

Synergetic effect of multiple stresses in microalgae for improvement of lipid production

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Microalgae have been focused as renewable energy resources because of their potential for producing biofuels from CO<sub>2</sub>. However, the cost for the production of biofuel must be reduced in order to be commercialized. The optimization of culture conditions of microalgae is important to increase lipid production. We rapidly analyzed the combined effect of various stress on the lipid production in various strains using a multiplex microfluidic system. We found that the lipid productivity was enhanced by 25 to 54% under combinations of two stress condition compared to the single stress condition. However, the combination of more than three stress conditions can reduce the lipid productivities of all strains because of more stressful environment to the cells. These results shows that synergistic effect of multiple stress conditions can be efficient strategy for the optimization in algal cultivation to produce algal biofuels with high quality and economic feasibility.