

Mucosal immune system (MALT)

MALT (Mucous Associated Lymphoid Tissue)

- GALT (Gut Associated Lymphoid tissue)
- BALT (Bronchi Associated Lymphoid Tissue)
- Immune tissues of the urinary tract, genital tract, conjunctiva, middle ear...
- Includes also breast gland!

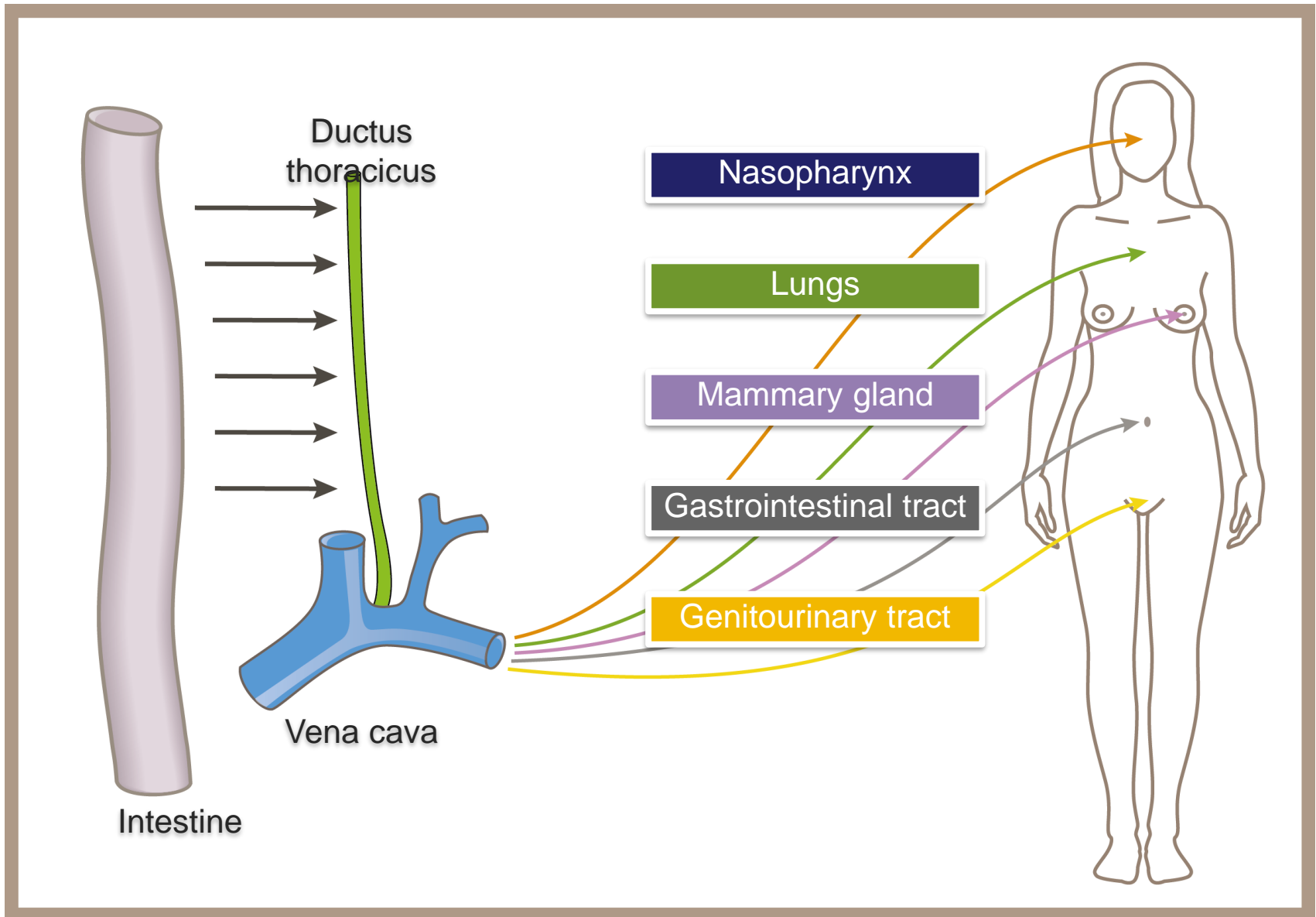
Anatomy of MALT

- Diffuse tissue containing lymphocytes and other cells of the immune system in submucosa.
- Specialized organs:
 - Waldeyer's ring
 - Payer's patches
 - Appendix

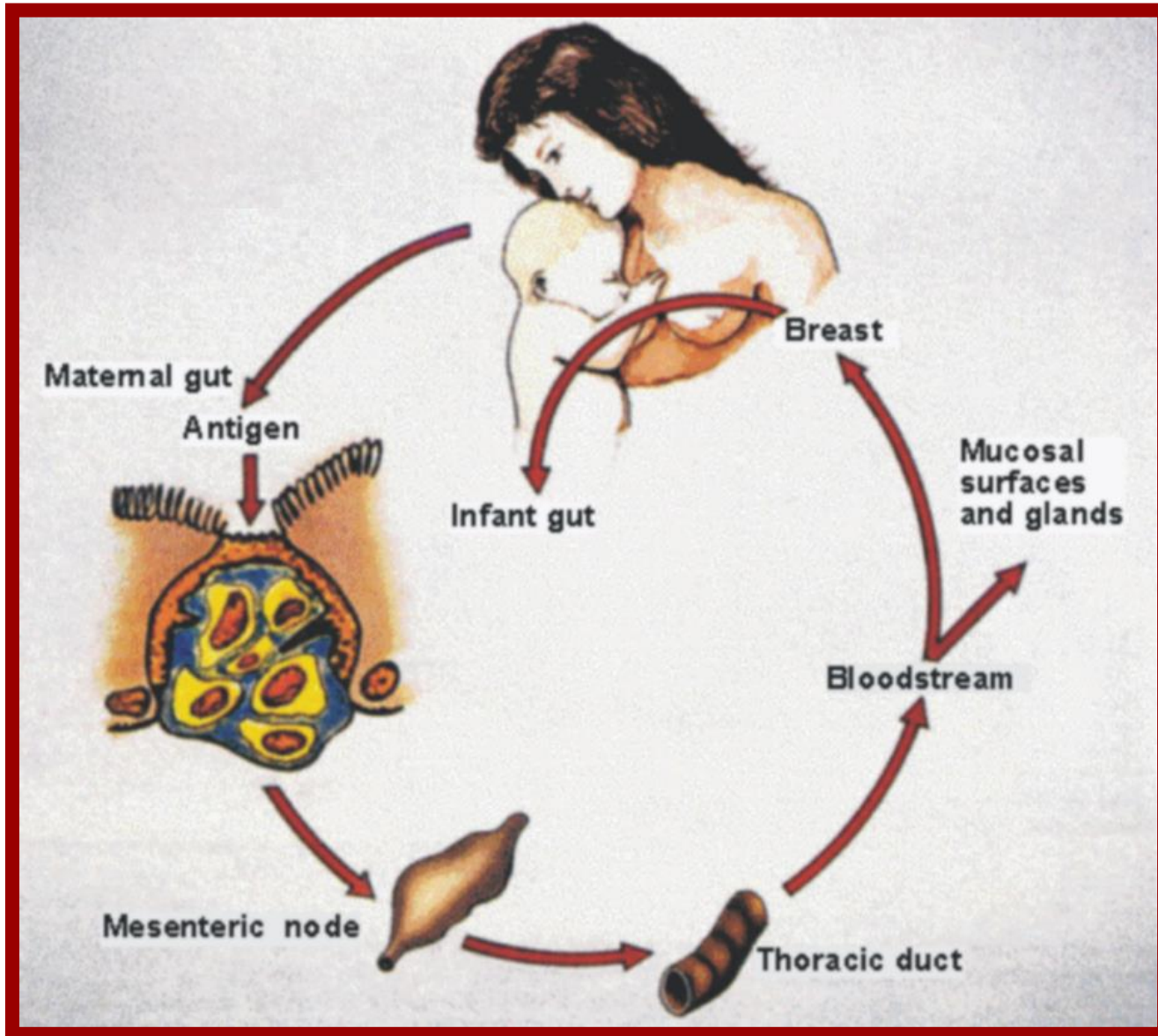
Mucosal immune system (MALT)

- Antigenic stimulation in one part of MALT leads to immune response also in other compartments of MALT.
- IgA is a predominant immunoglobulin secreted by the epithelial cells.
- Oral administration of antigens frequently leads to induction of immune tolerance.
- Intraepithelial lymphocytes - CD8+, restricted antigenic specificity.

Mucous- associated lymphoid tissue



Common immune system of mucous membranes



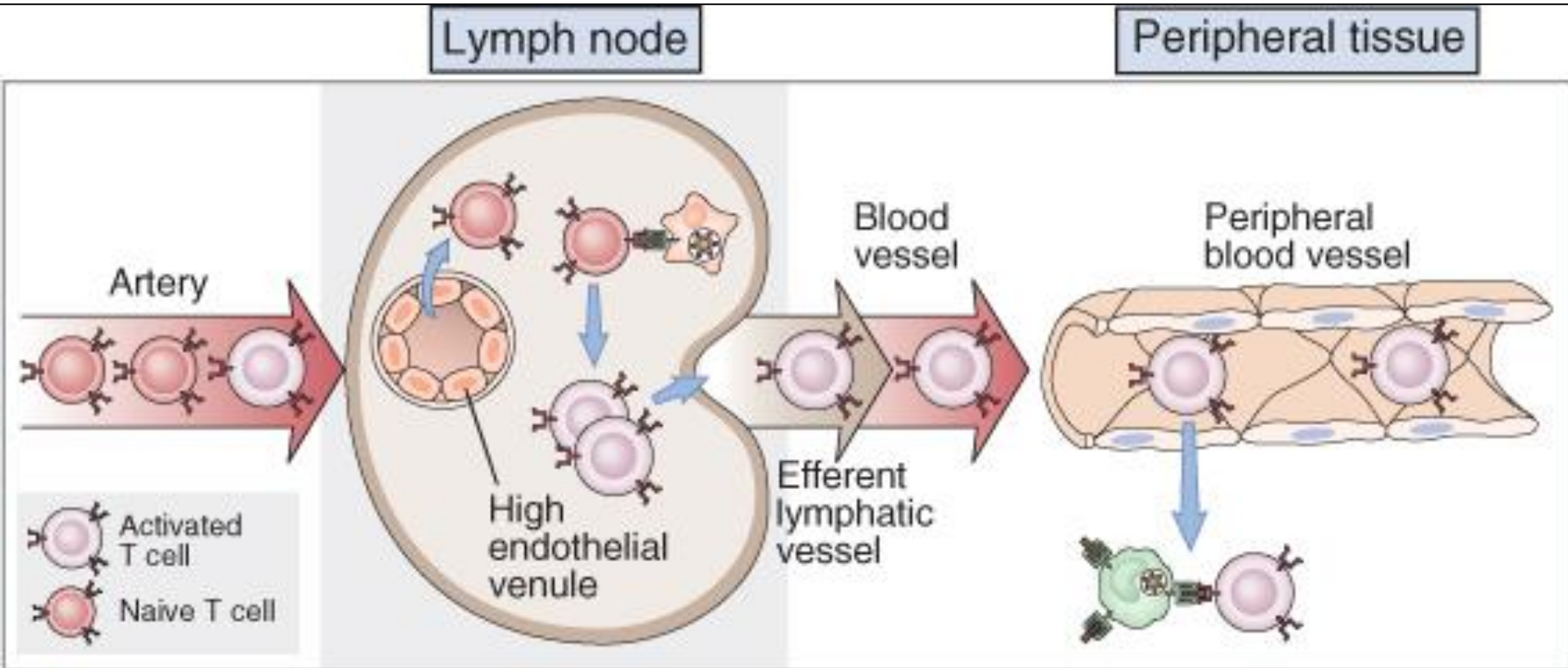
Homing of Lymphocytes

- The directed migration of subsets of circulating lymphocytes into particular tissue sites.
- Regulated by selective expression of adhesion molecules called **homing receptors** on lymphocytes.
- Tissue specific endothelial ligands are called **addressins**.

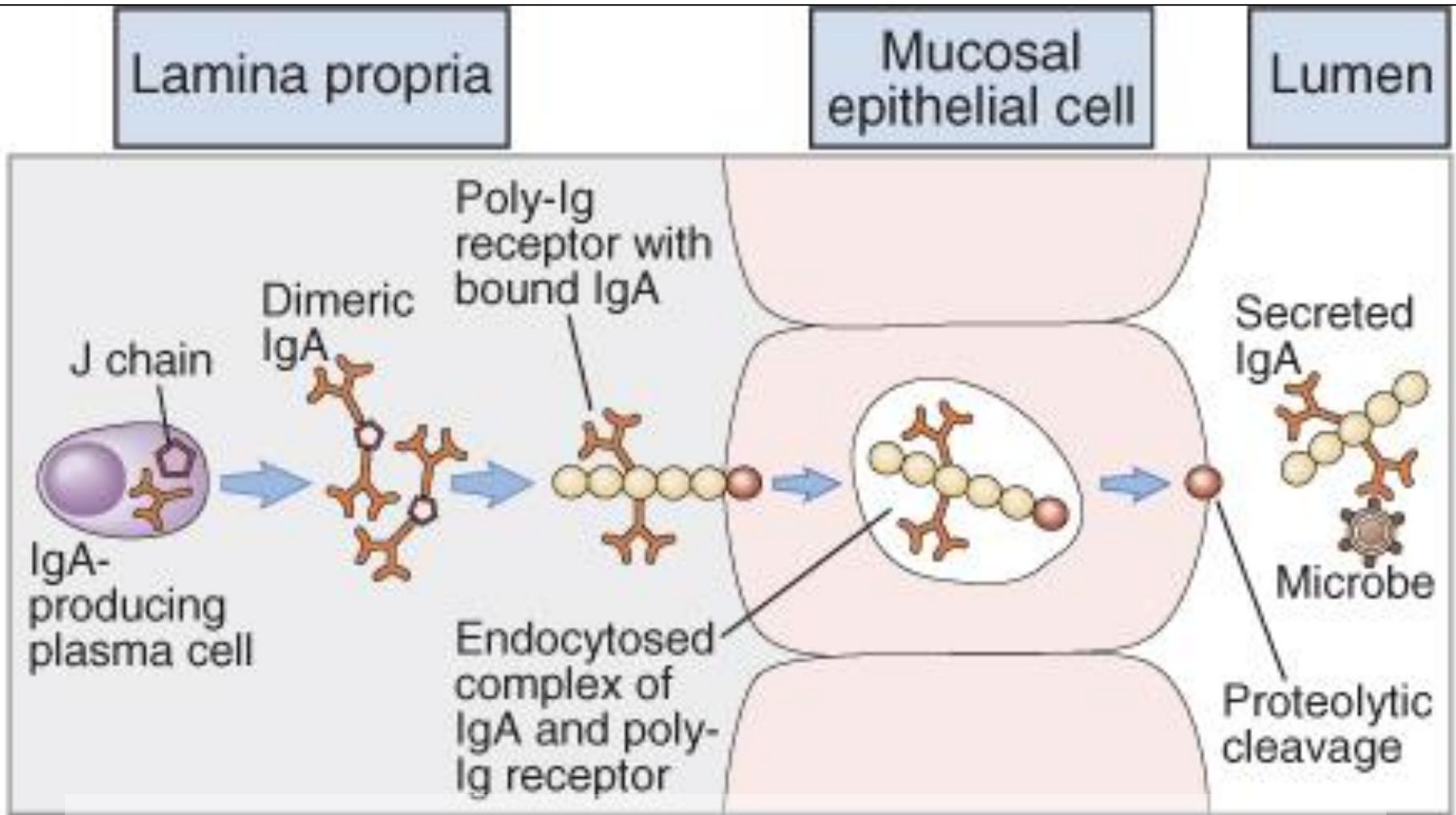
High Endothelial Venules

- Specialized venules. The site where lymphocytes leave the blood stream and migrate into lymph nodes, spleen, organs of MALT.
- Adhesion molecules enable selective attachment of various types of lymphocytes.

Circulation of lymphocytes



Secretory IgA formation



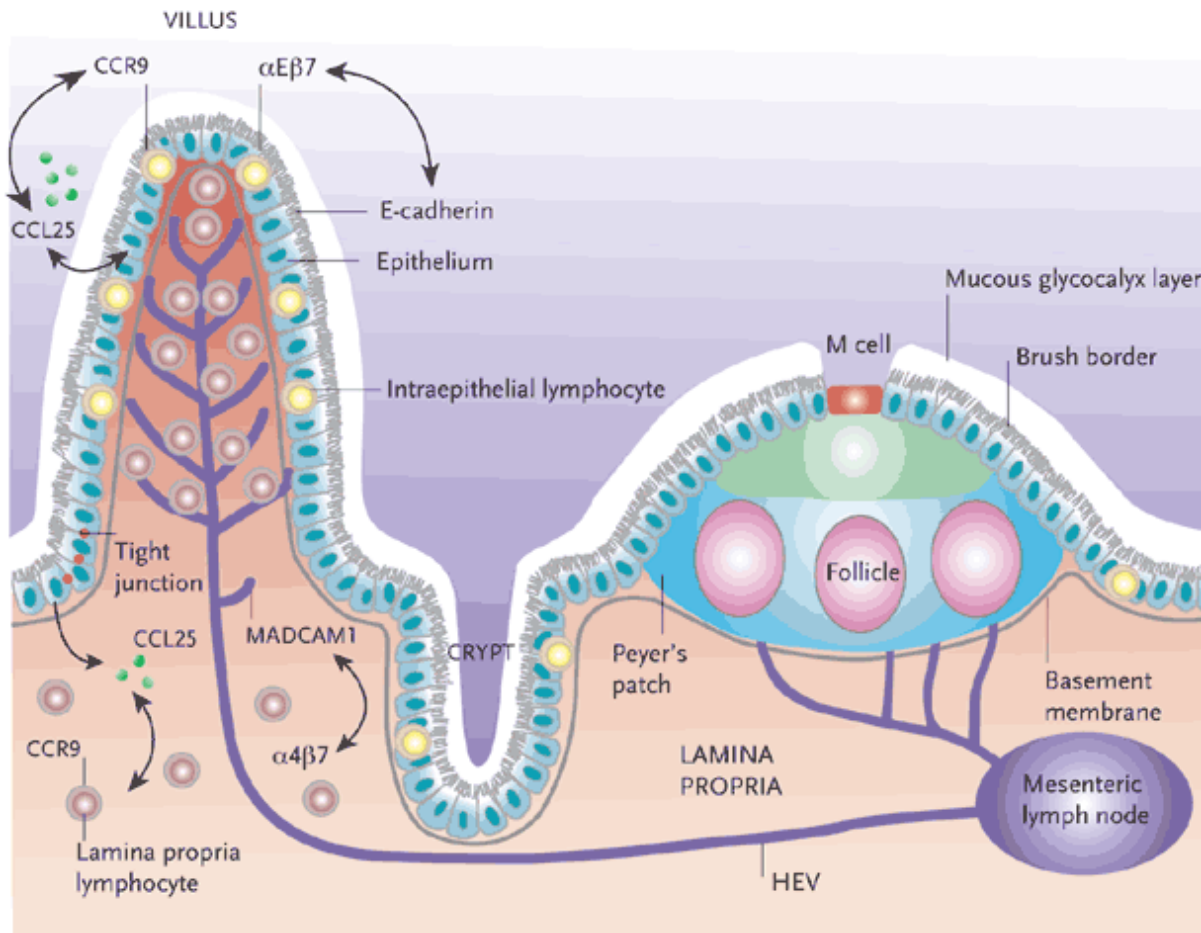
Intraepithelial T-lymphocytes

- TCR $\alpha\beta$ or $\gamma\delta$
- Extrathymic differentiation
- First line of specific immune response
- Predominantly CD8+
- Low antigenic specificity of TCR

M-cells

- Specialized enterocytes responsible for transport of antigens from the gut towards the immunocompetent cells inside the Payer's patches.
- Transport is mediated by transcytosis.

Lymphocyte circulation in GALT



Oral tolerance

- Stimulation of the GALT frequently leads to induction of immune tolerance to the stimulating antigen.
- This occurs mainly if the gut is in „normal, non-inflammatory“ conditions.
- Induction of Th3 cell is the main mechanism.
- The tolerance is important to avoid unnecessary reactions to non-pathogenic antigens.