College of Engineering
Summer Research Experience for Undergraduates Program

Request for an Engineering Student for Summer 2011 Research

Faculty Name ________Prof. Christopher Salthouse______________________________

Phone _________617-905-0789(cell) or 7-4308__(office)_______

Department ______ECE____________Email: ___salthouse@ecs.umass.edu_________

Brief description of Summer Research Project (please explain the interdisciplinary nature of this project).
Continuing the collaboration with Prof. Nugen in Food Science that led to a successful development of rapid prototyping techniques for microfluidics and a syringe pump, this summer’s REU will develop what we believe is the first array based ECL sensor. Prof. Nugen’s group is developing the most sensitive pathogen detection assays in the world using Electro-Chemical Luminescence based on a single photodetector. My group is developing arrays of photodetectors for a variety of bioassays based on fluorescence, luminescence, and phosphorescence. This work will combine the two.

Brief description of what the student will be doing:
The student will learn how to make array measurements of light emission for a graduate student focusing on array measurement of fluorescence emission. He or she will then add the electrodes required for ECL to the imaging array. Next, he or she will collect data on the spatial distribution of ECL under a variety of conditions. Finally, he or she will analyze this data.

Is this a CASA-related project? Yes ___ No _xx_

Preferred background of student (major(s), class, GPA, pre-requisites, etc.):
Prefer electrical engineering major, currently a sophomore or a junior, GPA above 3.5

Did you mentor a student last summer in the College REU Program?
Yes__X__ No ____

If yes, please describe the outcomes for that student (i.e. Honor’s thesis, conference presentations, manuscripts, papers, etc. Describe accomplishments to date as well as plans for the spring semester if the work has continued):
Stephen McKinley developed a rapid microfluidics prototyping protocol and in collaboration with Mengting Nan (another REU student) a syringe pump. He continued to an honor’s thesis with Prof. Sup.

Mengting Nan developed a printed circuit board and code for a microcontroller which is finding wide utility in my lab including in the syringe pump described above. She continues to work in my lab expanding the code base for the microcontroller.

Andy Gauvin began development of a temperature controller for PCR. His work on this project continues.