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iF647 Anti-Human CD14 Antibody

Catalog Number:	110103, 110104
Size:	25 tests, 100 tests
Target Name:	CD14, LPS receptor
Regulatory Status:	RUO

PRODUCT DETAILS

Clone:	M5E2
Application:	Flow Cytometry
Reactivity:	Human
Format:	iF647
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. iF647 has an excitation max at 656 nm and an emission max at 670 nm.
Excitation Laser:	Red Laser (633 nm)
Isotype Control:	301511
RRID:	AB_3738935

BACKGROUND INFORMATION

CD14 is a pattern recognition receptor that plays a central role in innate immune sensing of microbial products, particularly components of bacterial cell walls. It is primarily expressed on cells of the myeloid lineage, including monocytes, macrophages, neutrophils, and to a lesser extent dendritic cells. CD14 functions as a coreceptor in the recognition of pathogen-associated molecular patterns (PAMPs) and is especially important for initiating inflammatory responses to Gram-negative bacterial infections.

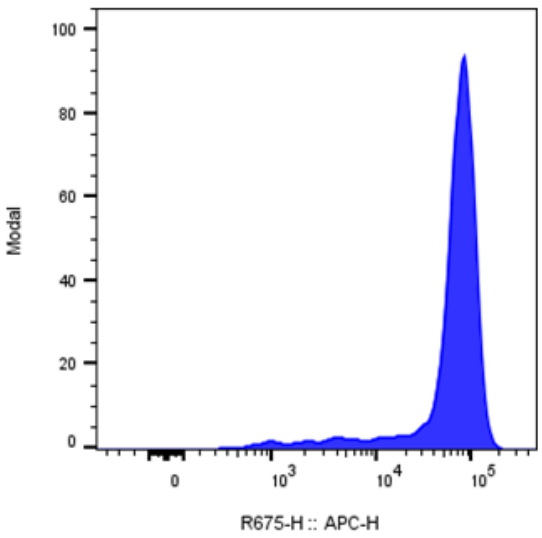
Structurally, CD14 is a glycoprotein composed largely of leucine-rich repeat (LRR) motifs that form a curved solenoid structure optimized for ligand binding. CD14 exists in two main forms: a membrane-bound form (mCD14), which is attached to the cell surface via a glycosylphosphatidylinositol (GPI) anchor, and a soluble form (sCD14), which is present in plasma and other body fluids. Unlike many immune receptors, CD14 lacks a transmembrane and intracellular signaling domain, meaning it cannot signal independently and must cooperate with other receptors to transmit activation signals.

Functionally, CD14 acts as a high-affinity binding protein for lipopolysaccharide (LPS), a major component of the outer membrane of Gram-negative bacteria. In conjunction with LPS-binding protein (LBP), CD14 transfers LPS to the Toll-like receptor 4 (TLR4)–MD-2 complex, which then initiates downstream signaling pathways leading to activation of NF-κB and production of pro-inflammatory cytokines such as TNF-α, IL-1β, and IL-6. Beyond LPS, CD14 can bind a range of microbial ligands, including lipoteichoic acid from Gram-positive bacteria, peptidoglycan, and certain viral and fungal components, broadening its role in innate immune surveillance.

CD14 is strongly implicated in disease, particularly in conditions driven by excessive inflammation. Overactivation of CD14-dependent pathways contributes to sepsis and septic shock, where uncontrolled cytokine release can lead to tissue damage, organ failure, and death. Elevated levels of soluble CD14 are associated with chronic inflammatory states, including atherosclerosis, metabolic disease, and HIV infection, and are often used as biomarkers of monocyte activation and systemic inflammation.

Therapeutically, CD14 is an attractive target for modulating innate immune responses. Monoclonal antibodies and other inhibitors targeting CD14 have been explored as strategies to dampen harmful inflammation in sepsis and other inflammatory disorders by limiting LPS-induced TLR4 activation. In diagnostics and research, CD14 is widely used as a defining marker of monocytes and macrophages in flow cytometry and immunohistochemistry, underscoring its importance in both clinical and experimental immunology.

PRODUCT DATA



Human peripheral blood monocytes stained with iF647 Anti-Human CD14 clone M5E2 (color-filled histogram).

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