

## Update of intestinal microbiota in systemic lupus erythematosus

盧俊吉

三軍總醫院風濕免疫科

The human body is colonized by millions of microorganisms that interact with systemic immune system in a cooperative and non-pathogenic manner. These microorganisms are present in the skin, gut, oral cavities, respiratory tract, and urogenital tract. The gut is a vital organ where microbiota can help shape immune system to defend invasions of pathogens and maintain homeostasis. Intestinal mucus layer limit microbiota invasion of the epithelium, and that in the small intestine microbiota predominantly colonizes the outer mucus layer while inner layer is nearly sterile. Gut microbiota is capable of mediating direct or indirect colonization resistance against intestinal pathogens. Mechanisms for direct colonization resistance include competing for nutrients and producing anti-microbial substances that target pathogens. Commensal bacteria also provide indirect colonization resistance by shaping host innate and adaptive immune responses against intestinal pathogens.

Intestinal mononuclear phagocytes are distributed in the Peyer's patches, mesenteric lymph nodes (MLN), and the intestinal lamina propria. CD103+ Dendritic cells coordinates adaptive immunity by sampling intestinal bacteria antigens, migrating to MLNs and contributing to T cell maturation at MLN. Lamina propria CX3CR1+ macrophages sample the intestinal luminal microbes by extending transepithelial dendrites into the intestinal lumen in a toll like receptors dependent manner. Lamina propria macrophages contribute to commensal bacteria (segmented filamentous bacteria, SFB) specific Th17, Treg, and innate lymphoid cells immune responses.

Increasing data have described how microbiota is involved in autoimmune pathologies affecting other tissues than the intestine, like rheumatoid arthritis, spondyloarthritis, atopic dermatitis, and systemic sclerosis. Here we discuss how metabolites derived from gut microbiota influence gut homeostasis and we focus on what is known about the role of gut microbiota engaged in the pathogenesis of rheumatoid arthritis and systemic lupus erythematosus. According to 2001 WHO definition, probiotic is defined as "live microorganisms which, when administered in adequate amounts, confer a health benefit on the host. we further discuss whether probiotics could be used as potential therapies for autoimmune diseases.