JOURNAL INTERACTIVE

UW study participants give one more sample for science

By Mark Johnson of the Journal Sentinel
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In the 58 years since they first responded to the Wisconsin Longitudinal Study, thousands of men and women have provided descriptions of their families, incomes, education, aspirations, social lives and health (both physical and mental). Many of the 10,317 who took the first survey have stuck with it, answering five follow-ups over the last half century.

They have given saliva for the cause of science. And recently, more than 400 gave something they could not have imagined providing back in 1957.

Stool samples.

The new collaboration between the leaders of the study and a professor of bacteriology will allow an unprecedented chance to compare the stories told in our lives with those told in our guts.

The community of different bacteria that live in our guts — known in science as the microbiome — varies from person to person. In fact, our guts are thought to be as distinctive to each of us as a fingerprint.

"As far as I know nobody has been able to find two people with the same set of species of microbes, even twins who live in the same house," said Federico Rey, an assistant professor of bacteriology at the University of Wisconsin-Madison and the researcher who conceived of the joint project with the Wisconsin Longitudinal Study.

The human gut, germ-free at birth, is rapidly colonized by bacteria within the first three years of life.

Each adult carries 100 to 200 different species of microbes. These play a role in the immune system that protects us from invaders and in the chemical reactions that take place inside us as part of digestion and metabolism.

Although some of our microbes can be harmful, most appear to be beneficial. We exchange microbes with each other whenever we kiss, hug, shake hands or high-five.

But we are still in the early stages of learning how all of these microbes affect our biology.

Research into the microbiome has become one of the fastest growing areas of science. In 2001, just one scientific paper mentioned the term "microbiome."

By 2008, the total had risen to 45. In 2014, the term appeared in 1,300 scientific articles.

The research in Wisconsin, however, promises to take the study of life in the gut to a new level by

allowing scientists to examine stool samples in a broader context.

Each study participant's collection of microbes is part of a detailed profile that includes a personal and health history, a drinking water sample and other information.

Rey, a native of Argentina who received his doctorate in microbiology from the University of Iowa, arrived at UW in 2013.

Almost immediately, he met Pamela Herd, the principal investigator for the Wisconsin Longitudinal Study.

"I saw the opportunity to have a repository of biospecimens from people we have a lot of data on," Rey said. "I saw the opportunity to ask questions that have not been asked. Does being more socially isolated influence the diversity (of microbes)?"

The collaboration made sense. Large studies such as WLS, once most useful to social scientists, are now able to incorporate biological information.

In recent years, WLS has expanded more and more into health issues as its participants grow older. Most are now in their mid- to late 70s.

'A different ball game'

The question was: Would people who have already gone to considerable lengths to help the study now find the request for a stool sample too personal, too strange or just too much?

"People have collected blood and saliva. A couple of surveys have collected urine. But fecal samples are a different ball game," Herd said.

Herd turned over the task of collecting samples to the UW Survey Center. Kerryann DiLoreto, a senior project director at the survey center, remembers her first reaction when Herd explained the new request researchers had for participants in the longitudinal study.

"Well, facetiously my first thought was, 'Really? For real?' " DiLoreto said. "But WLS has such a strong relationship with its participants. They have been willing to share so much."

At the same time, she realized, "This has never been done before, so it was new territory."

Staff at the survey center read stories and papers on the microbiome and prepared themselves to explain to the WLS participants why science would have an interest in their fecal matter.

Between June and August of 2014, the center tried out its approach on three focus groups, each comprising nine or 10 longtime survey participants.

The survey center staff explained what the sampling would involve and asked the focus groups to respond to each step of the process.

For example, would they have a problem storing a stool sample in the refrigerator until someone could drive over to collect it?

The response surprised DiLoreto. Few people showed much discomfort.

"We had one gentleman who said, 'What took you so long? I've known this was important'" DiLoreto said, explaining that the man was an agronomist, or soil expert.

Another man in one of the focus groups laughed and remarked: You're asking me to store that in my refrigerator? My wife won't even let me store my fishing worms there.

The survey center also mailed participants in the WLS to inform them of the new project and prepare them for the possibility they might be called and asked to participate.

Not surprisingly, there were some who declined, saying essentially: That's just asking a little bit too much.

How to define 'healthy'

The actual collection effort took place in November. Survey center workers contacted the study participants first by phone.

Then, if people were interested, a member of the survey staff would visit their home to explain what would be involved in participating.

Those who decided to take part were given special containers and instructions for packing and preserving samples.

Participants refrigerated their samples immediately and phoned UW to have the sample picked up within 24 hours.

Almost 70% of those asked agreed to provide a stool sample. Rey received about 430 samples.

"In my lab we're interested in how microbes in the gut help us metabolize the nutrients we consume, and how microbes affect cardiovascular disease," Rey said. "The nutritional value of food is affected by our gut microbes."

The unique mix of microbes in our gut may have much to do with why some diets work for some people but not for others. For example, the microbes in one person's gut may derive health benefits from flavonoids, nutrients found in blackberries and other fruits and vegetables. But having a different set of microbes in another person's gut may mean that flavonoids offer little or no benefit to that individual.

"The million dollar question is: What is a healthy microbiome?" Rey said, explaining that he suspects there won't be a one-size-fits-all answer. Rey's hunch is that what constitutes a healthy microbiome will depend on our genes, diet and the environment we're exposed to.

The 430 samples now sit in a freezer at UW set at minus 80 degrees. The round, white containers that hold each sample look a little like those a restaurant would give you to take home an unfinished order of nachos grande.

Rey said his lab will be isolating and characterizing the DNA from the samples.

"This is a terrific resource," he said. "We plan to keep them at least five to eight years."

http://www.jsonline.com/news/health/uw-study-participants-give-one-more-sample-for-science-b99541059z1-320358301.html

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