Thomas Jefferson University

Annual Progress Report: 2005 Nonformula Grant

Reporting Period

July 1, 2008 – June 30, 2009

Nonformula Grant Overview

Thomas Jefferson University received $4,151,919 in nonformula funds for the grant award period June 1, 2006 through May 31, 2010. Accomplishments for this reporting period are described below.

Research Project: Project Title and Purpose

Adipokines and Genotypes: Injury vs. Protection in Obesity-Related Co-Morbidity - The purpose of this Center of Excellence (COE) in Obesity Research is to develop knowledge that will lead to a reduction in the health burden of obesity in Pennsylvania. The center will develop and evaluate information to improve treatments of obesity and also the chronic health problems that are closely related to obesity. This COE focuses on the minority communities of Southeastern Pennsylvania in both the research project and the community-based interventions that are related to the research project, thereby contributing to reduction in racial disparities. This effort is reinforced through collaboration in education and training with Cheyney University of Pennsylvania.

Duration of Project

6/1/2006 - 5/31/2010

Project Overview

The goal of this COE in Obesity Research is to develop knowledge to advance treatments and to reduce racial disparities in obesity and obesity-related medical conditions, or co-morbidities. The COE goal will be accomplished through four objectives. Objective 1 is to conduct research on biomarkers that promote obesity related co-morbidities and also biomarkers that protect against obesity related co-morbidities. The research aims are: a) identify a clinical phenotype of obesity that predicts tissue injury and adverse health outcome from obesity; b) identify intermediate phenotypes or biomarkers (proteins called adipokines produced by fat cells) that mediate injury or protect against injury; c) identify genes (genetic polymorphisms) that control fat cell secretion of adipokines; and d) determine if weight reduction and/or blood pressure (BP) reduction in obese adults alters the intermediate phenotype.

Young adult African Americans will be enrolled and stratified according to body mass (obese or lean) and BP status (high BP or normal BP). Clinical measures, biomarkers, and genetic

measures will be obtained before and following weight reduction (for obese) and blood pressure control (for the hypertensive). Objective 2 supports research aim d and applies the Chronic Care Model in primary care clinics to reduce obesity and to treat obesity-related comorbidities in minority young adults. Support for the weight reduction intervention will be augmented by links to existing community-based programs. Objective 3 is to establish a Data Resource and Management Center (DRMC) that will manage and analyze data for the research project and evaluate the feasibility, effects, and costs of the Clinic-Community Intervention Program (CCIP). Objective 4 is to establish collaborations for education and training between Cheyney University and other COE participants. The research, CCIP and DRMC provide opportunities for Cheyney students and faculty to engage in collaborative research with the objectives of enhancing science education at Cheyney and increasing the numbers of Cheyney students who pursue careers or graduate in science.

Principal Investigator

Bonita Falkner, MD
Professor of Medicine and Pediatrics
Jefferson Medical College
Thomas Jefferson University
833 Chestnut Street
Suite 700
Philadelphia, PA 19107
(215) 503-2501

Other Participating Researchers

Paolo Fortina, MD, PhD, James Plumb, MD, MPH, Elizabeth Rappaport, MD, Nancy Brisbane, MD, Constantine Daskalakis, ScD, Stephanie DeLoach, MD, Yonghong Huan, MD, Scott Keith PhD, Adam Ertel PhD - employed by Thomas Jefferson University
Rickie Brawer, PhD, MPH - employed by Thomas Jefferson University Hospital
Steven G. Hughes, PhD, Kimberly Baldwin - employed by Cheyney University
Vanessa Briggs, MBA, RD - employed by Health Promotion Council
Lisa Bailey-Davis, MA, RD - employed by Pennsylvania Advocates for Nutrition and Activity
Anitha Vuppalapati, MD - employed by Philadelphia Department of Public Health
Trudy Burns, PhD – Consultant

Expected Research Outcomes and Benefits

It is expected that the research will show that the presence of both obesity and high blood pressure in young adults is a clinical indicator that there are additional serious health problems, and that these individuals will benefit from medical evaluation and interventions. In addition to this clinically practical outcome, it is expected that certain biomarkers (proteins produced by fat cells) will be identified that are engaged in the process that injures blood vessels and causes heart disease. It is also expected that other biomarkers will be identified that protect against blood vessel injury. It is expected that the genes that control the biomarkers that lead to injury as well as genes that control the protective biomarkers will be found. Identification of biomarkers and

the genes that control them could contribute to the new field of pharmacogenomics and lead to development of individually tailored treatments.

A comprehensive model for weight management that is linked to supportive community-based health programs will be implemented and evaluated, leading to more effective obesity treatments and a reduction in racial health disparities. A comprehensive data center will be available to support future basic, clinical, and public health research. Students from Cheyney University will be trained and encouraged to pursue careers in health and science; and Cheyney faculty will benefit from research collaborations. Strategies for reducing racial disparities in health and health outcomes will be developed through the new information developed and by preparing minority students for health careers.

Summary of Research Completed

Objective 1-Research Project: Identify clinical, biochemical, and genetic markers of obesity co-morbidities in young adults (predominantly minority population).

Enrollment of young adult African American participants was completed in October 2009. Follow-up and completion of clinical data on enrolled participants was achieved by February. Total enrollment was 505 subjects in the research project, which exceeded the target enrollment of 500. All data have been entered on the database. Data have been cleaned with entry errors identified and corrected. Data analyses began in January 2010 and continued throughout the remainder of year 4.

The genotyping assays continued throughout year 4, and a substantial amount of genotype data has been developed. We added assays for Ancestry Informative Markers (AIM), in order to make appropriate adjustments in the data analyses for proportion of African versus European ancestry in the genetic association studies. Polymorphisms on the designated genes ACE, GRK4, and NOS3 have been completed on over 400 subjects. These data have been analyzed and a manuscript reporting the association of GRK4 and ACE with hypertension in African Americans has been submitted for publication.

Our focus on the initial phase of data analysis has been on testing of hypotheses 1 and 2 in the research project. The key findings to date are the following:

1. Sub-clinical diabetes has been identified in 9% of this young adult African American cohort. A much higher portion of the cohort met criteria for prediabetes. Considering sub-clinical diabetes and prediabetes together, abnormal glucose tolerance is present in over 38% of young adult Africans.

2. The increase in metabolic risk factors, including abnormal glucose tolerance, abnormal lipids, and insulin resistance, is not limited to obesity (BMI $\geq$ 30 kg/m^2). Our data demonstrate an increase in metabolic risk factors among those who are overweight (BMI>25 – 30) especially among males.

3. Biomarkers of inflammation, especially hsCRP, are associated with obesity. There is a

significant positive correlation of inflammatory biomarkers with BMI. The rise in inflammatory cytokines is detectable when BMI exceeds 25 kg/m^2. These findings suggest underlying inflammatory tissue injury with increasing degrees of obesity.

4. Preliminary analyses of genotype data indicate some evidence of a role of GRK4 and ACE in hypertension and gene-gene interaction of ACE, GRK4, and NOS3. The statistical model for predicting hypertension improves when obesity is added in the analyses.

The following articles related to this project have been accepted for publication:

Huan Y, DeLoach S, Daskalakis C, Dunn SR, Sharma K, Falkner B. Regulation of TGF-B_1 by Insulin in Pre-Diabetic African Americans. Kidney International (in press 2010)

Ussai KE, Keith SW, Pequignot E, Falkner B. Risk Factors Associated with Urinary albumin excretion in African Americans. Journal of Human Hypertension (in press 2010)

Cui J, Panse S, Falkner B. The role of adiponectin in metabolic and vascular disease: A review. Clinical Nephrology (in press 2010)

The following manuscripts related to this project have been submitted and are in review:

Martinez Cantarin MP, Ertel A, Deloach S, Fortina P, Scott K, Burns TL, Falkner B. Variants in Genes Involved in Functional Pathways Associated with Hypertension in Black Americans. (Submitted; Am. J of Hypertension)

Cui J, Wu X, Andrel J, Falkner B. Relationships of Total Adiponectin and Molecular Weight Fractions of Adiponectin with Free Testosterone in African Men and Premenopausal Women. Metabolism (submitted J of CardioMetabolic Syndrome)

DeLoach S, Huan Y, Daskalakis C, Falkner B. Endothelin-1 Response to Glucose and Insulin Among Black Americans. (Submitted: J. of the American Society of hypertension.)

Rappaport, E. B., Daskalakis, C., Andrel, J.: Obesity and Other Predictors of Absenteeism in Philadelphia Schoolchildren. Journal of School Health (Submitted; under review)

Zeger MPD, Kowal K, Falkner B, and Ross JK. Kleinfelter Syndrome is a model for childhood metabolic syndrome and insulin resistance. (Submitted: Acta Pediatrica)

Objective 2- Health Service Project: Apply interrelated components of the Chronic Care Model to adults and families in low income, urban, minority communities to improve control of obesity and obesity related co-morbidities.

Referrals and enrollment were completed on May 31, 2009 for the Clinic Community Intervention Project (CCIP) to allow for a 9 month follow-up and final data analysis. In the final project year, enrolled individuals were followed and counseled at intervals and data were entered and analyzed for all participants. CCIP total cumulative referrals were 2525, and total cumulative enrollment was 788 (31% conversion). CCIP participants had an average age of 38 years, and

included 85% women and 89% minorities. A total of 221 participants had follow-up data (128 <9 months, 93 ≥9 months). Between the baseline and the last follow-up visit, body mass index (BMI) showed an average decrease of 0.6 kg/m^2 ($p = 0.001$). Blood pressure also decreased significantly, by an average of 15 mm Hg for systolic ($p = 0.001$) and 7 mm Hg for diastolic ($p = 0.002$). There were no meaningful changes in lipids or fasting glucose. The BMI change was significantly greater among the CCIP participants than among a control group of 150 non-participating patients (0.6 vs. 0.1 kg/m^2, $p = 0.032$).

Subjects who participated in the program had modest benefits in weight, BMI, and blood pressure. However, the fact that the majority of the study's participants did not continue after their baseline visit suggests that such programs are unlikely to have an immediate impact on the lifestyle and outcomes of most obese patients, unless greater effort is made to address the issues found in the two additional research studies completed in the previous year and the final process evaluation completed during this reporting period. The results of this process evaluation follow.

The process evaluation had four components: (1) surveys and interviews with health care providers; (2) telephone surveys with program participants; (3) interviews with project staff; and (4) chart reviews to assess documentation processes including height, weight, BMI, and chart notes designed to promote communication between the lifestyle counselor and the primary care provider.

Patient Satisfaction: To select participants for the telephone survey, a list was compiled that stratified participants into two groups depending on the number of sessions they completed with the lifestyle counselor. High users were defined as those with three or more visits including baseline and low users were those with less than three visits including baseline. The telephone survey was attempted with all 66 patients in the "*high user*" group. Patients completing less than three visits were alphabetized and then randomly selected for interview using a random start and then selecting every n^{th} participant for interview. Participants were called over a two week period on different days and times to increase the probability that they would be reached. Each patient was called up to three times if there was an answering machine or a voice messaging system. If the patient did not have voicemail or an answering machine, he or she was called up to five times. Participants in the program were asked about their satisfaction with the program including questions about their lifestyle counselor, satisfaction with scheduling, the community education program if they participated, and overall feelings about the program. They were also asked about behavioral changes they had made.

Thirty one telephone surveys were completed. Twelve of the 31 participants surveyed attended at least four of the 6 sessions with the lifestyle counselor, 14 participants attended 2-3 sessions, and 5 attended only the baseline session. Most of the participants reported having lost weight (51.6%) or having maintained their weight (29.4%). Almost 69% of participants who said they lost weight attended at least three lifestyle counseling sessions. The majority of those surveyed (> 90%) agreed or strongly agreed that the lifestyle counselors were respectful, that they were comfortable with the lifestyle counselor, and that the lifestyle counselor helped them to develop a personal action plan. However, only 61.3% felt that the plan was easy to follow and only 58% felt they had been successful in reaching their goals. This may reflect overly ambitious goals or the realization that while they succeeded with some aspects of their plan, they still had a long

way to go. The top reasons reported for attending the program were to become healthier through lifestyle changes (64.5%) and to lose weight (22.6%); almost 65% said they achieved what they hoped to achieve from the program. This may suggest that attending the program has more to do with learning how to be healthier than it does with weight loss. This is also supported by the fact that nutrition information and learning how to cook healthier were rated the best components of the program. In addition, when asked about behavioral changes made, eating more fruit (87%), vegetables (90.3%) and reducing sugar (90.3%) were cited most often, while reducing portion size was cited least frequently (67.7%). Most patients reported having changed the food they buy for their families (77.4%) and how they cook (71%); however, lack of family support was considered a barrier to weight loss. Almost 75% felt they were more confident in being able to manage their weight as a result of the program and had attended other activities to enhance their weight loss – particularly exercise programs. Only 35.48% of participants said that their primary care provider (PCP) discussed the weight management program with them since joining the program. Some patients felt that the program could be improved if PCPs "kept on their patients" through on-going communication and were more supportive and encouraging.

There was a disconnect between the number of sessions that participants reported attending and reality. 21.88% of participants said that they attended all of the sessions but in reality, only 9.68% actually attended all six sessions. Participants said they were not sure if they were supposed to call the counselor to schedule the appointments or vice versa. This confusion led them to believe that if there were more sessions, the lifestyle counselors would have contacted them to schedule the appointments. If the counselors never called them to schedule the appointment, the participants might have believed that they were done with the sessions. While the majority of those surveyed (93.6%) felt that scheduling appointments was easy, almost 65% indicated that evening and weekend appointments would be more convenient. The top reason for not attending more sessions was lack of time or scheduling conflicts (37.5%). When asked what they liked best about the program the top responses were a focus on behavioral change rather than dieting and the encouragement they received from the lifestyle counselor. Some participants (5 of 31) felt that the program would have been more effective if they could have had more frequent sessions with the lifestyle counselor. The majority (93.6%) of patients heard about the program from their PCP.

Only 13 of the 31 participants interviewed had participated in the community education program. The majority (10) had attended 4 or more session. Similar to the lifestyle counselor, 11 of 13 participants interviewed strongly agreed that the health educator was respectful, knowledgeable and easy to understand and rated the program highly (8 or more out of 10).

Overall improvements to the weight management program suggested by program participants included the need for more frequent sessions with the lifestyle counselor, more frequent community education classes (weekly); more continuity of lifestyle counselors and health educators (one educator went on maternity leave and patients were seen by other educators), and weekend and/or evening appointments/classes.

Provider Satisfaction: JFMA providers were asked to complete a survey in one of two settings, the monthly staff meeting or the weekly medical resident conference. In addition, telephone surveys were conducted with a subset of JFMA health care providers. Providers were stratified

by the number of patient referrals to the program and fifteen providers were then randomly selected for interview purposes using a random start and then selecting every n^{th} person. Interviews included questions about awareness of the program, perceptions of its effectiveness, feedback from patients, effectiveness of the professional education program and future practice needs for managing obese patients after completion of the grant. Interviews were summarized and thematic analysis was conducted.

Thirty-one staff and providers completed the survey. Multiple tools were developed to raise awareness about the weight management program and to encourage dialogue and referral. BMI charts, referral forms placed at nursing stations and in exam rooms and emails were used most often (93.3, 80.8 and 83.9 respectively) and found to be the most useful in maintaining awareness about the program. In addition, 48.3% of those surveyed said BMI charts in the room and patient self-referral (24.1%) were the most effective referral strategies. Providers interviewed also discussed the usefulness of these tools. According to most providers interviewed, having colorful BMI charts and flyers in exam rooms raised patient awareness that they were obese, empowered patients to discuss their weight with providers, and initiated referral to the weight management program. Other effective strategies were announcements at meetings, grand rounds, and interaction with Dr. Brisbon, a member of the project staff. Interviewees also noted that emails highlighting the number of referrals made by each provider provided a sense of competition and raised awareness about the project. Several of the providers interviewed stressed that referral to the program was sometimes dependent on the Patient's other health concerns at the time of the visit, such as depression or diabetes. While obesity is certainly linked to these health conditions, dealing with depression and diabetes took priority.

When asked about changes made as a result of the obesity program, 70.4 % said they discuss weight more frequently with patients, 29.7% use motivational interviewing more often, 61.5% check for BMI in the patient chart, and 51.9% refer patients more often to community programs. In terms of how providers are managing obese patients now that the program has ended, 68.2% are providing counseling in the office or referring to a pharmacist who provides counseling in the JFMA practice, 36.7% are referring patients to commercial programs (Weight Watchers and Jenny Craig, YMCA), and 32% are referring patients to other health professionals such as nutritionists. Several providers noted that they referred patients to multiple resources, including the JFMA program, because the extent of JFMA's program was limited and they believe that obese patients needed more support and reinforcement.

The majority of providers felt the program was somewhat effective and 11.5% very effective in helping patients to manage their weight. Components cited as working well included BMI charts in exam rooms (30.8%), patient self-referral (23%), lifestyle counseling (23%), and recruitment strategies (15.4%). Providers stated that the recruitment process was easily facilitated due to BMI charts and referral forms availability in exam rooms. They also said that once the age and zip code requirements were modified, recruitment became easier to facilitate. The most problematic component of the project was communication between project staff and care providers (60%). Survey respondents and those staff who were interviewed indicated that they were unaware of which patients had enrolled, the goals patients were working on in their personal action plans, or patient successes related to the program. The original design of the program was based on communication through the EMR; however, the EMR was not initially

available so a triplicate form was developed to provide feedback and was to be placed in the patient chart in the forms section. While this seemed a reasonable approach, filing was often delayed or not entered. This was confirmed in the chart review (only 30% of EMR records included Lifestyle Coaches notes). None of the providers interviewed were aware of the Lifestyle Counselor's chart notes and highlighted the need to have a method in the EMR that triggers awareness of which patients are involved in practice health education programs. This would alert providers to check the notes section of the patient record and remember to address follow-up related issues with the patient, such as did they enroll in the program. The majority of those interviewed felt that the EMR, once enhanced, will address communication and follow-up issues.

Feedback from their patients varied. For the most part patients felt the program was excellent – they received good health information and motivational support. However, several providers noted that feedback varied depending on the assigned lifestyle counselor. Some patients indicated they were not called to schedule a baseline appointment with the lifestyle counselor; however, this may have been a result of incorrect contact information in patient records or disconnected telephones. In addition caller ID influences which calls people choose to answer. This needs to be addressed in the future.

Recommendations for replication and scale-up:

- Increase the upper age level eligible for recruitment to 65.
- Increase the number and frequency of lifestyle appointments. Three months between visits does not provide enough support.
- Put BMI charts in every exam room (these were removed during renovations).
- Provide an easy way for providers to identify accessible (location, cost, etc) community resources that support weight loss and behavior change.
- BMI needs to be more prominent in the patient record. Increase feedback loop by developing a tab in the EMR that triggers the provider's awareness about health education programs in which the patient is participating. This information must be easier to find in the EMR.
- Consider initiating an adolescent weight management program.
- Integrate a family approach into counseling program.
- Improve communication strategies to increase provider awareness about patient involvement in weight management programs.
- Integrate nutrition counseling/lifestyle counselor into the practice. The lifestyle counselor must be visible at JFMA.
- Need to coordinate efforts to reduce obesity with other community resources and partners such as the workplace (systems changes to support healthier nutritional choices and opportunities for physical activity.

Staff Satisfaction: Telephone and in-person interviews: All project staff were interviewed either in-person or by telephone. Interviews included questions about expectations for the program, adherence to protocols, what worked well and could be improved, and recommendations for replication and the future.

Overall staff felt that the referral process worked well, was initiated as planned and became integrated into the practice (providers recognize the need for practice based counseling and have

requested that BMI charts be re-hung in patient exam rooms). Like providers the staff felt that the colorful BMI charts in exam rooms were most effective in raising patient awareness about their obesity, facilitating discussion about obesity and generating referrals. The majority of staff also cited that communication was a major issue. The model called for regular feedback between the providers and project staff but this, as previously discussed did not occur as planned. A factor limiting "face-time" in the practice was constrained by office space issues

In addition, several lifestyle counselors and providers shared that some patients dropped out of the program or were reassigned to another counselor due to personality conflicts with a lifestyle counselor (lack of support/positive reinforcement). In another case a patient suggested that having an overweight counselor did not promote behavior change. This highlights the importance of selecting counselors who are engaging, able to work with multiple cultures and who mirror healthy lifestyle behaviors. Lifestyle counselors and patients shared that continuity of counselors and health educators would have enhanced the program. Once trust/rapport is built with patients changing instructors discourages attendance and follow-through. Lastly, one lifestyle counselor was not always available at times that were convenient for patients. This affected patient enrollment and retention.

Overall staff felt that the community programs were very effective and provided needed support and assistance with problem solving. Lack of consistency of the health educator was again seen as a problem for program participants, but if the curriculum is provided consistently, the impact of staff changes can be reduced.

Programs at the city Health Center had other challenges. While the lifestyle counselor at this site was stable and spoke Spanish, administrators and providers at the Health Center changed often. This impacted the number of referrals into the program. On-going efforts to promote the program were necessary and included announcements at staff breakfasts and meetings, putting referral forms into patient charts, BMI charts in patient rooms, and flyers on bulletin boards and in patient exam rooms. Unlike JFMA, BMI charts were not as useful for generating referrals. In addition, the health center staff was reluctant to refer patients or remind them about appointments. Scheduling appointments with the lifestyle counselor was also problematic because they could not be made through the Health Center system. It was not possible to hold evening appointments or classes at the Health Center. Efforts to schedule community programs at other CBOs were initiated but not successful. Care-giving issues, the economy, disconnected telephone numbers and competing life priorities limited involvement in the community program.

Recommendations for replication and scale-up:

- Integrate lifestyle counselor more fully into the practice.
- Counselors should have time fully dedicated to the project to improve patient access to services.
- Lifestyle counselors should meet monthly with providers whose patients are enrolled in the program or send emails about patient progress on a regular basis.
- Utilize stage theory more regularly with patient counseling.
- Appointments and communication with the lifestyle counselor should be more frequent for patients particularly during the first 3 months for support and reinforcement. Utilize

technology and social networks (Facebook) to encourage communication between program participants.
- Share program results with faculty during grand rounds and residents conference more regularly.
- Specific job tasks should be assigned to a single individual rather than a team approach. This will decrease confusion about roles and responsibilities.
- Community classes should be weekly to avoid confusion and provide greater support initially.
- Offer day and evening classes for convenience of patients.
- Mail reminders to patients who don't regularly attend sessions.

Chart Reviews: An electronic medical record review was conducted to assess the documentation of physiologic indicators such as height, weight, and BMI and notes that promote communication between the lifestyle counselor and physician. This was completed for all program participants who had at least three sessions with their lifestyle counselor and for a random sample of patients with two or less visits (low users). The sample of low-user patients was chosen using a random start and systematic sampling of every fifth patient on the list. Of the 101 charts reviewed, 76.2% had height documented, 92.1% had weight documented and 72.3% had BMI calculated. In addition, half of the charts did not have a physician note that weight management was discussed. Lifestyle counselor notes were found in only 30% of program participants charts supporting provider's comments about the need for better communication and follow-up between providers and lifestyle counselors.

In addition, chart documentation of height, weight and BMI for JFMA patients in general was assessed by reviewing a random sample of 98 JFMA patient charts of patients who visited the practice on three separate days during May 2010. Eighty-four charts (85.7%) had documented height, weight and BMI; 4 charts (4.1%) had documented height and weight but not BMI; and of the remaining ten charts, nine were missing weight and one lacked height (91% of charts had documented weights; 99% of charts had documented heights). Overall, documentation of height, weight, and BMI has improved when compared to documentation findings during the first year of the grant. At that time only 52.8% of charts had BMI documented, 100% documented weight, and 76.4% had heights in the chart.

Based on comments from providers, BMI needs to be more prominent in the EMR. This may encourage completion of heights and weights so that BMI can be calculated automatically and utilization of BMI at patient visits.

Presentations:
1) Brawer R, Jayaraman B, Plumb JD - Assessment of factors that influence participation in a weight management program - Obesity Society – Washington DC – October 2009
2) Plumb JD, Brawer R, Brisbon N - Utilizing the Chronic Care Model in the Management of Obesity In Primary Care Practices Serving an Urban Minority Population – Lessons Learned- American Public Health Association – Philadelphia, Nov 2009
3) Brawer R, Jayaraman B, Plumb JD - Assessment of factors that influence participation in a weight management program – American Public Health Association – Philadelphia, Nov 2009

4) Plumb JD, Brawer R - Utilizing the Chronic Care Model in the Management of Obesity In Primary Care Practices Serving an Urban Minority Population – Lessons Learned- accepted American Public Health Association – Denver, Nov 2010

Publications:
Brawer R, Brisbon N, Plumb JD. Obesity and Cancer. Prim Care Clin Office Pract 2009;36: 509–531

Objective 3- Data Resource and Management Center (DMRC)

Throughout this last grant cycle, the DMRC continued to provide tracking data for the enrollment and participation in the CCIP (objective 2). In the past six months, Dr. Daskalakis supervised the completion of the data entry and data cleaning for the CCIP; the main data analyses for the CCIP have also been completed (see objective 2). Drs. Keith and Ertel have conducted data analyses to address aims of the Research Project (see objective 1).

The DMRC also served as a site for mentoring Cheyney University students. Dr. Daskalakis personally supervised the summer internship of one undergraduate during the summer of 2009. Dr. Daskalakis has also been involved in the mentoring of fellows and junior faculty members, including in the analyses of preliminary data and writing of grants.

DMRC personnel (Dr. Daskalakis and Ms. Andrel) are currently collaborating with Dr. Rappaport in analyses of data obtained through a data use agreement with the School District of Philadelphia. Specifically, the analyses will evaluate a school-based intervention designed to prevent obesity, which was conducted in 10 Philadelphia schools (project funded by the Thrasher Foundation, PI: Dr. Rappaport).

Objective 4- Cheyney University Education and Training Collaboration

Curriculum Development: During the spring 2010 semester, Dr. Rappaport and Dr Hughes again team-taught a research methods class. This was the second time such a class has been offered in the Department of Science and Allied Health at Cheyney. The department has completed the process of permanently adding this course by obtaining the approval of the University Curriculum Committee. It expects to continue this course in future years by making it a prerequisite for students seeking summer internship positions at TJU and other research facilities. Though Dr. Hughes will continue to be involved with this course as its primary instructor, future versions of the course will include the involvement of other departmental faculty members to add breadth to the course and to increase the intensity of the laboratory skills training.

Faculty Development: At the prompting of Dr. Rappaport, grant funds were used to hire a temporary library faculty member to interface with TJU librarians and to develop resources for Cheyney students and faculty. The librarian was employed at Cheyney from December 2009 through May 2010. She assisted Dr. Hughes in the research methods course and developed web-based interfaces and trained students to use available on-line and print resources to access scientific literature. One web interface focuses on obesity and co-morbidities http://cheyney.libguides.com/obesity and a second focuses on more generally research skills

http://cheyney.libguides.com/research and will be useful to science students in all disciplines.

Student research activities: One Cheyney student completed a summer internship with Dr. Constantine Daskalakis during the summer of 2009 (Project Year 4). In addition, 1 Cheyney student worked during the 2009-2010 academic year in the Division of Biostatistics doing data entry for the CCIP and 1 Cheyney student worked with Dr. Hughes on a project to assess adiponectin and IL6 levels in tilapia fed diets containing different processed carbohydrates or lipids sources. To date, 12 of 14 students who participated in research activities during the 4 year grant period have graduated. Eleven of these individuals are working or pursuing graduate studies in mathematics, biology or health-related sciences. Two are biological technicians; one is in nursing school; one is working as a nursing aid and plans to apply to medical school for entry in 2011. Two are enrolled in Master's degree programs in public health; one is enrolled in Master of Financial Mathematics program; one has been accepted in the Master of Science Program in Pharmacology in the Jefferson College of Graduate Studies; one has been accepted in the School of Podiatric Medicine, Temple University; one has been accepted in the Master's Program in Applied Statistics at West Chester University; and one plans to apply to veterinary school in 2011. Surveys completed by 75% of interns indicate that this experience helped them to focus their career plans.