Protect Medical Device Implants Against Oxidative Damage

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Technology description

Oxidation Resistant Bioprosthetic Tissues
Market Need
Over 200,000 patients worldwide receive bioprosthetic heart valves. Compared to mechanical valves, bioprosthetics do not require patient anti-coagulation treatment. Although the risk of thromboembolism is significantly reduced, bioprosthetic valves demonstrate poor durability. Structural deterioration results in reoperations in more than a quarter of patients. Aside from failure due to accumulation of calcium deposits on the valve surface, other factors impacting durability remain poorly understood.
Technology Overview
Dr. Robert Levy and his team identified reactive oxygen species (ROS) as potential contributors to the structural damage of bioprosthetic heart valves. By covalently attaching antioxidant molecules to heterograft tissue, the treated bioprosthetic can prevent oxidative degradation. Using bovine pericardium tissue ex vivo, researchers demonstrated that attaching anti-oxidant DBP-amine reduces ROS activity and mitigates the breakdown of the bioprosthetic tissue.

Advantages

- Improves valve durability in the presence of reactive oxygen species (ROS)
- Method extends to many bioprosthetic materials

Institution

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