

University of Pennsylvania

Annual Progress Report: 2009 Nonformula Grant

Reporting Period

June 1, 2010 – June 30, 2010

Formula Grant Overview

The University of Pennsylvania received \$4,600,000 in nonformula funds for the grant award period June 1, 2010 through May 31, 2014. Accomplishments for the reporting period are described below.

Research Project: Project Title and Purpose

Improving Vision and Preventing Visual Impairment in Rural Amish and Urban African Americans - We propose to assess methods for improving treatment of visual impairment for Age-Related Macular Degeneration; determine the genes associated with Age-Related Macular Degeneration in African Americans; phenotype Amish and African American subjects with Age-Related Macular Degeneration to determine characteristic retinal signs associated with genetic risk variants; determine the extent of cortical plasticity in advanced Age-Related Macular Degeneration; and identify disparities in vision care within the African American community.

Anticipated Duration of Project

6/1/2010 - 5/31/2014

Project Overview

The overall goal of this project is to investigate the genetic and environmental determinants of Visual Impairment, to develop new methods of treatment to delay its progression, and enhance the use of remaining residual vision. In particular, this project will focus on Age-related Macular Degeneration (AMD), which is the leading cause of Visual Impairment in Pennsylvania. The research aims are to (1) enhance vision rehabilitation for African Americans with central visual impairment, (2) determine the genetic and environmental modifiers in AMD, (3) determine visual cortex function in response to the central visual deficit seen in AMD, and (4) identify the barriers for minorities that prevent access to vision care.

To address the need for enhancing vision rehabilitation, a clinical trial will be performed comparing home vs. office-based rehabilitation in 60 African American subjects with visual impairment to determine if there is an advantage of one method over another. To assess the genetic and environmental modifiers in AMD, African American and Amish case/controls will be genotyped for risk variants and phenotyped for retinal changes with advanced imaging technology. To address the need to understand visual cortex function in AMD subjects with

central visual deficits, 40 subjects will undergo extensive testing with functional MRI to determine if there has been any remapping and shift of visual cortical responsiveness. To identify the reasons for minorities having poor access to vision care, faculty at Lincoln University in collaboration with other faculty participating on this project, will develop and test a study protocol to identify the hurdles that impede access to vision care in African Americans.

Principal Investigator

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Other Participating Researchers

Geoffrey Aguirre, MD, PhD, Samuel Jacobson, MD, Artur Cideciyan, MD, PhD, Jonas Ellenberg, PhD, Rui Feng, PhD, David Brainard, PhD, Sashank Prasad, MD – employed by University of Pennsylvania
Elise Ciner, OD, Sarah Appel, PhD, Marcy J. Graboyes, MSW, LSW, ACSW, Ruth Y. Shoge, OD, Erin Draper, OD – employed by Salus University
Daniel Weeks, PhD – employed by University of Pittsburgh
Judith Thomas, PhD, Patricia Joseph, PhD – employed by Lincoln University
Jeffrey Henderer, MD – employed by Temple University Health System
Omesh Gupta, MBA, MD – employed by Temple University School of Medicine

Expected Research Outcomes and Benefits

- (1) Of the 50 states, Pennsylvania has the 4th highest prevalence of visual impairment and blindness. Age-related Macular Degeneration is the leading cause of Visual Impairment in Pennsylvania. The outcome of our project will be improved methods to treat and diagnose Age-related Macular Degeneration resulting in earlier therapeutic intervention to prevent and slow progression of this blinding disease. Slowing progression will lead to less advanced disease which will impact the overall prevalence of Visual Impairment in Pennsylvania.
- (2) Ethnic, cultural and socio-economic factors contribute to the poor access of African Americans (AAs) to essential visual rehabilitative services and must be addressed to ensure that individual needs, rather than these modifiable factors, determine the potential for AAs to achieve successful outcomes. We expect that an understanding of these factors will lead to increased access to essential vision rehabilitative services and improved vision.
- (3) There is a need to empower the African American community in Philadelphia to perform vision screening and refer subjects to appropriate facilities for continued vision care if needed. We will train lay screeners from the community to educate their communities so services can be

continued beyond the grant period. This will result in less visual impairment long-term due to better education and access for community members.

(4) The future of stopping visual impairment will depend on preventing progression from early disease to later blindness. This project will identify modifiable risk factors in Age-related Macular Degeneration, such as diet and smoking behavior, and target subjects with these risks with interventions to reduce these risk factors. This reduction in risk factors will result in a decrease in prevalence of Visual Impairment.

Summary of Research Completed

This project began on 06/01/10 and the funding has only just been received. There is no research activity to report for this project at this time.