

## Advanced Materials Research Group

### project summary

<b>Project Title</b>	Phosphate Glass Coatings For Medical Implant Devices
<b>Researcher</b>	Bryan Stuart
<b>Project Summary</b>	<p>Current state of the art technology for coating load bearing hard tissue implant devices such as hip implants to assist biocompatibility and osseointegration is plasma spraying of hydroxyapatite. Both hydroxyapatite and plasma spraying have their short comings which may be rectified through the development of phosphate glass coatings applied by Physical Vapour Deposition (PVD) sputtering. Plasma spraying provides a relatively thick inhomogeneous coating layer, introducing problems with adhesion and porosity. Although hydroxyapatite is bio active it is no bioresorbable. Resorbable bioactive glass such as phosphate glass composites can be modified to tailor dissolution, cell proliferation rates and may be used to for fighting infection by ion doping, optimising biocompatibility. The sputtering technique is capable of providing a homogenous thin coating and can potentially be successful in applying novel phosphate coatings for next generation medical implants.</p> <p>Following the development of a phosphate glass coating by PVD for these implant devices, I will assess the current manufacturing processes and attempt to implement the new technology in accordance with medical regulations.</p>

