Job Description

Job title	Research Associate – Chemical Sensing of Water Contaminants
Department/School	Chemistry
Job family	Education and Research
Grade	7
Reporting to	Principal Investigator (PI) Tony James
Responsible for	Conducting research on colorimetric sensors for drinking water contaminants. Supervision of doctoral or undergraduate students may be required.
Location	University of Bath premises

Background and context

You will work as part of team on an Royal Society funded project on the development of colorimetric sensors for drinking water contaminants, with specific focus on contaminants relevant to the developing world, including fluoride and mercury. A key goal of the project will be to take small molecule chemical sensors and incorporate them into a delivery device, e.g. by immobilising them on paper test strips. Applicants should have (or be about to obtain) a PhD in synthetic chemistry, chemical/environmental engineering, or a related discipline. The post requires a strong background in synthetic organic chemistry. Experience of analytical techniques relevant to water contaminats is desirable, as is any relevant experience of product development. A proven track record in conducting high quality research, evidenced by publications in peer reviewed journal as well as well as excellent communication skills are essential.

For more information, see:

Chemical Communications, ***2017****, 53, 12580, doi:10.1039/c7cc07416f*

Job purpose

To provide subject-specific research expertise and undertake specific research work colorimetric sensors for drinking water contaminants as part of a research team for project funded by the Royal Society's Global Challenges Research Fund

Main duties and responsibilities	
	Responsible to the PI/CI for (as appropriate to discipline):
1	Conduct research into the development of colorimetric sensors for drinking water contaminants, with specific focus on contaminants relevant to the developing world.
2	Writing up results of research and contributing to publishing of results in high-quality peer-reviewed academic literature.
3	Contributing to the dissemination of research via presentations at prestigious national and international meetings and conferences.
4	Participate regularly in group and project meetings, prepare and deliver presentations and reports to the project team, internal and external stakeholders or funders.
5	Assist with the supervision of graduate students and undergraduate project students and the assessment of student knowledge.
6	Continually update knowledge and understanding in field or specialism to inform research activity.
7	Identify sources of funding and provide assistance with preparing bids to funding bodies; contribute to securing of funds for research.
8	Develop research objectives and proposals for own or joint research, with assistance of a mentor if required.

Person Specification

Criteria	Essential	Desirable
Qualifications		
A PhD degree in synthetic chemistry, chemical engineering, or a related discipline.	√	
Experience/Knowledge		
Post doctoral experience		√
Knowledge of synthetic chemistry theory and techniques; knowledge of synthetic route planning	√	
Experience of chemical sensor development, including titrations, Job's plots, selectivity tests		√
Knowledge of the field of chemical drinking water contaminants, their health effects, detection and remediation		√
Demonstrated awareness of latest developments in the field of research and in research design	√	
Demonstrated potential to publish in high quality, peer reviewed journals	√	
Skills		
Proficiency in synthetic chemistry techniques; synthesis, isolation, purification and characterisation of novel molecules)	√	
Excellent oral, interpersonal and written communication skills	√	
Ability to organise and prioritise own workload	√	
Ability to write research publications and reports and to effectively disseminate outcomes	√	
Attributes		
Enthusiasm for research, ability to take initiative	√	
Organisation – able to plan and deliver work to meet required deadlines	√	
Tenacity – working to achieve own and team objectives and to overcome obstacles	√	
Ability to be an effective team worker in an interdisciplinary team	√	
Willingness to aid in the day-to-day running of the research group & help in supervision of project students	√	

Job advert

Postdoctoral research associate in colorimetric sensor development

The United Nations 7th "*Millennium development goal*" set the target of halving the proportion of people without sustainable access to safe drinking water and basic sanitation (compared to 1990). However, as of now, 663 million people worldwide still rely on "unimproved" water sources (surface water from lakes, rivers, dams, or unprotected dug wells or springs) and the health of these populations is threatened by harmful contaminants that may be present in such water sources. Chemical contaminants such as arsenic, fluoride, mercury, etc., which may enter the water table through natural (geological) or anthropogenic processes (e.g. industrial pollution).

We have recently developed colorimetric sensors that can detect fluoride in water. The sensors consist of an azulene ring functionalised with a boronic acid ester; the former is known for its intense colour and the latter is known to bind fluoride with high selectivity and affinity. The colour of an azulene is very sensitive to the electronic nature of its substituents, hence a pronounced colour change occurs upon exposure to fluoride.

We recently published a proof-of-concept study on the above (*Chem. Commun.*, **2017**, *53*, 12580, doi:10.1039/c7cc07416f) and have now been awarded funding by the Royal Society's Global Challenges Research Fund to develop further this technology into a test kit that could be used by residents of affected developing world communities. See this video for further details:

https://www.reuters.com/video/2017/11/22/simple-water-test-could-prevent-cripplin?videoId=373032101&videoChannel=6

Applicants should have (or be about to obtain) a PhD in chemistry, chemical/environmental engineering or a related discipline. The post requires a strong background in synthetic chemistry and any specific relevant experience is beneficial, e.g. immobilisation of small molecules on supports, relevant analytical techniques, etc. A proven track record in conducting high quality research, evidenced by publications in peer reviewed journal as well as excellent communication skills and the ability to work effectively in multidisciplinary teams are essential. Applications should include a CV and covering letter explaining the interest in and suitability for the position.

This is a fixed term position of 12 months duration, with a start date as soon as possible in 2018, subject to negotiation.

Informal enquiries may be addressed to Prof Tony James t.d.james@bath.ac.uk or Dr Simon Lewis s.,e.lewis@bath.ac.uk. Please note that applications sent directly by email will not be accepted.