Gene name: **CCL19**

External Ids for CCL19 Gene: HGNC: 10617 NCBI Gene: 6363 Ensembl: ENSG00000172724 OMIM®: 602227 UniProtKB/Swiss-Prot: Q99731

NCBI Gene Summary: This antimicrobial gene is one of several CC cytokine genes clustered on the p-arm of chromosome 9. Cytokines are a family of secreted proteins involved in immunoregulatory and inflammatory processes. The CC cytokines are proteins characterized by two adjacent cysteines. The cytokine encoded by this gene may play a role in normal lymphocyte recirculation and homing. It also plays an important role in trafficking of T cells in thymus, and in T cell and B cell migration to secondary lymphoid organs. It specifically binds to chemokine receptor CCR7.

GeneCards Summary: CCL19 (C-C Motif Chemokine Ligand 19) is a Protein Coding gene. Diseases associated with CCL19 include Allergic Contact Dermatitis and Polyradiculoneuropathy. Among its related pathways are MIF Mediated Glucocorticoid Regulation and TGF-Beta Pathway. Gene Ontology (GO) annotations related to this gene include *chemokine activity* and *CCR10 chemokine receptor binding*. An important paralog of this gene is CCL21.

UniProtKB/Swiss-Prot Summary: May play a role not only in inflammatory and immunological responses but also in normal lymphocyte recirculation and homing. May play an important role in trafficking of T-cells in thymus, and T-cell and B-cell migration to secondary lymphoid organs. Binds to chemokine receptor CCR7. Recombinant CCL19 shows potent chemotactic activity for T-cells and B-cells but not for granulocytes and monocytes. Binds to atypical chemokine receptor ACKR4 and mediates the recruitment of beta-arrestin (ARRB1/2) to ACKR4. (CCL19_HUMAN,Q99731)
Cellular localization: mainly extracellular region.

CCL19, or **C-C motif chemokine ligand 19**, is a protein encoded by the **CCL19** gene located on chromosome 9p13. It belongs to the CC chemokine family, characterized by two adjacent cysteines, and plays a crucial role in immune regulation and inflammation. CCL19 is abundantly expressed in lymphoid organs, including the thymus and lymph nodes, and is essential for normal lymphocyte recirculation and homing. It specifically binds to the chemokine receptor **CCR7**, guiding the migration of T cells and B cells to secondary lymphoid organs and facilitating interactions between dendritic cells and T cells.

Function in Sepsis: In the context of sepsis—a severe systemic inflammatory response to infection—CCL19's role is not fully elucidated. However, studies have shown a significant increase in plasma CCL19 levels in patients with sepsis, which may be related to sepsis severity.

Pathways Involved in Sepsis:

CCL19, through its interaction with CCR7, is involved in several key pathways during immune responses:

- **Chemotaxis:** CCL19 attracts CCR7-expressing cells, such as dendritic cells and T cells, to lymphoid tissues, facilitating antigen presentation and the initiation of adaptive immune responses.
- **Activation-Induced Cell Death (AICD):** CCL19 has been shown to promote AICD in antigen-specific CD4+ T cells, regulating not only T cell mobilization but also the post-activation fate of T cells.

Diagnostic and Prognostic Role: Research on the relationship between CCL19 and sepsis is currently limited. While elevated plasma CCL19 levels have been observed in sepsis patients, further studies are needed to determine its potential as a diagnostic or prognostic biomarker.

Therapeutic Implications: Given its role in immune cell trafficking and activation, modulating CCL19 activity could influence immune responses during sepsis. However, the therapeutic potential of targeting CCL19 in sepsis requires further investigation.