

AzCATI

Arizona Center *for* Algae Technology *and* Innovation

an open test & evaluation
algae research center



asulightworks.com



open test & evaluation facilities for algae

AzCATI

BIOREMEDIATION CARBON CAPTURE



CO-PRODUCTS



NON-FUEL LIPIDS



EDUCATION

OUTREACH

WORKFORCE TRAINING



 **SCIENCE**
foundation
ARIZONA
Innovation at Work

strain development



AzCATI provides services for algal strain selection and improvement. The facility is capable of collecting, screening, selecting and characterizing naturally occurring and genetically engineered algal strains for various commercial applications (e.g., fuel, food, feed, and chemicals).

AzCATI also provides services for the development of culture media and maintenance protocols specific to the algal strains provided by customers and partners.

STRAIN SELECTION:

- Bioprospecting, screening, isolation, selection, identification and characterization of microalgae of commercial interest
- Development of culture media and maintenance protocols for selected strains
- DNA fingerprinting and phenotypic trait identification for selected strains

STRAIN EVALUATION

- Critical evaluation of microalgal strains provided by customers
- Side-by-side comparison of culture performance and productivity of customer-provided strains versus AzCATI's best-in-class strains in selected culture systems under defined environmental or culture conditions

GMO EVALUATION

- Biosafety level 2 greenhouse and closed photobioreactor facilities are available for evaluation of genetically modified algae provided by customers or created by AzCATI



feedstock production

AzCATI provides services for the evaluation of algal culture systems, including both open and closed models provided by customers and partners. The facility also offers critical side-by-side comparison of customized culture systems with the AzCATI's best-in-class open raceways and photobioreactors of various designs. In addition, the facility provides support and assistance on systems integration and techno-economic assessment of algal culture

Test bed access

- Provide state-of-the-art test bed for assessment of customer provided culture systems and processes using the strains provided by the customers or by AzCATI under various environmental and culture conditions

Chemical and biochemical analysis

- Biomass composition (total carbohydrate, starch, protein, amino acid profile, lipid and fatty acid profiles, nutrient and elemental analyses)
- Photosynthetic activity, growth and productivity measurements

Culture stability assessment

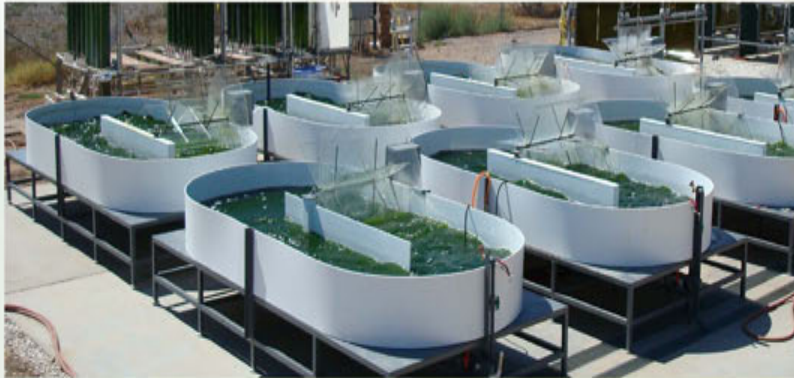
- Assessment of culture susceptibility to biological contamination (e.g., fungal/bacterial infection, grazing zooplankton)
- Determination of the occurrence and potential impact of destructive contamination of algal culture
- Development of control measures for prevention and treatment of microbial/predator contamination
- Assistance to customers in conducting techno-economic analysis of algal mass culture

Algal biomass supply

- Production and supply of algal biomass of quantity and quality defined by customers
- Provide algal biomass (both wet and dried) for customers to test their downstream processing equipment, processes and product



cultivation systems for use in evaluations



Cultivation Path	Type	Capacity
PBR - column type (outdoor)	32 units @ 40 liters/unit	1280 liters
PBR - panel type (outdoors)	100 units @ 55 liters/unit	5500 liters
PBR - panel type (greenhouse)	6 units @ 110 liters /unit	660 liters
PBR - panel type (greenhouse)	6 units @ 230 liters/unit	1380 liters
PBR - panel type production array (outdoor)	8 units @ 660 liters/unit	5280 liters
PBR - panel type production array (outdoor)	4 units @ 1380 liters/unit	5520 liters
PBR - panel type production array (outdoor) liters	3 advanced panels @ 2500 liter/unit	7500 liters
Raceways - (outdoor)	22 units @ 1500 liters/unit	33,000 liters
Raceways - (outdoor)	5 units @ 7500 liters/unit	37,500 liters
Raceways - (outdoor)	2 units @ 15,000 liters/unit	30,000 liters
Raceways - (outdoor)	1 units @ 150,000 liters/unit	150,000 liters



state-of-the-art open test beds

Processing Equipment	Feedstock Logistics
Dissolved air flotation Flocculation/sedimentation Membrane filtration Centrifugation Freeze drying Solar drying Belt press	Harvesting, dewatering and drying assessment
Conventional solvent extraction Hydrothermal-based pre-treatment and extraction Products fractionation and separation Product recovery	Pre-treatment, extraction and conversions

The AzCATI open test bed has state-of-the-art dissolved air flotation, membrane ultrafiltration, sedimentation, centrifugation and freeze drying equipment for algal harvesting, dewatering, and drying. The facility provides services for the evaluation of downstream processing equipment, and development of solutions for water/growth medium treatment and recycling.

The AzCATI open test bed facility has both conventional solvent- and hydrothermal-based extraction equipment for the preparation of oils, non-fuel lipids, and pigments for analytical and semi-preparation needs. The facility offers services on identification and analysis of algae feedstock products.



AzCATI contract research services

- Strain identification and evaluation
- Culture medium evaluation
- Culture systems design and evaluation
- Culture maintenance and operation protocol development
- Design recommendations for system integration & optimization
- Nutrient scaling, sustainability and management
- Water conservation, management and recycling
- Prototype unit operation assessment
- Process and techno-economic modeling
- Co-products identification and analysis

