

# 9<sup>th</sup> Nano Congress for Next Generation

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### Novel nanocrystalline bioactive coatings for Ti6Al4V bio-implants

Bone is a connective tissue composed of an organic collagenous matrix and a fine dispersion of reinforcing inorganic hydroxyapatite nanocrystals, whose synergistic and hierarchical structure renders unique properties to bone tissue in terms of hardness, flexibility and regenerative capacity. Metallic materials offer mechanical properties like resilience and strength required to replicate bone tissue in load-bearing applications. However, the success or failure of an implant depends on its interaction with the surrounding tissue. Thus mechanical as well as biological properties of bone implants should be most favorable for its swift and strong bonding with the bone tissue. Ti6Al4V as bio-implant in orthopedic research received a lot of attention in recent years because of its good biocompatibility and mechanical properties. However, it suffers from release of nickel and chromium ions in human body. In this concern, coatings can be applied to Ti6Al4V to reduce the ion release tendency and also to facilitate the process of bone healing. Hydroxyapatite is the most evident candidate for application as coating to improve the performance of Ti6Al4V bio-implants. The keynote will focus on an overview of recent trends and strategies that are currently being investigated to improve the performance of Ti6Al4V bio-implants in terms of functionality and biological efficacy.

### Biography

Uma Batra is Professor and Head of Department of Materials & Metallurgical Engineering and Dean of Faculty Affairs at PEC University of Technology, Chandigarh, India, a premier institute with a history of more than 100 years. Significantly PEC is the alma mater of the late Indo-American astronaut and Aeronautical Engineering student Kalpana Chawla. Her research areas include nano hydroxyapatite for bioimplants, bioactive coatings on metallic implants. She has authored more than 100 research papers in national and international journals. She has delivered more than 50 invited talks in the area of Metallurgy and Materials. She was nominated officially in 2007 as the first Indian Woman Engineer Representative to the U.S Society of Women Engineers (SWE) US by a delegation from the American Society of Engineering Education.

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