POSITION DESCRIPTION

Position Title: Research Fellow – Molecular Biology / Virology
Organisation Unit: School of Chemistry and Molecular Biosciences
Position Number: 3040297
Type of Employment: Full Time, Fixed Term for 3 years
Classification: 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 (45), QS World University Rankings (48), Academic Ranking of World Universities (55), and the Times Higher Education World University Rankings (69). UQ again topped the nation in the prestigious Nature Index, and our Academic Ranking of World Universities result in the field of Life and Agricultural Sciences is 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://uniquest.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 Faculty of Science is recognised as a powerhouse for some of the world's leading scientists, teachers, science programs and commercial outcomes. The Faculty is one of the largest Science groupings in Australia, with approximately 1100 (equivalent full-time) staff, and about 7500 (equivalent full-time) students.

Throughout its Schools and Centres, the Faculty unites the disciplines of agriculture and animals, biomedical and biological sciences, chemistry, earth sciences, food sciences, geography, marine science, maths and physics, the environment and veterinary science.

With strong links between the enabling and applied sciences, UQ researchers and graduates are working on a wide range of groundbreaking projects from the molecular characterisation of drug resistant bacteria that affect piglets through to finding better treatments for illness and rehabilitation of the environment.

Information about the Faculty may be accessed on the Faculty's web site: http://www.science.uq.edu.au/

School of Chemistry and Molecular Biosciences

The School of Chemistry and Molecular Biosciences (SCMB) combines the disciplines of Chemistry, Biochemistry & Molecular Biology, Microbiology and Parasitology into a single academic unit. The School has modern research laboratories with state-of-the-art equipment and research infrastructure. The School includes over 50 academic staff, who are widely published internationally and have extensive research backgrounds. Information about the School and research interests of academic staff may be found on the web site http://www.scmb.uq.edu.au.

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

To engage as a Postdoctoral Research Fellow in the development of a broad spectrum influenza vaccine. The research to be carried out involves rational design and molecular cloning of subunit vaccines based on the influenza hemagglutinin protein, protein expression and purification using a eukaryotic CHO cell line, in vitro protein characterisation, animal
immunizations and analysis of immune responses. This position is funded by NHMRC Development grant 2019-2021.

**Duties**

Duties and responsibilities include, but are not limited to:

**Research**

- Work within an established research group to conduct high quality research and publish scholarly papers related to the project outline below

**Project outline**

This project seeks to apply our novel clamp technology to generate HA-based vaccines for influenza A and B viruses, in which HA is constrained in its native pre-fusion conformation, equivalent to that of HA expressed on the virion surface. Animal models will confirm that immunization with pre-fusion HA induces enhanced protection against seasonal influenza viruses, and simultaneously boosts cross-protective humoral immunity against divergent strains.

The project will comprise four specific aims:

1. **Molecular engineering and protein purification**: A panel of recombinant HA proteins derived from both seasonal human influenza A and B virus strains, and avian/animal influenza A viruses with pandemic potential, will be generated in both stabilized and non-stabilized forms based on known structural information.

2. **In vitro characterisation of protein conformation and epitope presentation**: Conformational integrity of HA will be compared between HAclamp and commercial vaccines by biophysical analysis of HA trimerization, reactivity towards antibodies with defined epitope specificity and structural characterization by electron microscopy.

3. **Induction of antibody responses**: Antibodies induced to clamp-stabilised HA vaccine candidates will be compared to responses elicited following vaccination with non-stabilised constructs, or with commercial monovalent/trivalent/quadrivalent vaccines (MIV/TIV/QIV) to seasonal influenza viruses. Cross-reactivity, virus neutralization, antibody-dependent cellular cytotoxicity (ADCC), antibody-dependent cellular phagocytosis (ADCP) and complement dependent cytotoxicity (CDC) will be assessed using established *in vitro* assays.

4. **Protection in animal models of influenza**: Vaccine efficacy will be assessed in both mouse and ferret models of influenza infection following challenge of vaccinated animals with either homologous or divergent virus strains.

**Teaching and Learning**

- Some involvement in Honours and (where appropriate) Higher Degree by Research supervision would be expected.

**Service and Engagement**

Involvement in one or more of the following:

- Academic service responsibilities
- Contribute to the outcomes of internal committees
- Develop external contributions.
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/School
- 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 the project leaders, Prof Paul Young, Dr Keith Chappell and Dr Daniel Watterson.

SELECTION CRITERIA

**Essential**

- PhD in the area of *Molecular Biology, Immunology or Virology*.
- Demonstrated expert knowledge in the area of *Molecular Biology, Immunology and Virology*
- Experience in animal handling and research involving animals
- An ability to establish effect relationships and to represent and promote academic discipline at a university and wider community level, including industry, government and professional bodies.
- Evidence of a contribution to research, including published journal articles in *Molecular Biology, Immunology and/or Virology*.
- Ability to work collaboratively with colleagues.

**Desirable**

- Experience in vaccine development, manufacturing, regulations.
- Developed industry liaisons and professional contacts
- Demonstrated teaching skills at undergraduate and postgraduate levels
- Evidence of previously successful external grant applications.

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](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.

Accessibility requirements and/or adjustments can be directed to science.hr@uq.edu.au