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# iF488 Anti-Human HLA-DR Antibody

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| **Catalog Number:** | 102703, 102704 |
| **Size:** | 25 tests, 100 tests |
| **Target Name:** | HLA-DR, Major Histocompatibility Class II, MHC class II |
| **Regulatory Status:** | RUO |

## PRODUCT DETAILS

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| **Clone:** | L243 |
| **Application:** | Flow Cytometry |
| **Reactivity:** | Human |
| **Format:** | iF488 |
| **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 and 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. iF488 has an excitation max at 491 nm and an emission max at 516 nm. |
| **Excitation Laser:** | Blue Laser (488 nm) |
| **Isotype Control:** | 301505 |

## 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.

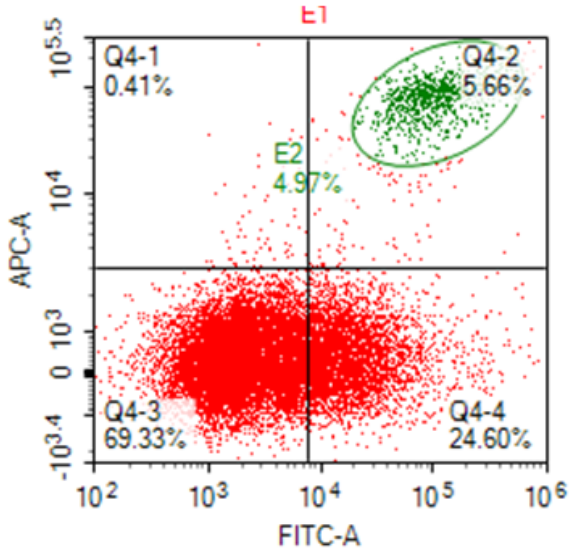
Structurally, HLA-DR is a heterodimer composed of an α chain (DRA) and a β chain (DRB), each containing two extracellular domains, a transmembrane region, and a short cytoplasmic tail. The α1 and β1 domains together form the peptide-binding groove, which accommodates peptides typically 13–25 amino acids 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 blood lymphocytes stained with iF647 anti-human CD19 clone SJ25C1 and iF488 anti-human HLA-DR clone L243.

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