

Science and Technology in Medicine



Research Project Proforma (School of Medicine)

Research Title:	Nanotechnologies for repairing the central nervous system
Keywords (up to 5)	Tissue engineering; Neuroscience; Hydrogels; Injury models; Nanotechnology
Supervisor: Job Title: Department: Email Address: Telephone: Webpage link:	Dr Chris Adams Lecturer in Neuroscience School of Life Sciences c.adams@keele.ac.uk 01782 7 33943 https://www.keele.ac.uk/lifesci/ourpeople/chrisadams/
Type of projects offered (delete as appropriate)	Intercalation (1 year) Studentship (8 weeks)

(1) Outline the broad aims of your research and its medical relevance (150 words):

Central nervous system disease and injury have a poor prognosis and constitute a large financial burden on healthcare providers. It has been proposed that cell transplantation may be an effective treatment for these conditions. However, these face numerous barriers to clinical use including low cell survival post-transplantation and poor functional integration. My lab is currently investigating a range of nanotechnology platforms which could improve effectiveness of cell transplantation therapies. Further, we also aim to

develop new models of nervous system injury within which therapies can be tested. Therefore projects within the laboratory may focus on:

- (i) 3-D culture of multiple neural cell types in implantable and aligned scaffolds for improved integration;
- (ii) Examining the use of conductive scaffolds for stimulation and recording of encapsulated neural cells for controlling/monitoring their behaviour post-transplantation and;
- (iii) Examining whether the chick embryo can be used as a potential nervous system injury model.

(2) Indicate the skills/techniques the student will learn (100 words)

- Primary neural cell/tissue culture (including stem cells)
- 3D cell culture in therapeutic hydrogels
- Immunocytochemistry for specific cellular detection and morphological analysis
- Fluorescence microscopy and 3D microscopy with associated image analysis

Please submit this form electronically to Faye Palmer at medicine.intercalation@keele.ac.uk