

MR1 Rabbit pAb

Catalog # AP98474

Product Information

Application	WB, IHC-P, IHC-F, IF
Primary Accession	Q95460
Other Accession	Q95460
Host	Rabbit
Clonality	Polyclonal
Calculated MW	39366
Physical State	Liquid
Immunogen	KLH conjugated synthetic peptide derived from human MR1
Epitope Specificity	23-120/341
Isotype	IgG
Purity	affinity purified by Protein A
Buffer	0.01M TBS (pH7.4) with 1% BSA, 0.02% Proclin300 and 50% Glycerol.
Important Note	This product as supplied is intended for research use only, not for use in human, therapeutic or diagnostic applications.
Background Descriptions	MR1 is a 341 amino acid single-pass membrane protein that localizes to the endoplasmic reticulum, as well as to the extracellular side of the cell membrane, and contains one Ig-like C1-type domain. Expressed ubiquitously, MR1 exists as a heterodimer with β -2-Microglobulin and plays an important role in antigen presentation, specifically in the development and expansion of mucosal-associated invariant T cells (MAITs). MAITs are located in the gut and are involved in monitoring flora levels, as well as in conveying distress signals to other areas of the body, indicating a role for MR1 in proper digestion and immune system function. MR1 exists as four alternatively spliced isoforms and is encoded by a gene which maps to human chromosome 1.

Additional Information

Gene ID	3140
Other Names	HLALS; HMR1_HUMAN; MR1; MHC class I-related protein 1; Class I histocompatibility antigen-like protein; major histocompatibility complex, class I-related; major histocompatibility complex, class I-like sequence
Dilution	WB=1:500-2000,IHC-P=1:100-500,IHC-F=1:100-500,ICC/IF=1:100-500,IF=1:100-500
Storage	Store at -20 °C for one year. Avoid repeated freeze/thaw cycles. When reconstituted in sterile pH 7.4 0.01M PBS or diluent of antibody the antibody is stable for at least two weeks at 2-4 °C.

Protein Information

Name	MR1 {ECO:0000303 PubMed:19416870, ECO:0000312 HGNC:HGNC:4975}
Function	Antigen-presenting molecule specialized in displaying microbial pyrimidine-based metabolites to alpha-beta T cell receptors (TCR) on innate-type mucosal-associated invariant T (MAIT) cells (PubMed:19416870, PubMed:23457030, PubMed:22692454, PubMed:23051753, PubMed:24101382, PubMed:23846752, PubMed:26795251). In complex with B2M preferentially presents riboflavin-derived metabolites to semi- invariant TRAV1.2 TCRs on MAIT cells, guiding immune surveillance of the microbial metabolome at mucosal epithelial barriers (PubMed:20581831, PubMed:24101382, PubMed:24695216, PubMed:26795251). Signature pyrimidine-based microbial antigens are generated via non- enzymatic condensation of metabolite intermediates of the riboflavin pathway with by-products arising from other metabolic pathways such as glycolysis. Typical potent antigenic metabolites are 5-(2-oxoethylideneamino)-6-D-ribitylaminouracil (5-OE-RU) and 5-(2-oxopropylideneamino)-6-D-ribitylaminouracil (5-OP-RU), products of condensation of 5-amino-6-D-ribityaminouracil (5-A-RU) with glyoxal or methylglyoxal by-products, respectively (PubMed:24695216, PubMed:32958637, PubMed:32709702). May present microbial antigens to various TRAV1-2-negative MAIT cell subsets, providing for unique recognition of diverse microbes, including pathogens that do not synthesize riboflavin (PubMed:27527800, PubMed:31113973). Upon antigen recognition, elicits rapid innate-type MAIT cell activation to eliminate pathogenic microbes by directly killing infected cells (PubMed:23846752, PubMed:24695216, PubMed:27527800). During T cell development, drives thymic selection and post-thymic terminal differentiation of MAIT cells in a process dependent on commensal microflora (By similarity). Acts as an immune sensor of cancer cell metabolome (PubMed:31959982). May present a tumor-specific or -associated metabolite essential for cancer cell survival to a 'pan- cancer' TCR consisting of TRAV38.2-DV8*TRAJ31 alpha chain paired with a TRBV25.1*TRBJ2.3 beta chain on a non-MAIT CD8-positive T cell clone (MC.7.G5), triggering T cell-mediated killing of a wide range of cancer cell types (PubMed:31959982).
Cellular Location	Cell membrane; Single-pass type I membrane protein Endoplasmic reticulum membrane; Single-pass type I membrane protein. Golgi apparatus membrane; Single-pass type I membrane protein. Early endosome membrane; Single-pass type I membrane protein. Late endosome membrane; Single-pass type I membrane protein. Note=In the absence of antigen remains within the endoplasmic reticulum where it acts as a metabolite sensor. Antigen binding triggers trafficking of the ternary complex to the plasma membrane. After presentation, most of these complexes are rapidly internalized and degraded via endocytosis. A small subset recycles via endosomes back to the plasma membrane and may thus acquire and present new antigens that do not efficiently reach the endoplasmic reticulum. [Isoform 3]: Cell membrane; Single-pass type I membrane protein. Endoplasmic reticulum membrane; Single-pass membrane protein. Note=The larger proportion remains in the ER in an immature state. The subset that reach cell surface does it through a B2M-independent pathway.
Tissue Location	Ubiquitous (PubMed:7624800, PubMed:9780177). Low expression is detected in peripheral blood B cells, T cells, monocytes and in bronchial epithelial cells (at protein level) (PubMed:27043408) Expressed in plasmablasts or plasma B cells in the lamina propria of ileum, appendix and colon (at protein level) (PubMed:19760593). Highly expressed on a subset of CD45-positive CD3-positive thymocytes (at protein level) (PubMed:22692454).