# 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 Smart Milk 4.0: A Better Tasting and Nutritionally Sound Plant-based ‘Dairy’ Experience for Consumers |
| Job Reference | 85084 |
| 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) | Werribee, Victoria |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Tanoj Singh, leader of the Food Chemistry team |
| Client Focus – Internal | 90% |
| Client Focus – External | 10% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact Tanoj Singh ([tanoj.singh@csiro.au](mailto:tanoj.singh@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. |

**Acknowledgement of Country**

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the areas that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our [vision towards reconciliation](https://www.csiro.au/en/about/Indigenous-engagement/Reconciliation-Action-Plan).

### 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.

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.

CERC Fellows **are appointed for three years or full-time equivalent.** This roleprovides an exciting opportunity for a new CERC Fellow to deconstruct the molecular composition and colloidal structure of traditional dairy milk and ingredients, to better understand the iconic sensory, flavour elements and the key nutritional factors. This fundamental understanding will allow the CERC Fellow to recreate the sweetness, and creaminess (mouthfeel) of dairy, while avoiding the less appealing attributes like sourness, bitterness, and specific flavour notes such as beany, oxidised, metallic, and sulphur flavours, using non-dairy ingredients.

Plant-based milk substitutes have become increasingly popular and numerous commercial products are currently available. In 2020, sales of this category grew twice as fast as cows’ milk in the US, and currently occupies 10% of the total dairy market. Oat milk sales more than tripled in this same timeframe, to $274 million, and almond milk topped $1.6 billion. The current generation of alternative milk products are manufactured by: (1) mechanically breaking down certain plant materials (including nuts, seeds, and legumes) to produce a dispersion of oil bodies and other colloidal matter in water; and (2) forming oil-in-water emulsions by homogenizing plant-based oils and plant protein ingredients as emulsifiers with water. Plant-based milk substitutes are typically designed to have a similar sensory and textural properties as traditional bovine milk so that they can be used in similar applications. In practice, however, each has its own unique properties that depend on the ingredients and unit operations used to create it. Still, many consumers haven’t made the switch from traditional milk, in part because of what is deemed inferior sensory, texture and nutritional properties.

In this project, the CERC Fellow will deconstruct the sensory, mouthfeel/texture, composition, and nutritional experience of drinking traditional bovine milk, based on the molecular make-up, presence, and variety of macro-molecular structures (milk fat globules/emulsion, casein protein/calcium phosphate complex known as casein micelles) and physico-chemical properties. This challenge requires a multi-disciplinary approach to develop plant-based milks that meet consumer expectations and offer enhanced nutritional quality (protein content, quality and bioavailability). This will require the CERC Fellow to develop a broad range of skills including fundamental chemistry & biochemistry, colloid/emulsion and sensory sciences as applied in food and ingredient processing and novel product development. The CERC Fellow will have further opportunity to enrich these skills by incorporating other structural visualisation and characterisation skills as needed. The CERC Fellow will be working closely with a supervisory team from diverse fields across three CSIRO Business Units, namely Agriculture & Food, Data61 and Health & Biosecurity. In addition, the CERC Fellow will have an exceptional opportunity to build scientific networks beyond the immediate team extending to researchers across CSIRO, academia, and industry. Scientific presentation at key conference(s) and journal publication will be encouraged and supported to further help the CERC Fellow in extending networks and building their career.

### Duties and Key Result Areas

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

* Characterise the molecular composition, physicochemical/structure, nutritional and flavour/sensory attributes of traditional dairy milk using a trained sensory panel and analytical approaches.
  + Develop experimental and modelling approaches to apply learnings from traditional dairy plant-based milk, leading to a step change in the manufacture of non-dairy milk and milk products.
  + 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 Zero Harm 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

## **Selection Criteria**

CSIRO is an Equal Opportunity employer working hard to recruit world-class talent that represents the diversity across our society. As part of our commitment to Aboriginal and Torres Strait Islander employment outcomes, preference will be given to Aboriginal and Torres Strait Islander candidates who meet the role 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 chemistry or biochemistry, colloid/emulsion science, food, dairy or material 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.

1. Experience in the preparation and characterisation of emulsion and colloidal food systems.
2. Experience in the chemical and physicochemical characterisation/analysis of food systems and method development e.g. analytical chemistry, characterisation of colloidal/emulsion structures, sensory-directed flavour analysis.
3. Experience in the design, execution, and analysis of experiments with the purpose of gaining new understandings of a physical system.
4. Experience in the use of chemometrics tools and working knowledge of modelling and simulation to deduce generic understanding from chemical and physicochemical characterisation data.
5. Proven track record of 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 can-do mindset to facilitate respect, collaboration, support, inclusiveness and accountability in the workplace.

## **Desirable**

1. Experience in advanced analytics, namely chromatography and mass spectrometry.
2. Remain productive, positive and resilient in complex, ambiguous and/or uncertain environments.
3. **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.**

## **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.

To be appointed as a CERC Fellow within CSIRO, candidates are required to have **submitted** their doctoral thesis 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 (AU$87,068). Upon CSIRO receiving written confirmation that the PhD has been awarded (within a six month period from 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.

Include if relevant:

* 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)