

Graduate Research Showcase

The Council of Graduate Studies (CGS) hosted a Graduate Research Showcase as part of the celebration of Graduate Studies Week. Graduate students showcased their research in form of a poster presentation. It was a 2 day event held on April 13 and April 14, 2009. The posters were presented in four sessions with the total participation leading to more than 70.

Daniel Vidt won first place and Varun Paul won third place in the third session which included approximately 25 posters entered by Graduate students from departments such as Chemical and Biological Engineering, Chemistry, Material Science, Ceramic Engineering, Geology, Environmental Engineering, etc.



First Place winner, Daniel Vidt,
Ph.D. student in Mining Engineering

Subterranean Algal Bio-Mining

Abstract

The production of fuel and chemical feedstock from algae possesses considerable potential as a viable fossil hydrocarbon replacement. However, conventional algae cultivation requires substantial surface area and/or support structures to provide adequate yields. Furthermore, open pond and other approaches are prone to many well documented problems. The perceived drawback to underground cultivation is the obvious lack of light. However, advances in solid state lighting technology and the fine tuning of light for the specific spectral, temporal, and intensity requirements of the algae has previously shown to outperform naturally incident sunlight in terms of algal yields. Therefore, a strategy of carefully engineered underground cultivation systems presents far greater potential in terms of both yields and economics.



Third Place winner, Paul Varun, M.S. student
Applied & Environmental Biology

Microbial Fuel Cells: Electricity from Bacteria

Abstract

Anaerobic, metal-reducing bacteria have been shown to attach and transfer electrons obtained from organic compound oxidation, to the surface of electrodes in a Microbial Fuel Cell (MFC), thereby producing current. Such electron shunting ability has been identified in several species of bacteria. In the present study, bacteria isolated from an extremely saline, alkaline environment of Soap Lake, Washington, were used in an MFC. The bacteria colonized the carbon cloth electrode efficiently and were shown to produce current densities up to 12.5 mA/m². The open circuit voltage was constant over several days reaching up to ~1V. Molecular characterization of 16S rRNA gene and RFLP analysis showed that the bacterium responsible was a single species with 97% 16S rRNA gene similarity to *Halanaerobium sp.*