

How colonization by microbiota in early life shapes the immune system

Thomas Gensollen¹,
Shankar S. Iyer¹,
Dennis L. Kasper²,
Richard S. Blumberg^{1,*}

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Abstract

Microbial colonization of mucosal tissues during infancy plays an instrumental role in the development and education of the host mammalian immune system. These early-life events can have long-standing consequences: facilitating tolerance to environmental exposures or contributing to the development of disease in later life, including inflammatory bowel disease, allergy, and asthma. Recent studies have begun to define a critical period during early development in which disruption of optimal host-commensal interactions can lead to persistent and in some cases irreversible defects in the development and training of specific immune subsets. Here, we discuss the role of early-life education of the immune system during this “window of opportunity,” when microbial colonization has a potentially critical impact on human health and disease.