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Eczema and skin microbiome

Abstract:

Numerous studies have reported key roles of dysbiosis in gut microbiome in shaping systemic inflammation related to diseases in multiple organ systems. A healthy microbiome in the gut competes with pathogens, improves nutrient metabolism, enhances gut barrier integrity and regulates immune system maturation. Dynamic interactions also exist between microbes, the immune system and food allergens that may lead to innate and adaptive tolerance. Eczema is the commonest chronic skin disease in children, but there is limited evidence for the importance of skin microbiome in influencing different eczema phenotypes. This is mainly due to the low biomass of skin samples that can be obtained for analyzing the abundance and composition of skin microbes. My group has performed several cross-sectional and birth cohort studies that analyzed flocked skin swab samples by both 16S rRNA sequencing and whole-genome shotgun approaches. The results revealed temporal variations in skin microbiota during the first 12 months, with a diminished biodiversity of skin microbiome being present in infants and children with eczema. Besides, early-life skin microbial biodiversity could predict the presence of persistent eczema during infancy. Early-phase clinical trials reported that the transfer of lantibiotic-producing Staphylococcus hominis was able to suppress Staphylococcus aureus growth and improve eczema severity. My group also identified a putative Staphylococcus hominis strain that may be tested in such biotherapy approach for childhood eczema. In conclusion, skin microbiota analysis offers promising targets for predicting and treating eczema in children.

Biography

Leung graduated from The Chinese University of Hong Kong in 1992, and he is currently a professor in Department of Paediatrics at The Chinese University of Hong Kong. His main research interests include natural history, novel diagnostics and host-microbe interactions for allergic diseases. He published more than 430 peer-reviewed journal articles.