Novel and Effective Anti-Inflammatory Molecules  
RU 1062

Technology Summary

Inflammatory disorders, including autoimmune diseases, are disorders involving abnormal activation and subsequent migration of white blood cells to affected areas of the body. These conditions encompass a wide range of ailments that affect the lives of millions of people throughout the world. Although various treatments are presently available, many possess significantly side effects or are not very effective in alleviating all symptoms.

Immunoglobulin G (IgG) has long been appreciated to mediate both pro- and anti-inflammatory activities through interactions mediated by its Fc fragment. Currently, intravenous gamma globulin (IVIG) and its Fc fragments are anti-inflammatory and are widely used to suppress inflammatory diseases. It has been proposed that glycosylation of IgG is crucial for regulation of cytotoxicity and inflammatory potential of IgG, one of which is sialylation at specific sites in the IgG molecule. However, only a minor population of IgG in IVIG are sialylated (sFc) and show the anti-inflammatory activity. As a result, for the suppression of autoantibody triggered inflammation in a variety of clinical settings, one has to administer IVIG at high doses (1-2g/kg), to enrich sialylated IgGs.

Our scientists have engineered the Fc portion of IgG to develop an IgG variant that is not sialylated yet has improved anti-inflammatory activity in vitro and in vivo compared to sFc. This novel IgG molecule has the potential to be a first-in-class molecule that can replace IVIG for the treatment of autoimmune diseases and other inflammatory disorders.

Advantage

Increased ease in manufacturing due to lack of requirement for sialylation. Administration of the IgG Fc variant will be at significantly lower doses than IVIG.

Area of Application

Treatment of inflammatory disorders, including autoimmune diseases.

Stage of Development

Discovery; the sialylation-free variant has been tested in mouse models for anti-inflammatory activity

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Patent Information

PCT patent application WO2013/095966 is pending.

Reference
