

Immuno-materials: the interaction at biointerface between materials and immune cells

*Wantong Song**, *Xuesi Chen*

5625 Remin Street
Changchun Institute of Applied Chemistry, Chinese Academy of Sciences
Changchun, Jilin, China
wtsong@ciac.ac.cn

The human immune system plays an integral role in health and disease, and its dysregulation drives the aetiology of cancer, autoimmune diseases and inflammation diseases. The immuno-materials represent a relatively new niche of biomaterials that combine materials science with the known molecular basis of immunology, invent and develop biomaterials capable of concentrating, interrogating, and manipulating immune cells *ex vivo* or in the human body to provide new treatment options to patients. A fundamental basis underlying immuno-materials is the study of the interaction at biointerface between materials and immune cells. Specially, the receptor clustering represents a major event in transferring extracellular signals into intracellular reactions, and macromolecules possess innate advantages in promoting this kind of clustering events. Our lab focuses on designing macromolecules or nanostructures for activating and suppressing immune cell functions via the clustering events, with the aim to develop ‘macromolecular therapeutics’ for immune-related diseases treatment. In this presentation, I will report our recent study in designing polymers for activating the stimulator of interferon genes (STING) pathway, as well as suppressing the macrophages activation for cytokine release syndrome therapy.

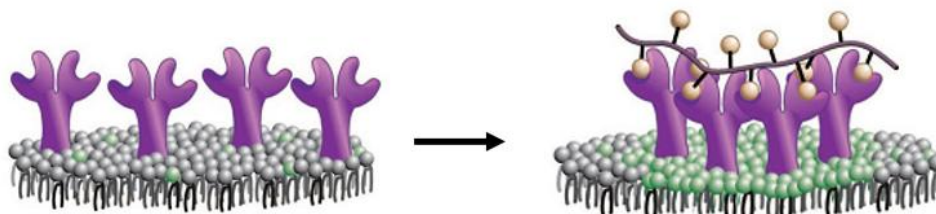


Figure 1: Polymer therapeutics for activating or deactivating immune cells through promoting the surface receptor clustering events.

References:

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