Removal of Endotoxins from Heparin, Heparosan and Aryl Sulfotransferase IV

by

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ABSTRACT

Endotoxins, which are found in the outer membrane of gram-negative bacteria, are essential for the bacteria's survival, giving it stability along with direction for other proteins. However, within a higher organism, such as humans, endotoxins are able to interact with several proteins, setting off a cascade of reactions that introduces inflammation causing fever and eventually toxic shock. With these issues in mind, it is of great importance to limit the amount of endotoxin present in products that are to be introduced into higher organisms through injection. Parenteral drugs, administered through injection, must be free of endotoxins to be safely administered. In these experiments we compare and contrast various methods of removing endotoxins from the parenteral drug heparin and from polysaccharides and enzymes used in the preparation of bioengineered heparin. The results of the current study demonstrate the effectiveness of bleaching for removing endotoxin from heparin, the effectiveness of base treatment for removing endotoxin from the polysaccharide heparosan and the effectiveness of anion-exchange or polymyxin B affinity chromatography for removing endotoxin from sulfotransferase enzyme.