

THE UNIVERSITY OF MANCHESTER
PARTICULARS OF APPOINTMENT
FACULTY OF ENGINEERING AND PHYSICAL SCIENCES
SCHOOL OF MATHEMATICS
RESEARCH ASSOCIATE IN APPLIED MATHEMATICS

Vacancy ref: EPS-08191

Salary: Grade 6, £30,738 to £37,768 per annum

Hours: 1 FTE

Duration: Fixed term available from 1 September 2016 for 2.5 years

Location: Oxford road, Manchester

Responsible to: Dr Igor Chernyavsky or Professor Oliver Jensen

Enquiries about the vacancy, shortlisting and interviews:

Dr Chernyavsky, MRC Research Fellow

Email: Igor.Chernyavsky@manchester.ac.uk

Tel: 0161 275 5844

Background

The University of Manchester is the largest single-site university in the UK and has produced more than 20 Nobel Laureates. The School of Mathematics enjoys strong engagement with industry and a long tradition for excellence in Applied Mathematics.

Applications are invited for a 2.5-year post-doctoral position focused on the biological physics and mechanics of the human placenta. The position is supported by a recently-awarded MRC Grant "Blood flow (dys)regulation and transfer function in the human placenta: an integrated *in silico* and *ex vivo* approach to fetal growth restriction".

The Research Associate will join a rapidly expanding effort in biomechanics within the School of Mathematics, working directly with Dr I. L. Chernyavsky and Professor O. E. Jensen, in close collaboration with physiologists and clinicians from the Institute of Human Development and the University of Southampton. This position forms a part of a wider recruitment that will involve employment of a Research Associate in experimental placental physiology to support the mathematical modelling effort.

Overall Purpose of the Job

The project lies at the interface between applied mathematics, continuum mechanics, multi-scale physics, spatial statistics and image analysis. The main aim of this project is in development of integrated analytical and computational techniques, informed by experimental data, for the study

of flow and transport processes in the human placenta, a unique and critically important interface between the maternal and fetal circulations.

Key Responsibilities, Accountabilities or Duties

The range of duties will include:

- Continually update knowledge and understanding in relevant field or specialism
- Use research resources and laboratories as appropriate
- Develop and conduct individual and collaborative research objectives, with guidance if required
- Interact closely with other members of the research team
- Write up research work for publication in high impact journals and contribute to annual project reports
- Present the results of the research at meetings, seminars and conferences
- Take part in research outreach activities and communicate effectively to a varied audience
- Be aware of the risks in the work environment and their potential impact on their own work and that of others.

Post holders are also required to familiarise themselves with the University's Equality and Diversity policies and to actively support these wherever possible.

PERSON SPECIFICATION

Essential

- Have a good first degree (or equivalent) in mathematics, physics or relevant aspects of engineering
- Have, or be about to obtain, a PhD in relevant area of applied mathematics, physics, biophysics, bioengineering, or a closely related field
- Possess specialist knowledge and have experience in at least one of the following areas: theoretical continuum mechanics; physics of transport in porous media; complex image analysis in two and three dimensions
- Have expertise in numerical simulation techniques and strong programming skills
- Have an enthusiasm for research at the interface of mathematics and biological sciences
- Have strong journal publication record in an area relevant to the project, including evidence of significant contributions to high quality research publications
- Excellent written and oral communication skills
- Excellent time management and organisational skills; ability to meet deadlines
- Ability to work independently and as part of a team
- Ability to liaise confidently and effectively with a range of individuals across different disciplines
- Willingness to learn and develop

Desirable

- Experience of collaboration with researchers from life sciences
- Knowledge of theoretical upscaling or homogenization techniques
- Experience of theoretical or computational imaging-based modelling in biophysics
- Familiarity with multiple computer operating systems
- Experience of use of Mathworks Matlab and COMSOL Multiphysics or FEI Amira / Avizo software packages.