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Revolutionizing metallic biomaterials for biodegradable implants

J. Sankar

North Carolina A&T State University, USA

Abstract

The purpose of this 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. Biodegradable systems offer significant therapeutic advantages over implants used today. 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. Biodegradable metal implants would reduce the expense and spare children the pain of multiple procedures used to implant, 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. Breakthrough activities include new alloying techniques to produce tunable degradable metallic implants, new improved versions of existing clinical-use plates and screws, innovative nanocoating technologies to yield special surface functionalities and methods to develop new sensors for monitoring/controlling implant corrosion and studying bone growth.

Biography

Author of 400 peer-reviewed articles, book chapters, and scientific papers, Sankar as PI, has generated more than $45 million of competitive research funding, organized and sponsored more than 25 international conferences/symposia and has given more than 20 Plenary/Keynote addresses. Some of Sankar's recognitions include, 2010- 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, one of the first Distinguished University Professors at NCAT, The White House Millennium Researcher title, 2004 AAAS Mentor Award- publisher of "Science", ORNL/DoE , ASME recognitions, NC/Triad Business Journal's most influential (2009- 2013), High level State and National blue ribbon committees and advisory boards, Honorary professorships, Various editorial boards, Special addresses at major avenues such as the National Academies, National SBIR get-togethers etc.