

## SCHOOL OF MEDICINE, DENTISTRY AND BIOMEDICAL SCIENCES

### CENTRE FOR PUBLIC HEALTH

**DEL Postgraduate Research Opportunities for September 2012 (*subject to funding*)**

#### **Closing Date**

Friday 24 February 2012

#### **Entry Requirements**

Candidates should have or expect to obtain a 2:1 or higher Honours degree or equivalent in a relevant biomedical or life sciences subject.

#### **Funding**

##### **DEL Research Studentships**

Eligibility for both fees and maintenance (£13,590 in 2011/12) depends on the applicants being either an ordinary UK resident or those EU residents who have lived permanently in the UK for the 3 years immediately preceding the start of the studentship. Non UK residents who hold EU residency may also apply but if successful may receive fees only.

For further details re eligibility criteria (including academic, citizenship and residency criteria) please click on the following link: [www.delni.gov.uk/postgraduate-studentships-terms-and-conditions-2011-12.pdf](http://www.delni.gov.uk/postgraduate-studentships-terms-and-conditions-2011-12.pdf)

#### **Projects**

##### **BETA-BLOCKER/CLOPIDOGREL USAGE AND CANCER PROGRESSION IN PATIENTS WITH COLORECTAL CANCER**

Supervisors: Dr Chris Cardwell ([c.cardwell@qub.ac.uk](mailto:c.cardwell@qub.ac.uk))  
Professor Liam Murray ([l.murray@qub.ac.uk](mailto:l.murray@qub.ac.uk))

#### **Background**

Beta-blockers have been proposed to protect against cancer progression with promising results in breast cancer, but little research in colorectal cancer patients.

Recent clinical trial results suggesting that a potent antiplatelet (prasugrel) increased cancer risk or progression has led researchers to question the safety of chronic intensive platelet therapy, particularly for a similar antiplatelet clopidogrel.

#### **Aims**

To determine whether colorectal cancer patients using beta-blockers/clopidogrel have higher or lower rates of cancer progression.

#### **Methods**

Colorectal cancer patients will be identified within a large general practice database. Cancer-specific death (from death certificates) will be compared between users of beta-blockers/clopidogrel and non-users. A similar analysis will be conducted within Northern Ireland after linking data from the Northern Ireland Cancer Registry, the Clinical Oncology Information System (providing detailed data on cancer diagnosis and treatment), and the Enhanced Prescribing Database (providing prescription data).

## **Potential**

This study will determine whether colorectal cancer patients using beta-blockers have lower rates of cancer progression, and could be useful in protecting against cancer progression. This study will also determine whether concerns about cancer risks associated with clopidogrel are justified or unfounded. Should the study determine that clopidogrel use accelerates cancer progression, current practice may need to be reconsidered.

## **PROSTATE CANCER INVESTIGATION REGRET: A STUDY OF REGRET ASSOCIATED WITH HAVING UNDERGONE A PROSTATE BIOPSY IN THE ISLAND OF IRELAND**

Supervisors: Dr Anna Gavin ([a.gavin@qub.ac.uk](mailto:a.gavin@qub.ac.uk))  
Professor Liam Murray ([l.murray@qub.ac.uk](mailto:l.murray@qub.ac.uk))

Prostate biopsies used in the diagnosis of Prostate Cancer are not without risk, complications include bleeding, infection and pain. There is also anxiety associated with having a test which could result in a cancer diagnosis. Little is understood about the psychological effects of prostate biopsies.

Patients are increasingly involved in decision making about their investigation and treatment for prostate cancer and face difficult choices which can affect their mental wellbeing, especially if they later regret decisions taken. Research on regret regarding clinical decision making is very limited and focuses on clinician regret, perhaps having missed a diagnosis, or regret among prostate cancer patients who picked one type of treatment over another. There is no information on the quality of life aspects of health related to prostate biopsy, especially in the area of regret.

The outcomes of this work will be:

1. To measure physical side effects of prostate biopsy for the first time in Ireland and compare these for two areas with different investigation levels.
2. To assess quality of life effects including decisional regret of prostate biopsy.
3. To provide information for men, reports for service providers and peer reviewed publications.
4. To provide data to improve counselling about prostate biopsy.

## **THE COST EFFECTIVENESS OF NOVEL BIOMARKERS FOR PRIMARY AND SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE**

Supervisors: Professor Frank Kee ([f.kee@qub.ac.uk](mailto:f.kee@qub.ac.uk))  
Dr Karen Cairns ([k.cairns@qub.ac.uk](mailto:k.cairns@qub.ac.uk))

We have effective drugs for preventing heart disease and stroke for people at high risk. Many people at low risk prefer to judge for themselves the balance of risks, costs and benefits from taking a medication potentially for life. This research will help them by building a model of the decision which takes account explicitly of the assumptions that affect the final judgement of benefit, providing both the patient and the health service with an estimate of the cost effectiveness of a strategy that relies on the use of novel biomarkers to identify those most likely to benefit.

The student will incorporate information from prospective cohort studies across Europe and from clinical trials initially to assess the performance of a novel panel of biomarkers for predicting who might get a coronary event or stroke and who might benefit more or less from treatment. These risks, and the predictive performance metrics of the biomarkers, will be applied to Markov state transition models that incorporate weights for costs (of testing and treatment) and the quality of life associated with each event, in order to derive an incremental cost effectiveness ratio (ICER). Sensitivity analyses will permit the discovery of the key influences on these and where the greatest value for health services and for future research may lie.

## **RETINAL VESSEL ATTENUATION – A POTENTIAL BIOMARKER FOR EARLY DIAGNOSIS OF RENAL AND VISION COMPLICATIONS IN DIABETES?**

Supervisors: Professor Peter Maxwell ([a.p.maxwell@qub.ac.uk](mailto:a.p.maxwell@qub.ac.uk))  
Dr Gareth McKay ([g.j.mckay@qub.ac.uk](mailto:g.j.mckay@qub.ac.uk))

Up to 40% of individuals with diabetes mellitus will develop **diabetic kidney disease** and an even higher percentage, develop diabetic retinal pathology. **Diabetic retinopathy** is the leading cause of blindness in the UK working age population and annually more than 2,000 people suffer sight loss secondary to this complication. Previous population-based studies have suggested that measurements of the blood vessels at the back of the eye (retina) using a non-invasive procedure may provide early indications of some of the complications associated with diabetes, such as those affecting the kidney and the eye. This research proposes to combine patient information collected separately by diabetes, nephrology and ophthalmology clinics in Northern Ireland to assess whether measuring retinal blood vessels would help in identifying diabetic individuals with increased risks of kidney or eye complications. This project will examine the relationships between measures of kidney function (estimated GFR) and retinal vessel diameter (derived from the diabetic retinopathy screening programme) recorded in the preceding 5 years. We aim to establish if measurements of retinal vessel diameters predict the subsequent development of nephropathy and/or retinopathy. This may afford an opportunity for earlier treatment which could prevent or slow the onset of these complications.

## **AN INVESTIGATION INTO THE ATHEROGENIC POTENTIAL OF HDL IN WOMEN WHO DELIVER LARGE FOR GESTATIONAL AGE BABIES**

Supervisors: Dr Jane McEneny ([j.mceneny@qub.ac.uk](mailto:j.mceneny@qub.ac.uk))  
Professor Ian Young ([i.young@qub.ac.uk](mailto:i.young@qub.ac.uk))

This studentship will examine the function and properties of one of the major lipids associated with cardiovascular disease risk – high density lipoprotein - in women who deliver large for gestational age babies. To assess the function of high density lipoprotein involves the use of a broad range of biochemical assays, including ultracentrifugation, ELISA,

spectrophotometry and fluorimetry, whilst biomarkers of nutritional status will be assessed using chromatographic techniques.

The studentship will best suit those with a strong Biomedical Science, Biochemistry, Nutrition or similar background. The successful student will join the Nutrition and Metabolism group within CPH which has a close to a 100% record of MPhil and PhD students completing their postgraduate studies. This project will provide the successful student with an opportunity to develop biochemical laboratory skills, nutritional epidemiology skills and statistical analysis skills.

## **THE EFFECT OF COOKING AND PROCESSING OF FRUIT AND VEGETABLES ON THE FUNCTIONALITY OF HDL<sub>2&3</sub>**

Supervisors: Dr Jane McEneny ([j.mceneny@qub.ac.uk](mailto:j.mceneny@qub.ac.uk))  
Dr Jayne Woodside ([j.woodside@qub.ac.uk](mailto:j.woodside@qub.ac.uk))

This studentship will determine whether different fruit and vegetables, or fruit and vegetable products, affect cardiovascular disease risk by measuring the function and properties of one of the major lipids associated with cardiovascular disease risk – high density lipoprotein. To assess the function of high density lipoprotein involves the use of a broad range of biochemical assays, including ultracentrifugation, ELISA, spectrophotometry and fluorimetry, whilst biomarkers of nutritional status will be assessed using chromatographic techniques.

The studentship will best suit those with a strong Biomedical Science, Biochemistry, Nutrition or similar background. The successful student will join the Nutrition and Metabolism group within CPH which has a close to a 100% record of MPhil and PhD students completing their postgraduate studies. This project will provide the successful student with an opportunity to

develop biochemical laboratory skills, human nutrition intervention study skills and statistical analysis skills.

## **EPIGENETIC MECHANISMS IN CHRONIC KIDNEY DISEASE**

Supervisors: Dr Amy Jayne McKnight ([a.j.mcknight@qub.ac.uk](mailto:a.j.mcknight@qub.ac.uk))  
Dr Gareth McKay ([g.j.mckay@qub.ac.uk](mailto:g.j.mckay@qub.ac.uk))

**Aim:** To extend existing knowledge and understanding of epigenetic influences on the development of chronic kidney disease (CKD), including identifying biological pathways that may provide novel targets for therapeutic intervention.

Recently, we identified risk markers for kidney disease ( $P < 2^{-8}$ ) by examining ~2.4 million unique genetic changes in 12,121 individuals with type 1 diabetes. This project extends those studies, employing state-of-the-art experimental and bioinformatic techniques to correlate genetic and epigenetic profiles for association with kidney disease. Techniques include real-time PCR, Sanger sequencing, Sequenom iPLEX, Illumina Infinium assays, and next generation sequencing technologies.

Our team combines skills and experience in clinical medicine, bioinformatics and population-based studies. More than 30 postgraduate students have been successfully supervised to timely completion of their higher degrees and many have subsequently pursued scientific careers. The successful student will gain comprehensive theoretical and practical training in the (epi)genetics of multifactorial diseases, additionally being encouraged to present and publish their work.

This project may develop a functional genetic risk profile to help identify the subset of individuals most at risk of developing chronic kidney disease and thus identify persons who would benefit from targeted therapies to prevent or slow the progression of this serious, costly disease.

## **PEER SUPPORT TO ENCOURAGE ADOPTION AND MAINTENANCE OF MEDITERRANEAN DIET: A FEASIBILITY AND PILOT STUDY**

Supervisors: Dr Jayne Woodside ([j.woodside@qub.ac.uk](mailto:j.woodside@qub.ac.uk))  
Dr Michelle McKinley ([m.mckinley@qub.ac.uk](mailto:m.mckinley@qub.ac.uk))

This studentship will determine whether using peer support encourages people at high risk of developing heart disease to change their diet towards a Mediterranean Diet [eating more wholegrain cereal foods, more fruit and vegetables, more fish (particularly oily fish), legumes and nuts, less red meat, more poultry and use of olive-oil based fats]. Initial work will determine what peer support might work best, by conducting focus groups with people at high risk of heart disease, along with interviews with health professionals and community groups. This peer support method will then be tested over one year, in comparison with an already-proven Mediterranean Diet-promoting intervention.

The studentship will best suit those with a strong Nutrition, Psychology, Biomedical Science or similar background. The successful student will join the Nutrition and Metabolism group within CPH which has a close to a 100% record of MPhil and PhD students completing their postgraduate studies. This project will provide the successful student with an opportunity to develop qualitative research skills, nutritional epidemiological (intervention trial) expertise, biochemical laboratory skills, and statistical analysis skills.

***Potential candidates are encouraged to contact the supervisor prior to submitting an application.***

**Please apply on-line by clicking on the following link:** <http://go.qub.ac.uk/pgapply>

**For further information on the Centre for Public Health, please click on the following link:**

<http://www.qub.ac.uk/research-centres/CentreforPublicHealth/>