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The Functional Microbiome and the Biofilm Phenotypes in Human Microbiome Discovery

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The clinical relevance of microbial biofilm phenotypes – sessile microbial communities characterized by genes in gene expression and which secrete extracellular polymeric substances – has been underestimated in the disease treatment and microbiome drug discovery paradigms. Ubiquitous in nature and quite likely the “preferred form of life” for microbes due to the inherent survival benefits conferred by the biofilm phenotype, these polymicrobial populations function as a unit and are found on virtually every internal and external human body surface. Microbiota in biofilm phenotype are species specific, hard to detect, and don’t fit into a developed diagnostic or regulatory rubric. Yet, could they be our “microbiome stem cells”, survivalists protected in gel-like biofilms and differential gene expression which dynamically seed local human tissues? Are bacteria in a biofilm phenotype a critical untapped discovery source? And could microbial biofilms explain some unanswered questions of human health and disease – clinically apparent infections but negative culture results, unexplainable chronic inflammation, auto-immunity? This talk seeks to acquaint the listener with some conceptual framework behind human mucosal and epidermal microbiota in biofilms and the functional microbiome and their relationships to human disease and their potential applications to human microbiome drug discovery.

Biography:

Dr. Nicholas Monsul trained as a physician and surgeon at Yale University School of Medicine and The Johns Hospital where he was involved in performing surgery, conducting basic science research and teaching residents. He is the Co-Founder of Quorum Innovations, a microbiome based therapeutics research and Development Company, where he is co-inventor on 7 issued United States patents.