Project and Teaching Assistant: Full-time Temporary Position (Summer/Fall 2018 to Spring 2019)

Project Title: Bioprocess engineering of microbial, algal and mammalian cell culture for biotechnology and bioenergy project and teaching applications

Position Context: In the lab, we culture microbial cells (e.g., GFP-*Escherichia coli*, *Pseudomonas putida*, yeast) and mammalian suspension cells (e.g., CHO) in the flask, benchtop bioreactor, and programmable robotic platform and study their metabolism in the batch, fed-batch or perfusion (continuous) culture modes. Current projects are carried out with support from technology companies, and aim to optimize production of the desired product. The product of interest can be recombinant albumin (by *Pichia pastoris*), Green Fluorescent Protein (by *E. coli*), fatty acids (by microalgae and yeasts) or an IgG (CHO), or can involve capture and degradation of a pollutant (CO_2 by microalgae, aromatic chemical by *P. putida*). State-of-the-art analyzers are available to measure cell and metabolic parameters (e.g., HPLC, biochemical analyzers, and mass spectrometer).

These biological platforms are used for project and teaching applications. For the latter, experiments developed by the selected candidate will be offered in the combination of courses 10.28, in the fall, 10.28L, in IAP-spring, and 10.26, in the spring. The team member will be involved in preparing and delivering experiments to juniors and seniors.

Position Responsibilities: As a project and teaching assistant, your duties will include helping teach and oversee a chemical-biological engineering undergraduate lab course (10.28/10.28L). In this duty, you will help set up and assist with laboratory experiments, develop new assays, and assist students in the lab and with homework along with testing and implementing new biotechnology modules. There is a strong digital teaching component in the lab, which is offered in different flavors, highlighted with the delivery of a hybrid course (10.28L), which is 80% on line, with videos, simulation tools and interactive platforms. This approach offers the staff a good opportunity to learn in this area, and contribute in developing original material.

In addition to teaching, there are many opportunities to work independently for developing new experimental modules and projects, which we have done with support from MITEI, for example. Work done by team members often lead to conference posters and presentations. Lastly, you will work with other members of the lab to maintain and manage the lab. This is a great opportunity for people who want to learn more about bioprocessing and gain valuable experience working with bioreactors nascent biotechnology. The current staff in this position have taken a gap year after their BS diploma (one in Course 7 and the other in Course 10) and will be joining medical schools in the fall.

Requirements:

- Prior cell culture experience
- Ability to work independently, and within a team
- Well-organized, responsible, dedicated, self-motivated, and good communicators.
- Teaching/ tutoring experience or willing to learn from MIT teaching lab

Recommended Additional Skills:

- Practical knowledge of the bioreactor platform (microbial or mammalian cells) (Preferred but not essential)

Contact:

Dr. Jean-François Hamel
MIT, Chemical Engineering Department
Cambridge, MA 02139 jhamel@mit.edu