

RESEARCH DIRECTIONS

Biodiesel from Microalgae

Associate Professor Kamali Kannangara, Dr Nguyen Tran and Dr Adriyan Milev from the School of Natural Sciences together with AusBiodiesel Pty Ltd have been awarded a UWS Research Partnership grant to investigate ultrasound effects on extraction of algal crude oils to biodiesel.

'Extraction of crude oils from microalgae is a essential step that will impact on the efficiency of the biofuel production' says Associate Professor Kannangara. 'A remarkably simple, scalable technique that enables fast extraction of microalgae crude oils has been recognised as the ultrasound-assisted process. This involves significantly less volume of solvents compared to conventional techniques. However, many technical issues such as the composition, stability and chemistry of the extracts are dependent on the physical property of the algal cell, chemical composition of the cytoplasm and the ultrasound intensity and energy'.

The research team will source the microalgae slurry externally which will then be filtered and the filtrate containing microalgae will be subjected to ultrasound-assisted oil extraction. The extraction procedure will be refined by systematically varying the operating conditions including times, ultrasound output intensity, and temperature, all of which are important for scaling up the process.



Before algal biodiesel can be established, it is essential to fully integrate all the steps in the process. In a related project funded by CSIRO, the research team is developing new heterogeneous catalysts for efficient conversion of algal extracts to biodiesel. This project has the potential to improve the industrial competitiveness of the "greener" ultrasound-assisted technique during manufacturing of the biodiesel fuels.

Project Title: Biodiesel from microalgae: ultrasound effects on algal crude oils

Funding has been set at: \$25,000

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