

Title: Employing Spectroscopic Analysis To Identify Chemical Changes Associated With Different Subtypes of Breast Cancer Tissue Samples

A fully funded PhD studentship is available in the area of Biomaterials and Cancer Research at the University of Sheffield. This studentship offers a valuable opportunity to work with scientists and clinicians at The University of Sheffield.

The Biomaterials Research group is a dynamic group of experienced basic scientists and clinicians with a wide range of interests ranging from tissue engineering to translational biomaterials science.

The project will be carried out in close collaboration with Sheffield Medical School. The student will investigate a range of breast cancer samples with different subtypes, for evaluation of how these tissues differ with respect to changes in their proteins, lipids and carbohydrates.

Breast cancer is increasing worldwide with the highest rates reported in affluent western societies (the risk ratio is approximately 1 in 8 to 1 in 12) and is now the most common cancer in the females in UK. In the 1970s around 5 out of 10 women with breast cancer survived the disease beyond five years. Now it's more than 8 out of 10.

This has been possible due to the early detection of breast cancer. Several techniques are currently used for breast cancer diagnosis, including mammography, ultrasound, Fine Needle Aspiration Cytology (FNAC), and MRI. However, most of these methods have significant limitations and are unable to provide molecular level information and unable to distinguish between histological subtypes. In contrast both Raman and Infrared (IR) spectroscopies are widely used tools for structural and compositional analysis of natural materials and have emerged as major techniques for biomedical applications making significant progress in the field of clinical evaluation. Both the techniques are relatively simple, non-destructive and are accurate enough for qualitative and the quantitative measurements. The spectroscopic techniques will be employed in this project. FTIR and Raman spectroscopic techniques will allow one to determine the functional groups and bands in the cells, responsible for the different morphology of the tissues. The techniques can give detailed information on changes in the structure and composition of the cellular molecules. These features can then potentially be used to identify the various histopathological subtypes.

The student will gain a wealth of experience from working in an interdisciplinary project of an applied nature and will learn applications of spectroscopic techniques in cancer research with this exciting emerging technology.

Eligibility

Applicants should have, or expect to achieve, a minimum of an upper-second-class Honours degree (2.1 or above) in chemistry, physics, biomaterials, biomedical science or related subject. The award covers UK/EU fees and a stipend at the standard UK research rate of £13,590 per annum. A prospective candidate should check the EPSRC's eligibility criteria prior to application.

Applications

Applications should be made using the on-line application form <http://www.shef.ac.uk/postgraduate/research/apply> and should include an up-to-date CV with a covering letter. The covering letter must include a summary as to why you wish to apply for this particular studentship and how your interests and experience relate to the project.

Further details of the project can be obtained by contacting Dr Ihtesham ur Rehman i.u.rehman@sheffield.ac.uk

Applications must be received by 1st July 2011.