Many disease complications constrict or block the airway, causing shortness of breath. Although surgical correction is preferred when technically feasible and permitted by the clinical status of patient, stenting is by far a reliable alternative. Our innovative technology platform is potentially, a cost-effective biodegradable tracheal stents solution that will alleviate the problems caused by existing stents made of materials such as silicone and Nitinol. The TracheoMag’s novel magnesium alloy exhibits ultra-high ductility – with elongation in the range of 50 percent – matching that of stainless steel. Since the constituent metals are already present in the human body the stents simply degrade over time, which helps with healing and normal airway relaxation.

Technology Description
The core technology is a biometal – a novel magnesium-based alloy that can be used to design and develop the biodegradable medical devices. The invention provides a material composition for medical device implants such as stents that includes an alloy involving magnesium and lithium along with other elements. While silicone stents cause difficulties during deployment combined with migration and distortion, nitinol stents lead to scarring, inflammation and infection. Permanent stents usually demand removal and replacement procedures. The invented material exhibits more natural properties than ever before. There is no more stent closure or no need for stent replacement.

Advantages
- Biodegradable
- Ultra-high ductility
- Devoid of rare earth elements
- Helps with tissue remodeling and regeneration

Applications
- Airway stent for lung cancer, lung transplantation and other causes of stenosis
- Stent for airway burns and trauma
- Coronary stents for heart attack
Dr. Kumta has over 27 years of experience in the field of materials science and engineering with particular expertise in the innovative synthesis, design and engineering of novel materials (ceramics, metals and polymers) and systems for a variety of electrochemical applications such as energy storage, conversion as well as bioengineering and biotechnology related applications including biodegradable materials for bone tissue engineering, non-viral gene delivery, stem cell plasticity and delivery platforms. He is a Fellow of the American Ceramic Society (ACerS) and the American Institute of Medical and Biological Engineering (AIMBE) and is the Editor in Chief of Materials Science and Engineering B, Advanced Functional Solid-State Materials, an International Journal.

Education
PhD University of Arizona
MS University of Arizona
BTech Indian Institute of Technology, Bombay, India

Publications

Dr. Shridhar is a physician-scientist pursuing his PhD in bioengineering with a focus on interventional devices. He has special interest in biodegradable magnesium technology due to his personal experiences of undergoing cardiac intervention with non-biodegradable (permanent) metallic implant. Puneeth has received post-doctoral training from University of South Florida, Drexel University and University of Pittsburgh. Dr. Shridhar is the Founder of Curehub (a medical device hub), Co-Founder of Docubator (life science incubator for physicians) and board member of Zippay (healthcare fintech). Puneeth is also the recipient of Business Plan Competition Award and STAR Award from Society for Biomaterials, Pittsburgh Innovation Challenge Award and many others.

Education
MD Rajiv Gandhi University of Health Sciences, India;
MS University of Pittsburgh, Pittsburgh

Mr. Wu has been conducting research on biodegradable magnesium stents for the past 5 years. He has participated in various competitions, winning $25K from the Pitt Innovation Challenge and first place in New York division at the 10th Chunhui Cup Innovation and Entrepreneurship Competition. He also received a research grant from Children's Hospital of Pittsburgh.

Education
BS University of Science and Technology of China