



UNIVERSITY OF LEEDS

## CANDIDATE BRIEF

**Research Fellow in Modelling of Blending and Granulation Processes for Pharmaceutical Materials, Faculty of Engineering**



**Salary: Grade 7 (£32,548 – £38,833 p.a.)**

**Reference: ENGPE1117**

**Closing date: XXXX**

**Fixed-term for up to 14 months, to end no later than 28<sup>th</sup> February 2019**

## Research Fellow in Modelling of Blending and Granulation Processes for Pharmaceutical Materials, School of Chemical and Process Engineering

Are you an experienced and ambitious researcher looking for your next challenge? Do you have a background in the modelling of pharmaceutical materials and their formulation? Do you have a passion to uncover the links between powder interactions at nano-/micro-scale and their bulk behaviour in inhaled drug delivery processes? Do you want to further your career in one of the UK's leading research intensive Universities?

This role is part of the £20.4M Advanced Digital Design of Pharmaceutical Therapeutics ([ADDoPT](#)) project, which has been funded by the Department for Business, Innovation and Skills' Advanced Manufacturing Supply Chain Initiative. The project is industry-led and is being delivered by a consortium of companies and academic institutions.

The aim of the ADDoPT project is to accelerate the translation of molecules into medicinal products. This project will optimise the manufacturing processes of pharmaceutical products to effectively supply the current and next generation of medicines.

This role is directed towards the development of constitutive models for manufacturing processes and product performance. In particular, you will look at the development of predictive tools for blending and granulation processes modelling and design, using discrete element method (DEM) modelling techniques. This research work is led by the University of [Leeds](#) and involves collaboration with [AstraZeneca](#), [Bristol-Myers Squibb](#), [BRITEST](#), Cambridge Crystallographic Data Centre ([CCDC](#)), [GlaxoSmithKline](#), [Perceptive Engineering](#), [Pfizer](#), Process Systems Enterprise (PSE) and the Science and Technology Facilities Council's (STFC) [Hartree Centre](#) together with the Universities of [Cambridge](#) and [Strathclyde](#).

This is an exciting opportunity to undertake internationally-leading research in the field of molecular-based process and product engineering, developing modelling approaches which are suitable for exploitation within the other work packages in the ADDoPT project.



## What does the role entail?

As a Research Fellow, your main duties will include:

- Analysing and developing fundamental models and methods for the assessment of particle-particle and particle-solution contact models for blending and granulation processes;
- Production of DEM models for the simulation of blending and granulation behaviour of APIs and excipients under various particle properties and process conditions;
- Integrating the fundamental models developed within this work with those developed in other work packages;
- Integrate particle/particle and particle/surface binding and dispersion into the DEM model;
- Perform sensitivity analysis of the blending and granulation processes based on both particle properties and process conditions;
- Utilise high performance computing (HPC) facilities at the Hartree Centre for integrating DEM code into the HPC systems;
- Deploy the models delivered through this work for the design and control of pharmaceutical blending and granulation processes;
- Work closely with PSE researchers in order to implement the models developed into the PSE's gPROMS commercial software platform;
- Develop initiative, creativity and judgement in applying appropriate approaches to research activities to find solutions to meet the project aims;
- Analyse and interpret data and, through this, draw conclusions on the research outcomes in order to critically evaluate research results;
- Ensure good day-to-day progress of work, and maintain good records and laboratory notebooks;
- Work both independently and collaboratively as part of a larger team of researchers both across the School and University, together with relevant industrial and academic partners;
- Write up results of the research (e.g. reports, and research articles) for publication in leading international peer-reviewed journals, and present findings at consortium meetings and at international conferences and workshops, in order to maximise the external impact of the research;
- Input into the development of research objectives and proactively consider research outputs, suggesting revisions to the Principal Investigator where necessary, to ensure meeting the project objectives;



- Work positively and inclusively within the ethos of the collaborative ADDoPT project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

## What will you bring to the role?

As a Research Fellow you will have:

- A relevant PhD (or close to completion) in Chemical Engineering, Physics, Chemistry, Mathematics, or a related discipline;
- Experience in the analysis and development of particle-particle and particle-solution contact models for blending and granulation processes;
- Experience in the analysis of blending and granulation processes of organic materials;
- Knowledge and experience of discrete element method (DEM) and related modelling methodologies;
- Knowledge of particle binding contact models and dispersion;
- Experience in DEM software packages and coding using C++ and/or Fortran as well as simulation utilising HPC;
- A track record of contributing to publications in high-impact factor journals;
- Good time management and organisational skills, with the proven ability to meet deadlines;
- Proven ability to work effectively on one's own, showing initiative and creativity;
- Proven ability to work effectively as part of a team, showing excellent communication skills.

You may also have:

- Knowledge of sensitivity analysis of particle processes;
- Familiarity with the basic principles of molecular dynamics (MD) and quantum mechanics (QM), and their application in blending and granulation processes;
- Experience of working collaboratively with industry or experience of working in industry;
- Experience in project supervision at undergraduate, Masters and/or PhD levels.



## How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by **23.59** (UK time) on the advertised [closing date](#).

## Contact information

To explore the post further or for any queries you may have, please contact:

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or

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## Additional information

### Faculty and School Information

Further information is available on the research and teaching activities of the [Faculty of Engineering](#) and the School of [School of Chemical and Process Engineering](#).

### A diverse workforce

The Faculty of Engineering is proud to have been awarded the [Athena Swan Silver Award](#) from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.



## **Working at Leeds**

Find out more about the benefits of working at the University and what it's like to live and work in the Leeds area on our [Working at Leeds](#) information page.

## **Candidates with disabilities**

Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our [Accessibility](#) information page or by getting in touch with us at [disclosure@leeds.ac.uk](mailto:disclosure@leeds.ac.uk).

## **Criminal record information**

### **Rehabilitation of Offenders Act 1974**

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page.

