

Advanced Materials Research Group

project summary

Project Title	Characterisation of Si-doped hydroxyapatite coated Ti for biomedical applications
Researcher	Jiin Woei Lee keyx9ljw@nottingham.edu.my
Project Summary	<p>Total joint replacements (TJRs) provide structural support and replace the function of damaged or diseased joints. TJRs fail after prolonged use and replacement surgery, or revision surgery, is needed for 10-20% of patients within 10-15 years of the initial procedure. The long-term aim of this project is to appraise the design of orthopaedic implant coatings, in order to enhance bone cell growth and prolong the lifespan of the implants. The model system used for this work is Si-doped hydroxyapatite (HA) -coated Ti, with TiN as an interlayer, grown by radiofrequency co-magnetron sputtering. Silicon is important for bone mineralisation and formation and is used to dope the HA. TiN is bioinert and biocompatible and used as a diffusion barrier between the Ti and SiO₂-doped HA to prevent the formation of unwanted chemical species, such as rutile, TiO₂, during post-deposition annealing processes. The findings from this study will be used to improve the design and development of biomedical implant materials for the enhanced early integration of bone cells with implant surfaces.</p> <p>Caption: Magnified image of a bone cell growing on a modified HA surface</p>

