

Gene name: **FCGR1A**

External Ids for FCGR1A Gene: HGNC: [3613](#) NCBI Gene: [2209](#) Ensembl: [ENSG00000150337](#) OMIM®: [146760](#) UniProtKB/Swiss-Prot: [P12314](#)..

NCBI Gene Summary: This gene encodes a protein that plays an important role in the immune response. This protein is a high-affinity Fc-gamma receptor. The gene is one of three related gene family members located on chromosome 1.

GeneCards Summary: FCGR1A (Fc Gamma Receptor Ia) is a Protein Coding gene. Diseases associated with FCGR1A include [Peritonitis](#) and [Pharyngitis](#). Among its related pathways are [ADORA2B mediated anti-inflammatory cytokines production](#) and [Regulation of actin dynamics for phagocytic cup formation](#). Gene Ontology (GO) annotations related to this gene include *obsolete signal transducer activity*, *downstream of receptor* and *IgG binding*. An important paralog of this gene is [FCRLB](#).

UniProtKB/Swiss-Prot Summary: High affinity receptor for the Fc region of immunoglobulins gamma. Functions in both innate and adaptive immune responses. Mediates IgG effector functions on monocytes triggering antibody-dependent cellular cytotoxicity (ADCC) of virus-infected cells.

Cellular localization: plasma membrane, Stabilized at the cell membrane through interaction with FCER1G.

CD64, also known as **Fc gamma receptor I (FcγRI)**, is a high-affinity receptor for the Fc region of immunoglobulin G (IgG). Encoded by the **FCGR1A** gene, CD64 is primarily expressed on the surface of immune cells such as monocytes, macrophages, and, upon activation, neutrophils. It plays a crucial role in immune defense mechanisms, including phagocytosis, antigen presentation, and cytokine production.

Function in Sepsis:

- **Activation Marker:** During sepsis, neutrophils become activated, leading to increased expression of CD64. This upregulation enhances the neutrophils' ability to recognize and eliminate pathogens through improved phagocytic activity.

Diagnostic and Prognostic Role:

- **Diagnostic Marker:** Elevated nCD64 expression has been extensively studied as a biomarker for the early detection of sepsis. Meta-analyses have demonstrated that nCD64 exhibits high sensitivity and specificity for diagnosing sepsis in critically ill patients, making it a valuable tool for distinguishing sepsis from non-infectious inflammatory conditions.
- **Prognostic Indicator:** Beyond diagnosis, nCD64 levels have been investigated for their prognostic value. Studies suggest that higher nCD64 expression correlates with increased severity of sepsis and may be associated with higher mortality rates, indicating its potential utility in assessing patient prognosis.

Measurement Techniques:Flow Cytometry: The quantification of nCD64 expression is typically performed using flow cytometry, which allows for precise measurement of CD64 levels on neutrophils. This method is widely used in clinical laboratories to aid in the rapid diagnosis of sepsis.

Therapeutic Implications: While nCD64 serves as a valuable biomarker, its role as a therapeutic target is still under investigation. Modulating CD64 expression or function could potentially influence the immune response during sepsis, but further research is needed to explore this possibility.

