Testing of Z-Scheme Photosynthesis Using PSI-Deficient Mutants of Green Algae

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To be presented to the Department of Energy
as final research paper on
December 6, 2000

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* Research supported by the ED Industrial Sector B Total Program of the Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy under contract DE-AC05-00OR22725 with UT-Battelle, LLC.

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ABSTRACT

This project is part of a testing process for a potential new type of photosynthesis. Conventional photosynthesis follows the Z-scheme model with both photosystem I (PSI) and photosystem II (PSII) reaction centers. This new type of photosynthesis is thought to be supported by a PSII light reaction alone. This project involves testing the photosynthetic rate of a number of PSI-deficient mutants of *Chlamydomonas*: B4-PsaA delta-2, LMFud26, Duke CC-1047, and the wild type CC125. These strains will also be tested on the basis of their PSI content by extraction of their thylakoid membranes. The photosynthetic rate and PSI content can then be compared for each mutant type. This project also involves the determination of the chlorophyll antenna sizes of PSI in the mutants by use of a rapid scanning spectrometer. The results of the PSI content and photosynthetic rate comparison support the theory of PSII photosynthesis. The results of the antenna size tests can be interpreted as somewhat contradictory to the theory but more tests need to be done to make a definite conclusion about PSII photosynthesis.