Two Postdoctoral Positions at the Centre for Infectious Diseases University of Edinburgh

Host-Parasite Interactions Elucidated by MCMC Based Bayesian Inference

Nick Savill, Andrew Read, £27,466 - £32,796, 2 years

Malaria is a globally important disease. The blood stages of malaria infections are responsible for pathology and transmission, and are thus key components of the clinical outcome for individual patients and for the epidemiology and evolution of the parasite. Understanding the natural determinants of infection dynamics, and the effect of interventions such as chemotherapy and vaccination on these, is key to understanding and controlling malaria.

Mathematical models can aid in determining the relative importance of factors regulating infection dynamics, how these factors interact, and in predicting the outcomes of possible interventions. Our key goal is to develop computational methods to overcome the principle challenge preventing the realisation of this potential: a very large number of mathematical models can be fitted to any data set. Prof. Read's lab has generated over 1,000 time series of malaria kinetics in a diverse range of infections in mice. We propose to construct a combinatorially large number of mechanistic mathematical models by combining sets of hypotheses about the actions and interactions of host and parasite factors. Models will be developed, fitted and their adequacy assessed using McMC based Bayesian inference.

This exciting project will yield new insights into the biological interactions between malaria parasites and their mammalian hosts in early bloodstage infections, as well as generating a theoretical toolbox for application to analogous issues relevant to studies of many other infectious agents, including human malaria. It will give important advances into the rational choice of drugs and vaccines and will be used to determine which new experiments will most usefully further reduce the number of surviving models.

We are looking for exceptional candidates with a strong applied computational or mathematical background. Experience of Bayesian inference, malaria research, mathematical biology and interaction with biologists would be beneficial, but not necessary.

For more details and to apply visit www.jobs.ed.ac.uk. Reference number 3008069. Or contact me directly.

Development of an Optimal Epidemic Influenza Surveillance System

Nick Savill, Mark Woolhouse, £27,466 - £32,796, 4 years

One of the key components in the global strategy to minimise the effects of pandemic influenza is surveillance; the process of collecting, analysing, interpreting and disseminating epidemiological data. Well designed and implemented surveillance systems will not only rapidly detect the emergence of epidemic influenza without throwing up false alarms, but in addition will be robust to the many uncertainties that exist about the virus, how it is transmitted between people, who people contact and how they react to a life-threatening infectious disease.

The overall objective of this project is to develop quantitative tools to facilitate robust, sensitive, specific and rapid detection of epidemic influenza in Scotland. Inputs will be both demographic, behavioural and epidemiological. Surveillance must detect epidemiologically unusual clusters against a background of seasonal cases. Different surveillance strategies will be tested against modelled outbreaks using state-of-the-art statistical methodologies. Linking outbreak analysis to Health Protection Scotland surveillance will provide real time early warning of epidemic influenza.

This project is part of the new Interdisciplinary Centre for Human and Avian Influenza Research (ICHAIR), an exciting new initiative funded by the Scottish Funding Council bringing together expertise based at the University of Edinburgh, Glasgow and St Andrews in virology, inflammation biology, structural biology, epidemiology and evolutionary biology to research influenza virus.

We are looking for outstanding candidates with a PhD in any quantitative subject. A background in applied mathematics is preferable.

For more details and to apply visit www.jobs.ed.ac.uk. Or contact me directly.

Closing date for both positions is 7th November 2007. Start date for both positions is asap.

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