Value Proposition
Coronary artery bypass surgery (CABG) is an open-heart surgery which requires cutting the sternum to access the heart resulting in significant complications and morbidity in high risk patients. An even higher number of patients are considered inoperable by current standards, and can only be medically managed. For patients who are too sick or too old to have open heart bypass surgery, our product is a catheter based system that bypasses coronary arteries, and assures to promote quick recovery and prolong life. Unlike minimally invasive bypass surgery, we can bypass all arteries of the heart through a single port.

Market Opportunity
Coronary artery disease is the leading cause of death among both men and women in the US. Its prevalence is roughly 26 million with 6 million new cases every year. Each year, about 161,000 high risk bypass surgeries are performed, accounting for one third of bypass procedures. Over 30,000 of these procedures fail, an extraordinarily high rate for modern medicine, costing up to $23 billion per year. There are a further 500,000 inoperable patients who don’t undergo intervention each year, each experiencing annual hospitalizations costing approximately $28,000/year, or nearly $14 billion total. Our technology will grow the market for CABG by over 500,000 per year, by improving clinical outcomes.

Competitive Landscape
PerQ enables bypass to be carried out more quickly and accurately than existing technologies. Unlike anastomosis devices used in minimally invasive bypass surgeries, our solution needs only one access port on the chest.

IP Landscape
Invention Disclosures filed with the University of Pittsburgh, April 2016 and October 2016

PerQ
(The End of Bypass Surgery Starts Here)

PerQ uses TINY SINGLE PORT (left) for CORONARY BYPASS in order to avoid OPEN HEART SURGERY (right) in sick and old patients

Technology
PerQ utilizes a novel anchor which seals bypass grafts without the need for sutures, clips, or staples. Furthermore, it can not only bypass arteries on the back and side of the heart, but also inflicts minimal intimal wall damage resulting in less narrowing of the arteries. We use smaller catheters for non-invasive graft manipulation through leg arteries.

Stage of Development
We are currently in the stage of development of functional prototype and in vitro evaluations. Our next plan is to perform pig-based (animal) studies and human testing with optimized prototype design.

Funding
University of Pittsburgh/Central Research Development Award
FEATURED INVENTORS:

Puneeth Shridhar MD
I am in the path of establishing myself as an Entrepreneur/Translational Scientist in the field of cardiac interventions with specific focus on transcatheter coronary bypass. Being a cardiac patient, I realize the benefits of catheter based solutions in the prevention of open heart surgery. Also, as a Founder of Curehub, an innovative medical device marketplace, I am aiming to bridge gaps in supply chain in order to reduce global healthcare costs. I have focused my last two years conducting post-doctoral research in the field of Bioengineering, Interventional Cardiology, Structural Heart Disease and Supportive Care Medicine with a sole intention to eliminate the need for bypass surgery in elderly patients. Winner of PinCh 25K Prize (2016).

Education
MD, Rajiv Gandhi University of Health Sciences, India (2006-12)
MS, Center for Medical Innovation, University of Pittsburgh, USA (2015-17)

Publications

Youngjae Chun PhD
My primary research interests include designing/manufacturing the smart metallic structure, investigating biocompatibility, analyzing the mechanical and physical behaviors, and testing biomedical devices. In current research, I combine the comprehensive knowledge from diverse fields such as material processing, MEMS/Nano fabrication, biomedical science, and surface engineering that is crucially important to successfully fulfill the goal of interdisciplinary projects of metallic biomaterial-based medical devices for vascular repair. I have developed various metallic biomaterial-based endovascular devices for treating brain/aortic aneurysms, cardiovascular disease, peripheral arterial disease (PAD), vascular injuries, trauma, and iatrogenic injuries.

Education
PhD, Mechanical Engineering, University of California, Los Angeles, USA
MS, Mechanical Engineering, University of California, Los Angeles, USA
BS, Mechanical, Aerospace, and Automations Engineering, Inha University, South Korea

Publications