

The billions that bug us: A genomic view of humans and their microbes

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The human species is dependent for its survival on the billions of microorganisms that inhabit multiple environmental niches within and on the human body. While microbes are commonly associated with diseases and infections, they are also vital in essential, beneficial roles such as digestion, where they help synthesize vitamins and ferment complex indigestible carbohydrates.

The overwhelming majority of [microbial species](#) (>99%) resist cultivation in the laboratory. However, recent advances in [microbial genomics](#) and sequencing technology have allowed researchers to study microbes in their natural environment. The identification and characterization of these [microbial communities](#) will undoubtedly establish links between these microorganisms and disease, their roles in the development of the immune system and their overall impact on human evolution.

Claire Fraser-Liggett, director of the Institute for Genome Sciences at the University of Maryland School of Medicine and a globally recognized microbial genomics scientist, is a lead researcher with the Human Microbiome Project (HMP), an international National Institutes of Health roadmap initiative to study the impact of microbes on human health and disease.

Fraser-Liggett's research focuses on microbes' roles in the development of the immune system and their overall impact on human health. Her HMP research has particular emphasis on the human gastrointestinal

tract, since this environment is home to the largest number of microbial "partners." One of the ultimate goals of the HMP is to better understand our microbiota, and, in the future, to be able to optimize the beneficial effects of [microbiota](#) for each individual.

"The human GI tract contains the densest concentration of bacteria in our bodies, and studying these GI [microbes](#) gives us insights into health and illness in the developed world and in developing countries," said Fraser-Liggett.

Fraser-Liggett will present a talk at the American Society for Biochemistry and Molecular Biology's annual meeting titled "The Role of Microbial Communities in Health and Disease."

Provided by Federation of American Societies for Experimental Biology

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