Beaumont Faculty Development Fund ("Molecular genetic dissection of GGA, a protein essential for targeting vesicular transport" $4954, grant account # 2-73093)

William S. Stark

Progress report

A fundamental portion of the budget was for supplies for my collaborative project with Prof Eissenberg at SLU's Doisy Research Center. Four months into the BFDF funding period, Shan Luan, my Ph.D. student, obtained knockouts of the GGA gene. While knockout technology had been pivotal in research with mice for decades, there had been very few reports of successful knockouts in Drosophila since the technology was fairly new. This achievement paved the way for rescue of the GGA mutant followed by the main specific aim of the BFDF, "to engineer site specific mutations in the GGA transgene construct to replace key amino acids with alanine, generate transgenic animals expressing the mutant GGA, and test the ability of the mutant GGA to complement the GGA mutation in lysosomal hydrolase and rhodopsin trafficking." Shortly after that breakthrough, Ms Luan presented her work (acknowledging the BFDF) at the Midwest Drosophila Research Conference (Luan, Ilvarsonn, Stark and Eissenberg "Drosophila – the ultimate model for analyzing the new adaptor protein GGA" on line at http://starklab.slu.edu/JCE/midwest2011meeting.pdf). By that time, she had demonstrated that wild-type transgenes rescued the mutant. Rounding out these studies, a refereed article was eventually published at PLoS: "The unique GGA adaptin of Drosophila melanogaster is not essential" on line at http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0045163 This paper also acknowledges the BFDF. Finally, Shan Luan successfully defended her Ph.D. defense in April, 2013 and graduated in May. Her dissertation acknowledged the Beaumont grant, and I posted the PowerPoint of her seminar here: http://starklab.slu.edu/JCE/LuanDisSem2013.pdf
Shan Luan is now a postdoctoral fellow in the laboratory of William Sly at the Doisy Research Center

The budget also allowed my laboratory to support research opportunities for SLU undergraduate students. The research note "Light-induced retinal degeneration in Drosophila with green fluorescent protein (GFP) attached to rhodopsin" was published in Drosophila Information Service (vol 44, 2011, pp80-82, on line at http://www.ou.edu/journals/dis/DIS94/Shah%2080.pdf). Of the 3 undergraduate authors who worked in my lab, one, Katelyn Anderson, was funded by the BFDF (as well as Imran Shaikh, acknowledged for his assistance). The Beaumont fund was acknowledged in this publication. Katelyn and Imran are now medical students at SLU. Two more research notes were published, and they both acknowledge the Beaumont funding:
http://www.ou.edu/journals/dis/DIS95/Denny%2079.pdf
and
http://www.ou.edu/journals/dis/DIS95/Anderson%2092.pdf
These two projects resulted from undergraduate research experiences for undergraduates Anderson, now a SLU medical student, and Denny, now a Washington University

medical student.