Sepsis Treatment Inactivates Endotoxins Using Molecules Derived From Chitosan Derivative

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Technology description

Background

Septicemia refers to the presence of pathogens in the bloodstream that leads to sepsis, a potentially life-threatening medical condition characterized by whole-body inflammation and the presence of infection. When microbes infect the blood, skin, lungs or other tissues, the body's immune system generates an inflammatory response in an attempt to fight the infection. The body's immune response to the infection causes the characteristic symptoms of sepsis and can lead to organ failure. The current treatment for sepsis requires antibiotics, fluid drainage, blood transfusions, and dialysis. Since individual cases are caused by different microbes, the correct antibiotic must be chosen to treat the infection. This causes a delay in treatment, which leads to an increase in the mortality rate.

Technology Summary

Purdue University researchers have developed a novel treatment for septicemia involving molecules derived from chitosan. Chitosan is a linear carbohydrate with many commercial and biomedical uses. This treatment inactivates endotoxins, which are toxins associated with certain types of bacteria and stimulates cytokine release (part of the body's inflammatory response that causes swelling and high fever). This new chitosan shows many advantages over current IV treatments for septicemia. This technology can be used to filter endotoxins out of plasmid DNA samples and filter bacteria from water, making contaminated water samples safe to drink.

Application area

Medical/Health
Sepsis treatment
Contaminant removal from drinking water

Advantages

Stronger affinity for inactivating endotoxins
Excellent biocompatibility upon injection
Lower potential to cause hemolysis, complement activation, and inflammatory responses
Can filter endotoxins out of plasmid DNA samples and remove bacteria from water

Institution

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