

## Research Associate in Organic Synthesis and Supramolecular Chemistry

Job Ref: REQ240655

### Department of Chemistry

#### Project Description

We invite applications for a 36-month postdoctoral research associate position in organic synthesis and supramolecular chemistry. This multi-disciplinary EPSRC project, led by Dr. Stephen Butler at Loughborough University, aims to synthesise macrocyclic luminescent probes to detect specific analytes in vapour and liquid.

The successful candidate will join a collaborative team with expertise in synthetic organic chemistry, photophysical analysis, polymer chemistry, optical engineering, and data science. The primary objective is to develop a portable luminescent sensing device to identify and locate specific chemicals. This breakthrough technology will enable security and defence organisations to quickly and safely identify the nature and spatial distribution of target chemicals, facilitating faster decision-making and response measures.

Building on our recent development of analyte-responsive luminescent lanthanide probes, the project aims to:

- Synthesise luminescent molecular probes capable of specific chemical recognition.
- Embed these probes within porous hydrogels integrated with LED optics.
- Construct a portable device to identify, measure and locate chemicals in liquid or vapour via an easy-to-interpret emission colour change (e.g. from green to red)
- Overcome limitations of existing methods by avoiding the need for time-consuming, power-intensive lab instrumentation or expert analysis.
- Evaluate probe performance, including selectivity, sensitivity, stability, emission colour change, and operational simplicity.

The position is ideally suited for an ambitious early career researcher with a strong background in multi-step organic synthesis. You will be proficient in the accurate characterisation of organic molecules and comfortable in the safe handling of reactive species and hazardous materials. Experience in photophysical analyses and supramolecular techniques (e.g. spectroscopic host-guest titrations) is advantageous. The successful candidate will be motivated to advance fundamental supramolecular chemistry research and collaborate with a skilled team to translate chemical probes into real-world sensing applications for environmental, security, and defence sectors.

This is a full-time 36-month position to commence on or after 7<sup>th</sup> October 2024.

For relevant publications please see: *Chem. Sci.*, **2023**, 14, 4979–4985; *Chem. Commun.*, **2024**, 60, 284–287; *Chem. Sci.*, **2022**, 13, 3386–3394.

More information about the Butler Group can be found here: <https://butler-researchgroup.wixsite.com/welcome>

For further details contact Dr Stephen Butler at [s.j.butler@lboro.ac.uk](mailto:s.j.butler@lboro.ac.uk)

#### Job Description

**Job Grade:** Specialist and Supporting Academic Grade 6

**Job Purpose:** This EPSRC project focuses on the multi-step synthesis of luminescent molecular probes designed to recognise specific analytes in vapour and liquid. Lead probes will be integrated into a portable device capable of identifying, measuring, and locating these chemicals. The project will involve optimising probe performance, including selectivity, sensitivity, stability, emission response, and operational simplicity.

## **Job Duties**

### **RESEARCH AND SCHOLARSHIP**

- Carry out the multi-step synthesis and characterisation of luminescent molecules with convergent binding sites and/or conjugation sites.
- Assess probe selectivity, sensitivity, dynamic response range and stability using physical organic chemistry and spectroscopic techniques.
- Collaborate effectively with academic partners, as well as defence and security agencies, to optimize probe and optical device performance.
- Plan and manage research activities to meet objectives and deadlines, keeping accurate scientific records.
- Lead discussions and provide regular research updates to the PI, and during wider research group meetings.
- Contribute to the preparation of research articles and patent applications.
- Engage in project promotion and engagement activities.
- Build external contacts and participate in knowledge exchange to strengthen relationships for future collaboration.
- Assist in preparing research proposals and applications for external funding.

### **TEACHING AND LEARNING**

- Assist in supervising undergraduate and postgraduate research projects within the Butler research group.
- Engage in training programmes through staff development consistent with your aspirations and that of the project.

### **OTHER ACTIVITIES**

- Assist with the management and smooth operation of equipment and instrumentation within the research group.
- Undertake other duties that may be reasonably requested and are commensurate with the nature and grade of the post.

### **Points To Note**

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

### **Special Conditions**

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

### **Organisational Responsibility**

Reports to Dr Stephen Butler, Reader in Chemistry.

## Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Assessment Centre/Presentation
- 3 – Interview

### Essential Criteria

Area	Criteria	Stage
Qualifications	Holds (or is about to obtain) a PhD in Organic Chemistry	1
Experience and Knowledge	Relevant postgraduate or industrial experience in multi-step organic synthesis	1
	Research experience with sufficient depth of specialist knowledge in the discipline	1,3
	Preparation of research publications and/or patents	1,3
	Advance knowledge of the research methods and techniques to work effectively within the research project	1,3
	Experience in supervision of postgraduate or undergraduate project students in the laboratory	1,3
Skills and Abilities	Ability to work effectively in a wider team with strong interpersonal skills	1,3
	Ability to organise time and plan effectively to meet deadlines	1
	Excellent written and oral communication skills	1,3
	Ability to deliver oral presentations, write research reports and produce draft publications	1,3
	Ability to share responsibility for the supervision and training of undergraduate and postgraduate students in the laboratory	1,3
Training	Willingness to travel to collaborators to undertake appropriate training in techniques and instrumentation	1,3
	Willingness to undertake appropriate further training (e.g. IP protection)	1,3

### Desirable Criteria

Area	Criteria	Stage
Experience	Experience collaborating with academic and/or industrial partners	1,3
	Experience in macrocyclic ligand synthesis	1,3
	Experience in photophysical analysis of luminescent molecules	1,3
	Experience in supramolecular chemistry (e.g. binding titrations)	1
	Experience in polymer chemistry (e.g. hydrogel and thin film preparation)	1
	Experience in reverse-phase HPLC purification	1

## Conditions of Service

The position is **full-time** and **fixed term** for a period of 36 months. Salary will be on research grade 6, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at <http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html>.

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>

In addition, the University is supportive, wherever possible, of flexible working arrangements.

We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swan/>

### **Informal Enquiries**

Informal enquiries should be made to Dr Stephen Butler by email at [s.j.butler@lboro.ac.uk](mailto:s.j.butler@lboro.ac.uk).