NIH Award from the National Institute of General Medical Sciences

Principal investigator: Bridget Lear, postdoctoral fellow, neurobiology and physiology
Weinberg College of Arts and Sciences

- **Project:** Regulation of a Pacemaker Neural Output in Drosophila Circadian Rhythms
- **Start Date:** July 1, 2009
- **Total Award Amount:** $90,000

**How the results of this project will benefit society:**
This proposal is highly relevant to the mission of National Institute of General Medical Sciences to elucidate the neurogenetics of behavior. The proposed research plan also has significant implications for human health. Defective circadian rhythms are associated with disease states including bipolar disorder and seasonal affective disorder. Moreover, circadian rhythms genes originally identified and characterized in Drosophila have been shown to have similar function in mammals, including humans.

**The problem the project is trying to solve:**
A central purpose of this award is to provide training to the grantee for successful transition from postdoctoral fellow to independent investigator. During the mentored phase of the proposal, Dr. Lear will obtain technical training and career guidance from the mentor, Dr. Ravi Allada, and co-mentor, Dr. Fred Turek. All facilities and equipment necessary to provide this training are available at Northwestern University.

The mentored phase will also allow time for other career development activities, including the faculty job search. In the independent phase, Dr. Lear will use the training received and previous expertise in order to perform and direct the experiments outlined in the research plan. The long-term goal of the candidate is to establish a successful independent research program studying the neural and genetic basis of circadian behavior, using the model system Drosophila melanogaster.

**How this project will work:**
The goal of the research plan is to elucidate regulatory mechanisms of circadian neural output, using genetic, molecular, and biochemical approaches. Previous research has demonstrated that putative ion channel narrow abdomen (na) functions in output of Drosophila circadian pacemaker neurons. However, little is known about regulation of na, and the circadian regulation of neural outputs remains poorly understood in both Drosophila and mammals. A novel Drosophila mutant, dunc-79, exhibits a strong decrease in na expression levels and displays circadian phenotypes similar to those of na mutants, dunc-79 encodes a novel protein with homologs in C. elegans and mammals, and preliminary evidence suggests that this gene may be circadianly regulated. This proposal will examine the role of the dunc-79 in circadian rhythms and na regulation.

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