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## POSITION DESCRIPTION

<b>Position Title:</b>	Postdoctoral Research Fellow in Biocatalysis and Molecular Crowding
<b>Organisation Unit:</b>	Australian Institute for Bioengineering and Nanotechnology
<b>Position Number:</b>	3043064
<b>Type of Employment:</b>	Full time, Fixed-term (Part time hours negotiable to 60% FTE)
<b>Classification:</b>	Research Academic Level A

## THE UNIVERSITY OF QUEENSLAND

The University of Queensland (UQ) contributes positively to society by engaging in the creation, preservation, transfer and application of knowledge. UQ helps shape the future by bringing together and developing leaders in their fields to inspire the next generation and to advance ideas that benefit the world. UQ strives for the personal and professional success of its students, staff and alumni. For more than a century, we have educated and worked with outstanding people to deliver **knowledge leadership for a better world**.

UQ ranks in the world's top universities, as measured by several key independent ranking, including the Performance Ranking of Scientific Papers for World Universities (43), the US News Best Global Universities Rankings (52), QS World University Rankings (47), Academic Ranking of World Universities (55), and the Times Higher Education World University Rankings (65). UQ again topped the nation in the prestigious Nature Index and our Life Sciences subject field ranking in the Academic Ranking of World Universities was the highest in Australia at 20.

UQ has an outstanding reputation for the quality of its teachers, its educational programs and employment outcomes for its students. Our students remain at the heart of what we do. The UQ experience – the UQ Advantage – is distinguished by a research enriched curriculum, international collaborations, industry engagement and opportunities that nurture and develop future leaders. UQ has a strong focus on teaching excellence, winning more national teaching excellence awards than any other in the country and attracting the majority of Queensland's highest academic achievers, as well as top interstate and overseas students.

UQ is one of Australia's Group of Eight, a charter member of edX and a founding member of Universitas 21, an international consortium of leading research-intensive universities.

Our 50,000-plus strong student community includes more than 13,000 postgraduate scholars and more than 12,000 international students from 144 countries, adding to its proud 240,000-plus alumni. The University has about 7,000 academic and professional staff and a \$1.8 billion annual operating budget. Its major campuses are at St Lucia, Gatton and Herston, in addition to teaching and research sites around Queensland and Brisbane city. The University has six Faculties and four University-level Institutes. The Institutes, funded by government and industry grants, philanthropy and commercialisation activities, have built scale and focus in research areas in neuroscience, biomolecular and biomedical sciences,

sustainable minerals, bioengineering and nanotechnology, as well as social science research.

UQ has an outstanding track-record in commercialisation of our innovation with major technologies employed across the globe and integral to gross product sales of \$11billion+ (see <http://uniquet.com.au/our-track-record>).

UQ has a rapidly growing record of attracting philanthropic support for its activities and this will be a strategic focus going forward.

## **Organisational Environment**

The University of Queensland's Australian Institute for Bioengineering and Nanotechnology (AIBN) is a dynamic multi-disciplinary research institute dedicated to developing technology to alleviate societal problems in the areas of health, energy, manufacturing and environmental sustainability. AIBN brings together the skills of more than 450 world-class researchers complimented by an extensive suite of integrated facilities, working at the intersection of biology, chemistry, engineering and computer modelling. With a reputation for delivering translational science, AIBN conducts research at the forefront of emerging technologies, and has developed strong collaborations with leading members of industry, academia and government. AIBN goes beyond basic research to develop the growth of innovative industries for the benefit of the Queensland and Australian economies. Information about the Institute can be accessed on the Institute's web site at <http://www.aibn.uq.edu.au/>.

AIBN is committed to supporting the career growth of female researchers and have a number of initiatives to support females in developing and achieving a fulfilling research career at the institute. For more information, please visit our AIBN Women in Science web site at <http://www.aibn.uq.edu.au/women>.

The Vickers group has an established track record in synthetic biology, isoprenoid metabolism/biology, and metabolic engineering. We use advanced systems and synthetic biology approaches to (a) understand metabolic regulation of the isoprenoid group of natural products, and (b) engineer production of industrially-useful biochemicals. We work in yeast, cyanobacteria, *E. coli*, and plants; this provides us with a variety of different organisms in which to answer questions and solve problems. We are part of the CSIRO-University of Queensland Synthetic Biology Alliance, a new initiative that will see significant growth in the immediate future. As part of this initiative, we are building on-site biofoundry capabilities. We strive to provide a supportive collegial and social environment that delivers a great vocational experience as well as an excellent scientific experience; we value good team players and exceptional science.

Associate Professor Vickers holds a joint appointment with the Commonwealth Science and Industry Research Organisation (CSIRO), Australia's Federal research organisation, as Director of the CSIRO Synthetic Biology Future Science Platform, a \$40 million research and development program aimed at expanding Australia's capability in synthetic biology.

This position is funded by a Human Frontiers Research Program grant to participate in an exciting interdisciplinary project in collaboration with our colleagues, the Douglas lab at Indiana University (USA) and the de Pablo lab at the Autonomous University of Madrid (Spain). The overall aim of the program is to better understand *in vivo* catalytic conditions in crowded environments, using virus-like particles as cellular compartment proxies.

The successful candidate will work closely with Dr Frank Sainsbury, a Senior Researcher at AIBN. Dr Sainsbury leads a research program on the self-assembly of protein-based nanoparticles as synthetic biology tools to investigate fundamental and applied aspects of health and industrial biotechnology.

Vickers Group at AIBN: [www.aibn.uq.edu.au/claudia-vickers](http://www.aibn.uq.edu.au/claudia-vickers)

Vickers Group Website: [www.claudiavickers.org](http://www.claudiavickers.org)

CSIRO SynBioFSP: [research.csiro.au/synthetic-biology-fsp/](http://research.csiro.au/synthetic-biology-fsp/)

Dr Frank Sainsbury profile: <http://researchers.uq.edu.au/researcher/2990>

## Information for Prospective Staff

Information about life at UQ including staff benefits, relocation and UQ campuses is available at - <http://www.uq.edu.au/current-staff/working-at-uq>

The University of Queensland [Enterprise Agreement](#) outlines the position classification standards for Levels A to E.

## DUTY STATEMENT

### Primary Purpose of Position

The primary purpose of this position is to perform research in biocatalysis and metabolic pathway engineering using virus-derived nano-compartments. The successful candidate will establish a well characterised panel of isoprenoid enzymatic pathway elements for encapsidation within virus-derived protein cages. Control over packing density and volumetric concentration will be used to address fundamental questions on the impact of macromolecular crowding on enzymatic function *in vitro* and, ultimately, to improve enzyme scaffold designs for *in vitro* and *in vivo* biocatalysis.

### Duties

Duties and responsibilities include, but are not limited to:

#### Research

- Work in collaboration with the principle investigator (PI) and other members of the research group
- Conduct literature reviews in the appropriate area(s)
- Develop a research program in biocatalysis and engineering isoprenoid pathway elements, as well as other model catalytic processes
- Collaborate with an international team of interdisciplinary researchers working both *in vitro* and *in vivo* in virus-based nanotechnology, single and particle enzymology, and advanced atomic force microscopy
- Conduct cutting-edge research and publish scholarly papers
- Contribute to the supervision of undergraduate and postgraduate research students
- Maintain accurate and comprehensive records of laboratory research
- Provide written and verbal reports (inclusive of manuscript submissions) on outputs associated with the project, inclusive of associated data analyses
- Maintain high standards of scientific research, cleanliness, and health and safety

- Participate in applications for external research funding
- Maintain absolute confidentiality regarding the results of the project where appropriate and when requested

### **Service and Engagement**

- Contribute to the processes that enable the academic team to manage the work of the Institute, including participate in Institute decision-making and serve on Institute committees
- Foster the Institute's relations with industry, government departments, professional bodies and the wider community.
- Any other duties as reasonably directed by your supervisor

### **Other**

Ensure you are aware of and comply with legislation and University policy relevant to the duties undertaken, including but not exclusive to:

- the [University's Code of Conduct](#)
- requirements of the Queensland occupational health and safety (OH&S) legislation and related [OH&S responsibilities and procedures](#) developed by the University or Institute
- the adoption of sustainable practices in all work activities and compliance with associated legislation and related University [sustainability responsibilities and procedures](#)
- requirements of the Education Services for Overseas Students Act 2000, the National Code 2007 and associated legislation, and related [responsibilities and procedures](#) developed by the University

### **Organisational Relationships**

The position reports to Associate Professor Claudia Vickers and Dr Frank Sainsbury.

## **SELECTION CRITERIA**

### **Essential**

- PhD in the area of *Enzymology, Metabolic Engineering, Biochemistry or Molecular Biology with a related focus, or a related discipline.*
- Demonstrated expert knowledge in the area of *Enzymology.*
- Expertise in molecular cloning and recombinant protein expression and purification.
- Evidence of a contribution to research projects, including publication in scholarly international journals.
- Demonstrated understanding of and adherence to local regulations governing biosafety and work with genetically modified organisms.
- Ability to work collaboratively with colleagues.

### Desirable

- Experience in protein engineering, enzyme scaffolding or metabolic pathway engineering.
- Experience in liaising and collaborating with external research groups to develop co-operative research projects.
- Demonstrated ability to manage multiple research projects.
- Supervision of undergraduate research students.

### **Seminar**

Applicants invited for interview may be expected to present a seminar in conjunction with the selection interview process.

### **Qualification Verification**

An appointment to this position is subject to the verification of the highest academic qualification from the conferring institution.

**The University of Queensland values diversity and inclusion and actively encourages applications from those who bring diversity to the University. Please refer to the University's Diversity and Inclusion webpage (<http://www.uq.edu.au/equity>) for further information and points of contact if you require additional support.**

**This role is a full-time position; however flexible working arrangements may be negotiated to minimum 60% FTE.**

**Accessibility requirements and/or adjustments can be directed to the contact person listed in the job advertisement.**