3 Year Funded PhD in Health Sciences

**Project:** The genetic basis of ethnic differences in disease risk

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**Project Description:**

Many diseases show a difference in incidence between ethnic groups. Examples included increased rates of cardiovascular disease and of type-2 diabetes in South Asians, and increased incidence of prostate cancer in men with African ancestry. Some examples are especially pronounced in certain populations, such as gout in Polynesians, while others such as breast cancer are emerging in the developing world as non-communicable diseases attain greater prevalence.

Historically, such differences have been addressed by migration studies; for example, rates of breast and prostate cancer in Japanese immigrants to Hawaii have increased towards those of the Caucasian population while rates in Japan remain lower, suggesting a role of environment. However, rates of type-2 diabetes remain high in British Asians despite two or more generations of assimilation. Such a difference could be explained by continuing cultural differences, such as diet, but may also be accounted for by genetic differences. Recent developments in genetic technology now allow us to directly measure the genetic element of ethnic risk differences.

Genetic differences in risk may arise because risk genes have different effects in different populations, or because they occur more frequently, or from a combination of both. These factors are summarised in the *polygenic risk score*, which is a measure of the total genetic risk carried by an individual. Comparing polygenic risk scores from one population to another, we can estimate the difference in risk explained by genetics.

In this project, which is entirely computer based, you will develop a statistical model to measure how much genetic risk differences are attributable to gene effects or gene frequencies. You will perform simulation studies and develop improved models using advanced statistical regression methods. You will apply these models to large datasets on cardiovascular disease, type-2 diabetes and prostate cancer, in different populations. You will compare your findings to previous migration studies and propose explanations for any discrepancies.

While your focus will be on common diseases, more controversially, ethnic differences exist for traits such as educational attainment and athletic performance. Based on your results, you will evaluate the prospects for gaining similar insight into these cases.

This project provides an excellent opportunity to gain experience in the high profile and fast moving field of genetic epidemiology. You will be based in an internationally leading group with collaborations in several disease areas. You should have a background in statistics, epidemiology, bioinformatics, or genetics with an aptitude for computing and a keen interest in genetics and disease.

**References:**


Entry Requirements

- First class or upper second class undergraduate degree in a relevant subject OR an equivalent overseas qualification
- Standard English language requirements
- Available only to applicants who are eligible to pay the UK/EU tuition fee - i.e., those who are permanently resident in the UK or another EU country
- Available for full-time study only
- Applicants must be able to start in September 2018

Informal Enquiries

- Informal enquiries are welcome - please contact Prof Frank Dudbridge

Apply Now

Draft a brief (1,000 words maximum) personal statement that:
- explains why you want to work in this area
- describes any relevant research experience - for example, as part of a previous degree
- lists any academic work you have published or which is awaiting publication

Prepare your supporting documents
Submit your online application Apply for Health Sciences Research.
- In the Funding Section of the online application form select STUDENTSHIP and in the drop down menu select CLS STUDENTSHIP