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| Job Description |  |
| **Research Fellow in Microbial and Enzyme-based Plastics Degradation****Ref: B04-04599** | Grade 7UCL Grade 7, salary £42,099 - £50,585 pa(including London Allowance) 1.0 FTE*Appointment at Grade 7 (£42,099 - £50,585 pa including London Allowance) is dependent upon having been awarded a PhD. Where applicants have not been awarded a PhD, appointment will be made at Research Assistant UCL Grade 6B (£37,332 - £39,980 pa including London Allowance) and payment at UCL Grade 7 salary will be backdated to the date of submission of the PhD thesis (including corrections).**This post is available from 01/03/2023 for 28 months in the first instance.* |
| Department: Chemistry | Location: University College London, Christopher Ingold Building, 20 Gordon Street, London, WC1H 0AJ |

#### Reports to

**LONDON’S GLOBAL UNIVERSITY**

Prof Helen C Hailes in Chemistry and Dr Jack Jeffries in Biochemical Engineering

**Context**

Applications are invited for a PDRA to work in the groups of Helen Hailes in the Department of Chemistry and Jack Jeffries in Biochemical Engineering at University College London. *The Comfort Loop: A systems approach for sustainable absorbent hygiene products* is an UKRI-funded project aimed at developing ways to understand whether industrial composting of biodegradable hygiene products or recycling is the most sustainable option. Combining a multidisciplinary team, the project connects our research expertise in aspects including polymer biodegradability, life cycle analysis (LCA), behaviour of the public, and materials design. The project is part of the UCL Plastic Waste Innovation Hub which is an interface between researchers and the public.

The aim of this component of the project is to develop the results from our analysis of different biodegradable plastics to consider how the disposal and industrial composting of hygiene products could create a sustainable system. In particular, we will develop microbial and enzyme-based strategies, for the effective degradation of compostable hygiene products containing biodegradable plastics. The multidisciplinary position will be carried out in the Departments of Chemistry and Biochemical Engineering at UCL. The UCL Department of Chemistry has international strengths in the development of new reaction methodologies, biocatalysis, and chemical biology. The UCL Department of Biochemical Engineering is one of the leading international centres for synthetic biology and bioprocess research in the Industrial Biotechnology sector.

The research is highly interdisciplinary and the postholder will be required to discover and develop microbial consortia and enzymes, investigate the enzymes and genes responsible, produce the consortia and proteins and perform plastic degradation reactions under a range of reaction conditions. They will also develop biofragmentation screens using analytical chemistry methods to characterise products and polymer characterisation methods to assess non-degraded materials. The postholder will work in a multi-disciplinary environment with members of the Plastic Waste Hub so excellent team-working and communication skills will be required. The postholder will also supervise PhD and Masters students, and monitor lab safety.

The position is funded by UKRI (EPSRC) for up to 27 months. The candidate will join Helen Hailes’ research team in the Department of Chemistry, and Jack Jeffries team in the Department of Biochemical Engineering at the Bloomsbury Campus, and Manufacturing Futures Laboratory at UCL East, of University College London. Information about the groups can be found at <https://profiles.ucl.ac.uk/816>; https://profiles.ucl.ac.uk/37542.

**The Chemistry Department**

The Chemistry Department at UCL is one of the top-ranked departments in the UK and is committed to supporting excellence in both research and teaching. The Chemistry Department has over 60 members of academic staff carrying out world-leading research, with an annual research income of around £15 million, derived from many sources including UKRI (EPSRC, BBSRC, MRC, and NERC), European Commission and a wide range of charities and industrial partners in the UK, Europe, and the USA.

A multidisciplinary research ethos is fully embedded in our activities in the Departments with highly innovative research programmes across Engineering and Bioscience Departments and elsewhere at UCL as well as nationally, internationally and with industry. We specialize in the areas of organic synthesis, chemical biology, and green synthetic strategies for molecular assembly including the discovery, enhancement, and use of biocatalysts. The incorporation of renewable feedstocks into our synthetic methodologies and plastics biodegradation is also of high priority. Details about our research can be found on the departmental website <http://www.ucl.ac.uk/chemistry>.

#### Main purpose of the job

The postholder will be required to carry out research on biodegradable plastic degradation using microbial consortia and enzymes. This will involve: (i) assessment of microbial consortia present for biodegradable hygiene product degradation under aerobic and anaerobic conditions, (ii) new enzyme discovery from the consortia using DNA sequencing and functional metagenomics analysis & cloning of degrading enzymes to assess activities in more detail, (iii) assessment of plastic biodeterioration, biofragmentation and bioassimilation post after treatment with microbes/enzymes and product analysis and characterisation using analytical chemistry methods, (iv) polymer analysis, post-microbial/enzyme treatment using TGA, FTIR, (v) applications of microbial consortia/enzymes working with project collaborators. The postholder will work in a multi-disciplinary environment with members of the Plastic Waste Hub. They will also be expected to supervise PhD and Masters students, assisting experimentally with their research projects, where necessary, and reading drafts of reports and papers, as well as managing lab safety.

**Key Requirements**

The successful candidate will have a PhD degree (or be about to be awarded a PhD) in an area of Molecular Biology, Chemical Biology, or equivalent subject. Experience in several of the following areas: polymer biodegradation, enzyme discovery, expression and screening, assay development and compound/polymer characterisation, together with a good publication track record, a demonstrated commitment to excellence, and excellent problem solving skills in the lab are required. They will be required to work in a multidisciplinary, collaborative team and have effective written and verbal communication skills in English.

#### Duties and responsibilities

* To carry out research on the discovery and development of enzymes that degrade biodegradable plastics in hygiene products.
* To find and develop microorganisms and communities that can degrade biodegradable plastics and develop these for both aerobic and anaerobic degradation.
* To use genomics to identify novel microbes/enzymes for biodegradable plastics degradation.
* To produce microbes/enzymes, use them in reactions and develop screens where required. To characterise products using e.g. GC analysis.
* To collaborate and share research findings with project collaborators.
* To attend and contribute positively to project meetings with the funder.
* To oversee the setting up and running of the planned experiments, ensuring that experiments are appropriately supervised and supported.
* To record, analyse and write up the results of the research.
* To manage, oversee and assist (both experimentally in the lab and in reading report and paper drafts) PhD and Masters research students, including monitoring lab safety as required.
* To contribute to the drafting and submitting of papers to peer reviewed journals.
* To prepare progress reports on research as required.
* To contribute to the preparation and drafting of research bids and proposals.
* To contribute to the overall activities of the research team and department as required.
* To undertake a limited amount of teaching in relation to subject area.
* To contribute to the induction and direction of other research staff and students as requested.
* To be responsible for ensuring that equipment is safe and maintained in working order.
* The job description reflects the present requirements of the post, and as duties and responsibilities change/develop, the job description will be reviewed and be subject to amendment in consultation with the post-holder.
* The postholder will carry out any other duties as are within the scope, spirit and purpose of the job as requested by the line manager.
* The postholder will actively follow UCL policies including Equal Opportunities and be expected to give consideration within their role as to how they can actively advance equality of opportunity and good relations between people who share a relevant protected characteristic and people who do not share it.
* The postholder will maintain an awareness and observation of Fire and Health & Safety Regulations.
* To be aware of and act upon:
	+ Disciplinary procedure and disciplinary rules
	+ Grievance procedure
	+ Section 7 and 8 of the Health and Safety at Work Act

# Person Specification

| **Criteria** | **Essential or Desirable** | **Assessment method****(Application/Interview)** |
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| **Qualifications, experience and knowledge** |  |  |
| PhD (or about to be awarded a PhD) in Molecular Biology, Chemical Biology, or equivalent subject | Essential | Application |
| Experience/knowledge of microbial/enzyme discovery, bioinformatics, cloning, and enzyme expression  | Essential | Application |
| Experience/knowledge of analytical compound characterisation using techniques such as GC/HPLC | Essential | Application |
| Experience of microbial/enzyme screening and assay development. | Essential | Application |
| Experience of strategies to improve enzyme performance  | Desirable | Application |
| Experience of polymer biodegradation/characterisation | Desirable | Application |
| GCSE English Grade C or above (or equivalent, e.g. IELTS) | Essential | Application |
| Experience of working in a research environment | Essential | Application |
| Experience of multi-disciplinary working | Essential | Application |
| **Skills and abilities** |  |  |
| Proven research skills: experience of microbial/enzyme discovery, cloning, expression and enzyme transformations | Essential | Application |
| Proven skills in maintaining research/analytical equipment | Essential | Application/Interview |
| Ability to analyse and write up data | Essential | Application |
| Ability to present complex information effectively to a range of audiences | Essential | Interview |
| Effective written and verbal communication skills in English | Essential | Interview |
| Management of lab instrumentation | Desirable | Application/Interview |
| **Personal attributes** |  |  |
| Commitment to high quality research and excellent problem-solving skills | Essential | Interview |
| Ability to work collaboratively and as part of a team | Essential | Application/Interview |
| Good publication record | Essential | Application |
| Excellent organisational skills | Essential | Application/Interview |

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**APPLICATIONS PROCEDURE**

Interview date to be confirmed.

**Enquiries / Visits**

Informal enquiries should be made to: Professor Helen Hailes (h.c.hailes@ucl.ac.uk).

**Applications should be completed online** [**http://www.ucl.ac.uk/hr/jobs/**](http://www.ucl.ac.uk/hr/jobs/),

Any questions about the application process should be directed to: hr.chem@ucl.ac.uk

**SUPPLEMENTARY INFORMATION**

Please use these links to find out more about:

**Employee benefits:** <http://www.ucl.ac.uk/hr/benefits/employee_benefits.php>

**Further information about UCL:** <http://www.ucl.ac.uk/hr/docs/UCLstandard_information.php>

**General information for overseas applicants:**

<https://www.ucl.ac.uk/human-resources/working-ucl/employment-contract-administration-team/immigration>

<https://www.ucl.ac.uk/human-resources/working-ucl/relocating-uk-guide>

**Equal opportunities:**

[www.ucl.ac.uk/hr/docs/equal\_opportunity.pdf](http://www.ucl.ac.uk/hr/docs/equal_opportunity.pdf)

The Department has been awarded a Silver Athena Swan Award and we support the Athena beliefs that:

* The advancement of science, engineering, and technology (SET) is fundamental to quality of life across the globe.
* It is vitally important that women are adequately represented in what has traditionally been, and is still, a male-dominated area.
* Science cannot reach its full potential unless it can benefit from the talents of the whole population, and until women and men can benefit equally from the opportunities it affords.

Further information on Athena Swan is at <http://www.athenaswan.org.uk/>