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Magnesium based materials -from bio to lightweighting

The current National Science Foundation (NSF) - Engineering Research Center (ERC) is transforming the 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. Additionally, the Mg based alloys are widely acknowledged to have enormous potential for lightweight structural applications, given their low density, high specific strength, good cast ability and better damping capacity. However, to actualize the widespread interest in Mg-alloys for lightweighting applications, focused efforts are required to reach the strength, ductility, and corrosion resistance design end goals. The talk will specifically provide a scientific update on the various innovations, translation and trailblazing pathways for developing the biodegradable implants to lightweighting applications through holistic University- Industry partnerships for economic ecosystem and commercialization.

Biography

J Sankar is the Director for the NSF- ERC-RMB. He is the author of more than 400 peer-reviewed articles, book chapters, and papers. He as PI, has generated more than $60 million of research funding, organized and sponsored more than 25 international conferences/symposia and has given more than 35 Plenary/Key-note addresses around the globe this millennium. Some of his recognitions include the “White House Millennium Researcher”, the “Order of Long Leaf Pine” the highest civilian honor by the Governor of NC, USA, “O Max Gardner Award”- the highest honor from the UNC 17 institutions System - for the greatest contributions to the welfare of the human race, Hind-Rattan Award on the eve of India’s Republic day. He is fellow of AIMBE, NanoSMAT and NIA, NC/Triad Business Journal’s most influential (2009-2015), recognitions from ASME, ORNL/DoE etc. He was one of the first Distinguished University Professors at NCAT. He is member of various editorial boards as well as of State and National blue-ribbon committees. He was presented as special addresses at major avenues such as the National Academies and, TV and news media numerous times including “Science Nation”.

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