

Graduate Research Assistant Opportunity (MS or PhD) in Du Lab

Du Lab (<http://www2.hawaii.edu/~duz/>) of the Department of Molecular Biosciences and Bioengineering (MBBE, CTAHR, UHM) is recruiting a graduate student for bioengineering on designing, manufacturing, and testing photobioreactors for photosynthetic organisms such as microalgae and cyanobacteria.

Microalgae research is a booming field. Microalgae and their concomitant derivatives are an increasingly promising source for sustainable materials and marketable bioproducts. Microalgae has a particular utility as a food and feed resource and nutraceutical supplement with regard to the provision of fatty acids, β -carotene, and astaxanthin, to name a few. A growing number of studies indicate that Hawaiian algal species are useful in animal and human consumption. In addition, over 70% of the oxygen in the atmosphere is produced by marine plants, in which algae contribute a significant part. They also can be employed as a remediating agent for other environmental events such as greenhouse gas emissions, changes in ocean acidity, and purification of runoff.

Although microalgae are vital to the biotech and ecology communities, the research on microalgae is restricted by the costly facilities and instruments. The propagation of algae at the laboratory scale is facilitated through reaction processes contained within a bioreactor unit, emulating natural environmental conditions to manage growth patterns. The current commercial devices are cost-prohibitive, small in capacity, and incomprehensive with regard to function for specific strains of algae (Fig. 1). Through the fabrication of a custom bioreactor with a range of capabilities to meet the demands of the algal growth of various species, our design will become an essential tool for microalgae research globally. It can also promote local algae research and industry, taking advantage of the abundant tropical resources in Hawaii.

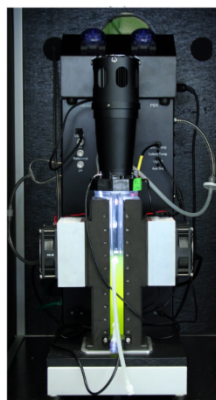


Fig. 1A
AlgaeMetrics
Photobioreactors

Over 50k for each system, depending on the features.

With the controls of different growth parameters but the total cultivation volume is small (~300 ml).

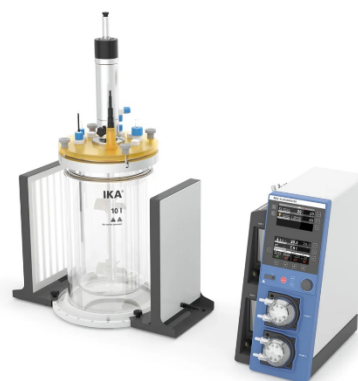


Fig. 1B
Ika 20015196 Algaemaster 10 Photo
Bioreactor

Over 30k

Hold up to 10 liter cultures but lack of controls of different growth parameters.

Fig. 1 Current commercial models of photobioreactors for algal research and production

The student will design and assemble the environmental photobioreactors that can control various environmental factors such as light intensity, temperature, and air supply.

Minimum qualifications:

- Bioengineering skills: CAD design; circuit board design and modification; basic computer programming;
- Good communication and writing skills in English

Desirable qualifications:

- Knowledge of molecular biology and biochemistry; Cell culturing; Microscopy

Salary: starts at \$25,908 yr plus health benefits

(Est) Start Date/Term: May 1st, 2023

To apply, please send your CV and names & contacts for three professional references to Dr. Zhi-Yan (Rock) Du, duz@hawaii.edu. Ph.D. Assistant Professor, Molecular Biosciences & Bioengineering University of Hawaii at Manoa.