



Pathogenic and Symbiotic Microbes at Mucosal Surface: the Yin and Yang of Hygiene

by

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Abstract:

Over the last decades, cellular microbiology has addressed the molecular cross-talks established between pathogenic microbes and the cells composing the target organ(s) and immune system of their infected hosts.

Thanks to this molecular and cellular deciphering, our understanding of infectious diseases has been considerably improved, hence offering novel tools for their control. Recent approaches have also emphasized the need to address the infectious process at the integrated level of tissues and organs, thus the novel concept of tissue microbiology. In addition, cellular and tissue microbiology now offer a framework to decipher the mutualistic interactions established between the symbiotic microbes that compose the microbiota and the host. In brief, the field is undergoing a conceptual and technological drift from studying the pathogenesis of infectious diseases to analysing the homeostasis that reflects a long and essentially healthy co-evolution of the world of complex multicellular eukaryotes with their commensal microbes. This emerging cellular microbiology of symbionts reveals an array of microbe-host interactions affecting key physiological functions in primates such as immune maturation, nutrition and metabolism, tissue regeneration, as well as some brain functions. In the possible ruptures of these homeostatic mechanisms reside “novel”, non-transmissible pathologies, reflecting mishandling of the microbiota by the host, or deletion of microbiota diversity causing pathogenic dysbioses. These “post-modern” conflicts between the host and its microbiota may be slowly filling—at least in industrialized countries—the gap in infectious disease incidence that reflects the less than one century old implementation of hygiene, antibiotics and vaccines. This so-called “hygiene hypothesis” may account for the exponential growth in incidence of diseases such as allergy, asthma, inflammatory bowel diseases and colon cancer.

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Venue: Connie Fan Multi-media
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