

Cytokine

- [Inflammatory, White Matter, and Neurodegenerative Mechanisms in Fluid Ability Decrements in Chronic Mild-to-Moderate Traumatic Brain Injury](#)
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- [Ectopic expression of GDF15 in cancer-associated fibroblasts enhances melanoma immunosuppression via the GFRAL/RET cascade](#)
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- [Anti-Inflammatory and Analgesic Effects of Marine-Derived Antimicrobial Peptide Tilapia Piscidin 3\(TP3\) in Alleviating Chronic Constriction Injury-Induced Neuropathic Pain in Rats](#)

Cytokines are small [proteins](#) or [peptides](#) that act as cell-signaling molecules in the immune system and other biological processes. They play a crucial role in mediating communication between various cells, including immune cells, and are involved in regulating immune responses, inflammation, hematopoiesis (the formation of blood cells), and numerous other physiological and pathological processes.

Cytokines and angiogenic factors are closely linked to the brain cancer behavior. Moreover, recent studies suggest a link between inflammation and tumorigenesis, underlying the complex nature of this topic, especially the anti- and pro-tumoral activities of inflammation and the two-way interactions between immune and tumor cells. The current understanding of the mechanisms by which CNS cancer cells modulate the immune system, especially how bi-directional communications between immune cells and tumor cells create an immunosuppressed microenvironment, gives important information about the promotion of tumor survival and growth ¹⁾.

Chemokines are a superfamily of secreted proteins involved in immunoregulatory and inflammatory processes. The superfamily is divided into four subfamilies based on the arrangement of N-terminal cysteine residues of the mature peptide.

Functions

Cell Signaling: Cytokines are released by immune cells and other cell types in response to various stimuli, such as infections or tissue damage. They serve as signaling molecules that transmit information between cells.

Immunomodulation: Cytokines help regulate the immune system by influencing the activation, differentiation, and function of immune cells, such as T cells, B cells, macrophages, and natural killer (NK) cells.

Inflammation: Many cytokines are involved in the initiation and regulation of inflammatory responses. Proinflammatory cytokines, for example, promote inflammation, while anti-inflammatory cytokines help resolve inflammation.

Cell Recruitment: Some cytokines, known as chemokines, guide immune cells to specific sites within the body where they are needed, such as infection or injury sites.

Hematopoiesis: Cytokines participate in the regulation of blood cell development and maturation, influencing processes like erythropoiesis (production of red blood cells) and leukopoiesis (production of white blood cells).

Antiviral Defense: Certain cytokines, like interferons, play a critical role in antiviral defense by inhibiting viral replication and boosting the immune response against viruses.

Tissue Repair: Cytokines can also contribute to tissue repair and regeneration following injury or infection.

Classification

[Cytokine classification.](#)

Examples

[Interleukin 33](#)

1)

Casili G, Paterniti I, Campolo M, Esposito E, Cuzzocrea S. The Role of Neuro-Inflammation and Innate Immunity in Pathophysiology of Brain and Spinal Cord Tumors. Adv Exp Med Biol. 2023;1394:41-49. doi: 10.1007/978-3-031-14732-6_3. PMID: 36587380.

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