150 YEARS OF GIANT LEAPS
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DISCOVERY PARK
DISTINGUISHED LECTURE SERIES

David Relman

- Thomas C. and Joan M. Merigan Professor in Medicine, and Microbiology & Immunology at Stanford University
- Chief of Infectious Diseases at the Veterans Affairs Palo Alto Health Care System

Thinking about the human microbiome as a source of benefit and risk

Tuesday, September 24
1:30 - 2:30 p.m. MRGN 121

Berkeley Science Review (Spring, 2005; Alan Moses, "Intelligent Design: Playing with the Building Blocks of Biology").

The diversity and intimacy of our relationships with the communities of microbes that live in and on our body is nothing short of breathtaking. Recent findings raise questions about how these relationships get started early in life, the ways in which they contribute to human health and disease, and how these relationships are maintained in the face of disturbance, especially the major disturbances produced by modern health care and lifestyle. Given the known and suspected benefits that humans derive from their microbiota, the stability and resilience of this ecosystem are critical properties that deserve attention. We have undertaken longitudinal studies in human subjects, some of whom are monitored before and after a standardized pulse, or acute disturbance, with the goals of describing the temporal dynamics of the human microbiome, and identifying features that are associated with stability in the face of disturbance as well as recovery of a prior state. A predictive understanding of the microbiome and the mechanisms that underlie resilience will inform effective strategies for its manipulation, so as to maintain or restore health, and avoid or mitigate disease. At the same time, these same strategies could be exploited to cause harm; awareness and oversight of these emerging capabilities are critical.

David A. Relman is the Thomas C. and Joan M. Merigan Professor in Medicine, and Microbiology & Immunology at Stanford University, and Chief of Infectious Diseases at the Veterans Affairs Palo Alto Health Care System. He is also Senior Fellow at the Freeman Spogli Institute for International Studies (FSI), and served as Science Co-Director at the Center for International Security and Cooperation (2013-2017), at Stanford. He is currently director of a new Biosecurity Initiative at FSI. Relman trained at MIT and then Harvard Medical School, followed by clinical training in internal medicine and infectious diseases at the Massachusetts General Hospital in Boston, and then a postdoctoral fellowship in microbiology at Stanford.

Relman was an early pioneer in the modern study of the human indigenous microbiota (microbiome). A landmark paper in 2005 was one of the first to describe the human gut microbiota with molecular methods. Most recently, his work has focused on human microbial community assembly, and community stability and resilience. Principles of disturbance and landscape ecology are tested in clinical studies of the human microbiome. Previous work included the development of methods for pathogen discovery, and the identification of several historically important and novel microbial disease agents. One of those papers was selected as "one of the 50 most important publications of the past century" by the American Society for Microbiology.

Among policy-relevant activities in health and biological security, Relman served as vice-chair of the National Research Council Committee that reviewed the science performed for the FBI 2001 Anthrax Letters investigation, chair of the Forum on Microbial Threats (2007-2017), a member of the Committee on Science, Technology & Law (2012-2015), and is currently a member of the Intelligence Community Studies Board (2016-), all at the U.S. National Academies of Science. He was a founding member of the National Science Advisory Board on Biosecurity (2005-2014), a member of the Working Group on Biodefense for the President's Council of Advisors on Science and Technology (The White House) (2016), and served as President of the Infectious Diseases Society of America (2012-2013). He also serves in a variety of capacities as advisor to the US national security communities. He was a recipient of NIH Pioneer and Transformative Research Awards, and was elected to the National Academy of Medicine in 2011.

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