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TITLE: Vitamin D Levels and Related Genetic Polymorphisms, Sun Exposure, Skin Color, and Risk of Aggressive Prostate Cancer

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14. ABSTRACT We have been collecting more participants from the participating sites with funding from Dr. Kittles' laboratory. Preliminary findings showed that the rates of vitamin D deficiency with prospective specimen collection are 76% of all men. Rates of vitamin D deficiency were approximately 45% of European American men in Chicago and 86-95% of African American men depending on which deficiency cutoff definition used. The most predictive factor for being vitamin D deficient was season of the blood draw. Additionally, dietary intake of vitamin D was less than 200IU per day and the majority was not taking vitamin D supplementation. The mean vitamin D levels are lowest in African American men followed by Hispanic men, whom were also more deficient than European American men.					
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ANNUAL REPORT:

INTRODUCTION:

The purpose of the protocol funded by the training award was to determine the influence of vitamin D status and related genetic polymorphisms on overall risk of prostate cancer and risk of aggressive forms of prostate cancer. It involves three Chicago area academic affiliated urology clinics where 2025 men will be recruited. Age 40-79 year old men are recruited prior to prostate biopsy and serum vitamin D and blood for genetic analysis is drawn. Also questionnaires on medical history/demographic information, sun exposure, and dietary calcium and vitamin D intake are ascertained. Finally, the melanin content of the skin is measured using a skin reflectance meter called a Deraspectrometer, to measure baseline skin melanin content, which is known to inhibit vitamin D synthesis from sunlight. This physician research-training award would provide the recipient, Dr. Adam Murphy, with mentorship from prominent researchers from cancer genetics and clinical research in prostate cancer. As part of his training program, he will also be receiving some formal laboratory training from Dr. Kittles on several genetic data analysis techniques and laboratory techniques involved with genotyping. The training program also provided for several opportunities to deepen his connection with other potential research collaborators across institutions. Moreover, it is providing for time for taking classes in the Program in Public Health at Northwestern University to improve his skills in biostatistics, epidemiology and research methods.

BODY: This will address various items described in the Statement of Work as detailed in the original Prostate Cancer Research Program in the protocol description.

Year 1 accomplishments: (Months 1 - 12)

A. ADDITIONAL TRAINING:

1. Taking coursework at Northwestern University's Program In Public Health.

a) Month 3 - 6

1. Topics in Public Health

2. Beginners Epidemiology

b) Months 9 – 12: PUB HLTH 302- Introductory Biostatistics

2. M. Alfred Haynes Health Disparities Research Training Institute-

Month 10: a two-week NIH-sponsored fellowship focused on training clinicians about health disparities research from clinical, translational, and community based participatory research perspectives. This was designed to provide the fellows with knowledge, research techniques and networks for conducting high impact research protocols that addresses health disparities.

B. HRPO APPROVAL:

Month 12: There were multiple delays with the approval for the protocol since there was so many institutions involved and since the primary mentor left University of Chicago and went to University of Illinois at Chicago. It was finally decided in July 2011 that since the protocol was identical at each site and since the principal investigator was responsible for most of the recruiting at each site that the other sites would not be under the purview of the Department of

Defense. The only site that then required HRPO approval was Northwestern University, which occurred in Month 10.

C. IRB PROTOCOL RENEWALS:

1. Month 6 & 7: Submitted information for the continuing reviews to the IRBs of University of Chicago and John H. Stroger Hospital. These amendments were approved.
2. Month 8: February 2011- submitted requested protocol and consent form changes to the Northwestern University IRB and received approval for the continuing review.
3. Month 11: Submitted application to resume recruitment at University of Chicago Hospitals. This decision is still pending.

D. PAPER DRAFTING:

1. Month 11: Submitted an abstract on predictors of vitamin D in Chicago-area men based on preliminary data collection to the American Association of Cancer Researchers Health Disparities Conference.
2. Month 12: Worked on preliminary data collection data to address specific aim 1: determine if there is a correlation between serum 25-OH D levels and Gleason score on prostate biopsies. July – August 2011, work with Dr. Kittles and Catalona on performing data analysis with plans to draft a paper on 25-OH D status and Gleason score on prostate biopsy based on preliminary data collection in conjunction with newly enrolled under the DOD approved consent forms and protocols.

KEY RESEARCH ACCOMPLISHMENTS:

1. I have completed the continuing review for Northwestern University and we will begin recruitment with the revised consent forms listing the Department of Defense as a study sponsor.
2. I have secured a replacement site investigator, Dr. Gregory Zagaja MD, at University of Chicago to allow for continued recruitment at this site since Dr. Kittles left to go to UIC.
3. I have submitted an abstract to the AACR meeting on predictors of vitamin D status and deficiency.
4. I have posted a job posting for a research assistant to aid in clerical and recruiting efforts. I will begin interviewing in September 2011.

REPORTABLE OUTCOMES:

Our group submitted an abstract to the American Association of Cancer Researchers for the Health Disparities conference, which takes place in Washington, D.C. in September 2011. (See Below)

Title: Vitamin D Predictors in African American and European American Men in Chicago

Introduction: Vitamin D deficiency is epidemiologically linked to prostate, breast and colon cancer. African American (AA) men have increased risk relative to European American (EA) men, but few studies evaluate vitamin D status in AA men. We evaluate the biological and environmental predictors of vitamin D deficiency in AA and EA men in Chicago, Illinois, a low ultraviolet radiation (UVR) environment. **Methods:** Blood samples were collected from 492 men, age 40-79, from urology clinics at three hospitals in Chicago, along with demographic and medical information, BMI, and skin melanin content using a portable narrow-band reflectometer. Additionally, vitamin D intake (dietary and supplemental) and UVR exposure were assessed using validated questionnaires. **Results:** Mean and median 25-OH D levels (normal: 30-80 ng/ml) were 17.2 and 16.0 ng/ml in AA men and 26.0 and 25.0ng/ml in EA men, respectively ($p < 0.01$). Also, 93% of AA vs. 69.7% of EA men ($OR = 1.33$) were vitamin D deficient ($P < 0.01$). AA status ($p = 0.04$), age, and BMI ($p < 0.01$) were positively correlated with vitamin D deficiency, while vitamin D supplement use and sun exposure were negatively correlated ($p < 0.05$). Our multivariate analysis revealed that AA status, BMI, and lack of vitamin D supplementation were negatively associated with 25-OH D level ($p < 0.05$). **Conclusion:** AA men in Chicago have high rates of vitamin D deficiency. Race and sunlight exposure should be taken into account for recommended daily allowances for vitamin D intake.

CONCLUSIONS:

The HRPO approval to begin recruiting participants was just provided in month 11. However, preliminary data collection has been continuing and I have worked with my mentors on research training goals. I have also enrolled in multiple classes in the program in Public Health at Northwestern University. We are set up to continue with the Department of Defense approved protocol.

In Chicagoland, 76% of men, age 40-79, presenting to the urology clinics are vitamin D deficient with relatively high rates of deficiency persisting in the warm months in Chicago. The season was the biggest predictor of vitamin D level followed by use of vitamin D supplements. African American men were more likely to be deficient using any of the potential cutoffs. There was also a high rate of deficiency among European American men, which will allow for comparison groups to address our aims. This project will provide adequate numbers of men for detecting the effects of vitamin D status on prostate cancer risk.

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