# Position Details

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

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| The following information is for applicants | |
| Advertised Job Title | CSIRO Postdoctoral Fellowship in Beyond Antibiotics: Smart Oral Delivery Platforms for Targeted Therapeutics in Aquaculture |
| Job Reference | 100800 |
| Tenure and Work Schedule | Specified Term of 3 years; Full-time |
| Salary Range | AU$99,990 - AU$109,527 pa (pro-rata for part-time)  plus 15.4% superannuation |
| Location(s) and Office Arrangements | Brisbane (St Lucia), QLD |
| Relocation Assistance | Will be provided to the successful candidate if required |
| Applications are open to | * Australian Citizens * Australian/New Zealand Citizens and Australian Permanent Residents * Australian Temporary Residents with a valid working visa for the duration of the specified term |
| Position reports to the | Research Scientist, Livestock & Aquaculture, Agriculture & Food |
| Client Focus – Internal | 100% |
| Client Focus – External | 0% |
| Number of Direct Reports | 0 |
| Enquire about this job | Contact: Paula Lima – Research Scientist - Paula.Lima@csiro.au |
| Support and Workplace Adjustments | We offer a range of reasonable supports and workplace adjustments. Please let Laura Mason know via [careers.online@csiro.au](mailto:careers.online@csiro.au) if we can help you to equitably participate in our recruitment process or the role itself. |
| 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). |

**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).

**About CSIRO**

As Australia's national science agency, CSIRO is solving the greatest challenges through innovative science and technology. Many of our iconic innovations were once considered impossible until someone, just like you, joined us and took on the challenge.

As one of the world’s largest multidisciplinary mission-driven research organisations, we are focused on the issues that matter the most: for our quality of life, for the economy and for our environment. We believe diverse teams are more effective and deliver more innovative outcomes. When we all focus on the big things that really matter, and work in partnership with our communities and [Indigenous Australia](https://www.csiro.au/research/indigenous-science), Australian science and technology can solve seemingly impossible problems and create new value for all Australians. Visit [CSIRO.au](https://www.csiro.au/) for more information.

### 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 full-time equivalent.**

Antimicrobial resistance (AMR) and the demand for sustainable production systems are driving urgent global need for smarter, non-antibiotic interventions in animal production. While many next-generation therapeutic strategies, such as antimicrobial peptides (AMPs), probiotics, bacteriophages, and immune modulators, show promise, their effectiveness is limited by challenges such as poor stability during feed processing, low stability in water, rapid degradation in the gastrointestinal tract, limited bioavailability at target tissues, and variable pharmacokinetics depending on the delivery method or formulation used.

This project addresses these barriers by developing oral delivery platforms for fragile therapeutics and functional compounds in feed. Leveraging CSIRO’s unique integration of feed manufacturing, materials science, aquaculture nutrition and health and aquatic animal physiology this fellowship will pioneer encapsulation and smart carrier technologies that improve the stability, precision, and efficacy of bioactive delivery in monogastric animals, with a focus on aquaculture species. A key component of the project will be to explore the use of low-cost, sustainable materials such as biochar and agricultural by-products, including the valorisation of agricultural waste streams through dry fractionation, as carrier matrices for oral delivery platforms.

The project builds on recent proof-of-concept work across Agriculture & Food programs (Aquaculture, Food, Livestock & Animal Systems, Environment) including:

* Encapsulation of antimicrobial peptides and nanoparticles in feed matrices.
* Evaluation of biochar as feed additive.
* Use of bacteriophages as an effective strategy for Vibrio inhibition.
* Application of multi-omics approaches to validate mechanisms of action and host responses.

### The CERC Fellow will contribute to translating these emerging approaches into functional feed solutions for aquaculture, supporting the development of antibiotic alternatives, improved sustainability, and enhanced animal health and welfare.

### Duties and Key Result Areas

Under the direction of research and senior scientists across the Livestock & Aquaculture, Food, and Environment programs, the Fellow will:

* Conduct literature reviews to assess current oral delivery technologies and identify key gaps in feed-based delivery of labile therapeutics and bioactives.
* Design, develop and optimise novel oral delivery platforms (e.g. nanoencapsulation, matrix encapsulation and carrier systems) to stabilise and protect labile bioactives during feed processing and digestion.
* Evaluate the potential of low-cost, sustainable materials (e.g., biochar and agricultural by-products) as carrier matrices for oral delivery platforms.
* Conduct in vitro testing of compound stability, release kinetics, and bioavailability using simulated feed manufacturing and digestive models.
* Undertake in vivo validation of delivery technologies in model organisms (e.g. Artemia) and production species (e.g. fish, prawns), assessing therapeutic efficacy, pharmacokinetics, host response, and potential cytotoxicity.
* Apply multi-omics approaches to analyse complex biological datasets and elucidate mechanisms of action at the host–microbe–diet interface.
* Collaborate with cross-disciplinary teams to integrate food technology, feed formulation, processing, and animal health insights into scalable, industry-ready solutions.
* Communicate research findings effectively through peer-reviewed publications, conference presentations, industry forums, and technical reports.
* Deliver innovative and impactful research aligned with CSIRO’s vision to reduce antibiotic use, enhance animal health and welfare, and support sustainable high-value protein production.

**Learning and Development Opportunities**

The CERC Fellow will receive tailored learning and development support co-designed with their CSIRO supervisors, including training and mentoring in:

* Advanced feed manufacturing and formulation technologies.
* Encapsulation, nano- and micro-particle characterisation, and biochar science.
* In vitro models systems and animal trial design.
* Application of multi-omics approaches to therapeutic delivery, animal health and nutrition.
* Industry engagement and science translation across aquaculture and livestock sectors.
* Professional growth including project management, communication, and collaboration skills.

The Fellow will gain experience across multiple CSIRO sites (e.g. Werribee, Black Mountain, St Lucia, and Bribie Island) and will collaborate with academic and industry partners, including opportunities for international engagement through advisory networks.

## **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 animal nutrition, feed science, pharmaceutical sciences, materials science, microbiology, or biotechnology.

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

1. Demonstrated expertise in at least one of the following areas: materials science and biomaterials engineering, pharmaceutical and drug delivery sciences, digestive biology and gut physiology.
2. Experience in designing and conducting experiments with scientific rigour, including in vitro simulation models and/or in vivo animal trials relevant to oral delivery and digestive biology.
3. Proven ability to analyse complex datasets and apply scientific methodologies effectively.
4. Ability to work effectively as part of a multi-disciplinary and geographically dispersed research team, as well as the motivation and discipline to carry out autonomous research.
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.

## **Desirable**

1. Practical experience or strong understanding of encapsulation technologies and carrier matrix development.
2. Experience working with antimicrobial peptides, probiotics, bacteriophages, nanoparticles, or similar bioactive compounds.
3. Familiarity with multi-omics approaches and/or data integration methods.
4. Experience working with aquaculture or monogastric livestock species, including animal health and welfare monitoring.
5. Demonstrated ability to engage with external stakeholders and industry partners.
6. Ability to remain resilient, adaptable, and maintain productivity in complex, ambiguous, or uncertain research environments.

**Not sure if you meet all the criteria?**

While it is CSIRO policy that the successful candidate must meet all the essential criteria, there are many ways to demonstrate this. Don’t let the list discourage you. If you are unsure about applying, please reach out to the contact on page 1 of this document so we can discuss the role further.

## **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$96,811). 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.

**Setting You Up For Success**

We understand that not everyone works in the same way and sometimes people may require reasonable support and adjustments to perform at their best. Whether related to the recruitment process and or the role itself, this may include options such as providing different methods of communication, flexible hours or physical adjustments to work methods. If you feel comfortable, we encourage you to share any support and adjustments you may need to carry out the inherent requirements of the role. Please let us know via contact details on Page 1 if we can help you to equitably participate in our recruitment process or the role itself.

**Life at CSIRO and Flexible Working Arrangements**

We [work flexibly at CSIRO](https://www.csiro.au/en/careers/life-at-csiro/Flexible-work), offering a range of options for how, when and where you work.  We can discuss flexible work arrangements with you during the recruitment process. CSIRO also offers a range of leave entitlements, [benefits](https://www.csiro.au/en/careers/life-at-csiro/Benefits) and [career development](https://www.csiro.au/en/careers/life-at-csiro/Career-development) opportunities. To learn more, visit [Careers at CSIRO](https://www.csiro.au/en/careers).

We celebrate the uniqueness of our workforce and are committed to creating [diverse and inclusive teams](https://www.csiro.au/en/careers/life-at-csiro/Diversity-inclusion-belonging) where everyone feels they belong. CSIRO is an equal employment opportunity organisation dedicated to recruiting people based on merit, and reflecting the diversity of the community we serve. We recognise true diversity encompasses all ages, nationalities, abilities, cultures, genders, sexualities, faiths, levels of education, diversity of thought and many more aspects of identity. By empowering diverse teams, our community is reflected in the solutions we create.

**CSIRO Values**

CSIRO is a values-based organisation committed to values-based leadership.

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| **Value** | **Descriptor** | **Behaviour** |
| **People First** | Our priority is the safety and wellbeing of our people. We believe in, and respect, the power of diverse perspectives. We seek out and learn from our differences. | * Respectful * Caring * Inclusive |
| **Further Together** | We achieve more together than we ever could alone. We listen and collaborate, in teams, across disciplines, across boundaries. We embrace ambiguity and use discussion and persistence to generate unique solutions to complex problems. | * Accountable * Authentic * Courageous |
| **Making it Real** | We do science with real impact. We thrive when taking on the big challenges facing the world. We take educated risks and defy convention. We celebrate successes and failures and leverage them to learn as we strive to be the force for positive change. | * Partnering * Cooperative * Humble |
| **Trusted** | We’re driven by purpose but remain objective. We fight misinformation with facts. We earn trust everywhere through everything we do. We trust each other and we hold each other accountable. Together our actions drive Australia’s trust in CSIRO. | * Curious * Adaptive * Entrepreneurial |

**Child Safety**

CSIRO is committed to the safety and wellbeing of all children and young people involved in our activities and programs. View our [Child Safe Policy](https://www.csiro.au/en/about/policies/child-safe-policy).

Special Requirements

Appointment to this role is subject to provision of a pre-employment background check and may be subject to other security/medical/character clearance requirements.

Include if relevant:

* The successful candidate will undertake a pre-employment background check. Please note that individuals with criminal records are not automatically deemed ineligible. Each application will be considered on its merits.