The Center of Biomedical Research Excellence (CoBRE) in Neuroscience at the University of Vermont (UVM) has not focused on a specific area of neuroscience. Rather, the grant was designed to enhance the research and training infrastructure in neuroscience broadly across the campus. Over the first 10 years of funding the Neuroscience CoBRE supported research projects of nine junior and middle stage neuroscience investigators from Departments in several Colleges. Graduation from CoBRE funding allowed the Center to fund eight Pilot Projects, which helped other investigators obtain preliminary data for grant submission. The Center also provided funds to assist in recruitment of nine new neuroscience faculty across the campus.

Although we consider our mentoring and development of individual faculty to be a very significant accomplishment of the UVM Neuroscience CoBRE, an even greater success in terms of overall impact has been the creation of two, very successful multi-user research facilities, a Cell/Molecular Biology Core and an Imaging/Physiology Core. Both provide expertise, service and sophisticated equipment not readily available in laboratories at UVM. Described below is how the CoBRE support was used to create, enhance and sustain one of these facilities, the Imaging/Physiology Core. This has included continuing to add new or replacing outdated imaging systems as well as developing and instituting a fee-for-service user schedule that could provide financial support to sustain the Imaging Core following termination of Phase III funding.

At the time of the initial award, we were fortunate to have in the Anatomy and Neurobiology Department space container an electron microscope suite, which could be converted to a dedicated Neuroscience CoBRE-supported Imaging/Physiology Core. Departmental funds were used to renovate the former electron microscope suite so it could accommodate multiple imaging systems dedicated to live imaging. Initially, the Imaging/Physiology Core housed a Noran Laser Scanning Confocal Microscopy system, which was donated by the department chair, a DeltaVision Restoration Microscopy system, which was purchased with CoBRE funds and a separate, small room dedicated to multiple imaging analysis programs, which were also purchased with CoBRE funds. Taking advantage of CoBRE supplemental funding during the first grant period, we obtained grant funds to purchase a BioRad-Zeiss Radiance 2100 MPD Dedicated Multiphoton microscopy system. During the second 5-year grant period, CoBRE funds were used to obtain a Nikon TIRFM (total-internal reflection fluorescence microscopy system and purchase an Olympus imaging workstation with Andor EMCCD camera and Andor iQ-CORE software microscopy system.

The Core is managed by a full-time Director, who is an imaging expert, and who is supported partly by CoBRE funds and partly by departmental funds. A full-time Director provides a significant advantage over using partial effort of a faculty member to manage the facility. The Director is readily available for training of faculty, staff and students and for project development and trouble shooting. He installed an on-line scheduling system that allows easy tracking of equipment use. He has also been able to offer an imaging techniques course in conjunction with a faculty member and provide the mentorship of the students' course projects. Over the past three years, while a Transitional CoBRE, we have taken advantage of the formal management/oversight structure of the Imaging/Physiology Core to successfully obtain two Shared Instrument Grants (SIG), the first to purchase a Zeiss LSM 7 MP Dedicated Multiphoton Microscope, which is needed to replace the original Biorad Multiphoton Microscope, because it is no longer under service contract. Second, we used the SIG mechanism to purchase a Yokogawa CSU-W1 spinning disk confocal system coupled to a Nikon Eclipse NI-E upright microscope

with Andor EM CCD detectors, which replaced the very old Noran Laser Scanning Confocal Microscopy system. The favorable review of these applications for additional imaging equipment cited the well-developed management structure in place to provide operational management for the new equipment.

In year 3 of the Transitional CoBRE grant period, we initiated the process to develop a fee-for-service schedule for instrument use. Using guidelines already in place at our institution, we were able to formulate the fee schedule and implement it in January, 2013. Current usage fees are very modest, but will increase as CoBRE support ends. As part of the CoBRE and SIG applications, we obtained MOUs from key user Departments and the College of Medicine Dean's Office that will ensure continued support for 5 years following termination of CoBRE funding. Collectively, the MOUs guarantee salary support for the Core Director and operating expenses. With funds derived from the user fees and from MOU guarantees, the Core should be sustained in future years.