

RESEARCH DIRECTIONS

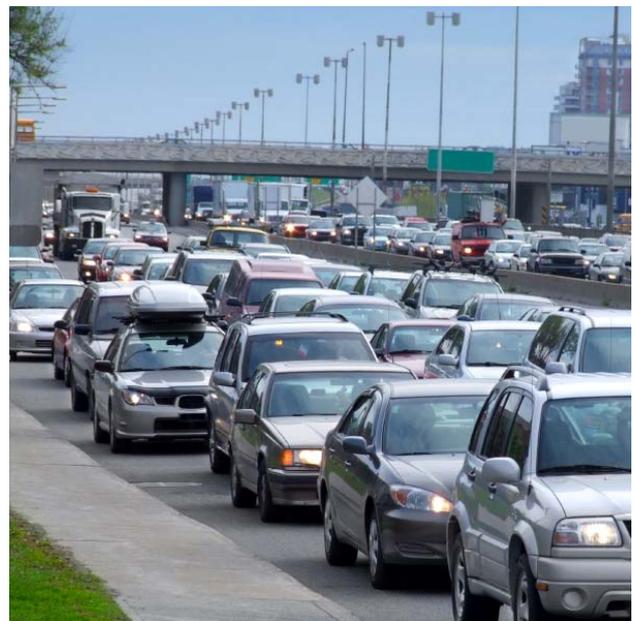
New Transport Fuels from Algae

Dr Nguyen Tran, Dr Kamali Kannangara, Professor John Bartlett and Dr Adriyan Milev from the School of Natural Sciences with Emeritus Professor Mick Wilson are working to establish a new hybrid technology for generating transport fuels from algae. This research is supported by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) through its Flagship Collaboration Research Fund.

'There is much speculation about fossil fuel supply, with some people estimating the supply to peak within decades,' says Dr Tran. 'These fuels and their extraction also have adverse impacts on the environment, so there has been a dramatic increase of interest in renewable fuels, such as biofuels. One source of biofuels is oil refined from agricultural products but this use of land is in competition with land needed for food production and the fuel produced will not meet current world fuel demands anyway.'

'Algae, on the other hand, can produce 10 to 250 times more oil than any land plant,' continues Dr Tran. 'Some algae can produce biofuels much closer to conventional petroleum. Biodiesel fuels from algae could be taken up in very large volumes and eventually dominate the diesel vehicle market. Given that Australia has large areas of land and "brackish" water, cheap bio-fuel production through the cultivation of micro-algae has great potential. At present very little oil is being produced this way.'

This research focuses on green algae such as *Botryococcus braunii* found in lakes and reservoirs in Australia and other parts of the world. It involves modifying how the hydrocarbons – organic compounds needed for the production of oils – break down in the algae (called cracking). This species is being targeted because it can contain an exceptionally high amount (up to 90%) of its dry weight in hydrocarbons.



The research team is seeking to establish a hybrid technology combining biorefinery and chemical refinery that enables mass production of refined products including petrol, diesel and jet fuel.

There will be significantly less greenhouse emissions than fossil fuels from biofuels from algae and it may become greenhouse gas neutral if efficient methods of production can be developed, such as using recycled carbon dioxide from other industrial productions. This research aims to contribute to reducing climate change effects and efficiency of Australia's new energy generation technologies.

Project Title: Improved Biofuel Production from Algae.

Funding has been set at: \$215,000

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