Technology Overview

Integration of Microbial Fuel Cell Within Algal Bioreactor
OTT#1265

APPLICATIONS

Municipal wastewater treatment plants play a critical role in environmental protection, but the operations of such plants consume an extensive amount of energy.

TARGET PROBLEMS

An ongoing challenge to sustainability is developing improved wastewater management with reduced energy demands and increased energy recovery from waste.

KEY BENEFITS

- **Dual Use** allows for the production of bioelectricity and biomass simultaneously
- MFCs and algal bioreactors process and treat wastewater using **lower energy consumption**
- Use of algae for bioenergy over other power alternatives produces **higher yields**
- **Efficient Waste Removal** of both organic wastes and nutrients from wastewater treatment facilities using only one method

TECHNOLOGY

In this novel system, wastewater is fed into the microbial fuel cells (MFCs) where organic contaminants are converted into bio-electricity; the remaining nutrients are then discharged into an algal bioreactor for algal growth, which strips nutrients out of the water before the treated effluent is released for final treatment (e.g., disinfection). The two treatment processes are cooperatively linked for the same purpose of treating wastewater, with two different bioenergy products: bioelectricity from the MFCs, and algal biomass for biofuels production. Overall, the system hopes to combine previous methods of wastewater removal processes in order to achieve the most energy efficient method possible.

INTELLECTUAL PROPERTY

US 9130216 – Integrated photo-bioelectrochemical systems

This technology is part of an active and ongoing research program and is seeking partners for development of the final product. It is available for developmental research support/licensing under either exclusive or non-exclusive terms.

INVENTOR

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