

Microbe-aware precision medicine

Lunch with a Scientist: Katherine S. Pollard, PhD
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Whole genome sequencing technology has led to a surge in research on personalized medicine, which aims to optimize a patient's treatment based on genetics. But scientists can only test a tiny percentage of our genes: the human ones.

This is because human biology is also influenced by the trillions of microbial residents that contribute most of the DNA in our body. In fact, genes from bacteria, viruses, and other microbes—collectively known as the human microbiome—influence health in complex ways, from producing anti-inflammatory compounds to inactivating drugs.

An expert in the field, Katherine Pollard, PhD, director of the Convergence Zone at the Gladstone Institutes, advocates for a precision medicine approach at the microbial level, analyzing a person's microbiome to determine its effect on human health and disease.

These microbes interact with our cells in a number of ways. So, if scientists only study human DNA, they could miss answers to health problems that reside in pathways outside our genes, which are actually vastly outnumbered by those in the microbiome.

This raises the enticing hypothesis that our microbial genes hold answers to biomedical problems that we cannot solve by studying human cells alone.

Still, it is not enough to quantify what microbes are present in each patient, given that the DNA of each microbial species is quite different from one person to another, just as our human DNA is. Pollard will describe emerging techniques for microbiome genetic testing and how this approach will transform research and health care.