# Position Details

## CSIRO Early Research Career (CERC) Postdoctoral Fellowship– CSOF4

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| The following information is for applicants | |
| Advertised Job Title | CSIRO Winanga-y Postdoctoral Fellowship in Nutritional and Health Qualities of Insect Protein |
| Job Reference | 89842 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$89,926 to AU$98,504 pa (pro-rata for part-time) + up to 15.4% superannuation |
| Location(s) | Brisbane |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All candidates |
| Position reports to the | Team/Group Leaders in Agriculture and Food |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Dr Utpal Bose ([utpal.bose@csiro.au](mailto:utpal.bose@csiro.au)) and Dr James Broadbent (james.broadbent@csiro.au) |
| How to apply | Apply online at <https://jobs.csiro.au/>  Internal applicants please apply via **Jobs Central**  If you experience difficulties when applying, please email [careers.online@csiro.au](mailto:careers.online@csiro.au) or call 1300 984 220. |

### Role Overview

**CSIRO Early Research Career (CERC) Fellowships** provide opportunities to scientists and engineers who have completed their doctorate and have less than three years relevant research experience. These Fellowships aim to develop the next generation of future leaders of the innovation system through:

* A differentiated career development program to deliver capability excellence and breadth across all facets of the national innovation system;
* Research training via strategic research and development projects with a clear focus that will deliver real impact through science and engineering excellence;
* An innovative culture supporting the development and demonstration of original thinking and expertise leading to peer-recognition; and
* Opportunities to develop skills and experience in collaborative research teams to effectively work within national and global multi/transdisciplinary and multi-stakeholder environments.

CERC Fellows **are appointed for three years or full-time equivalent.**

We are thrilled to be able to deliver on the commitment we made in our strategy to invest in frontier science with the CSIRO Agriculture & Food Winanga-y Postdoctoral Fellowship scheme. The word Winanga-y (pronounced win-na-gnay) is a cultural asset gifted by the Gomeroi Nation in Myall Vale to CSIRO's Agriculture and Food Business Unit to name the new Postdoctoral Fellowship Scheme. Winanga-y means to understand, know, remember, and think.

Many insects can efficiently transform low-value organic residues from food production into high-quality protein, amino acids and vitamins. Insects are considered an important step in creating sustainable circular food production systems. The global insect protein market is projected to reach USD $8 billion by 2030. The safety of insect-based products needs full attention, as food safety is closely linked to legislative approval. As a result, understanding aspects of insect protein food safety is critical to including mainstream food and feed products.

Insects and crustaceans (prawns, crabs) have monophyletic relationships and proteins from both groups share a degree of sequence homology, resulting in cross-allergenicity upon human consumption. In addition, insects have been proposed for feed for aquaculture and livestock industries. However, intrinsic microbes and parasites may cause severe animal health impacts. Various food processing technologies involving thermal and/or non-thermal procedures have been applied to reduce the allergenicity and pathogenicity of certain foods. Although insects are increasingly processed as protein for feed and food, data on safety and nutrition (allergenicity, toxic potential, antinutrients, microbial risk and microbial/enzymatic stability, and nutrient stability) as it relates to processing conditions is limited. This gap underscores the need to quantify the impact of food processing on the safety and nutrition of reared insects.

This project aims to apply cutting-edge tools such as food processing, proteomics, bioinformatics and microbial screening to pre-empt an inevitable health problem associated with allergenicity and microbial safety assessment of insect protein as food or feed. The CERC Fellow will closely work with domain-specific national and international collaborators to obtain skills in food processing, allergen detection and quantification using proteomics and analytical chemistry, big data mining strategies, and microbial screening for food safety using microbiological assays. Supported by the team, the CERC Fellow will (i) establish the effect of processing methods on insect protein nutrition, quality and stability; (ii) develop allergen detection and quantitation methods using proteomics for raw and processed insect protein products; and (iii) determine microbial safety assessment of processed insect protein for food and feed. The CERC Fellow will apply these methodologies to enable food quality, safety, and shelf stability assessment to provide an informed position for the expanding insect protein industry, consumers and regulators.

### Duties and Key Result Areas:

Under the direction of senior research scientists and engineers, this CERC Fellow will:

* Apply protein analysis methodologies such as protein separation, immuno-blot, protein purification, and spectrophotometry to establish immunological and biochemical properties of insect proteins using mass spectrometry and traditional immunological methods such as ELISA.
* Acquire and develop discovery and targeted proteomics methods for allergen quantitation for insect proteins.
* Collaborate to develop microbiological screening methods.
* Review of literature to select suitable insect protein processing methods.
  + Carry out innovative, impactful research of strategic importance to CSIRO that will, where possible, lead to novel and important scientific outcomes.
  + Recognise and exploit opportunities for innovation and the generation of new theoretical perspectives, and progress opportunities for the further development or creation of new lines of research.
  + Utilise design thinking methodology to plan and prepare research proposals, and apply non-academic impact methodology to research projects.
  + Carry out research investigations requiring originality, creativity and innovation.
  + Record, manage, and analyse data/information using relevant domain data science techniques.
  + Proactively undertake development to grow effective researcher capabilities to support career goals.
  + Adhere to the spirit and practice of CSIRO’s Code of Conduct, Health, Safety and Environment procedures and policy, Diversity initiatives and Making Safety Personal goals.
* Other duties as directed.

The CERC Fellow learning, development and training programis developed between the CERC Fellow and their CSIRO supervisor. The program will focus on enhancing the Fellow’s capabilities to the level expected of an independent researcher and will include on-the-job and course-based development encompassing:

* Discipline-specific techniques and protocols
* Professional growth
* Project management
* Communication and influencing skills
* Working and collaborating with others

## **Required Competencies:**

* **Teamwork and Collaboration:** Cooperates with others to achieve organisational objectives and may share team resources in order to do this. Collaborates with other teams as well as industry colleagues.
* **Influence and Communication:** Uses knowledge of other party's priorities and adapts presentations or discussions to appeal to the interests and level of the audience. Anticipates and prepares for others reactions.
* **Resource Management/Leadership:** Allocates activities, directs tasks and manages resources to meet objectives. Provides coaching and on the job training, recognises and supports staff achievements and fosters open communication in the team.
* **Judgement and Problem Solving:** Investigates underlying issues of complex and ill-defined problems and develops appropriate response by adapting/creating and testing alternative solutions.
* **Independence:** Recognise and makes immediate changes to improve performance (faster, better, lower cost, more efficiently, better quality, improved client satisfaction).
* **Adaptability:**Copes with ambiguity or situations that lack clarity. Adapts readily to changing circumstances and new responsibilities (which may include activities outside own preferences) in the interests of achieving team objectives. Recognises the need for and undertakes personal development as a result of changes.

## **Selection Criteria**

#### Essential

*Under CSIRO policy only those who meet all essential criteria can be appointed.*

1. A doctorate (or will shortly satisfy the requirements of a PhD). The doctorate must be in a relevant discipline area, such as analytical chemistry, food allergy, food safety, molecular immunology, or food science. Please note: To be eligible for this role you must have no more than 3 years (or full-time equivalent) of relevant research experience.
2. Experience in protein analysis methods such as protein separation, immuno-blot, protein purification and spectrophotometry methods.
3. A good understanding of food allergy and cross-reactivity and peptide biomarker identification.
4. Characterising allergenic proteins from various food sources using one or more techniques including genomics, proteomics and molecular cloning techniques.
5. High-level written and oral communication skills with the ability to represent the research team effectively internally and externally, including the presentation of research outcomes at national and international conferences.
6. A sound history of publication in peer-reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
7. A record of science innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.
8. Demonstrated ability to support a positive work culture that promotes collaboration, inclusiveness, and accountability in the workplace.

**Desirable:**

1. Design and generate constructs to study specific regions of targeted allergenic proteins.
2. Knowledge or experience in proteomics sample preparation, data acquisition and analysis.
3. Knowledge of sample processing effects on allergenicity.
4. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
5. The ability to work effectively as part of a multi-disciplinary, potentially regionally dispersed research team, plus the motivation and discipline to carry out autonomous research.

To be appointed as a CERC Postdoctoral Fellow within CSIRO, candidates will be expected to commence employment by January 2023. Candidates are also required to have **submitted** their PhD at the time of commencement, as a minimum requirement, if PhD conferment has not been obtained. If a candidate has submitted, but their PhD has not yet been formally attained, the starting salary will be CSOF4-1 ($87,068). Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six-month period from the commencement date), the salary will be increased to the negotiated level and the difference will be back-paid to the Officer’s start date.

Special Requirements

Appointment to this role may be subject to conditions including provision of a national police check as well as other security/medical/character clearance requirements.

* The successful candidate will be asked to obtain and provide evidence of a National Police Check or equivalent. Please note that people with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.
* If the successful candidate is not an Australian Citizen or Permanent Resident, they may be required to undergo additional security clearances, which may include medical examinations and an international standardised test of English language proficiency (i.e. IELTS test).- https://ielts.com.au/

**Our value proposition**

We want CERC Fellows to join our world class science, engineering and digital teams to solve big, complex problems that make a real difference to the future of Australia and the world.

You'll get to work with some of the most talented minds in their fields, not just in Australia, but in the world. At CSIRO, we spark off each other, learn from each other, trust each other and collaborate closely to achieve more than we could individually.

Find out more about our CSIRO Early Research Career (CERC) Fellow Experience Employee Value Proposition (EVP) [here](https://www.csiro.au/en/careers/postdoctoral-fellowships).

## **About CSIRO:**

We solve the greatest challenges through innovative science and technology. To find out more visit us [online](http://www.csiro.au/)!

CSIRO is a values-based organisation.  In your application and at interview you will need to demonstrate behaviours aligned to our values of:

* 1. People First
  2. Further Together
  3. Making it Real
  4. Trusted

Find out more about CSIRO [Agriculture and Food](https://www.csiro.au/en/Research/AF)

Find out more about CSIRO [Data61](https://www.csiro.au/en/about/people/business-units/Data61)

Find out more about CSIRO [Health and Biosecurity](https://www.csiro.au/en/Research/BF)

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