



## Job Description

### Research Fellow in Organic Synthesis of Bioluminescent Molecules

**Department:** Chemistry

**Grade:** 7

**Location:** UCL Bloomsbury Campus

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#### Reports to:

#### Context

##### The Chemistry Department

The Chemistry Department at University College London is the oldest in England, and today is one of the best in the UK, being ranked 2<sup>nd</sup> in the UK for the world-class impact of its research in REF(2014). We are located in Bloomsbury, at the heart of London, and offer an exciting and vibrant environment in which to study in one of the UK's top universities. The Department of Chemistry at UCL is committed to supporting excellence in both research and teaching. The department offers undergraduate BSc and MSci programmes in Chemistry and currently teaches 400 undergraduates registered in Chemistry as well as students who select Chemistry on the Natural Sciences programme and first year Chemistry for life scientists.

The Chemistry Department has over 50 members of academic staff carrying out world-leading research. We specialise in the areas of organic synthesis, chemical biology, computational chemistry, nanotechnology, inorganic and materials chemistry, physical chemistry and chemical physics. The department has an annual research income of around £15 million, derived from many sources including the Research Councils (EPSRC, BBSRC, MRC, and NERC), European Commission and a wide range of charities and industrial partners in the UK, Europe and the USA.

Details about our research can be found on the departmental website <http://www.ucl.ac.uk/chemistry>.

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#### Main purpose of the job

The overall aim of this new project is to develop a molecular-level understanding of bioluminescence for the rational design of new bioluminescence tools for multicolor, deep-tissue imaging. The postholder will be required to carry out research in the field of multi-step organic synthesis, developing new strategies for the

synthesis of new bioluminescent molecules. The research will entail the design and implementation of novel synthetic sequences, and the identification and characterization of reaction products. They will play a key role in an interdisciplinary feedback loop between synthesis (this position), time resolved photoelectron spectroscopy (another position, supervised by Professor Helen Fielding, UCL) and computational chemistry (another position, supervised by Professor Graham Worth, UCL) and synthesis.

The postholder will be primarily responsible for the synthesis of the light giving forms of known luciferins and analogues, their oxyluciferins, based on D-luciferin. The project will then move on to the synthesis of more complex analogues around the infraluciferin skeleton. Results from the physical measurements will inform the design and synthesis of future targets. The oxyluciferins will be synthesized as discrete molecular entities or generated in situ from the parent luciferin. The postholder will contribute to other bioluminescent projects in the research group.

Some relevant publications from our group include the following:

1. A Dual Color Far-Red to Near-Infrared Firefly Luciferin Analogue Designed for Multi-Parametric Bioluminescence Imaging. Jathoul, A.P.; Grounds, H.; Anderson, J.C.; Pule, M.A. *Angew. Chem. Int. Ed.* **2014**, *53*, 13059-63.
2. Shining light on the electronic structure and relaxation dynamics of the isolated oxyluciferin anion. Patel, A.M.; Henley, A.; Parkes, M.A.; Assmann, M.; Worth, G.A.; Anderson J.C.; and Fielding, H.H. *Phys. Chem. Chem. Phys.* **2020**, *22*, 19022-32
3. Synthesis and bioluminescence of electronically modified and rotationally restricted colour-shifting infraluciferins. Anderson, J.C.; Jathoul, A.P.; Syed, A.J. *Tetrahedron* **2019**, *75*, 347-5.
4. Photoelectron spectroscopy of luciferin and infraluciferin chromophore anions *in vacuo*: competing photodetachment, photofragmentation and internal conversion. Woodhouse, J.L.; Assmann, M.; Parkes, M.A.; Grounds, H.; Pacman, S.; Anderson, J.C.; Worth, G.A.; Fielding, H.H. *Phys. Chem. Chem. Phys.* **2017**, *19*, 22711-20
5. A Convergent Synthesis and Optical Properties of Near-infrared Emitting Bioluminescent Infra-luciferins Anderson, J.C.; Grounds, H.; Jathoul, A.P.; Murray, J.A.H.; Pacman, S.J.; Tisi, L. *RSC Advances* **2017**, *7*, 3975-82.

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#### **Duties and responsibilities:**

- To contribute to the design and execution of organic synthetic sequences. To analyse and characterize compounds using spectroscopic techniques. To record, analyse and write up the results of these experiment.
- To record, analyze and write up the results of the research.
- To contribute to the drafting and submitting of papers to peer reviewed journals.
- To prepare progress reports on research for funding bodies 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.
- 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)
<b>Qualifications, experience and knowledge</b>		
PhD in Synthetic Organic Chemistry (or about to be awarded a PhD)	Essential	Application
GCSE English Grade C or above (or equivalent, e.g. IELTS)	Essential	Application
Experience of working in an organic synthesis research environment	Essential	Application
<b>Skills and abilities</b>		
Ability to synthesise complex organic molecules using multi-step sequences	Essential	Application and interview
Ability to optimise organic reactions and synthetic sequences	Essential	Application and interview
Ability to elucidate and characterise the structure of organic molecules by the interpretation of complex spectroscopic data such as 1D and 2D NMR spectroscopy, infrared spectroscopy, mass spectrometry	Essential	Application and interview
Ability to analyse, write up data and present findings of research activity effectively to colleagues for review purposes	Essential	Application and interview
Effective written and verbal communication skills in English	Essential	Application and interview
<b>Personal attributes</b>		
Commitment to high quality research	Essential	Interview
Ability to work collaboratively and as part of a team	Essential	Interview

## General Information

### Terms & Conditions of Employment

The post is a UCL grade 7 post, the salary for which ranges from £36,028 to £43,533 per annum (including London Allowance of £3,211 p.a.). Starting salary is usually £36,028.

All posts that are based outside of London, for example at Harwell, will **not** have London Allowance included in the salary.

Please note, appointment at Grade 7 is dependent upon having been awarded a PhD; if this is not the case, initial appointment will be at Research Assistant Grade 6B (salary £31,542 to £33,257 per annum, including London Allowance of £3,211) with payment at Grade 7 being backdated to the date of final submission of the PhD thesis.

Progression through the salary scale is incremental. Cost of living pay awards are negotiated nationally and are normally effective from 1st August each year. UCL's non-clinical pay and grading structure is at [http://www.ucl.ac.uk/hr/salary\\_scales/final\\_grades.php](http://www.ucl.ac.uk/hr/salary_scales/final_grades.php).

UCL's terms & conditions for research, teaching and professional services staff are at:

<https://www.ucl.ac.uk/human-resources/conditions-service-research-teaching-and-professional-services-staff>

The full range of benefits is at [http://www.ucl.ac.uk/hr/benefits/employee\\_benefits.php](http://www.ucl.ac.uk/hr/benefits/employee_benefits.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/>

## Apply

To apply for this position visit:

[ucl.ac.uk/jobs](http://ucl.ac.uk/jobs)

Search under Ref no:1874783