

MRC PhD Studentship in Cancer Science

Studentship Number: MRC-12/02

Primary Supervisor: Dr. Jacqui Shaw
Tel: 0116 2523148
Email: js39@le.ac.uk
Department of Cancer Studies & Molecular Medicine

Co-supervisor: Prof. Catrin Pritchard
Department of Biochemistry

Host Department: Cancer Studies & Molecular Medicine

Project Title: Molecular Analysis of Plasma Nucleic Acids for the Early Detection of Lung Cancer

Project Description:

Lung cancer is the leading cause of death by cancer worldwide and is a priority of the Cancer Theme at Leicester University. Surgery offers the best chance of cure, but most patients present at a late stage with local and/or metastatic spread. Earlier detection could potentially increase survival rates up to 50 fold and one attractive approach is to use circulating biomarkers, both circulating free DNA (cfDNA) and microRNAs (miRNA), in blood plasma for early detection. This studentship aim is to evaluate the diagnostic value of a number of markers detectable in plasma (cfDNA quantity, stratification of tumour specific mutations (*TP53*, *KRAS*, *PIK3CA* and *EGFR*) and miRNAs as a tool for early detection of lung cancer. Real time PCR assays will be developed for common mutations and miRNAs will be profiled *de novo*. Markers will be evaluated in blood and matched tissue samples from non-small cell lung cancers (NSCLC), which account for about 75% of all lung cancers and compared with controls. The student will determine the correlation between tumour genotype and cfDNA genotype, between miRNA profiles in tumour and plasma, and between cfDNA and miRNA. The studentship builds on existing expertise of circulating biomarkers in breast cancer. The student will join a growing cross departmental research team and will be able to access patient samples and technical expertise ensuring timely progression. This project is fully funded and will provide the student with an excellent grounding in state-of-the-art molecular techniques, bioinformatics and statistics. Hard-working, enthusiastic students who can work well in a team are encouraged to apply.

Selected References:

Shaw JA, et al. Genomic analysis of circulating cell free DNA infers breast cancer dormancy. *Genome Res.* 2011 Oct 11.

Lee YJ et al. Circulating cell-free DNA in plasma of never smokers with advanced lung adenocarcinoma receiving gefitinib or standard chemotherapy as first-line therapy. *Clin Cancer Res.* 2011; 17(15):5179-87.

Ding L, et al. Somatic mutations affect key pathways in lung adenocarcinoma. *Nature.* 2008 Oct 23;455(7216):1069-75.