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InnoCyto Inc.

15375 Barranca Pkwy, Suite I-103
Irvine, CA 92618
Email: info@innocyto.com
Phone: 1-949-418-7543

iF700 Anti-Human CD16 Antibody

Catalog Number:	105915, 105916
Size:	25 tests, 100 tests
Target Name:	CD16, FcγRIII
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	3G8
Application:	Flow Cytometry
Reactivity:	Human
Format:	iF700
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 uL 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. iF700 has an excitation max at 690 nm and an emission max at 710 nm.
Excitation Laser:	Red Laser (633 nm)
Isotype Control:	301433

BACKGROUND INFORMATION

CD16, also known as Fc gamma receptor III (FcγRIII), is a low-affinity receptor for the Fc region of immunoglobulin G (IgG) and plays a pivotal role in antibody-mediated immune responses. It is expressed primarily on natural killer (NK) cells, neutrophils, monocytes, and macrophages, with expression patterns and function varying by cell type. In humans, CD16 exists in two closely related forms encoded by distinct genes: CD16a (FcγRIIIA) and CD16b (FcγRIIIB).

Structurally, CD16 is a type I transmembrane glycoprotein composed of two extracellular immunoglobulin-like domains responsible for IgG binding. CD16a is a transmembrane receptor expressed on NK cells and some myeloid cells, where it associates with signaling adaptor proteins containing immunoreceptor tyrosine-based activation motifs (ITAMs), such as FcεRIγ and CD3ζ. In contrast, CD16b is attached to the cell surface via a glycosylphosphatidylinositol (GPI) anchor and is expressed almost exclusively on neutrophils, lacking direct intracellular signaling capacity.

Functionally, CD16 mediates antibody-dependent cellular cytotoxicity (ADCC) and phagocytosis. Upon binding to IgG-opsonized

target cells, CD16a on NK cells triggers activation signals that lead to the release of cytotoxic granules containing perforin and granzymes, resulting in target cell death. On myeloid cells, CD16 engagement promotes phagocytosis, oxidative burst, and cytokine release, contributing to pathogen clearance and inflammation. CD16 preferentially binds IgG1 and IgG3 subclasses, which are commonly elicited during effective immune responses.

CD16 plays important roles in both protective immunity and disease. Genetic polymorphisms in FCGR3A influence IgG binding affinity and have been associated with susceptibility to infections, autoimmune diseases, and cancer outcomes. Excessive or dysregulated CD16 activation contributes to inflammatory and autoimmune conditions such as rheumatoid arthritis and systemic lupus erythematosus, where immune complexes drive tissue damage. In cancer, CD16 expression and function on NK cells are critical determinants of immune surveillance and therapeutic efficacy.

In therapeutics, CD16 is central to the mechanism of action of many antibody-based drugs. Therapeutic monoclonal antibodies used in oncology, such as those targeting tumor antigens, rely on CD16-mediated ADCC for clinical activity. Engineering antibodies with enhanced Fc affinity for CD16 or developing CD16-engaging bispecific antibodies are active areas of drug development. Additionally, adoptive NK cell therapies often aim to optimize CD16 expression and signaling, highlighting CD16 as a key bridge between antibody recognition and cellular immune effector function.