

Science and Technology in Medicine



Research Project Proforma (School of Medicine)

Research Title:	<i>Intercalation (1 year)</i>
Keywords (up to 5)	Investigation of heart valve calcification mechanisms through the creation of biomimic in vivo pathological micro-environments <i>Studentship (4-8 weeks)</i> Assessment of cellular properties of tissues by biomechanical markers
Supervisor: Job Title: Department: Email Address: Telephone: Webpage link:	Ying Yang Reader ISTM (GHRC) y.yang@keele.ac.uk 01782674386 http://www.keele.ac.uk/istm/staff/yingyang/
Type of projects offered (delete as appropriate)	Intercalation (1 year) and Studentship (4-8 weeks)

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

Valvular calcification is one of the commonest cardiac conditions in the elderly population. The calcification is a multifaceted phenomenon. The precise reasons for the calcification process and the cellular mechanism involved are not well-understood, which prevents to develop effective strategies in reduction of the

calcification. Ours and other previous research confirm that activation of valve interstitial cells (VICs), the predominant cell type of cardiac valves, is the crucial cause of the calcification. The advance in biology and biomaterials field enables us mimicing various cell culture environments as found in vivo to observation of the activation process. Thus, we shall recreate pathological conditions through engineering *in vitro* culture microenvironment and to culture VICs under these conditions, aiming to generate better understanding for valvular calcification treatment.

The globe biomechanical property of tissues or tissue engineered constructs is determined by the cellular activities of the cells within them. It is valuable to obtain the global biomechanical property through new non-destructive techniques such as microindenetation to identify the cellular activities in pathological tissues, e.g. prolapse tissue, and tissue engineered cartilage.

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

The broad techniques/skills will be learnt including tissue dissection, cell culture, and various assessment assays e.g. cell proliferation, specific assays for differentiation markers, histochemical and immunochemical analysis, optical microscopy, microendentation.

Please submit this form electronically to Prof Divya Maitreyi Chari on d.chari@keele.ac.uk by 31 July 2015