

## Cytokine Network

Cytokines are small proteins secreted by cells of both the innate and adaptive immune systems. They regulate diverse functions in the immune response. Cytokines include interferons, tumor necrosis factors, chemokines, and colony-stimulating factors.

Growth factors are soluble signaling molecules capable of stimulating a variety of cellular processes, including cell proliferation, migration, differentiation and multicellular morphogenesis during development and tissue healing. Typically, growth factors consist of secreted proteins and steroid hormones. Growth factors include epidermal growth factor (EGF), fibroblast growth factor (FGF), insulin-like growth factor (IGF), platelet-derived growth factor (PDGF), transforming growth factor (TGF), and vascular endothelial growth factor (VEGF), etc.

The terms 'growth factor' and 'cytokine' are often used interchangeably because some peptides categorized as growth factors are referred to as cytokines. Additionally, certain cytokines that influence cell growth and differentiation pathways are considered growth factors.

Cytokines and growth factors bind to receptors on the membrane of target cells, subsequently initiating transmembrane and intracellular cascade events in the signal transduction process. They mediate intracellular communication to regulate cellular and nuclear functions, forming a 'network'. This ensures a balanced immune response and supports immune cell development, activation, and performance, enhancing the immune system's ability to fight pathogens and diseases.

