

Unlock Innovation with Advanced Algal Services

Accelerate product development and improve performance with advanced algal phenomics capabilities with the UTS Climate Change Cluster and CSIRO, combining a world-class algal biobank with cutting-edge phenomics to accelerate your R&D, product development, and scale-up needs.



Australia's algae industry is primed for growth, with emerging markets demanding innovative, scalable, and sustainable solutions. The University of Technology Sydney (UTS), in partnership with CSIRO, offers a powerful suite of advanced algae services to help partners overcome development bottlenecks and bring next-generation products to market.

With access to cutting-edge infrastructure and deep scientific expertise, our services support progress from strain discovery to large-scale application—addressing critical challenges and enabling real-world impact.

Specialised facilities and infrastructure at UTS

Drive sustainable biotech innovation through rapid screening, testing, and optimisation of microalgae using world-class infrastructure. We have state-of-the-art facilities that underpin research at different stages and scales, including:

Algae Phenomics Facility

The UTS Algal Phenomics Facility is the only one of its kind in the world, offering rapid screening, testing, evolution, and characterisation of microalgae. This advanced platform accelerates product development and efficiency, driving innovation in sustainable biotechnology.

We work with startups, multinationals, government agencies, and environmental organizations to enhance sustainability, and profitability.

How we can help:

- ✓ Optimize growth for maximum biomass
- ✓ Tailor regimes for high-value compound production
- ✓ Improve traits through evolution, breeding, or hybridization
- ✓ Assess phenotypic responses to environmental changes

Advanced algal cultivation facilities:

Includes an Industry 4.0 demonstration facility with robot controlled sensor and digital twin for advanced algal manufacturing as well as a wide range of facilities such as raceways, photobioreactors, incubators, light/temperature controlled rooms for algal cultivation and upscaling, and PC2/AQIS accredited work areas.

Industry-Ready Services for R&D and Commercialisation

At UTS, the specialised **Algae Phenomics Facility** offers a unique suite of services to support partners in developing cutting-edge algae solutions:



Algae Biobank

Access to elite and well-characterised marine & freshwater microalgae strains.



Pheno-Select Robotic Array

High-throughput screening for growth & productivity traits, biochemical profiles & stress tolerance.



Pheno-Grow Robotic Array

Custom growth optimization for yield, biomass, or compound targets.



Product Development

Tailored R&D support and modelling across sectors: biofuels, feed, nutraceuticals, aquaculture, bioplastics.



Algae Biobank (Cryostore)

Secure cryopreservation & strain biobanking.

Our mission is to deliver sustainable climate change mitigation solutions in the areas of food security, energy security, environment, and healthcare by replacing fossil-based raw materials with solar-based and sustainable algal products, simultaneously removing CO₂ from the atmosphere.

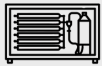
Key Services

We stimulate collaborative research by serving as a platform for strategic partnerships fostering interaction between industry and academia in the following research areas:



Algae strain selection and strain development:

Commercial access to a number of microalgae wild strains, including algae from extreme environments: microalgae with higher salt or temperature tolerance offer advantages in commercial scale production, being less prone to contamination. Developing elite microalgae strains and assisting with IP protection. through mutation and assisted breeding programs.



Algae cultivation and production:

Developing microalgal biomass cultivation systems; algal biomass harvesting, separation and purification processing methods; genetic and molecular engineering; photobioreactor design; analytical techniques; and sensor and optical-sensing technologies.



Algae Product Development

- Developing new bioplastic polymers from seaweed and microalgae; developing natural fibres, capacity for carbon capture and use in the production of low-carbon footprint materials; and developing non-petrochemical dyes and colourants.
- Developing products and services that support agricultural practices such as fertilisers, animal and aquaculture feeds, and nutritional additives.
- Developing carbon capture and re-use systems from CO₂ emitting industries; environmental bioremediation; renewable biofuels for transportation; wastewater and solid-waste treatment solutions; green design for urban development.



Comprehensive analyses, including:

- **Chemistry Analysis:**
A wide range of facilities are available for untargeted or targeted genetic engineering of algal strains including various cloning systems, transformation and mutagenesis methods, as well as single-cell screening and sorting capabilities.
- **Omics Analyses:**
Includes capacity for the genomic, transcriptomic, proteomic, and metabolomics analysis of algal biomass including state-of-the-art molecular and bioinformatics tools.
- **Genetic and molecular engineering:**
A wide range of facilities are available for the analysis of chemical composition, including liquid chromatography, gas chromatography, mass spectrometry Raman and FTIR, and nuclear magnetic resonance.



Algae Waste Valorisation

We specialise in transforming residual algae biomass -after primary extraction or service delivery - into valuable secondary products and solutions. Our expertise helps you maximise value, reduce waste, and enhance sustainability across your operations.

Our Capabilities Include:

- **Method Development:** Tailored approaches for diverse biomass types
- **Product Piloting:** Real-world testing of new applications
- **On-Site Implementation & Training:** Practical support and skills transfer
- **Modelling & Best-Practice Advice:** Data-driven insights to guide decision-making



From Strain to Scale at UTS

How we can work with you

We have one of the world's largest groups of integrated algal specialists who are uniquely placed to address specific industrial challenges. Our team of experts are knowledge leaders from varied backgrounds from marine biology to metabolic engineering.

Our **Algae Services** can be tailored to meet your specific needs through a customised research program, leveraging one or more of the capabilities listed below, and where appropriate, in collaboration with external partners:



Algae Biobank

- Select from a range of wild type or UTS-developed elite microalgae, cyanobacteria, or macroalgae strains.
- Strains are available as **cultures for purchase, or for license** (elite strains).



Pheno-Select Robotic Array

High-throughput screening for:

- Screening up to 5000 strains simultaneously, sub-cultures, or culture combinations; including developed elite strains.
- Screening growth conditions (i.e. nutrient concentrations, additions, light, and CO₂).
- Outcomes include growth & productivity traits, biochemical profiles & stress tolerance.
- Services can be conducted in standard and tailored (non-standard) runs for selected variables.



Pheno-Grow Robotic Array

Custom **growth optimisation** for yield, biomass, or compound targets. Services can include:

- Both standard and tailored (non-standard) runs.
- Optimisation in a range of scaled bioreactors; including flat-panel and tubular.



Product Development

Tailored **R&D support and modelling** across including:

- Product development.
- Waste valorisation.
- Modelling including technoeconomic modelling.
- Extractions and development of protocols.



Algae Biobank (Cryostore)

- Secure **cryopreservation & strain biobanking**.
- Development of cryopreservation protocols for new strains.
- Store your own strain or a developed elite strain.

We focus on designing and developing innovative tools, methodologies, and techniques to deliver a broad array of radical advances spanning the entire algae production process.

Partner With Us

We continually strive to use our expertise and capabilities to meet the needs and demands of communities, governments, and industry. We develop mutually beneficial associations to deliver real results with quantifiable impact. We can work with you on short-term projects to solve specific problems or on a long-term basis to develop programs that meet a broader objective.

By combining expert knowledge and experienced know-how, core infrastructure, rigorous process optimisation, and relentless monitoring of yield versus cost, we can:

- provide research and development for new algae-derived products and services.
- help optimise algae culture and processing to produce the best outputs and yield.
- translate bench-scale data and processes into larger scale unit operations, process designs and operations.
- provide robust feasibility data and projections regarding process, scale-up, and manufacturing to support your business case.
- provide consulting and training services to help industry partners become more sustainable by unlocking the potential of algae to decarbonize our economy.
- assist with intellectual property security, including Plant Breeders Rights (PBR) and patent applications.



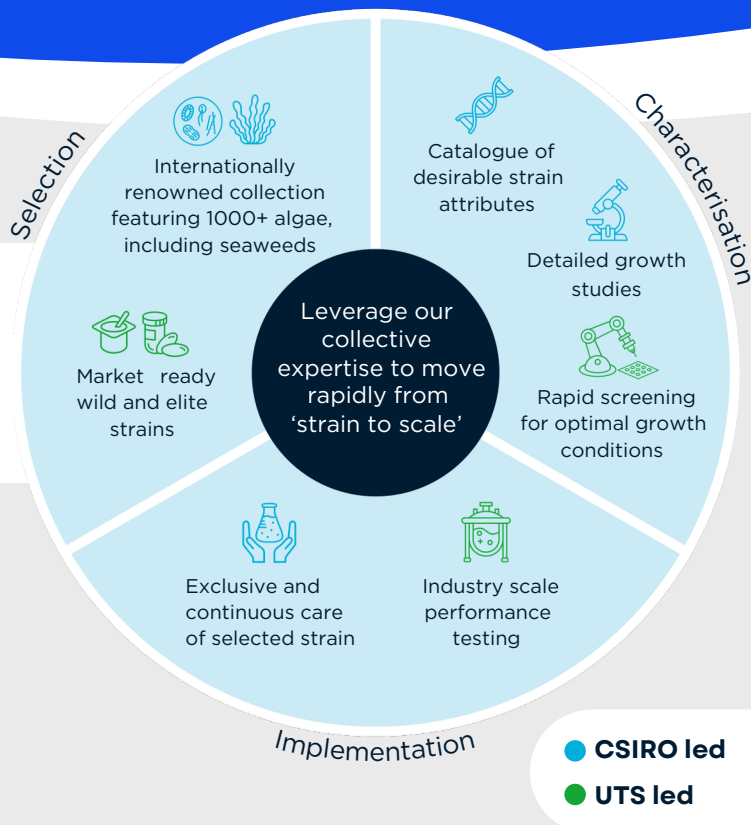
CSIRO & UTS

Accelerating the Australian algae sector, together.

Australian National Algae Culture Collection (ANACC) CSIRO and the Climate Change Cluster (C3) UTS bring together world-class science, innovation, and infrastructure to support a thriving Australian algae industry. By combining our expertise, we offer integrated services that de-risk development, accelerate innovation, and enable rapid optimisation from lab to industrial scale. With access to unique national resources and a wide selection of locally sourced strains, we help industry partners scale faster, reduce uncertainty, and unlock new commercial opportunities.

Strain to Scale

A thriving algae industry offering a greater choice of Australian sourced strains integrated with rapid optimisation for industrial scale-up.



Further information

For further information about our algae capabilities, or about working with UTS contact:

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Scan for more information on our Algae Services