Cytokine receptor

- Rejuvenation alleviates prolonged postsurgical pain in aging mice by mitigating inflammaging
- Mutations in PSEN1 predispose inflammation in an astrocyte model of familial Alzheimer's disease through disrupted regulated intramembrane proteolysis
- Characterization of Arterial Aneurysms in Loeys-Dietz Syndrome
- EGFRvIII-positive glioblastoma contributes to immune escape and malignant progression via the c-Fos-MDK-LRP1 axis
- Exploring the role of neutrophils in inflammatory pain hypersensitivity via single-cell transcriptome profiling
- 5-ALA Assisted Surgery of Human Glioblastoma Samples Reveals an Enrichment of T Cells Expressing PD-1 and CD103 in the Intermediate and Marginal Layers
- CD70 CAR-T cells empowered by TS-2021 through ex vivo transduction show potent antitumor efficacy against glioblastoma
- Natural Killer Cell Immune Checkpoints and Their Therapeutic Targeting in Cancer Treatment

Cytokine receptors are a class of cell surface receptors that play a crucial role in the immune system and other physiological processes. These receptors are activated by cytokines, which are signaling molecules that mediate communication between cells in the immune system and regulate various immune responses, inflammation, and other functions in the body. Cytokine receptors are essential for transducing the signals from cytokines, ultimately leading to changes in gene expression and cell behavior.

Key features of cytokine receptors include:

Diversity: Cytokine receptors form a diverse group of receptors, and they can be classified into different families based on their structural characteristics and mechanisms of signal transduction. These receptor families include Class I, Class II, and Class III cytokine receptors, as well as other subtypes.

Transmembrane Proteins: Cytokine receptors are typically transmembrane proteins, meaning they span the cell membrane, with an extracellular domain that binds to cytokines and an intracellular domain that initiates signaling cascades when activated.

Signal Transduction: When a cytokine binds to its specific receptor, it induces a conformational change in the receptor, leading to the activation of intracellular signaling pathways. One of the most common signaling pathways triggered by cytokine receptors is the JAK-STAT (Janus kinase-signal transducer and activator of transcription) pathway, but other pathways can also be activated.

Dimerization: Many cytokine receptors exist as dimers. They can form homodimers (consisting of two identical receptor subunits) or heterodimers (consisting of two different receptor subunits) upon cytokine binding. Dimerization is often a crucial step in receptor activation.

Cellular Responses: The activation of cytokine receptors results in a wide range of cellular responses, such as changes in gene expression, cell proliferation, differentiation, and immune cell function. The specific responses depend on the type of cytokine, receptor, and signaling pathway involved.

Examples of well-known cytokine receptors include:

The interleukin-2 receptor (IL-2R), which is important for T cell activation and immune responses. The erythropoietin receptor (EpoR), which regulates red blood cell production. The interferon receptors

(IFNAR, IFNBR, etc.), which are involved in antiviral and immune responses. Dysregulation or mutations in cytokine receptors can lead to various immune-related disorders, autoimmune diseases, and other health conditions. Understanding how cytokine receptors work and their roles in immune responses is essential for advancing our knowledge of immunology and developing treatments for related diseases.

Classification

Cytokine receptor superfamily