

## Advanced Materials Research Group project summary

<b>Project Title</b>	Development of a 3D Osteochondral Scaffold
<b>Researcher</b>	Amy Prosser
<b>Project Summary</b>	<p>The overall aim of this project is to develop a novel biopolymer structure for tissue repair of osteochondral defects as well as culture conditions that can support osteochondral differentiation. By identifying key candidate growth factors in the osteogenic and chondrogenic differentiation pathways the suitability of combining these growth factors, or growth factor mimics, into the scaffold can be evaluated.</p> <p>Beginning with 2D <i>in vitro</i> testing using Mesenchymal Stem Cells (MSCs) and progress to 3D testing incorporating MSCs, growth factors or synthetic mimics, and the 3D chitosan scaffold. The properties of the chitosan scaffold produced, such as pore size, porosity and degradation profile, can be altered by changing the porogen used and including additional fillers into the scaffold such as hydroxyapatite. The degradation profile of chitosan will be determined and any cytotoxic effects of chitosan will be investigated using MSCs and 3T3 fibroblasts. Development of a culture medium that can support osteochondral differentiation is another key aim of the project. The use of growth factor mimics that can support both osteogenesis and chondrogenesis and reduce or remove the requirement for the growth factor itself is being investigated.</p> <p>Alizarin Red staining showing mineralisation of hMSCs after 21 days of cell culture.</p>

