Special Issue

Macrophages in Regulation of Human Diseases

Message from the Guest Editors

Macrophages play a pivotal role in immune responses, during which they are activated by a wide range of surface ligands and cytokines to acquire a continuum of functional states. The diverse differentiation status of macrophages has been referred to as “polarization”, a reversable process that modifies macrophage’s functionality. Macrophages are involved in tissue homeostasis and in the dynamic promotion or resolution of inflammatory reactions leading to tissue damage, repair, or remodeling. Macrophages and their polarization orchestrate virtually all major diseases—sepsis, infection, acute and chronic inflammatory diseases, autoimmune diseases, neurodegenerative disease, and cancer. Reprograming macrophage status is considered a promising strategy for designing novel therapies for human diseases. Given the complexity of the phenotype determination of a macrophage, the molecular regulation of macrophages and their polarization is not fully understood, and the tissue-specific and disease stage-specific manner of macrophages, including resident macrophages and circulation-derived macrophages, has not been completely characterized.

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