

THE UNIVERSITY OF MANCHESTER  
PARTICULARS OF APPOINTMENT  
FACULTY OF SCIENCE & ENGINEERING  
SCHOOL OF CHEMISTRY  
EXPERIMENTAL OFFICER FOR HIGH THROUGHPUT ROBOTICS PLATFORMS  
VACANCY REF: S&E-10951

**Salary:** Grade 6 £31,604 to £38,833 per annum  
**Hours:** Full Time  
**Duration:** Fixed term starting 1st December 2017 to 30th November 2018  
**Location:** Oxford Road, Manchester

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**Enquiries about the vacancy, shortlisting and interviews:**

Manager: Professor Patrick Cai

Email: [yizhi.cai@manchester.ac.uk](mailto:yizhi.cai@manchester.ac.uk)

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**THE PROJECT**

Wanted: Ambitious Experimental Officer to maintain, develop and extend our state of the art High Throughput Robotics platforms to engineer biology at the genome scale.

**BACKGROUND**

This position is a central part of Manchester's £12M investment into synthetic biology approaches for next generation biotechnology, and will be based in Professor Patrick Cai's group. The University of Manchester was awarded BBSRC/EPSRC Synthetic Biology Research Centre funding (>£10M) to establish the [SYNBIOCHEM](#) Centre, a UK/European Centre of Excellence for the Synthetic Biology for fine and speciality chemicals production. The Centre is located in the Manchester Institute of Biotechnology (MIB), a unique cross-disciplinary research institute at the University of Manchester, which brings together more than 450 researchers with expertise in the foundational sciences supporting Synthetic Biology, including molecular biology, chemistry, engineering, materials science, computer science and medicine and as such is at the forefront of international developments in the emerging science of Synthetic Biology.

The Cai laboratory has pioneered the design, construction and characterization of completely synthetic eukaryotic chromosomes. Cai lab's significant research achievements to date include: 1) Cai helped originate and continues to coordinate the International Synthetic Yeast

Genome (Sc2.0) Consortium, which involves >10 top universities in 4 continents with the aim of building the first fully re-designed eukaryote genome. The Sc2.0 project is the largest synthetic biology project in the public domain. Cai's leadership and coordination efforts for this large-scale project have ensured that milestones and scientific deliverables of the consortium have been met in a timely fashion. In March 2017 the Sc2.0 consortium published 7 original research articles in *Science* on the first six designer chromosomes, for which the Sc2.0 project was featured on the issue cover. 2) The Cai lab has pioneered de novo genome design and synthesis through multi-disciplinary approaches that rely on robotic automation, high-throughput cloning and assembly frameworks. At the outset of his independent career Cai founded the Edinburgh Genome Foundry supported by a £5.3M BBSRC award for a UK national SynBio facility focused on automating DNA design, assembly and characterization. 3) The Cai lab is translating these technological breakthroughs in genome engineering to broad social and economic impact. The group is actively exploring new applications of artificial chromosome technology, including the generation of novel natural product-like chemical matter. Cai lab was recently awarded a Bill and Melinda Gates Foundation Global Challenge pilot grant to develop artificial chromosome-based strategies for discovery of novel anti-TB agents.

We are now seeking to recruit a skilled Experimental Officer to join the team with the expertise and experience to guide and support the further development of the Centre's High Throughput Robotics platform, essential for the delivery of the multidisciplinary discovery and implementation pipeline. We are seeking a skilled member of staff with the necessary expertise and experience to support and develop the platform, work effectively across the wider SYNBIOCHEM platforms and help to drive forward multiple science programmes. A strong ethos for team-based working will be essential for the smooth integration and delivery of the scientific projects across the technology platforms. Applications are welcome from engineers and developers of robotics technology platforms and/or users of HTP capabilities in the context of SynBio.

A strong ethos for team-based working and the ability to communicate comfortably with interdisciplinary research scientists will be essential for the success in this critical role.

## **JOB DESCRIPTION**

### **Overall purpose of the position**

As a member of the Cai lab, you will be responsible for overseeing the synthetic biology automation system. You will work on multiple synthetic biology projects working closely with members of the SYNBIOCHEM centre and members from the Cai lab. You will also work closely with the other senior technology leads to ensure the timely and appropriate flow of data and protocols across the platforms to drive forward the Centre's scientific vision.

### **Key responsibilities, accountabilities or duties**

It is essential that the EO is highly skilled with extensive experience and knowledge in the use of High Throughput Robotics (HTP) equipment for the generation of biocatalyst library parts (enzymes), pathway assembly and screening of engineered microorganisms. The EO will also integrate suitable analytical throughput at each stage to complement the workflow of library generation, screening and detailed characterisation of outputs (enzymes/pathways/strains). A thorough understanding of robotics equipment and its numerous applications and companion

technologies for Synthetic Biology will be essential. A strong collaborative team-based ethos is imperative.

As the EO you will:

- Work closely with the members in the Cai lab and SYNBIOCHEM to ensure timely and successful delivery of projects in your technology area.
- Deliver the Cai lab and SYNBIOCHEM High Throughput Robotics Platform (HTP) through the provision of technical expertise and assistance for collaborative research projects according to the needs of Cai lab and SYNBIOCHEM.
- Ensure full integration of the HTP platform into the wider SYNBIOCHEM Centre and MIB.
- Provide training in HTP and related techniques to researchers/collaborators in the Cai lab and SYNBIOCHEM.
- Effectively and efficiently manage and coordinate SYNBIOCHEM projects utilising the HTP platforms.
- Have the required broad vision and scientific knowledge and training to enhance the capabilities of the technology platforms to deliver world-leading synthetic biology outputs.
- Act as a contact for your technology field with the wider academic/industrial community, continually updating knowledge and understanding in the field.
- Work closely with the data repository manager and SYNBIOCHEM team to ensure wider community access to data/standards/protocols that arise, in addition to access to the high throughput robotics platform facilities.
- Work closely with all SYNBIOCHEM partners and technology experts to deliver the technology team based resource.
- As an EO you will be expected to contribute to research publications, further grant applications and to develop collaborations to ensure the sustainable future of the Centre.
- Build internal and external contacts and participate in internal/external networks for the exchange of information and to form relationships for future SYNBIOCHEM collaboration.

## **PERSON SPECIFICATION**

### **Essential Knowledge, Skills and Experience:**

You will have:

- A relevant PhD in engineering/biochemistry/synthetic biology or a master degree in engineering (or equivalent).
- Solid demonstrated experience in the use of a range of HTP robotics (in industry or academia) and acoustic dispenser systems in relation to biocatalyst library generation, pathway assembly and engineered chassis screening, and the ability to trouble shoot.
- Specialist knowledge and direct experience of applying and delivering HTP methods and related techniques which will include knowledge and experience of how to assemble kits/relevant equipment into the HTP platform, as well as integrating the software from each kit, and maintenance/trouble shooting of the HTP robot.
- Experience of handling large/complex high throughput biology projects.
- Demonstrated track-record in establishing new and innovative experimental protocols.

- We would expect the candidate to have familiarity with the concepts and technologies of synthetic biology alongside expertise in engineering.
- A good journal publication record.
- A strong collaborative ethos for team-based working.
- Excellent communication (both written and oral) and interpersonal skills.
- Excellent time management and organisational skills Ability to liaise confidently and effectively with a range of individuals.
- Flexible approach to dealing with research problems as they arise.
- Ability to meet deadlines.
- A self-motivated individual with the ability to work independently and as part of a team.
- The ability to evaluate and communicate complex data.
- Ability to work with multiple research groups and organise your workload accordingly.
- Ability to translate knowledge of advances in the subject area into research activity.
- Communicate complex information and material of a specialist or highly technical nature, orally, in writing and electronically.
- Collaborate with academic / industrial colleagues on areas of shared research interest.
- Attend and contribute to relevant meetings.
- Use initiative and creativity to identify areas for research, develop new research methods and extend the research portfolio.
- Use creativity to analyse and interpret research data and draw conclusions on the outcomes.
- Contribute to collaborative decision making with colleagues in areas of research.

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The above particulars are intended as a general guide to the duties of the post and the conditions of service. They do not constitute a contract of employment between the University and the person appointed. The successful applicant will, however, receive a full set of conditions of service on appointment.

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