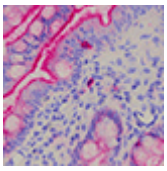
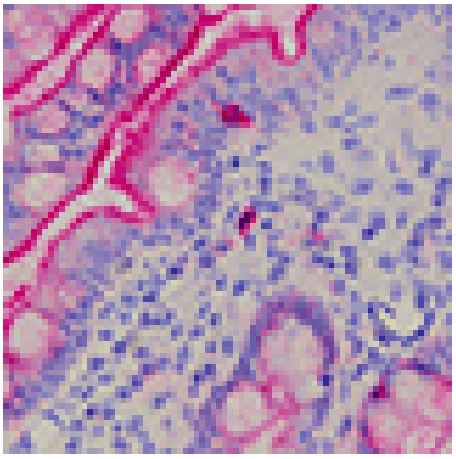
Ontogeny of MAITs





Ben Youssef et al., 2018 JEM. Figure 1D: Immunohistochemical staining of intestinal tissue sections from normal small intestine samples showing the presence of CD8+ Vα7.2+ cells. Staining is detected with AP- (panels a–d) or HRP (panels e and f)-antibody conjugate.

Mucosal-associated invariant T cells (MAITs) are non-conventional T cells that represent a considerable proportion of total adult T cells. MAITs recognise microbial-derived riboflavin (vitamin B2) derivates via the MHC class I-related (MR1) molecule. Due to their ability to recognise microbial metabolites, they are considered crucial players in antimicrobial immunity.

MAITs predominantly express the semi-invariant T cell receptor (TCR) Vα7.2-Ja33/20/12. MAITs characteristics and functions have been predominantly studied in adult populations. These studies show that MAITs co-express high levels of CD26 and CD161, and are able to secrete inflammatory cytokines and have cytotoxic activity in both an MR1-dependent and -independent fashion. Additionally, using MR1- tetramers MAITs that express other TCRs have been identified. Researchers from France, aimed to determine the postnatal expansion and maturation of MAITs from birth to adulthood using cross-sectional samples.

Ben Youssef *et al.,* predominantly defined MAITs as Vα7.2+ CD161high T cells, as the MR1-tetramer was not available for most of their experiments. They observed lower levels of MAITs in neonate cord blood compared to adult blood. MAITs detected in cord blood shared many characteristics as adult MAITs such as the expression of the master transcription factor *PLZF*. However, cord blood MAITs were predominantly MR1-tetramer negative, expressed an immature profile (CD45RO- and CD8b+), with little to no functional capacity (determined by IFNg and Granzyme B expression). By 6 months of age, MAITs detected in infant were more adult-like, predominantly MR1-tetramer positive and expressed a mature MAIT profile.

This study highlights key difference in MAITs phenotypes and functions between neonate (cord blood) and adult MAITs, that need to be taken into consideration when studying MAITs function and profiles. Where MAITs in infants are more heterogenous, and exposure to microbes throughout life results in a greater homogeneity within the MAIT compartment.

Journal Article: Ben Youssef *et al.*, 2018. Ontogeny of human mucosal-associated invariant T cells and related T cell subsets. Journal of Experimental Medicine.

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