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# InnoSite™ PB Anti-human HLA-ABC Antibody

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| **Catalog Number:** | 180605, 180606 |
| **Size:** | 25 tests, 100 tests |
| **Target Name:** | HLA-ABC, Major Histocompatibility Class I, MHC class I |
| **Regulatory Status:** | RUO |

## PRODUCT DETAILS

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| **Clone:** | HLACB |
| **Application:** | Flow Cytometry |
| **Reactivity:** | Human |
| **Format:** | PB |
| **Isotype:** | Rabbit IgG |
| **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. Pacific Blue has an excitation max at 404 nm and an emission max at 455 nm. |
| **Excitation Laser:** | Violet laser (405nm) |
| **Isotype Control:** | 380006 |
| **Brand:** | InnoSite |

## BACKGROUND INFORMATION

HLA-ABC refers to the classical human leukocyte antigen (HLA) class I molecules, HLA-A, HLA-B, and HLA-C, encoded within the major histocompatibility complex (MHC) on chromosome 6. These molecules are expressed on the surface of nearly all nucleated cells and play a pivotal role in the adaptive immune response. Their main function is to present endogenously derived peptide antigens, typically from intracellular proteins, to cytotoxic $CD8^+$ T lymphocytes. This antigen presentation enables the immune system to continuously monitor cell integrity and identify cells infected by viruses or transformed by cancer.

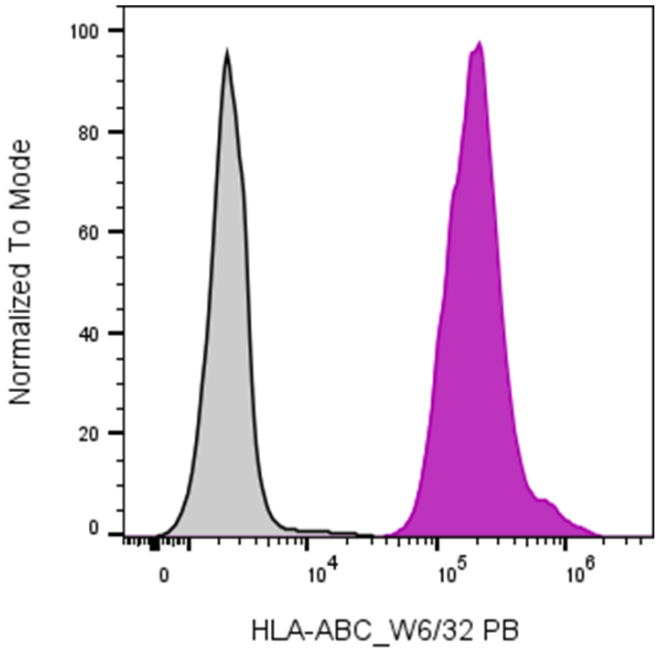
Structurally, HLA class I molecules are heterodimeric complexes consisting of a transmembrane heavy (alpha) chain and a non-covalently associated light chain known as β2-microglobulin. The heavy chain comprises three extracellular domains (α1, α2, and α3), a transmembrane region, and a short cytoplasmic tail. The peptide-binding groove is formed by the α1 and α2 domains and accommodates short peptides 8–10 amino acids in length. Peptides are generated through proteasomal degradation of

intracellular proteins and transported into the endoplasmic reticulum by TAP (Transporter Associated with Antigen Processing) proteins, where they bind to nascent HLA-I molecules before being shuttled to the cell surface.

Ligands for HLA-ABC primarily include T cell receptors (TCRs) on $CD8^+$ T cells, which recognize the peptide-HLA complex in a highly specific manner. Additionally, HLA class I molecules interact with receptors on Natural Killer (NK) cells, especially Killer-cell Immunoglobulin-like Receptors (KIRs) and CD94/NKG2A. Under normal conditions, these interactions deliver inhibitory signals that prevent NK cells from attacking healthy cells. When HLA-I expression is lost or downregulated—as frequently occurs in viral infection or tumor cells-NK cells are activated to destroy the abnormal cell, a mechanism known as “missing-self” recognition.

In disease, alterations in HLA-ABC expression or polymorphisms contribute to susceptibility to autoimmune disorders, infection progression, and cancer immune evasion. Many viruses, such as HIV and cytomegalovirus, have evolved mechanisms to reduce HLA-I surface expression, avoiding T cell detection. Similarly, tumor cells that downregulate HLA-I to escape cytotoxic T cells can simultaneously become vulnerable to NK cell-mediated killing. In cancer immunotherapy, restoring or enhancing HLA-I expression can improve antigen presentation and T cell recognition. Clinical strategies, such as checkpoint inhibitors and peptide-based vaccines, rely heavily on functional HLA-I presentation. Furthermore, HLA typing remains essential in tissue transplantation, where donor and recipient compatibility determines graft acceptance or rejection through T cell recognition of HLA differences.

## PRODUCT DATA




Human peripheral blood lymphocytes were stained with PB Anti-Human HLA-A,B,C clone HLACB (color-filled histogram) or an isotype control (gray histogram).

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