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Your Body is a (Bacterial) Wonderland

MOSCOW, Idaho – Scientists at the University of Idaho soon will be investigating one of the most unexplored – yet most common – ecosystems on the planet; the human body.

The research project – which teams Idaho with the University of Maryland and the University of Alabama – Birmingham – recently was awarded \$10.5 million over four years from the National Institutes for Health. The multi-university team is one of several investigating the ecosystems of bacteria and other microorganisms that are vital to human health.

Specifically, Idaho scientists will be investigating what communities of bacteria live in the human vagina, how they interact with each other and the human body, and how they work to maintain women's health.

“The easiest way to think about this project is in terms of a plant community,” said Larry Forney, co-principal investigator of the project and director of the University of Idaho's Initiative for Bioinformatics and Evolutionary Studies (IBEST). “In a diverse, healthy community of plants, weedy species can't invade and become established. But when you disturb their environment, weeds come in, and they are aggressive and grow rapidly.”

Similarly, the human vagina is home to diverse communities of bacteria. When healthy, these robust ecosystems produce chemicals that prevent infectious diseases while contributing to the stability of normal functions in the body.

But when disturbed, the body becomes susceptible to many diseases and health issues including bacterial vaginosis (BV), sexually transmitted diseases, including HIV, and pre-term delivery.

The study will follow 250 women for 10 weeks, who will take daily samples while keeping detailed daily diaries regarding diet, sexual activities, birth control methods and many more factors that could influence the bacterial communities.

The University of Alabama – Birmingham will be the clinical site where the samples are collected. The University of Maryland's Institute for Genome Studies will analyze the samples to understand what organisms are present and what genes are expressed. The University of Idaho's role is to analyze the resulting data and to put the pieces of the puzzle together.

“We're trying to understand the dynamics of the vaginal ecosystem,” said Zaid Abdo, professor of statistics and mathematics at the University of Idaho, and collaborator on the project. “We want to see what changes occur, when and why upsets take place, how we can predict and diagnose them, and ultimately if there is something we can do to prevent them.”

It is estimated that bacteria cells outnumber human cells by a factor of ten to one, yet very little is known about how these microorganisms live, grow and influence human development, physiology, immunity and nutrition. The Human Microbiome Project is a major initiative by the National Institutes for Health to characterize these microorganisms and analyze their role in human health and disease.

For more information about the Human Microbiome Project, visit <http://nihroadmap.nih.gov/hmp/>.

For more information about IBEST, visit <http://www.ibest.uidaho.edu/home/home.php>.

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About the University of Idaho

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