

Inhibiting Staphylococcus epidermidis Infections

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Technology description

Problem or Unmet Need:

A serious complication in the use of implanted medical devices, such as intravascular catheters and ventricular assist devices (VADs), is the high rate of device-related infections. Staphylococcus epidermidis is one of the leading causes of device-related infections, accounting for 74-92% of infections caused by staphylococci. Even with the concomitant use of antibiotics, the probability of infection upon VAD implantation is roughly 25%, and fatal sepsis is common. Also, as all implant patients are treated post-operatively with antibiotics, the rise of antibiotic resistant strains is a serious issue.

A method for preventing S. epidermis colonization of implanted medical devices without the use of antibiotics would be beneficial for both the patient and the device manufacturers, as it would reduce the likelihood of a fatal infection and facilitate increased use of implanted medical devices, such as VADs, as not only 'bridge to transplant' devices but also as longer-term 'bridge to recovery' devices.

Details of the Invention:

This invention describes a method for preventing or treating Staphylococcus epidermidis infections of implanted medical devices. This method involves the preparation of a therapeutic agent, such as a vaccine, antibody or peptide, developed against the S. epidermis protein which binds to the collagen deposited on the surface of these medical devices. This protein was discovered to be vital for bacterial adherence by investigation of transcutaneous drivelines from explanted ventricular assist devices. Further investigation of the exposed surface of these indwelling devices showed that this binding was to collagen, and antibodies directed against this collagen-binding protein reduced binding of S. epidermis to collagen. This invention also describes methods for preparing vaccines and/or peptides against the collagen-binding protein.

Application area

Therapeutic agent for prevention or treatment of Staphylococcus epidermidis infections of implanted medical devices

Method for development of antibodies against the collagen-binding protein, a key mediator of adherence to surface of devices

Development of a prophylactic vaccine against S. epidermis

Antibodies for passive immunization during S. epidermis infection

Advantages

Vaccine against *S. epidermis* would be prophylactic against infection, reducing morbidity and mortality associated with device-related infections

Reduces the requirement of antibiotics after implantation and thereby reduces the risk of developing antibiotic-resistant strain

Institution

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