POSITION DESCRIPTION

Position Title: Senior Research Officer
Organisation Unit: Institute for Molecular Bioscience
Position Number: 3007047
Type of Employment: Full Time Fixed Term until 31.12.2021
Classification: Academic Research Level B

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+
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 Institute for Molecular Bioscience, located on the main
University campus, is Australia’s leading biosciences research institute. Established in 2000,
the Institute is home to over 420 staff and is located in thriving Brisbane, a city consistently
ranked as one of the world’s most vibrant and liveable cities.

The Institute, ranked in the Top 20 globally for life sciences research, pursues a
multidisciplinary approach to solving some of the world’s most serious challenges in the
fields of health, disease and sustainable solutions for our cities, fuels and foods. The
Institute is housed in a single building and is organized into technological platforms
(Divisions) and research themes (Centres). The Divisions support state-of-the art facilities
including the Centre for Microscopy and Microanalysis, which houses new cryo-electron
microscopes; the NMR facility containing 500, 600 and 900 MHz machines; the Mass
Spectrometry Facility accommodating a wide array of instrumentation; suites for work with a
variety of model organisms; a plethora of next generation DNA sequencing technologies and
the southern hemispheres leading program in complex genetic traits. The Research Centres
accommodate 36 groups using a combination of genomics, chemistry and cell biology to
take life science discoveries from the genome to drug design and application in the areas of
antimicrobial resistance, inflammation, pain, cardiovascular disease and rare and
developmental diseases.

The quality of our internationally recognised researchers underpins our research excellence.
Over the past five years, our group leaders have attracted nearly $250 M in research
funding. They have leveraged funding from over 40 different national and international
research sponsors including significant support from federal and state government sources.
The success rate in federal funding schemes is amongst the highest in all of Australia. The
accomplishment of our staff is reflected by the consistent contribution they make to the
prestigious Nature science index and by the fact five are listed in the prominent 2018
Clarivate Highly Cited Researchers List.

A corner stone of the Institute is the strong emphasis on ensuring our discovery science has
impact by translating our research discoveries to meet industry, community and clinical
needs. The Institute has generated more than 30 patent families and has spun out multiple
companies. The impact of our work is illustrated by two biopharmaceutical companies
founded in the Institute, Protagonist Therapeutics Ltd and Inflazome Ltd. The former
company entered into a $1 B worldwide agreement to co-develop a drug for inflammatory
bowel disease and the latter recently received $70 M to develop treatments for inflammatory
diseases. Our ambition to strengthen our translational portfolio continues. For example, in
the last 12 months researchers from the IMB:
• were part of a successful push to put endometriosis on the national agenda to improve
  understanding, treatment and support of this debilitating disease
• identified genetic factors contributing to the risk of developing diseases like endometriosis
  and motor neurone disease, advancing our understanding of these disorders on a global scale
• discovered a new type of cell in the brain that mops up cellular waste and may provide
  protection against stroke and dementia
• discovered a small protein in spider venom that could prevent the devastating brain damage caused by stroke
• discovered we could shrink brain tumours using existing breast cancer treatments
• found a promising potential treatment for breast cancer that blocked cancer spread and improved survival rates in models
• discovered a molecular trigger for inflammation that could lead to new treatments for rheumatoid arthritis, inflammatory bowel disease and neurodegenerative diseases
• furthered research in development of new medicines for treating inflammatory diseases, including allergies, by building molecular switches that can control immune response
• as part of a global team, identified a new gene behind a rare form of inherited childhood kidney disease
• combated superbugs by creating a new diagnostic, repurposing old drugs and continuing to crowdsource the next antibiotic
• developed the first new therapy in over 30 years to be used successfully in patients to treat antibiotic resistant infections
• helped an Australian family-owned company create the first mass-produced organic insecticide from peptides found in the Butterfly Pea plant
• initiated a program to use algae to produce clean water, livestock feeds, foods, fuels and medicines

IMB’s research outcomes are protected and commercialised by UQ-owned technology transfer group UniQuest.

Details of the research interests of the Institute may be accessed on the Institute’s website at: https://imb.uq.edu.au/

Program in Complex Trait Genomics

The Program in Complex Trait Genomics (website: http://cnsgenomics.com) is a joint initiative between the Institute for Molecular Bioscience (IMB) and the Queensland Brain Institute (QBI). Physically located in IMB, the broad research focus is towards a better understanding of complex traits and disorders, including psychiatric and neurological disorders. A key research strength is the development of underpinning computational and statistical analysis methods. The Program is led by an Executive comprising Prof Peter Visscher, Prof Naomi Wray and Prof Jian Yang who were awarded a five-year Program Grant by the Australian National Health and Medical Research Council, commencing in 2017. In addition, Peter Visscher was awarded a five-year Australian Research Council Laureate Fellowship in 2018 to enhance capacity in human complex trait genetics and genomics.

Visscher, Wray and Yang and their colleagues are internationally recognised for pioneering the use of multi-marker statistical methods in human genetics and for innovative methods in the analysis of genetic and genomic data of complex traits. Their research is regularly published in top journals such as Nature, Science, Nature Genetics, Nature Communications, Genome Research, American Journal of Human Genetics, PLoS Genetics and Molecular Psychiatry.

Research in the Program covers four major themes: Statistical Genomics, Systems Genomics, Psychiatric Genomics and Motor Neuron Disease Genomics. The Program consists of over 20 postdoctoral research staff as well as PhD students, research assistants and visiting academics. Current research involves; the development of novel statistical genetics methodology and software; analysis of genotype, expression and methylation array data alongside DNA and RNA sequencing data; application of statistical genetic methods to infer the genetic control of traits and diseases.
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

Level B postdoctoral staff will be expected to develop and run their own research program in collaboration with members of PCTG.

Below are some examples of existing projects.

1. Multivariate whole genome estimation and prediction analysis of genomics data applied to psychiatric disorders. This project will require the development of statistical methods and computer algorithms to perform multivariate association analysis in large samples. Whilst the focus is on neurological or psychiatric disorders (e.g. schizophrenia, motor neuron diseases, Parkinson’s disease and Alzheimer’s disease), methods and software can be applied to other traits and disease phenotypes.

2. Develop methodology to estimate genetic parameters in quantitative and disease traits from whole-genome sequence data. This project will build on recent cutting-edge research performed by PCTG for accurate estimation of genetic variance from large-scale samples. One major focus of this initiative is the development of efficient and user-friendly software, which is to be made publically available.

3. Develop methods for the analyses of ‘omics data. The project will build on the large amount of ‘omics data collected by PCTG and collaborators, including genome-wide SNPs, whole-genome sequence, genome-wide gene expression, and genome-wide DNA methylation in large samples. The aim of this project is to use the integrated information from ‘omics data to identify genes and genetic regulatory mechanisms responsible for the genetic etiology of complex diseases and to achieve a higher accuracy of disease risk prediction.

4. Analysis of genomics data of motor neuron disease (e.g. SNP, blood DNA methylation, exome sequence) from Australian and Chinese cohorts, in particular leading analyses that are informed by knowledge and understanding of the underlying biology of the disease.

5. Analysis of data from the Australian Genetics of Depression study. In collaboration with the Queensland Institute of Medical Research we have detailed questionnaire data and genome-wide genotypes on 15,000 cases. The appointee will lead analyses of these data and integration with external data sets to better understand the genetic and non-genetic factors of depression and response to antidepressants.
Duties

Duties and responsibilities include, but are not limited to:

Research
- Research in the broad field of statistical genomics, including analysis of data generated by the Program, by collaborators or in the public domain, method development and testing and writing computer code data analysis
- Engage in independent and/or team research programs including external funding, and achieve national recognition and impact in the research area.
- Conduct research and publish scholarly papers in both academic peer-reviewed and professional journals that contribute to the School's strategic research strengths.
- Presentation of results in lab meetings and conferences
- Displaying a work ethic expected for a researcher aspiring to a long-term career in science
- Administrative aspects that underlie scientific research including record keeping and timeline development.
- Collaboration with other group members, and as part of national and international consortia

Teaching
- Work with colleagues and postgraduates in the development and conduct of joint research projects, especially projects that are interdisciplinary and contribute to the strategic direction of the School.
- Co-supervision of undergraduate and postgraduate student projects
- It is encouraged that you actively seek teaching opportunities.

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 Prof Peter Visscher and supervises one post-doctoral researcher, one research assistant and 2 students.
SELECTION CRITERIA

Essential

The successful candidates will have a strong background in statistics and a proven ability to code efficiently in low-level programming languages.

- PhD in a relevant field and at least two years post-doctoral experience or equivalent and demonstrated research productivity consistent with this experience
- Evidence of research productivity, including high-profile publications, conference presentations and external grant applications
- Knowledge or Expertise in:
  - the principles of genetics and genomics
  - computer programming languages (e.g., C/C++)
  - linear model methodology
- Excellent attention to detail and record-keeping skills
- Self-reliance and motivation
- A high level of written, oral and interpersonal communication skills
- Ability to work collaboratively with colleagues
- Initiative and problems solving skills
- Ability to work relatively independently with excellent organisational skills that allow for meeting deadlines.

Desirable

- Knowledge or Expertise in one or more of the following:
  - Quantitative genetics models and theories
  - The development and application of multi-marker methods
  - The analysis of large-scale SNP array and whole genome sequencing data
  - Motor neurone disease pathology and genetics
  - Analysis of large-scale genetic data
  - Integrative analysis of omics data
  - Psychiatric disorder genetics
- Past track record in genetics related research demonstrating ability to both work within teams and independently to successfully complete research projects
- Experience in supervising or co-supervising PhD students
- Experience in dissemination of knowledge in complex trait genetics to undergraduate and postgraduate 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.

Accessibility requirements and/or adjustments can be directed to Rebecca Richter r.richter@uq.edu.au.