

## **Revolutionizing Metallic Biomaterials for Biodegradable Implants – A Global Status**

J. Sankar

[sankar@ncat.edu](mailto:sankar@ncat.edu)

Distinguished University Professor and White House Millennium Researcher  
Director -NSF ERC for Revolutionizing Metallic Biomaterials  
NC A&T State University, Greensboro, NC, USA 27411

The purpose of the National Science Foundation (NSF) - Engineering Research Center (ERC) is to transform current medical and surgical treatments by creating "smart" implants for craniofacial, dental, orthopedic, cardiovascular, thoracic and neural interventions. The ERC is developing biodegradable metals with the premise that new kinds of implants can adapt to the human body and eventually dissolve when no longer needed, eliminating multiple surgeries and reduce health care costs. Magnesium based biodegradable systems offer significant therapeutic advantages over implants used today. Breakthrough activities include development, processing and testing of novel degradable alloy systems, new improved versions of existing clinical-use plates, screws and stents, innovative nanocoating technologies to yield special surface functionalities and methods to control implant corrosion, biocompatibility and improved bone growth. These innovations would particularly benefit pediatric patients suffering from cleft palate, angular deformities of long bones, limb length discrepancies, or trauma including fractures that require pins and screws for repair, then later remove, refit and re-implant the current generation of devices. Biodegradable stents could reduce or eliminate the need for additional invasive procedures. Sensors and other neural applications developed by the ERC will provide new information on the biological response of the body to implanted devices.

The talk will specifically provide a status update on the various innovations, translation and trailblazing pathways for developing the biodegradable implants and the impact of Mg knowledge in other multiple future applications through holistic University- Industry partnerships for economic ecosystem and commercialization

### **Short Biography**

Author of > 400 peer-reviewed articles, book chapters, and scientific papers, Sankar as PI, has generated more than \$60 million of competitive research funding, organized and sponsored more than 25 international conferences/symposia and has given more than 25 Plenary/Keynote addresses around the globe. Some of Sarkar's recognitions include the "*White House Millennium Researcher*" title from the Department of Education, the "*Order of Long Leaf Pine*" the highest civilian honor by the Governor of NC, USA, "*the O. Max Gardner Award*"- the highest honor from the University of North Carolina 17 institutions System -given for the greatest contributions to the welfare of the human race, Hind-Rattan Award on the eve of India's Republic day from the Non Resident Indians Association, AAAS Mentor Award-publisher of "Science", Fellow of NIA and AIMBE, NC/Triad Business Journal's most influential (2009- 2015), recognitions from ASME, ORNL/DoE etc, One of the first Distinguished University Professors at NCAT, Honorary professorship, Various editorial boards and High level State and National blue ribbon committees/Advisory boards/Special invited addresses at major avenues such as the National Research Council, National Academy of Engineering, National Academy of Sciences and for the Board for S &T Innovation, NSF, National SBIR get together, TV and news media numerous times including "*Science Nation*".