CALL FOR ABSTRACTS AND PRESENTATION PROPOSALS

Submissions due by 16 April 2010

ENGINEERS AUSTRALIA
Queensland Division

USQ UNIVERSITY OF SOUTHERN QUEENSLAND
Faculty of Engineering and Surveying

Submit your abstract and/or presentation proposal via email to **engsummit@usq.edu.au**. Abstracts and proposals should be aligned with the conference theme of 'Engineering regional prosperity and sustainability' with any of the following sub-theme(s):

- Energy
- Water
- Infrastructure
- Transport
- Environment
- Education and training
- Engineering management
- Regional development
- Interdisciplinary engineering
- Mechatronic engineering

PROPOSAL FORM

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Sub-theme(s): Energy/Interdisciplinary Engineering

Paper/presentation title: Growth and characterisation of Chlorella vulgaris under increase lipid culture regimes

◉ Presentation only ○ Full paper ○ Peer review

Abstract/presentation proposal (approx 300 words):

Keywords: Biodiesel, microalgae, Chlorella vulgaris, lipid optimisation, lipid and fatty acid analysis, biodiesel fuel efficiency

Microalgae lipids and fatty acids have a range of applications and have attracted much global attention in recent years for their potential use as a source of biodiesel. The lipid and fatty acid content of microalgae vary according to species used and the nutrient, environmental and developmental conditions in which cells are cultured. Specifically, certain stresses such as nutrient limitation have been reported to increase lipid content. There is little information regarding the effect of growth conditions, particularly the effect of iron, on lipid productivity including its content and composition. Studies investigating the effects of growth conditions on lipid content and composition are essential given that the distinction in the main lipid classes and fatty acid composition are important for the subsequent conversion of microalgal oils to biofuels.

This presentation will document a 1 year Science Honours project which is currently investigating the lipid classes and fatty acid composition of the freshwater microalgae Chlorella vulgaris during growth on media designed to increase lipid content. Proposed studies will involve a two phase batch culturing of the microalgae which utilises media for optimal growth in the first phase with subsequent transfer of the algae to media designed to increase lipid content. The specific media conditions to be investigated will include factors such as nitrogen limitation and addition of iron at different concentrations. Growth and lipid content will be measured under the various culture conditions and the cultures will be characterised in terms of lipid classes and fatty acid composition during periods of optimal lipid accumulation. To quantitatively analyse these factors, techniques including gravimetric analysis, in situ Nile Red determination of neutral lipids, and GC-MS analysis of extracted and transesterified fatty acids will be utilised. The results of nutrient limitation and addition will be reported for each culture condition and the specific effects on growth phase, lipid accumulation and composition will be presented under each different culture regime.