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PE/iF594 Anti-Human HLA-DR Antibody

Catalog Number:	102719, 102720
Size:	25 tests, 100 tests
Target Name:	HLA-DR, Major Histocompatibility Class II, MHC class II
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	L243
Application:	Flow Cytometry
Reactivity:	Human
Format:	PE/iF594
Isotype:	Mouse IgG2a
Antibody Type:	Monoclonal
Formulation:	Phosphate-buffered solution, pH 7.2, containing 0.09% sodium azide and 0.2% (w/v) BSA
Protein Concentration:	Supplied at a lot-specific concentration.
Storage&Handling:	The antibody solution should be stored undiluted between 2°C and 8°C, and protected from prolonged exposure to light. Do not freeze.
Recommended Usage:	For flow cytometric staining, it is recommended to use 5 µL 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. PE/iF594 has an excitation max at 565 nm and an emission max at 603 nm.
Excitation Laser:	Blue Laser (488 nm) Green/Yellow laser (532/561nm)
Isotype Control:	301517

BACKGROUND INFORMATION

HLA-DR is a major histocompatibility complex (MHC) class II molecule that plays a central role in adaptive immune responses by presenting antigenic peptides to $CD4^+$ T helper cells. It is primarily expressed on professional antigen-presenting cells (APCs), including dendritic cells, macrophages, B cells, and thymic epithelial cells, and its expression can be induced on other cell types under inflammatory conditions, particularly by interferon-γ.

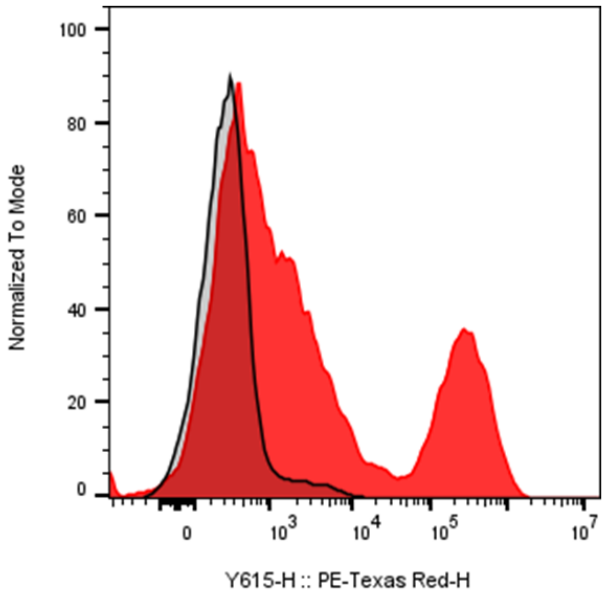
Structurally, HLA-DR is a heterodimer composed of an α chain (DRA) and a β chain (DRB), each containing two extracellular domains, a transmembrane region, and a short cytoplasmic tail. The α1 and β1 domains together form the peptide-binding groove, which accommodates peptides typically 13–25 amino acids in length. This groove is open at both ends, allowing for flexibility in peptide size. HLA-DR is highly polymorphic, particularly in the DRB genes, enabling the immune system to present a broad repertoire of antigenic peptides derived from pathogens or self-proteins. The ligands of HLA-DR are processed peptide antigens generated from extracellular or vesicular proteins that are internalized, degraded in endosomal compartments, and loaded onto

HLA-DR molecules. Peptide loading is tightly regulated by accessory molecules, including the invariant chain (Ii), which prevents premature peptide binding, and HLA-DM, which facilitates peptide exchange and stabilizes high-affinity peptide–HLA-DR complexes. The primary functional interaction of HLA-DR is with the T cell receptor (TCR) on $CD4^+$ T cells, initiating T cell activation and differentiation.

HLA-DR is strongly implicated in disease. Specific HLA-DR alleles are associated with susceptibility or protection in numerous autoimmune diseases, including rheumatoid arthritis, type 1 diabetes, systemic lupus erythematosus, and multiple sclerosis, reflecting differences in self-antigen presentation. Aberrant or reduced HLA-DR expression is also observed in cancer and sepsis, where impaired antigen presentation contributes to immune evasion or immunosuppression. Conversely, elevated HLA-DR expression on monocytes is often used as a marker of immune activation and immune competence.

Therapeutically, HLA-DR has both direct and indirect relevance. Anti-HLA-DR monoclonal antibodies have been explored in transplantation and hematologic malignancies to modulate immune responses or deplete malignant APCs. In cancer immunotherapy and vaccine development, effective antigen presentation via HLA-DR is essential for robust $CD4^+$ T cell help, supporting durable antitumor and antiviral immunity. Additionally, HLA-DR expression is widely used as a diagnostic and prognostic biomarker in immunology, oncology, and critical care settings.

PRODUCT DATA



Human peripheral lymphocytes were stained with PE/iF594 Anti-Human HLA-DR clone L243 (color-filled histogram) or an isotype control (gray histogram).

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