Posters-at-the-Capitol

Frankfort, Kentucky
February 5, 2009

FINAL INSTRUCTIONS

1) **All participants (students and faculty) should plan to be in the group photograph at 10:15 a.m. on the Senate staircase. Please be on time.**

2) **All posters need to be set up and ready for display by 10:30 a.m.**

3) **Welcoming remarks and invited guests will begin at 11:00 a.m. in the Rotunda.** If you do not have meetings scheduled with your legislative representatives at that time, please be certain to gather in the Rotunda for this.

4) All students need to be by their poster during the afternoon reception – 1:30 p.m. to 3:00 p.m. Student participants will be allowed to move through the reception line a few minutes prior to 1:30 p.m. so that they may return to their poster for the poster session.

5) **All posters are to remain on display until 3:30 p.m.** Students are responsible for removing their own posters.

6) **PLEASE!! Return your backing board, number tag, binder clips, and easel to the registration table at 3:30 p.m., but not before!**

SCHEDULE OF ACTIVITIES

9:00 a.m. to 11:00 a.m. ……..…… Poster Setup
9:00 a.m. to 1:30 p.m. ……..…….. Legislative Visits
10:15 a.m. ….. Group Photograph with Sec.Mountjoy and other guests (Senate Staircase)
11:00 a.m. ……..……..……..……..Welcome (Rotunda)
Guests Include:
Representative Carl Rollins, Chair, House Education Committee (invited)
Senator Ken Winters, Chair, Senate Education Committee
Dr. Mike Seelig, Interim Vice President, Council on Postsecondary Education
Mr. Robert L. King, President, Council on Postsecondary Education
Secretary Helen Mountjoy, Cabinet for Education and Workforce Development
11:00 a.m. to 3:30 p.m. ……..…..…….General Poster Session Viewing
1:30 p.m. to 3:00 p.m. ……..…….……... Reception
3:00 p.m. to 3:30 p.m. ……..……...…….... Conclusion

** All times listed on this document are in Eastern Standard Time (EST).*

Errata:

- Student Jeremy Haysley from Murray State University was added to project #82.
- Student Abdul Kakar from Kentucky State University is unable to participate in the program. His research was to be project #58. It has been replaced by student Marc Harik from the University of Kentucky. The abstract for his project is included below.
- Student Lesley Mann from the University of Kentucky is unable to participate in the program. Her research was to be project #73. It has been replaced by student Matthew Ward from the University of Kentucky. The abstract for her project is included below.

Marc Harik

University of Kentucky
Mentor(s): Kozo Saito & Issam Harik

Subsurface Creep Corrosion and Defect Detection in Coated Bridges

Of the country's nearly 600,000 bridges, 26% were found structurally deficient or "functionally obsolete" in a 2006 U.S. Department of Transportation report. The cost to repair these bridges is estimated to be $65 billion. Deficiencies due to the surface condition, defects and improper coating application in steel bridges are considered to contribute to premature failure. A new method to measure the surface condition and detect defects in coated bridges will be introduced. Samples with different corrosion levels, surface conditioning and defect sizes were studied with Infrared thermography, a non-contact method, to measure the physical and thermal properties of the surface. Results suggest that the acquired thermal signal can distinguish between varieties of surface conditions, estimate the level of corrosion in coated bridges and detect sub-surface defects. The primary advantage of this method-over existing ones-lies in its ease of deployment and interpretation of the results by non-technical professionals; it is non-contact, non-destructive and provides a method to inspect bridges rapidly and quantify the damage.

Matthew Ward

University of Kentucky
Mentor: Robin Cooper

Roles of the SERCA, PMCA and NCX in Calcium Regulation in the *Drosophila* Larval Hart

We investigate three regulatory proteins that impact [Ca2+]i in cardiac myocytes, by examining heart rate (HR), in the genetically attractable model, *Drosophila melanogaster*. The NCX, PMCA and SERCA were compromised by ionic, pharmacological or mutational manipulations, or a combination of approaches, while HR was monitored. Dissected preparations were used to expose the heart directly; however, the HL3 bathing media did not appear to be optimal. In intact larva, a decreased SERCA function reduced HR more than in dissected larva. A compromised PMCA also reduced HR; however, attenuated NCX function increased HR. A combined loss of function in all three channels did not show a significant change in HR from normal as the increase in HR, by reduced NCX action, is compensated by the decrease in HR from the SERCA and PMCA inhibition. The results indicate that the NCX and PMCA are important in regulating HR where as the SERCA does not have as pronounced role. However, in intact preparations the loss of SERCA function, by mutation, does have an impact on HR. Pharmacological approaches to alter PMCA, SERCA and NCX paralleled the results obtained by ionic and mutational approaches. This substantiated the effects or lack of them, by the different approaches.