

Additive Manufacturing for improved biointerfaces

Kate Fox^{1,2}, Aaqil Rifai², Avik Sarker^{1,2}, Phong A Tran³, Nhiem Tran⁴

¹Center for Additive Manufacturing, RMIT University, Melbourne, VIC, 3001, Australia

²School of Engineering, RMIT University, Melbourne, VIC, 3001, Australia

³Institute of Health and Biomedical Innovation, Queensland University of Technology,
Kelvin Grove, QLD, Australia,

⁴School of Science, RMIT University, Melbourne, VIC, 3001, Australia

e: kate.fox@rmit.edu.au

3D printing is rapidly becoming a useful tool for orthopedic implants. Although metal implants have more commonly been produced using subtractive manufacturing processes, 3D printing of metal implants for personalized applications is gaining considerable traction. In order for these implants to be used, post-processing is commonly performed to ensure that the interface between the implant and hard tissue is suitable. Two methods to improve the interface will be discussed in this presentation, (i) the orientation of components within the printing process to control the surface of metallic components and (ii) the investigation of new materials such as diamond. We report that both methods to improve the implant interface show both increased hamster ovarian cells (CHO) viability and decreased *Staphylococcus aureus* biofilm formation compared to control substrates.