

TRANSFORMING
AGRICULTURE AND
BIOMANUFACTURING
THROUGH PLANT
SYNTHETIC BIOLOGY



PLANT
SYN BIO
AUSTRALIA



plantsynbio.au

Plant SynBio Australia is funded through Bioplatforms Australia under the National Collaborative Research Infrastructure Strategy (NCRIS) and institutional partners



BIOPLATFORMS
AUSTRALIA

Adelaide
University



Australian
National
University



LA TROBE
UNIVERSITY



THE UNIVERSITY OF
WESTERN
AUSTRALIA



Mission

Transforming agriculture and biomanufacturing through plant synthetic biology.



Vision

Our world class infrastructure and services have enhanced agricultural productivity and biomanufacturing for a healthier planet.



About Plant SynBio Australia

Plant SynBio Australia (Plant SynBio) is a national network dedicated to accelerating synthetic biology solutions for climate-resilient agriculture, sustainable biomanufacturing, and global food security.

Funded through Bioplatforms Australia under the National Collaborative Research Infrastructure Strategy (NCRIS) and institutional partners, Plant SynBio unites the capabilities of leading universities including Adelaide University, Australian National University, La Trobe University, and The University of Western Australia, to deliver an integrated pipeline of synthetic biology innovation, infrastructure and expertise which will drive accelerated gains in agricultural productivity and environmentally sustainable bio-manufacturing.

Plant Synthetic Biology

Plant SynBio focuses on synthetic biology, using engineering principles, to redesign biological pathways and construct new biological components and systems.

Our technologies and infrastructure support novel development of plant vaccine production, bio-pharmaceuticals, novel crops and foods, improved yields, and increased resistance to drought, disease or other environmental stresses.

Synthetic biology infrastructure and services

Our multidisciplinary team of scientists, engineers, and technical specialists work collaboratively offering unique capabilities to deliver high-quality, reproducible synthetic biology solutions across national nodes.

We provide infrastructure and expertise for research providers, government and industry institutions as fee-for-service as well as providing incubation space for the start-up community and opportunities to collaborate.

We operate under stringent regulatory frameworks and following biosafety and ethical standards, and stringent quality control protocols to ensure product compliance, safety and efficacy.

Our offering includes:

Infrastructure



Gene editing and GMO services

Advanced molecular componentry design and characterisation, transient and stable transformation platforms, and omics-based phenotypic evaluation of transformed plants.

Controlled environment testing, scale-up, and field validation through a national network.



Transformation of multiple crops

Genetic manipulation of plants, cells, proteins, pathways, and processes for research and commercial applications.

Transformation capacity for oilseed, cereal, horticultural, medicinal species and model plant species.

Validation services for genetic traits and modifications.



Transient expression platforms

Flexible and accessible systems for plant cell-based, cell-free systems to accelerate synthetic biology workflows.



Biomanufacturing

Upstream cell culture and bioreactor optimisation combined with downstream purification and formulation expertise



Data

Project consultation, pipeline optimisation, and data analytics support.

Integrated bioinformatics and data management solutions.

Services



Integration with national facilities

Connectivity with other NCRIS investments for validation and analytics.

Collaboration with the Australian Plant Phenomics Network for advanced phenotyping.



Start up support

Links to research hotels and industry incubators to promote commercialisation and start-up growth.

Expert advice on regulatory frameworks and intellectual property management.



Node Locations



Plant SynBio Australia operates as a collaborative network across four university nodes, each offering specialised expertise and infrastructure to address sector-specific challenges.

Each facility provides capability across the synthetic biology cycle including design of molecular componentry, genetic editing and transformation, and the phenotypic evaluation of the bio-designed plants.

Each node also offer specialist expertise as follows:

1. Adelaide University

The Adelaide University node enables plant synthetic biology services for agricultural crops, as well as for synthetic biology projects in model plants.

CONTACT: Prof. Matthew Gillham:
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2. Australian National University

The ANU node specialises in oilseed and cereal crop biotechnology, offering expertise across molecular componentry design, gene editing, transformation, and phenotypic assessment.

CONTACT: Dr. Allen Wen: allen.wen@anu.edu.au



3. La Trobe University

The LTU node focuses on agricultural, horticultural and medicinal plant species. The node provides synthetic biology infrastructure and expertise for research translation and industry application.

CONTACT: Prof. Monika Doblin: m.doblin@latrobe.edu.au



4. University of Western Australia

The UWA node drives discovery and development across the Design-Build-Test-Learn cycle, focusing on novel componentry, advanced genetic tools, and high-throughput testing platforms.

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