”

Yet when it comes to pinpointing exactly how these microbes of the intestines and colon affect the immunology of patients with MS, things are less clear. Ochoa-Repáraz is focusing his current research, with the aid of undergraduate and graduate microbiology students at EWU, on finding out whether the presence of a specific microbiome makeup is somehow linked to the cause of MS, or if a patient’s microbiome is in turn altered by the presence of the disease.



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