

ABSTRACT

The present invention provides pharmaceutical compositions comprising second-generation molecules that are superior than TOCILIZUMAB, by altering the amino acid sequences of the variable and constant regions of TOCILIZUMAB, which is a humanized anti-IL-6 receptor IgG1 antibody, to enhance the antigen-neutralizing ability and increase the pharmacokinetics, so that the therapeutic effect is exerted with a less frequency of administration, and the immunogenicity, safety and physicochemical properties (stability and homogeneity) are improved. The present invention also provides methods for producing these pharmaceutical compositions.

The present inventors have successfully generated second-generation molecules that are superior to TOCILIZUMAB by appropriately combining amino acid sequence alterations in the CDR domains, variable regions, and constant regions.