

Bacterial Infection of Oral Mucosa: Mucosal Immunity

By

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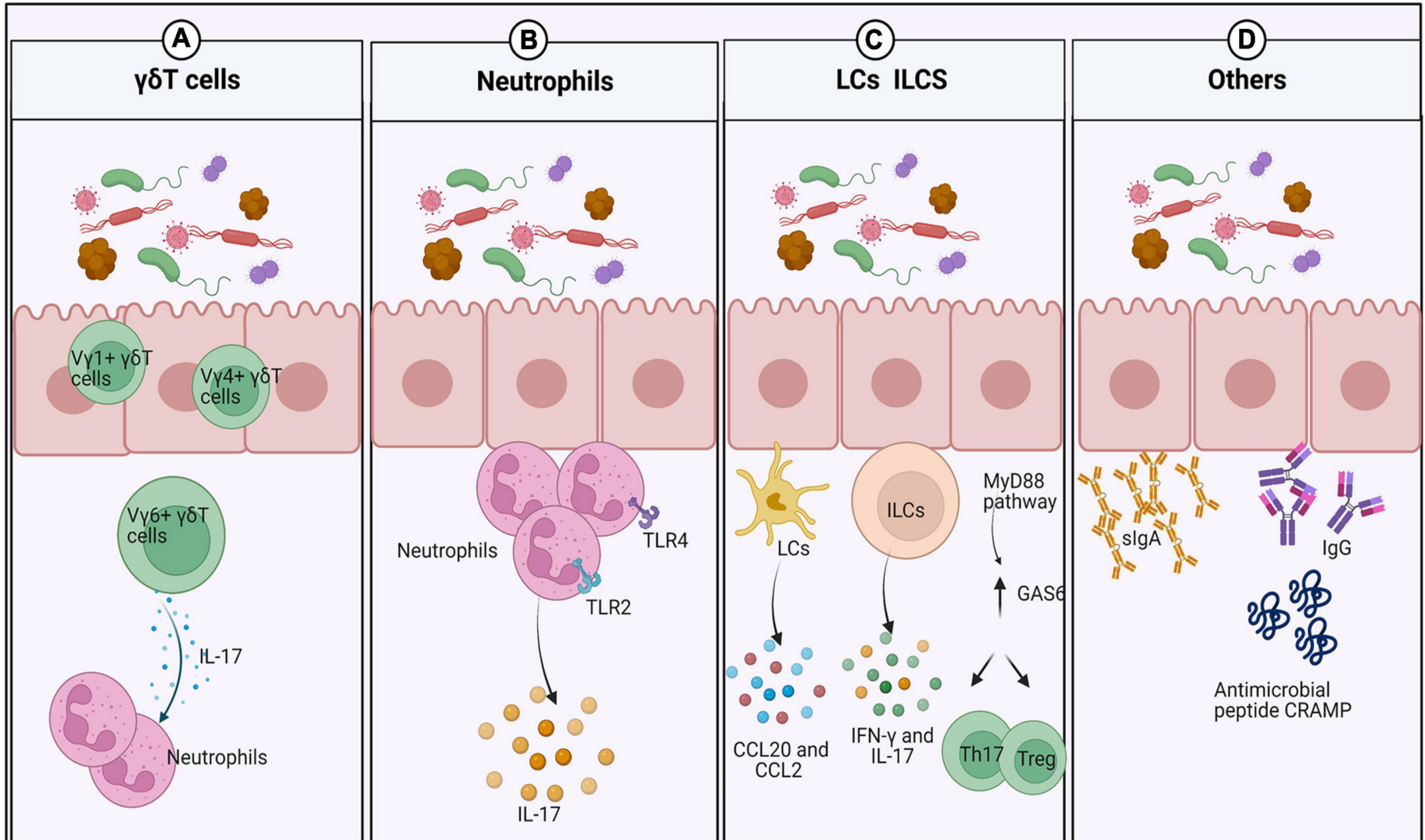
Introduction

- The oral cavity is exposed to external microbiota and foreign antigens starting at birth, leading to colonization of the oral mucosa by diverse microbes.
- Microbial colonization **modulates** the early **development of immune system** in oral mucosal tissues, as well as the **development of oral tolerance** through the regulation of macrophages and innate lymphoid cells.

Introduction

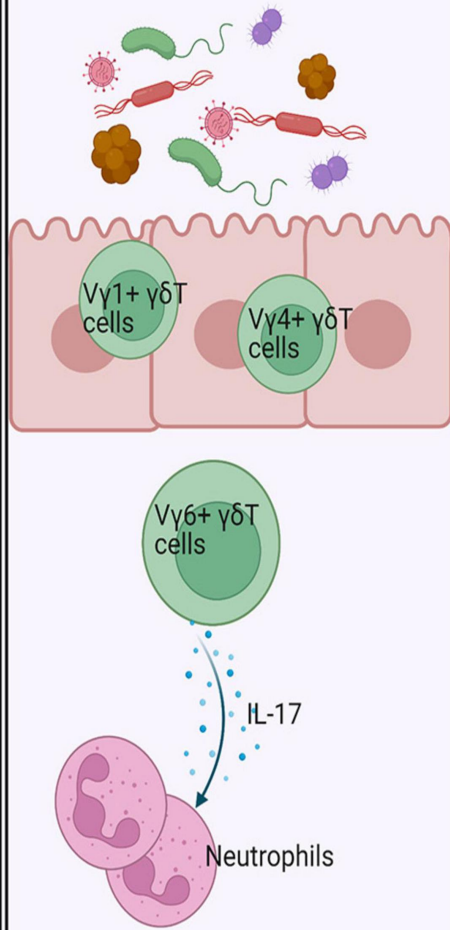
- These early life events have critical impacts on later health and disease.
- The oral mucosa contains various epithelial and stromal cells, along with resident leukocytes, such as $\gamma\delta$ T cells, neutrophils, innate lymphoid cells, and Langerhans cells. These innate lymphocytes are recruited before and after birth.

Interactions between the oral microbes and immune cells in infection

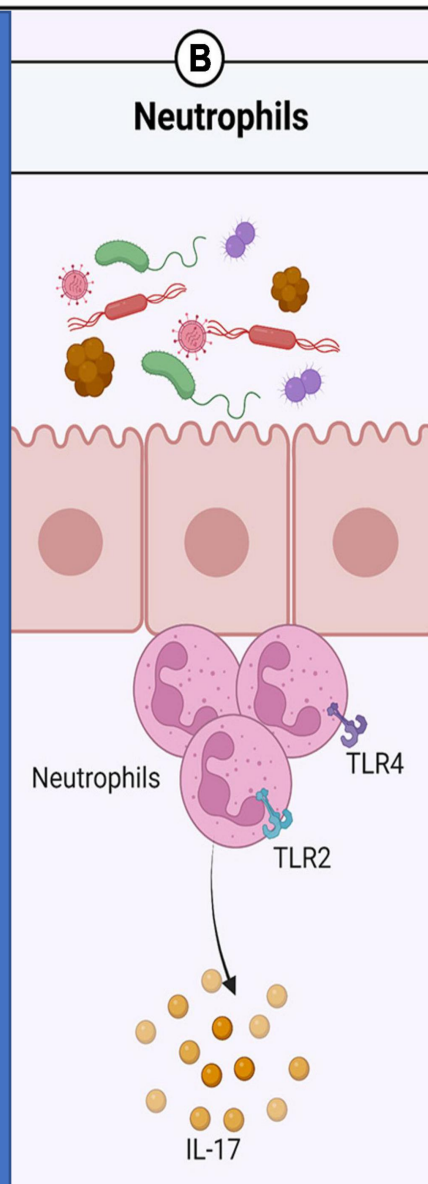


A

$\gamma\delta$ T cells

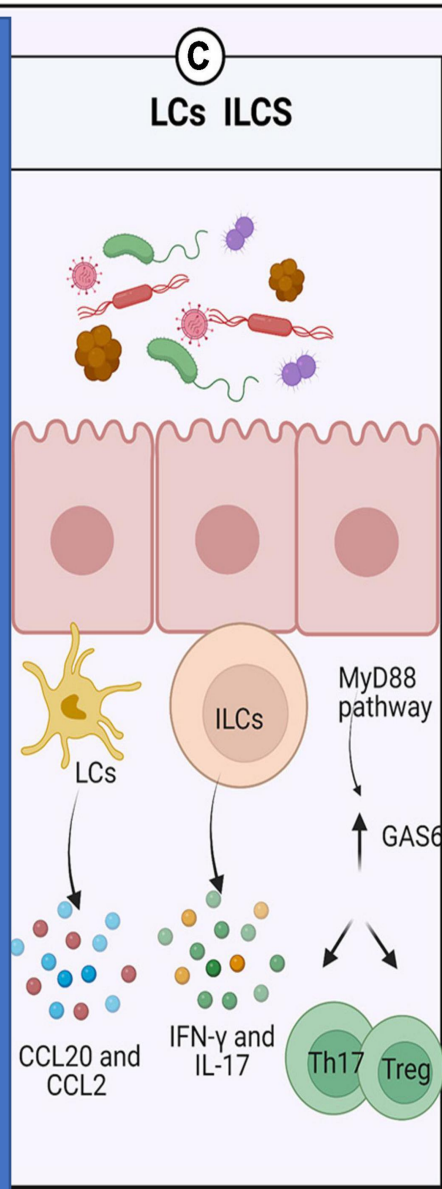


(A) After exposure to the external microbiota, numerous innate lymphocytes expand into the oral mucosa. $\gamma\delta$ T cells increase rapidly in abundance and recruit neutrophils by producing IL-17.



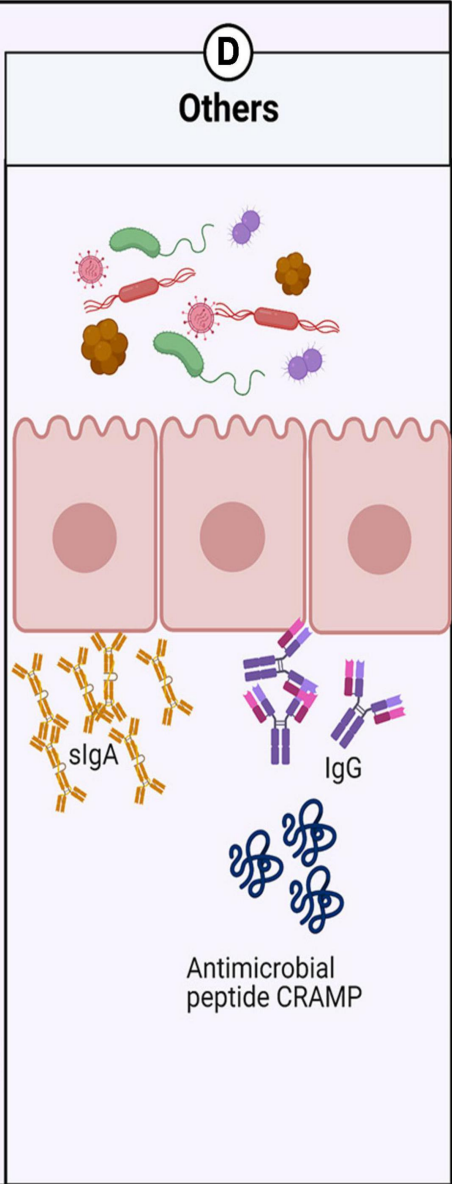
(B) Neutrophils increase in response to the **local microbiota** and **IL-17** in the neonatal epithelium, but depend only on IL-17 in the gingiva.

(C) Oral **ILCs** produce IFN- γ and IL-17 to protect the oral mucosa from bacterial and viral infection. **LCs (APCs)** are recruited by CCL20 and CCL2 to maintain mucosal homeostasis and prevent tissue destruction. In response to **oral microbes**, expression of **Growth arrest-specific 6** GAS6 is upregulated



in the gingival epithelium to maintain microbial homeostasis and downregulate gingival inflammation.

(D) The oral microbiota promotes the induction of salivary antimicrobial components such as IgA and antimicrobial peptides.



Thank you