InnoCyto Inc.
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Technical Data Sheet

iF488 Anti-Human CD53 Antibody

Catalog Number: 110002, 110003
Size: 25 tests, 100 tests
Target Name: CD53, OX44
Regulatory Status: RUO

Product Details

Clone: HI29
Application: Flow Cytometry
Reactivity: Human
Format: iF488
Isotype: Mouse IgG1
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. iF488 has an excitation max at 491 nm and an emission max at 516 nm.
Excitation Laser: Blue Laser (488 nm)
Isotype Control: 301409

Background Information

CD53 is a member of the tetraspanin superfamily, a group of small transmembrane proteins that function as molecular scaffolds to organize membrane microdomains and regulate signaling, adhesion, and trafficking. It is widely expressed on leukocytes, including B cells, T cells, monocytes, macrophages, and neutrophils, and to a lesser degree on some non-hematopoietic tissues. CD53 plays a key role in regulating immune cell activation, survival, and communication within the immune system, coordinating complex intercellular interactions during both innate and adaptive responses.

Structurally, CD53 is a 25-30 kDa glycoprotein composed of four transmembrane domains, two extracellular loops (a small EC1 and a larger EC2), and short intracellular N- and C-terminal tails. The EC2 loop contains conserved cysteine residues that stabilize the protein through disulfide bonding and participate in interactions with other membrane components. Like other tetraspanins, CD53 does not bind a unique ligand in the traditional sense but forms complexes with integrins, signaling molecules, and other tetraspanins to assemble dynamic signal transduction platforms, often referred to as tetraspanin-enriched microdomains.

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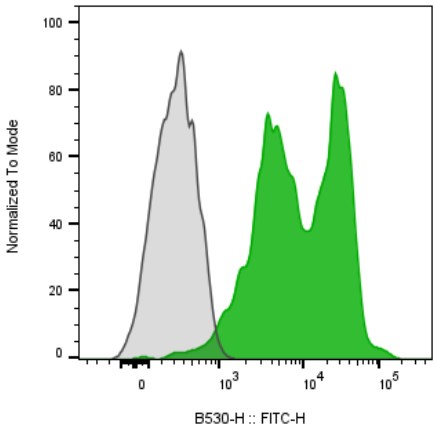
Functionally, CD53 influences multiple immune processes, including cell proliferation, adhesion, migration, and antigen presentation. It modulates signaling through interactions with various receptors such as CD19 and integrins, enhancing immune cell activation and stabilizing surface molecules. In T and B cells, CD53 aids in maintaining membrane organization and survival signaling, particularly under conditions of oxidative stress or immune challenge.

In disease, CD53 has been implicated in immune deficiencies and malignancies. Mutations in the CD53 gene are rare but have been linked to severe combined immunodeficiency (SCID)-like conditions characterized by defective lymphocyte activation and recurrent infections. Altered CD53 expression has been observed in cancers, including lymphoma, leukemia, and glioma, where its expression level correlates with tumor progression or prognosis depending on cellular context. Moreover, CD53 is involved in inflammatory disorders, influencing leukocyte migration and cytokine production.

Therapeutically, CD53 is being examined as a potential biomarker and immune target. Its surface expression on immune and cancer cells makes it a candidate for antibody-based therapies or diagnostic imaging. Additionally, the regulatory role of CD53 in immune cell signaling suggests that modulation of its function could support therapies aimed at restoring immune balance, enhancing antitumor immunity, or dampening pathological inflammation.

Product Data



Human peripheral blood lymphocytes stained either iF488 Anti-Human CD53 clone HI29 (color-filled histogram) or an isotype control (gray histogram).