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Immune Recruitment or Suppression by Glycan Engineering of Endogenous and Therapeutic Antibodies

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Abstract

Healthy human serum IgG contains multiple glycoforms which exhibit a range of binding properties to effector molecules such as cellular Fc receptors. Emerging knowledge of how the Fc glycans contribute to the antibody structure and effector functions has opened new avenues for the exploitation of defined antibody glycoforms in the treatment of diseases. Here, we review the structure and activity of antibody glycoforms and highlight developments in antibody glycoengineering by both the manipulation of the cellular glycosylation machinery and by chemoenzymatic synthesis. We discuss wide ranging applications of antibody glycoengineering in the treatment of cancer, autoimmunity and inflammation.