Increasing microalgae yields through magnetic field stimulation

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Abstract (300 word limit)

The optimization of growing conditions for algae is a relevant challenge when considering the coming food needs to feed a growing population with already nearly saturated farming land and an algae market with an expected growth of 4 to 7% CAGR in the coming 5 years. Still, further room for optimization of growth and reduction of production costs exists and has not been totally explored. We examine the effect of induced magnetic fields on algal growth, an effect, which has been observed in several settings. The aim of our experiments is to show that we can modulate the growth metrics and that this can be used for development of growth promoting technologies. We examine the molecular mechanism of the magnetic field on the algae, likely due to the subtle changes in the photosynthetic pathway by an external magnetic field. Photosynthesis is fundamentally a quantum mechanical phenomenon, and as such, it is highly sensitive to even subtle changes in the electromagnetic environment. Our research investigates the mechanisms by which magnetic fields cause increased growth in algae when combined to appropriated light and deuterium concentration. This work illuminates techniques for algae producers to maximize the growth potential of their algae crops.

Keywords: electromagnetism, free radicals, photosynthesis, biophysics, microalgae, optimization, bioreactor

Recent Publications (minimum 5)

1. D'Haene, S. (2020). Regulation of light energy in photosynthetic bacteria, thesis.
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4. Wahadoszamen, M., D'Haene, S., Ara, A.M., Romero, E., Dekker, J.P., van Grondelle, R., Berera, R. (2015). Identification of Common Motifs in the Regulation of Light Harvesting: The Case of Cyanobacteria IsiA. Biochimica et Biophysica Acta (BBA) - Bioenergetics 1847, 4:486–92.
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6. Boulay, C., Wilson, A., D'Haene, S., and Kirilovsky, D. (2010). Identification of a Protein Required for Recovery of Full Antenna Capacity in OCP-Related Photoprotective Mechanism in Cyanobacteria. Proceedings of the National Academy of Sciences 107, 25: 11620–25.



Biography (150 word limit)

Specialized in photosynthesis, Sandrine brings into play microbiology, molecular biology, biophysics and biochemistry for several research projects.
Currently, she is involved in new activities to promote new sustainable solutions and valorization of research.
Cyanobacteria, like spirulina, and microalgae offer a great answer to our food and energy needs. They can clean the air and water with high value products as a result.
Workshop and awareness for a better You and Earth @ Green Light Atelier. Environmental citizen.

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Notes/Comments