RESEARCH SPOTLIGHT: MICROBES, DAY AND NIGHT

Featuring Vanessa Leone, PhD

By: Anne Ford

No one likes having their nighttime routine interrupted—not even microbes.

But whereas a bad night's sleep might do nothing but leave us a bit bleary-eyed the next morning, the consequences of our gut microbes having their schedule thrown off can be much more dire.

That's the discovery of Vanessa Leone, PhD, a postdoctoral researcher in the Dr. Eugene B. Chang Lab of the University's Knapp Center for Biomedical Discovery.

"Gut microbes do different things during the day versus the night," explains Dr. Leone.

In the daytime, gut microbes are generally busy acquiring and burning energy; at night, they're storing it.

As it happens, diet affects the regularity of this cycle. "When we take in a diet that's high in fiber and low in fat, that day-versus-night cycle is pretty normal and helps to maintain our circadian health," Dr. Leone says.

But if one's diet is high-fat and low-fiber instead, "now we have disruptions in the day-versus-night cycle that can disrupt our circadian rhythm, which leads to the development of obesity."

Dr. Leone's research is some of the only work on the topic to consider gut-microbe activity on this time scale. "A lot of the data that's out there now is looking at it on a month-to-month or year-to-year basis, but we're saying that things are happening even faster, like within a 24-hour time period," she says.

Her findings have implications not only for obesity, but for other disorders as well. "The work that I'm doing may also impact inflammatory bowel disease, because we know that a number of IBD patients have disrupted sleep patterns," she points out.

Looking at the livers of laboratory mice—specifically, mice raised in the absence of not just gut microbes but all microbes in general—allowed Dr. Leone and her team to make these discoveries. But during her student days, Dr. Leone found herself working with another animal entirely: the chicken.

"I did my undergrad and PhD at the University of Wisconsin, Madison, and I was actually in the animal-science department, pretty heavily invested in studying poultry nutrition," she smiles.

That changed late in the course of obtaining her PhD, when she found herself helping develop a student seminar about the development of IBD. "It got me thinking about how nutrition in general can shape our gut microbes," she says. "Since then, as a postdoc, I've been able to do the research that piqued my interest in the field, so it's been kind of cool to see how I've grown."

Vanessa Leone, PhD

That growth, she adds, wouldn't have been possible without the support of the GI Research Foundaton.

"I don't think I'd be in the position that I am without the GI Research Foundation" she says. "It gave me some pilot funding when I first started at the University of Chicago, and it's been a big supporter of my work by giving me additional funding as well. It's really important to the research that we're doing. Ultimately what we're trying to do is come up with cures for the patient, and the GI Research Foundation is so invested in how it can help do that."

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