

Anti-Mouse H-2 Antibody

Catalog Number:	200301, 200302
Size:	25 ug, 100 ug
Target Name:	H-2, major histocompatibility complex (MHC) H-2
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	M1/42
Application:	Flow Cytometry
Reactivity:	Mouse
Format:	Purified
Isotype:	Rat IgG2a
Antibody Type:	Monoclonal
Formulation:	Phosphate-buffered solution, pH 7.2, containing 0.09% sodium azide
Protein Concentration:	0.5 mg/mL
Storage and Handling:	Store the antibody undiluted at 2°C to 8°C.
Recommended Usage:	For flow cytometric staining, it is recommended to use less than 0.2 µg of this reagent per 0.5-1.0 million cells in a 100 µL volume. Optimal reagent performance should be determined by titration for each specific application.
Isotype Control:	300201

BACKGROUND INFORMATION

The mouse H-2 complex is the murine major histocompatibility complex (MHC), a highly polymorphic genomic region that plays a central role in adaptive immunity. Encoded on mouse chromosome 17, the H-2 complex governs antigen presentation to T lymphocytes and is essential for immune recognition of pathogens, tumors, and transplanted tissues. Through regulated expression of MHC class I and class II molecules, the H-2 complex enables the immune system to distinguish self from non-self and to mount appropriate cellular immune responses.

Structurally, the H-2 complex is divided into several regions, most notably the class I (H-2K, H-2D, and in some strains H-2L), class II (I-A and I-E), and class III regions. Class I H-2 molecules are composed of a polymorphic heavy α chain non-covalently associated with β 2-microglobulin, forming a peptide-binding groove that presents short endogenous peptides to CD8+ T cells. Class II H-2 molecules consist of polymorphic α and β chains that together form a peptide-binding cleft for longer peptides derived from extracellular proteins, which are presented to CD4+ T cells. The class III region encodes several immune-related proteins, including complement components and cytokines, rather than antigen-presenting molecules.

The primary ligands for H-2 class I and class II molecules are peptide antigens generated by intracellular or extracellular antigen-processing pathways, respectively. Class I molecules bind peptides typically 8-10 amino acids in length, derived from

cytosolic proteins processed by the proteasome, while class II molecules present longer peptides derived from endosomal and lysosomal processing of exogenous antigens. These peptide-MHC complexes are recognized by T cell receptors, forming the basis of antigen-specific T cell activation.

Variation within the H-2 complex has profound effects on disease susceptibility and immune outcomes in mice. Specific H-2 haplotypes are associated with resistance or susceptibility to infectious agents, autoimmune diseases, and cancer in experimental models. H-2 compatibility is also a dominant determinant of graft rejection in transplantation studies, making the complex a critical factor in experimental immunology. Differences in peptide-binding preferences among H-2 alleles influence T cell repertoire selection and immune response strength.

In therapy and biomedical research, the H-2 complex is indispensable for the development and interpretation of mouse models of human disease. It shapes responses to vaccines, immunotherapies, and infectious challenges in preclinical studies. Understanding H-2-restricted antigen presentation is also essential for designing mouse tumor models, evaluating T cell-based therapies, and translating immunological findings from mice to humans, underscoring the H-2 complex's foundational role in immunology.

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