

Alzheimer's and Related Diseases Research Award Fund

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**FINAL PROJECT REPORTS FROM THE  
1998-1999 ALZHEIMER'S RESEARCH AWARD FUND**

The Alzheimer's and Related Diseases Research Award Fund (ARDRAF) was established by the Virginia General Assembly in 1982 to stimulate innovative investigations into Alzheimer's Disease along a variety of avenues, such as the causes, diagnosis, and treatment of the disorder; public policy and financing of care; and the social and psychological impacts of the disease upon the individual, family and community. ARDRAF conducts an annual competition for pilot study awards of \$16,500 each, administered by the Virginia Center on Aging at Virginia Commonwealth University.

**VCU/MCVJ. James Cotter, Ph.D., "Special Care for Persons with Alzheimer's Disease or Related Disorders: The Response of Virginia's Nursing Facilities, Adult Care Residences, and Home Care Agencies"**

Long-term care organizations are responding to the new challenges of serving older persons with dementia by establishing Special Care Units (SCUs) and Special Care Programs (SCPs). Our study, the Continuum of Special Care Project, surveyed 301 nursing facilities, 584 adult care residences and 422 home health care agencies in Virginia to determine how many and what kind of SCUs and SCPs were being implemented and what types of organizations were initiating SCUs and SCPs. One in five nursing homes and adult care residences has an SCU or SCP. Nursing facilities serve an average of 39 residents in the SCUs; adult care residences served an average of 16 residents in their SCUs. Based on the facilities' plans, 33% of these facilities will have established an SCU or SCP within the next two years. Nursing facilities and adult care residences that are larger, part of chains, in urban areas, and/or with affiliations to other providers, have a greater tendency to establish special care units than do other facilities. Most of the SCUs have a number of the key characteristics associated with special care units and programs, but only 14% have the full range of traits that characterize special care. Initiatives in home health agencies are nascent and focus on training and assignment of aides. Responses indicate considerable interest and experimentation on the part of long-term care organizations in Virginia to better serve persons with Alzheimer's disease or related dementia. (Dr. Cotter can be reached at 804/828-6938).

**VA Tech Bradley G. Klein, Ph.D. and Jeffrey Bloomquist, Ph.D., "Improved Visualization and Localization of the Neural Substrates of Experimental Parkinsonism"**

Parkinson's disease is a debilitating movement disorder of the brain which afflicts at least 1 million Americans in late middle age. It is analogous to Alzheimer's disease in its clinical target population, progressive neurodegenerative nature, and its functional, emotional and economic impacts upon the family and society. A condition almost identical to Parkinson's disease can be experimentally produced in animals by a compound called MPTP, which is similar in chemical structure to the herbicide paraquat. Although the MPTP model has provided important information on the neural mechanisms of Parkinson's disease, it is difficult to localize the regions and cells in the brain that use MPTP to produce the hallmarks of the disease. This research project addressed the usefulness of a chemical analog of MPTP, called *t*-THP, with regard to its potential for providing direct visualization of the brain regions and cells that are involved in experimental Parkinsonism. In general, results support several important similarities in metabolism, kinetics, and neurochemical function between MPTP and *t*-THP. However, one important difference demonstrated by our ARDRAF data, is that the *t*-P<sup>+</sup> pyridinium metabolite of *t*-THP does not appear to rely on sodium-dependent membrane transporters for incorporation into nervous system elements. It appears that *t*-THP has promise for use as a visual marker for micro-environments where MPTP-like compounds are taken and converted to potentially neurotoxic pyridinium species. The utility of this marker is further underscored by our ARDRAF-funded finding that *t*-THP does not appear to destroy components of the system it is meant to identify. Such a marker could be employed to address some of the issues regarding the selectivity of MPTP neurotoxicity. (Drs. Klein and Bloomquist can be reached at 540/231-7398)

**UVA Carol A. Manning, Ph.D. and J. Hunter Downs, III, Ph.D., "Brain Effect of Glucose Facilitation on Memory in Alzheimer's Disease: A Functional Magnetic Resonance Imaging Study"**

Numerous experiments indicate that increasing the blood glucose level improves memory in patients with Alzheimer's disease. Glucose, which is the main fuel for the brain, can cross the blood-brain barrier and enter the brain. What happens to brain activity when blood glucose levels are raised has yet to be definitively determined. A new technology called Functional Magnetic Resonance Imaging (fMRI) allows researchers to examine brain activity while patients are performing memory tasks. In this study, brain activity was compared in Alzheimer's patients and healthy elderly people. Each participant had a functional MRI with high blood glucose levels on one occasion and normal blood glucose levels on another. While undergoing the fMRI, they performed tests of memory for stories and faces. Significant and novel results indicate that glucose improves memory for healthy elderly and people with Alzheimer's disease, and that the critical brain areas involved are similar. In addition, glucose has a direct effect on brain activity in both groups of people. (Drs. Manning and Downs can be reached at 804/982-1012)

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