

Anaerobe 2010

The 10th Biennial Congress of the
Anaerobe Society of the Americas

Philadelphia, PA USA • July 7-10, 2010

SESSION I: KEYNOTE ADDRESS

Clinical Implications of Disturbances in the Human Microbiome

*Relman, D.A.**

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CLINICAL IMPLICATIONS OF DISTURBANCES IN THE HUMAN MICROBIOME

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Complex microbial ecosystems occupy the cutaneous and mucosal surfaces of humans. Recent advances have highlighted both the tremendous diversity of these communities and their importance to host physiology. But questions remain about the ecological processes that establish and maintain the human microbiota throughout life, and in particular, about the response of the microbiota to disturbance. Resistance to perturbation and a capacity to return to the pre-disturbed state (resilience) are measures of community robustness, which may have applicability to human health and disease. With this goal in mind, we have been studying the effects of perturbation on patterns of human fecal bacterial diversity, by administering ciprofloxacin for 5 days to healthy human volunteers, twice during the course of a year. In the initial phase of this study, our analysis indicated that ciprofloxacin treatment influenced the abundance of about a third of the bacterial taxa in the distal gut, decreasing the taxonomic richness, diversity and evenness of the community. The taxonomic composition of the community closely resembled its pre-treatment state by 4 weeks after the end of treatment. In a more recent analysis of the temporal dynamic at finer scale, we have found inter-subject variability in the amplitude of the community response and in the rate and degree of the return towards pre-treatment baseline. In addition, the second (identical) treatment course, six months after the first, provoked a more significant response in each of the subjects. The study of additional subjects as well as further analysis of these data are pending. Perturbation may reveal aspects of community stability and resilience that can be exploited for maintaining and restoring health. By recognizing the early signs of impending disturbance, we may be able to predict and avoid disease.