Research Equipment Reserve Fund Award Final Report

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Type of Award: RERF

Instrument: "Crystallization Robot for Facilitating Structural Studies"

Award date and amount: RERF Fall 2008-09 cycle; $62,000 awarded January 2009

Final statement describing how the RERF funds were expended.
The robot was discounted from $85,000 to $80,000; the $5,000 saved used to purchase a CrysCam Digital Microscope with Video Capture, X-Y Stage and Scoring Software. Normally $20,000, the system was discounted to $5000. Thus, the award allowed us to purchase the robot in the Spring of 2009 and the CrysCam in the summer. All RERF and matching funds allocated were used for these purchases.

Brief summary of the scholarly work/activities made possible as a result of the RERF.
The Phenix robot was installed and Andrea Hall (PhD student in the Karplus lab) was trained to be the person in charge. In addition, an afternoon training session was attended by personnel from the Karplus, Barbar, Beckman, Ciuffetti, and Arp laboratories. Since the installation two years ago, crystallization screens on protein targets have been carried out by the Karplus, Barbar, Beckman, Ciuffetti, Arp, and Dreher laboratories. Already five papers/manuscripts have resulted from structural studies enabled by this equipment:

• Carter, EL, Tronrud, DE, Taber, SR, Karplus, PA & Hausinger, RP (2011) Iron-Containing Urease in a Pathogenic Bacterium. PNAS. In the press

In addition new crystals of virus capsids having designed mutations in the coat proteins have been obtained (Dreher lab). Data will be collected on these crystals shortly and, as the work is currently not funded, the information will be used in support of a grant application to fund further work on this viral engineering project. Also, new crystals related to additional ongoing projects in the in Barbar and the Karplus labs have been obtained.

External funding requests submitted as a result of the RERF funding.
To my knowledge, the purchased equipment has specifically supported four proposals.

• Karplus (PI of subcontract) R01 proposal on “Mechanistic Studies of Alkyl Hydroperoxide Reductase and related redox systems” submitted to NIH July 2009. Has been funded as NIH GM-50389-17.
• Taifo Mahmud (PI) – R21 proposal on “Radical SAM Enzymes in Natural Product Biosynthesis” submitted to NIH June 2010. (not funded)
• Taifo Mahmud (PI) – R01 proposal on “Biosynthetic Studies and Genetic Engineering of Pactamycin Analogues” submitted to NIH Oct 2010. (not funded)
• Dan Arp (PI) – Proposal on “Structure and Role of Erythrin, an Ancient Member of the Ferritin-Like Super Family with a Unique Di-Iron Center” submitted to NSF July 2010. (not funded); revised proposal submission planned for Sept. 2011.