



Position for a PhD student in Microbiology in Advanced Biofuels Production

Site : Microbiologie et immunologie
Faculté de Médecine, Université de Montréal,
Montreal City, Province of Quebec, Canada

Laboratory of : Dr. Patrick C. Hallenbeck

web site: <http://mapageweb.umontreal.ca/hallenbe/>

Laboratory research theme: Microbial Technologies in Advanced Biofuels Production

Project description: Several biofuels research projects are currently underway. Hydrogen is an ideal future energy carrier, and we are investigating different biological methods for producing hydrogen. Metabolic engineering approaches are being used to create bacterial strains giving higher hydrogen yields while carrying out dark fermentation or photofermentation. Possible renewable substrates for these processes are various waste streams, including: glycerol from biodiesel manufacture, beet molasses, and food industry wastes, or cellulose from agricultural byproducts. We are also working on algal systems for biofuels production. Algae are capable of directly converting sunlight and carbon dioxide into usable biofuels, such as biodiesel. We are currently isolating algae from different locations in Quebec, chosen to give organisms with different, interesting characteristics. The algae will be selected and characterized on the basis for their ability to produce and store large amounts of lipids. Pilot scale operations will be carried out at NRC Algal Biofuels Initiative, Halifax.

References :

- Ghosh, D. and Hallenbeck, P.C. "Response surface methodology for process parameter optimization of hydrogen yield by the metabolically engineered strain *Escherichia coli* DJT135" *Bioresource Technology* 101:1820-1825, 2010
- Hallenbeck, P.C. and Ghosh, D. "Fermentative hydrogen production: the way forward?" *Trends Biotech.* 27:287-297, 2009
- Sabourin-Provost, G. and Hallenbeck, P.C. "High yield conversion of a crude glycerol fraction from biodiesel production to hydrogen by photofermentation." *Bioresource Technology* 100:3513-3517, 2009
- Turcot, J., Bisaillon, A., and Hallenbeck, P. C., "Hydrogen Production by Continuous Cultures of *Escherichia coli* under Different Nutrient Regimes", *International Journal of Hydrogen Energy*, 33:1465-1470, 2008

Disciplines/ Qualifications:

Candidates should have a formal training in microbiology and molecular biology or a related discipline (biochemistry), have excellent organizational, interpersonal, and communication skills, and have a strong interest in metabolic engineering and biofuels.

Contact:

Applicants should submit a resume, university records, a short statement of research interests, TOEFL results and two letters of recommendation to Dr Hallenbeck by email (patrick.hallenbeck@umontreal.ca), if possible in one .pdf document.

Collaboration: Collaboration is possible with a former supervisor or another researcher in that field. Please contact me.