NAME OF THE THEME: Physical & Mathematical Science

Recent advances in bioactive ceramics scaffolds using 3D printing

Palakurthy Srinath, P. Abdul Azeem*, K. Venugopal Reddy

Department of Physics, National Institute of Technology Warangal, Warangal 506004, India

Email Id: srinath972@gmail.com, drazeem2002@yahoo.com

Abstract: Bone tissue engineering has become known as an inventive and promising approach for the treatment of bone defects. However, the use of additive manufacturing technologies in bone tissue engineering has been slow due to concerns related to strict performance, standards and partial quality. Nevertheless, three dimensional (3D) printing is becoming popular in recent years in printing scaffolds. The advantages of 3D printing in production of scaffolds are many, including the ability to produce complex geometries according to computer design, controlled surface chemistry and porosity. In this study, our recently developed bioactive ceramics such as calcium silicates, calcium borosilicate and effect of addition of small amount of transition metal ions (Ti, Zr, Cu, Zn, Mg, Ag) on their osteogenic properties have been discussed and mainly focused on production of scaffolds of these ceramics using advanced 3D printing technology and recent advances in 3D printed scaffolds.

Keywords*: bioactive ceramics, bone tissue engineering, three dimensional (3D) printing*