BIOLOGICAL VENTRICULAR ASSIST DEVICE

MEDICAL DEVICES
Biologic ventricular assist device capable of capturing, growing, and administering stem cells in situ to regenerate and restore damaged myocardium in the heart.

TECHNOLOGY SUMMARY
Ventricular assist devices (VADs) typically support heart failure patients until a donor heart becomes available. VAD's not only fail to regenerate heart tissue and restore normal function, but the longer a VAD is in place, the more scar tissue replaces healthy heart tissue, leaving the patient incapable of functioning without the device.

A novel biological VAD restores heart function by delivering stem cells, genes, genetically modified cells, or other therapeutic agents to end-stage heart failure patients. It also includes a stem cell accessory that captures circulating stem cells and cultures them for delivery back to the heart by an electro-mechanical delivery system. Delivering stem cells and other agents to the heart allows the myocardium to regenerate and repair itself, restoring normal function to the heart and allowing the VAD to be removed.

FEATURES AND BENEFITS
- Repairs damaged myocardial tissue and restores normal heart function.
- Acts as a repeat delivery system for stem cells and therapeutics through an inlet-outlet feature that provides convenient access to the heart.
- Captures cardiac stem cells that exist in normal circulation and acts as a culturing chamber to allow the proliferation of these stem cells.

INVENTOR PROFILE
David A. Bull, M.D., Adjunct Professor - Pharmaceutics and Pharmaceutical Chemistry
Sung Wan Kim, Ph.D., Distinguished Professor - Bioengineering