# Position Details

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

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| The following information is for applicants | |
| Advertised Job Title | CERC Postdoctoral Fellowship on developing a bio-based battery prototype for sustainable energy storage |
| Job Reference | 92171 |
| Tenure | Specified Term of 3 years  Full-time |
| Salary Range | AU$92,624 to AU$101,459 pa + up to 15.4% superannuation |
| Location(s) | Perth, WA |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | All Candidates |
| Position reports to the | Senior Research Scientist |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Maneesha Ginige at [maneesha.ginige@csiro.au](mailto:maneesha.ginige@csiro.au) or phone +61 8 9333 6130 |
| 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.

The bio-based battery prototype project is part of the **Revolutionary Energy Storage Systems Future Science Platform (RESS FSP).** The RESS FSP is exploring ground-breaking science to deliver the required transformational energy storage solutions. Without the limitations of current energy storage platforms, materials, device designs and management systems, the FSP environment is designed to enable paradigm shifts, critical for the revolutionary changes needed to power the future.

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

### The CERC Postdoctoral Fellow will be part of CSIRO’s efforts to advance our current energy storage technologies. The CERC fellow will explore opportunities to store and harness electrical energy using biologically derived compounds in bioelectrochemical systems (BES), which are a promising technology platform for energy conversion applications. He/she will be part of the Resource Sector Biotechnology Team of Industrial Biotechnology Group in Industry Environments Program of Environment Business Unit.

With a deep dive into earth’s nutrient cycling and being guided by circular economy principles, this CERC Fellow will develop a novel biobased battery prototype. Feasible and environmentally sustainable oxidation-reduction (redox) reactions will be identified and integrated into a (bio)electrochemical system. Nature-inspired biocatalysts will be explored to bring a high degree of selectivity to drive the redox reactions under mild conditions in the bio-based battery system.

The development of such a bio-based battery demands a multidisciplinary approach. It is a combined approach of disciplines, e.g., electrochemical engineering, bioengineering, genetic engineering, material sciences etc., which may enable advance this proposed technology. The successful candidate will cut across traditional disciplinary boundaries and will engage with senior researchers from Environment and Agriculture and Food Business Units to explore strategies to integrate different lines of science. With input from this multidisciplinary team of individuals, the Fellow will design and construct bioelectrochemical reactor(s) suitable for electrical energy storage and recovery. The Fellow will further enrich/identify electrochemically active or inactive model microorganisms with metabolic pathways that produce energy-dense end products suitable for energy storage and electricity generation.

Once a successful prototype is developed, the project also offers opportunities to enhance the fundamental knowledge of the bioengineered process using metagenomics, transcriptomics, proteomics and metabolomic studies. The Fellow will also have opportunities to travel and build networks with peer researchers and industry partners.

### Duties and Key Result Areas

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

* + Carry out innovative, impactful research of strategic importance to the project and CSIRO that will, where possible, lead to novel and important scientific outcomes.
  + Develop, lead, and manage the project and deliverables with support from the research team.
  + Supervise PhD and Undergrad interns.
  + 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.
  + Undertake appropriate training and development to grow effective researcher capabilities to support career goals.
  + Produce progress updates and high-quality scientific papers suitable for publication in peer review journals together with co-authors.
  + Prepare conference papers and present those at national and international conferences.
  + Communicate openly, effectively, and respectfully with all staff, clients and suppliers in the interests of good business practice, collaboration and enhancement of CSIRO's reputation.
  + Contribute to the effective functioning of the research team and help deliver CSIRO's organisational objectives and plans.
  + 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.
* Perform 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**

#### 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 bioelectrochemistry, biotechnology, electrochemistry or chemical engineering (a knowledge of microbiology, molecular biology, synthetic biology, or similar would be desirable but not essential).

Please note: To be eligible for this role you must have no more than 3 years (full-time equivalent) of relevant post-doctoral research experience.

1. Demonstrated experience in bioengineering technologies, where microorganisms or other bio-based catalysts have been integrated with an electrochemical method to improve reducing or oxidizing metabolisms.
2. Demonstrated experience in the study of electron transfer and energy transformation, i.e., the interchange of chemical energy and electrical energy.
3. Demonstrated experience in the selection and optimization of electrode materials, design of electrochemical devices, and screening of electrochemically active or inactive model microorganisms.
4. Demonstrated experience in the development of bioelectrochemistry applications including electricity generation and the production of valuable products.
5. Demonstrated experience in designing and conducting experiments, analysing data and delivering outcomes in agreed timeframes.
6. 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.
7. A sound history of publication in peer-reviewed journals and/or authorship of scientific papers, reports, grant applications or patents.
8. A record of scientific innovation and creativity, including the ability & willingness to incorporate novel ideas and approaches into scientific investigations.

## **Desirable**

1. Knowledge/experience with Enzymatic Electrochemical Systems where electrodes with enzymes have been used as external electron donors or acceptors.
2. Knowledge/experience with electron mediators, electron shuttles and/or nano-particles to enhance electron transfer.
3. Experience in physical-chemical methods for quantifying chemical compounds and/or characterising materials.
4. Remain productive, positive, and resilient in complex, ambiguous and/or in 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.**

## **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$89,680). 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.

* The successful candidate will be asked to obtain and provide evidence of a National Police Clearance or equivalent. Please note that individuals 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. Visit [CSIRO Online](http://www.csiro.au/) and [Environment](https://www.csiro.au/en/about/people/business-units/Environment) business unit for more information.

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

* People First
* Further Together
* Making it Real
* Trusted