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Award Number: **W81XWH-09-1-0161**

TITLE: Prostate Cancer Research Training in Health Disparities for Undergraduates (PCaRT)

PRINCIPAL INVESTIGATOR:
Flora A. M. Ukoli

CONTRACTING ORGANIZATION:
Meharry Medical College
Nashville, TN 37208

REPORT DATE: March 2011

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Annual Summary

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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13. SUPPLEMENTARY NOTES

14. ABSTRACT

Meharry faculty mentored five enthusiastic Fisk university students by providing training opportunities in ongoing research projects. Two students were rated as exceptional, two were excellent, and one was good. The two seniors applied for postgraduate positions. The students reported that the program met its training objectives but one student did not understand the objectives of the research project and one other student expected a lot more supervision than received. Four posters are near completion and will be presented at the next student research day at MMC. We met all for training program aims to: 1). Improve knowledge about PCa epidemiology and ethnic disparity. 2). Enhance familiarization with research methods, and critical review of the literature. 3). Improve understanding of communication networks in the African-American community, and Human subject protection training. 4). Improve laboratory and epidemiological methods and skills.

15. SUBJECT TERMS

Prostate cancer, Dietary risk factors, Lycopene, Genetic predisposition, African-Americans, Cancer research training, Quality of life, Community outreach, Recruiting study participants, Cell line inhibition, Animal studies, Prostate cancer screening.

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Annual Report April, 2011

INTRODUCTION:

[Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.]

The Meharry Medical College (MMC) Prostate Cancer Research Program (PCRP) funded by the Department of Defense utilizes a multidisciplinary approach to address the issue of PCa ethnic disparity. Our research cuts across basic science, translational and clinical areas, addressing issues of barriers to PCa screening, investigating the role of diet and nutrients in PCa risk, and studying biological responses of PCa cells to specific exposures in vitro and within mice models to better understand the role they may play in carcinogenesis. **The program goal** is to stimulate the interest of young scientists so as to empower them to consider an academic career in PCa research by providing summer training opportunities for HBCU undergraduates. This is an efficient strategy for sustaining the next generation of minority PCa researchers who will study PCa disparity. **Program Plan:** Fisk University was established in 1867, a couple of years after the Emancipation Proclamation, to provide a comprehensive and quality undergraduate education open to all, regardless of race, and has continued to meet its mission. Across the street from Fisk University, Meharry Medical College (MMC) has maintained an impressive history of leadership in the education and training of minority physicians, and the provision of health services for minority populations in the United States since 1876. These two institutions with a similar mission and passion to serve the same population of the under privileged, are conveniently located for easy collaboration, being situated on the opposite sides of Dr. D.B. Todd, Jr. Blvd, in Nashville. Creating mentorship relationships at the undergraduate level is a solid foundation for Fisk undergraduates to confidently conceptualize their educational growth in the medical field with a focus on research that will impact the African-American community positively. Given the Meharry-Vanderbilt Alliance since 1999, retention of our NCI Comprehensive Minority Institution/Cancer Center Partnership (U-54) grant since 2000 in partnership with the Vanderbilt-Ingram Cancer Center, and several independently funded investigators at Meharry, we are in a very good position to offer a summer training program for undergraduates. This program will enhance knowledge, research competence and skills, foster positive attitude to biomedical research, stimulate interest in prostate cancer research, develop strong mentorship relationships that are expected to continue beyond this period. The program curriculum included tutorials, seminars,
community activities, laboratory experiments, data collection, data management, and development of research reports. **Program aims:** 1). Improve knowledge about the epidemiology of prostate cancer, and the existing ethnic disparity in both incidence and mortality statistics. 2). Enhance familiarization with research methods and the ability to critically evaluate scientific literature in the area of prostate cancer. 3). Improve the understanding of the dynamics of developing, maintaining and sustaining communication networks in the African-American community, and undergo Human subject protection and safety training. 4). Improve laboratory and epidemiological methods and skills particularly related to the research projects of the mentors in this program.
Projects: 1). Community-Based Participatory Research: A prostate cancer education program for low-income African-Americans. 2). Basic science research: Regulation of the Erk signaling pathway by the PPAR gamma ligand troglitazone. 3). The role of lycopene (antioxidant) in prostate cancer risk among African-Americans and Africans. 4.) Case-control study of pesticide exposure and prostate cancer in African American and Caucasian men. 5). Urology symptoms in Nigerians. The program advisory board is composed of MMC and Fisk faculty and headed by Derrick Beech, M.D., professor and chair of surgery at Meharry.

Annual Report April, 2011

BODY:

*[This section of the report shall describe the research accomplishments associated with each task outlined in the **approved** Statement Of Work. Data presentation shall be comprehensive in providing a complete record of the research findings for the period of the report. Appended publications and/or presentations **may** be substituted for detailed descriptions but **must** be referenced in the body of the report. If applicable, for each task outlined in the Statement of Work, reference appended publications and/or presentations for details of result findings and tables and/or figures. The report shall include negative as well as positive findings. Include problems in accomplishing any of the tasks. Statistical tests of significance shall be applied to all data whenever possible. Figures and graphs referenced in the text may be embedded in the text or appended. Figures and graphs can also be referenced in the text and appended to a publication. Recommended changes or future work to better address the research topic may also be included, although changes to the original Statement of Work **must** be approved by the Grants Officer. This approval must be obtained prior to initiating any change to the original Statement of Work.]*

Statement of Work:

Task 1: **Start-Up Phase and Plan Development** **(Month 1 – 4)**

Planning for this summer program started at the beginning of the academic year with discussions with relevant administrators (Vice-President for research at MMC, the Provost at Fisk University, Fisk grant Manager, and Shirley Rainey-Brown (Co-PI).

Selection of Summer Interns: Program Advertisement:
- -Year 1: February 2009
- -Year2: February 2010

1 Co-PI informed faculty at Fisk University to encourage their students to apply for and make use of the opportunity using mass email.

2 Distributed flyers on Fisk University Campus (See Appendix 1: Program Flyer 1)

3 Seminar hosted at Fisk University at which program mentors show-cased their research projects (See Appendix 2: Seminar Flyer 2)

4 Seminar presentations: (See Appendix 3: Three Seminar Presentations) organized for the purpose of show-casing mentors' projects.

5 PI identified Meharry faculty relevant to this program, met with them individually, and secured their cooperation to participate as speakers in the program tutorials.

6 Development and Design of program materials:
-Application package (Appendix 4)
-Program evaluation tool (Appendix 5)
-Student tracking form (Not yet available)

Deliverables:
Meetings	2
Seminar	1
Speakers	22
Program related documents	5

Task 2: Training Primary Mentors (Month 3 – 4)

In 2007 the PI attended the National Leadership Workshop on Mentoring Women in Biomedical Careers. Theme "Mentoring is Everybody's Business". NIH. Bethesda MD. November 27-28, 2007. Program mentors were provided copies of two presentations from this conference to enhance mentoring skills:

1 Nature's guide for mentors
2 Mentor's manual for health sciences training in Uganda.
3 Each mentor had access to the Meharry Office of Faculty Development for additional support to update their mentoring skills.

In 2010 the new mentors, M. Sanderson and SK. Das, received copies of these presentations.

Deliverables: A research team mentoring meeting was held in 2009, but no meeting was held in 2010. Rather the PI met privately with the new primary mentors.

Task 3: Development of research apprenticeship program (Month 3 – 5)

Core course for all trainees: A core course was developed for this program and experts were invited to deliver presentations to the interns. They presentation their talks in 2009 as well as 2010. (Appendix 6)

Training program (Apprenticeship): Each mentor developed an apprenticeship plan for each of the students they mentored. This involved expecting them to read scientific materials in the area of study, get involved in data collection in the laboratory or in the community, and where applicable learn to manage electronic data base, analyze and interpret statistical reports.

Deliverables: Course work and Research apprenticeship Program booklet (Appendix 7)

Task 4: Program Implementation (Month 5 – 24)

Year 1:The Summer Program ran for 10 weeks starting from June 1, 2009 – August 6, 2009. The program started off with a one-week PCaRT Short Cancer Course at which students received introductory information in various research related fields from 20 experts.

Year 2: The Summer program began May 24, 2010, and ended August 6, 2010. (See course schedule in program booklet page 17). After the one week intense course work the interns spent the following 9 weeks completing the following training process:

1 Literature review
2 Critical reading and summarizing of topic related research articles (At least 3)
3 Reading and understanding research project aims and objectives, methods, and protocols.
4 Conducting research
    a. Basic science projects (Laboratory experiments)
    b. Community-based research (Outreach, participant recruitment and consenting)
5 Data collection and Data management
6 Data analysis and preparation of results
7 Preparing reports and/or posters

The mentoring relationship was maintained after the summer to varying degrees by each mentor-mentee pair. The Co-PI was contacted as needed to track summer interns during this period. From January - March 2011 interns from 2009 and 2010 who were able to attend the March IMPaCT conference in Florida were actively involved in completing their posters.

Deliverables for 2010:

8 Posters completed. (Appendix 8)

5Powepoints completed

1 Conference: Attended by PI, Co-PI, and 2 interns (PJ. Moton, and Bomadi Ogaga. 11th Anniversary HBCU/Hispanic Health Services Research Conference, "Health Equity and Ethics: Minority Researchers Leading the Quest for Improved Health Outcomes". Jackson, Mississippi. September 9, 2010.

PI presented preliminary data on prostate cancer education program.

1 IMPaCT Conference: Attended by PI, Co-PI, 2 mentors (S. Sanderson, L. Stewart) 5 Summer interns (V. Edwards, PJ Moton, B. Ogaga, M. Cheeks, C. Fields), and one program volunteers from Union University (C. Franks).

Task 5: Report and Presentation of Program Outcome (Month 12 – 24)

The performance of the 5 summer interns was assessed by each mentor during and after the program. This program was presented at the IMPaCT Conference in FL as poster number P12-1 on page 46 of the conference program. A final program manuscript will be developed for presentation at a national conference and the findings will be published. Mentors are working hard to keep in contact with their mentees before and after they graduate, providing them with letters of recommendation as the apply for positions in graduate schools all over the country. The Co-PI will continue to track program interns, and begin to stimulate interest among the FISK student population to apply for internship if the next summer grant is funded.

We plan to source for funds to continue summer training program for undergraduates, and will be responding to the 2011 DOD PCRP announcement. We intend to source for other funding sources such as the NIH R25 to support this program.

Deliverables:

Tracked all 11 trainees for 2009 and 2010.

Developing manuscript & Presentations at national and international conferences

Annual Report April, 2011

KEY RESEARCH ACCOMPLISHMENTS:

[Bulleted list of key research accomplishments emanating from this research.]

This program succeeded in meeting its goal of establishing a prostate cancer summer research training for HBCU undergraduates at Meharry Medical College.

1. The prostate cancer summer research program (PCaRT) has been established at Meharry Medical College, and the program has been implemented the in its entirety in the summers of 2009 & 2010.
2. 11 HBCU undergraduates were involved in pilot projects under the mentorship of Meharry faculty in the area of basic, translational and clinical research, and they submitted course evaluations.
3. Eight of the eleven mentor-mentee research teams are active and two of them include collaboration with investigators from Vanderbilt University. The mentors also submitted evaluations of their mentee.
4. The program has access to four basic science research laboratories at Meharry developed by Dr. Stewart, Dr. Das, Dr. M'Koma, and Dr. Marshall, and two epidemiology research programs developed by Dr. Sanderson and Dr. Ukoli.

5. <u>Pilot Projects 2009.</u>

   a. Project 1: (Danielle Jones): Inhibition of PCa Growth by Histone Deacetylase (HDAC) inhibitors. (Mentor: Stewart L)

   b. Project 2: (Robertino Simpson): 2-amino-1-metyl-6-phenylimidazole[4,5-b]pyridine (PhIP) induced activation of PCa in a mice model. (Mentor: Ogunkua O)

   c. Project 3: (Charlette Goodin): The Role of lycopene in PCa Risk among African-Americans: A Case-Control Study. (Mentor: Fowke J/Ukoli F).
   The objective of this study is to evaluate the role of plasma lycopene in prostate cancer risk among African-American men in a case-control design.

   d. Project 4: (Liana Geddes): Overcoming barriers to PCa screening among low-income African-Americans in Nashville. (Mentor: Ukoli F/Adams)
   The study objective is to use focus groups to assess the barriers to prostate cancer screening in a low-income African-American community in Nashville. The goal is to improve their level of knowledge about prostate cancer, and positively change their attitude towards early detection of prostate cancer by PSA & DRE screening**.**

   e. Project 5: (Curtis Field): A prostate cancer education program for low-income African-American men in Nashville. (Mentor: Ukoli/Pasipanodiya).
   The study objective is to evaluate a culturally appropriate prostate cancer education program specifically developed for low-income African-American men in Nashville.

   f. Project 6: (Marico Cheeks): The role of meat, fish and eggs in prostate cancer risk among African-American men. (Mentor: Ukoli F)
   The study objective is to use statistical methods to evaluate the role of meat, fish,

seafood, dairy and eggs in prostate cancer risk among African-American men in a case-control design.

6. Pilot Projects 2010:

a. Project 1: (Valexia Edwards): The effect of thiazolidinediones on PCa cell invasion. (Mentor: Stewart L)

b. Project 2: (Mmekom Ekon): Age at circumcision and prostate cancer risk. (Mentor: Sanderson M.)

c. Project 3: (Pierre Moton): Evaluating decisional conflict in a PCa education and screening program. (Mentor: Ukoli F/Adams C)

d. Project 4: (Kerris Sease): Plasma lycopene and PCa Risk among African-Americans and Nigerians: A Case-Control Study. (Mentor: Fowke J/Ukoli F)

e. Project 5: (Bomadi Ogaga): The Pattern of Urological Symptoms in Community and Outpatient Nigerian Men. (Mentor: Ukoli F./Pasipanodya A)

f. Project 6: (Chace Franks: Guest intern volunteer, Union University, Jackson): Dietary intake of vitamin E and other selected antioxidants in prostate cancer risk among African-American men. (Mentor: Ukoli F)

g. Project 7: (All Summer Interns): Plasma Vitamin E and PCa risk in African-Americans and Nigerians: A Case-Control study. (Mentor: Das S.K./Ukoli F)
The goal of this pilot project was to provide the summer interns the opportunity to conduct nutrient assay of vitamin E in serum samples stored from consented study participants previously recruited from Nashville and Nigeria. The students learned how to conduct this laboratory assay.

REPORTABLE OUTCOMES:

[Provide a list of reportable outcomes that have resulted from this research to include:]

Year 1:

1. Laboratory research:
   - i) One completed research project with results
   - ii) One partially completed research project
2. Community-Based Participatory Research
   - i) Two completed projects with results
   - ii) Two sub projects only partially completed

Year 2:

1. Laboratory research:
   - i) One completed research project with results

ii) One partially completed research project

2. Community-Based Participatory Research

iii) Two completed projects with results

iv) Three secondary analysis completed with results

Deliverables: 8 Posters presented at the 2011 IMPaCT Conference in FL. (Listed in Appendix).

CHALLENGES:

Selection of Summer Interns:

Student turn out at both program seminars at Fisk University to advertise the program was not as impressive as expected. This was attributed to students' unavailability as they were preparing for course examinations as well as inadequate dissemination about the seminar. Once a month meeting with interns post-summer has not been regular as students claim time constraint, which is outside the PI's control. However when invited to perform research related tasks they were able to do so, especially when some form of payment was available. The current method of selecting summer interns was based on interview performance. Invitation to interview was based on their application statement of interest in a biomedical research career pathway. It may be necessary to investigate other methods of assessing their interest such as prior involvement in research and health program related activities.

Report Preparation:

Unlike laboratory research, community-based projects take much longer to implement and data management is also more complex. Students were therefore not able to complete the process of data analysis and interpretation. They were therefore expected to focus more on the following areas: Introduction, Aims & Objectives, and Materials and Methods. Only preliminary results were expected from the students at the conclusion of the summer, and they had to work with the mentor thereafter to complete the project posters and final reports.

CONCLUSIONS:

[Summarize the results to include the Importance and/or implications of the completed research and when necessary, recommend changes on future work to better address the problem. A "so what section" which evaluates the knowledge as a scientific or medical product shall also be included in the conclusion of the report.]

It will be highly encouraging if the Department of Defense considers requesting application for grant renewal for another two-year period to maintain the momentum that is building up with the Fisk University undergraduates. This program has successfully stimulated the interest of eleven minority undergraduates in the area of PCa disparity research, they have all demonstrated and showed evidence of their ability to conduct good research, two are already in medical school, one has been admitted to school of dentistry, one is already in a graduate program, and a fifth has applied to graduate school. The enthusiasm of program mentors must be supported by supplemental funds or grant renewal.

REFERENCES: *[List all references pertinent to the report using a standard journal format (i.e. format used in Science, Military Medicine, etc.).]*

APPENDIX:

Appendix 1: Program Flyer

Appendix 2: Program Seminar Flyer

Appendix 3: Seminar Presentations by Mentors (2 of 4 PowerPoint Presentations)

Appendix 4: Application Package For The Program

Appendix 5: Program Evaluation Forms

Appendix 6: Program Coursework

Appendix 7: 2010 Program Welcome & Award Luncheon

Appendix 8: 2010 Program Booklet

Appendix 9: List of Posters Presented at IMPaCT 2011 Conference

Appendix 10: PowerPoint Reports Presented by 2010 Summer Interns at the End of the Program.

i) The effect of TZDs on Prostate cancer Cell Metastasis/Invasion. Valexia Edwards
ii) Plasma Lycopene and prostate cancer risk among African-Americans. Kerris Sease.
iii) Pattern of urology symptoms among Nigerians: Hospital & Community. Bomadi Ogaga
iv) Case-control study of pesticide exposure and PCa in African-Americans. Mmekom Ekon
v) Evaluating decisional conflict in PCa screening among African-Americans. Pierre Moton
vi) Dietary intake of vitamin E in PCa risk among African-American men. Chace Franks

Appendix 11: Posters Presented at IMPACT 2011 Conference in Florida. March 2011. (9 Posters)

Ukoli F, Stewart L, Ogunkua O, Sanderson M, Adams C, Pasipanodya A, Rainey-Brown S, et al.
Ukoli F, **Goodin C, Sease K,** Oguike T, Gross M, Akumabor P, Osime U, Fowke J, Beech D.
Ogaga B, Hassan Z, Ukoli C, Oside P, Iyamu E, Akumabor P, Osime U, Ukoli F.
Cheeks M, Taher K, Weriwoh M, Chambers T, Pasipanodya A, Ukoli F.
Moton P, Patel K, Pasipanodya A, Taher K, Davis R, Beech D, Ukoli F.
Jones D, Stewart L.
Edwards V, Moss P, Stewart L.
Fields C, Geddes L, Patel K, Taher K, Beard K, Adams C, Beech D, Ukoli F.
Ekon M, Sanderson M, Hental P, Ukoli F.

Appendix 12: PowerPoint Reports Presented by a 2009 Summer Intern.

i) The effect of benzo pyrene & cadmium on proliferation of PCa cells. Robertino Simpson

2010 Summer Research Training Program

for

Fisk University Undergraduates

Summer Experience in Cancer Health Disparities Research at Meharry

Basic Science, Translational & Clinical Research

Purpose: To provide prostate cancer research experience for highly qualified HBCU undergraduates who are considering graduate school and careers in biomedical research.

Description: Students will work full-time in laboratories or communities on projects of mutual interest, attend didactic lectures from experts, attend seminars on related and special topics, present written and oral reports on their work, and receive independent study credit.

Duration: Starts May 17, 2010 – August 13, 2010 (12 weeks)

Eligibility:	Applicants must be U.S. citizens, permanent residents, or legal aliens, who have completed at least one year of undergraduate education at Fisk University by summer 2010. Selection will be based on academic record, recommendations from professors and academic advisers, and future career goals. The goal of this program is to encourage and prepare highly qualified undergraduates from an HBCU to attend graduate school and pursue a career in cancer research, particularly prostate cancer disparity research.	
Financial: **Application Package:**	Successful applicants will receive a stipend of $1,500/month with benefits. 1. 2010 Summer Training Program application form (Available at Dr. Shirley Rainey's Office) 2. Letter of recommendation from a Fisk University professor or academic adviser 3. Letter of recommendation from a community member (church, volunteer center etc.) 4. A written personal statement 5. Official transcript(s) of undergraduate grades	
Return to: **Deadline:** **Notification:**	Dr. Shirley Rainey, Dept. of Sociology, Park Johnson Building, Room 311 Fisk University, 1000 7th Ave. North, Nashville, TN 37208 **By 4:00pm., Friday March 26, 2010.** On or before April 30, 2010.	
Information:	Contact: Shirley Rainey, Ph.D. Department of Sociology Fisk University 1000 7th Ave. North, Nashville TN 37208 Tel. 615-329-8756 Email: srainey@fisk.edu	Contact: Flora A. M. Ukoli, MD, MPH. Department of Surgery Meharry Medical College 1005 Dr. D. B. Todd,Jr. Blvd. Nashville TN 37208 Tel: 615-327-6565 Email: fukoli@mmc.edu




MEHARRY MEDICAL COLLEGE AND FISK UNIVERSITY

INVITES YOU TO A

Research Training in Health Disparities for Undergraduates
Prostate Cancer Seminar (PCaRT)

Friday, February 26, 2010
12:00-1:30 P.M.
Appleton Room

The seminar is to provide Fisk's undergraduate students with valuable information about the 2010 Summer Prostate Cancer Research Training Program. Participants will be provided a stipend for participating in the research project.

"COME LEARN MORE ABOUT THIS GREAT OPPORTUNITY"

Department of Defense HBCU Summer Research Training Program

Flora A. M. Ukoli, MD., MPH.

(PI: Meharry Medical College)

Shirley Rainey-Brown, Ph.D.

(Co-PI: Fisk University)

The Program Goal

- Stimulate interest & empower young scientists to consider a career in biomedical research
  - The next generation of minority researchers
- Purpose of biomedical research
  - Cause, Diagnosis, Treatment, Prevention and Control of disease
- Program Focus: Cancer Health Disparities
  - Eliminate the disproportionate cancer burden borne by African-Americans

Program Strategy

- Select 5 Fisk students
  - Expected to receive hands-on experience within existing research projects
  - Developed by the program mentors
- Encouraged to develop a pilot project
  - Can be considered for
    - Selection in the second year of the program
    - Doctoral thesis in the future

Program Aims

- Improve knowledge
  - Prostate carcinogenesis
  - Epidemiology of prostate cancer
    - Existing ethnic disparity in incidence & mortality
- Enhance familiarization with research literature
  - Ability to critically evaluate scientific literature
- Improve research skills
  - Laboratory methods & techniques
    - Conducting experiments
  - Epidemiological methods
    - Community networking, Participant recruitment
    - Human subject protection and safety
    - Data collection and management

Program Mentors

Carlton Adams, M.D.

LaMonica Stewart, Ph.D.

Olugbemiga B. Ogunkua, M.D., Ph.D.

Alphonse Pasipanodya, M.D.

Jay H. Fowke, Ph.D., MPH.

Salil K. Das, Sc.D., D.Sc.

Maureen Sanderson, Ph.D.

Flora A. Ukoli, M.D., MPH.

Dietary Determinants of Prostate Cancer Risk in Black Populations

Flora A. M. Ukoli, MD.,MPH.

Primary Mentor & PI

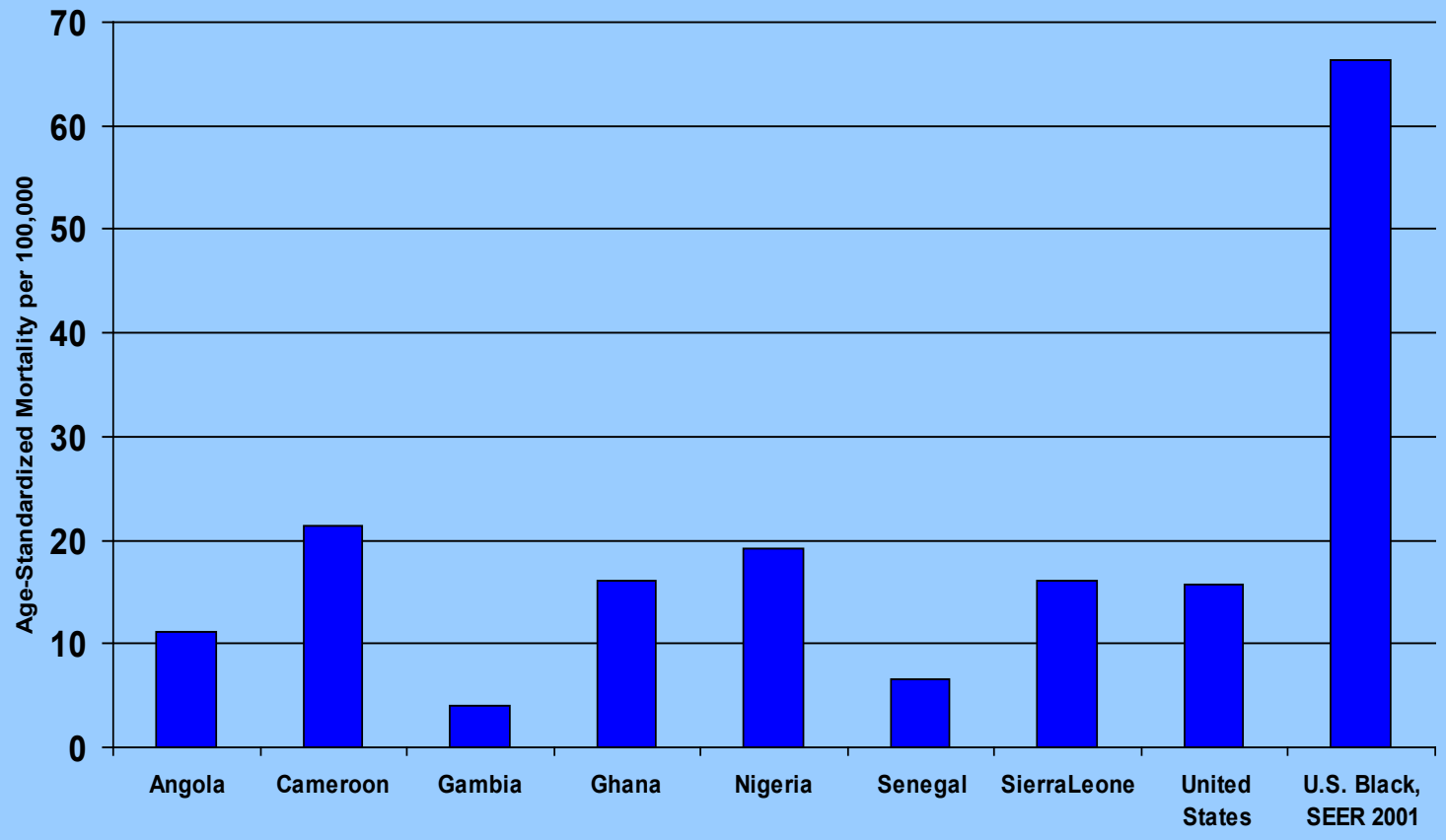
Other Investigators

Jay Fowke, Ph.D., MPH.

Rodney Davis, MD.

Derrick Beech, MD.

Age –Standardized Mortality Rates for Prostate Cancer



Source: Ferlay J, Bray F, Pisani P, et al. GLOBOCAN 2002: cancer Incidence, Mortality and Prevalence Worldwide. IARC Cancerbase No. 5, version 2.0, IARC Press, Lyon, 2004.

Why do African-American men have the highest prostate cancer incidence and mortality in the world? Is this because of genetic susceptibility or environmental exposures? Can we find an answer by comparing African-Americans and Africans who share similar genes but diverse cultural exposures?

Study Design: Case-Control Study

Study Sites: Nashville & Nigeria

Funded by the Department of Defense

Environmental Risk Factors of Prostate Cancer

- It is estimated that 90% of all prostate cancer is due to environmental rather than genetic factors.
- The high disparity in prostate cancer incidence between African-Americans and Africans may be related to diet.
- Reports from research studies:

  Suspected risk factors:

  -DIETARY FAT

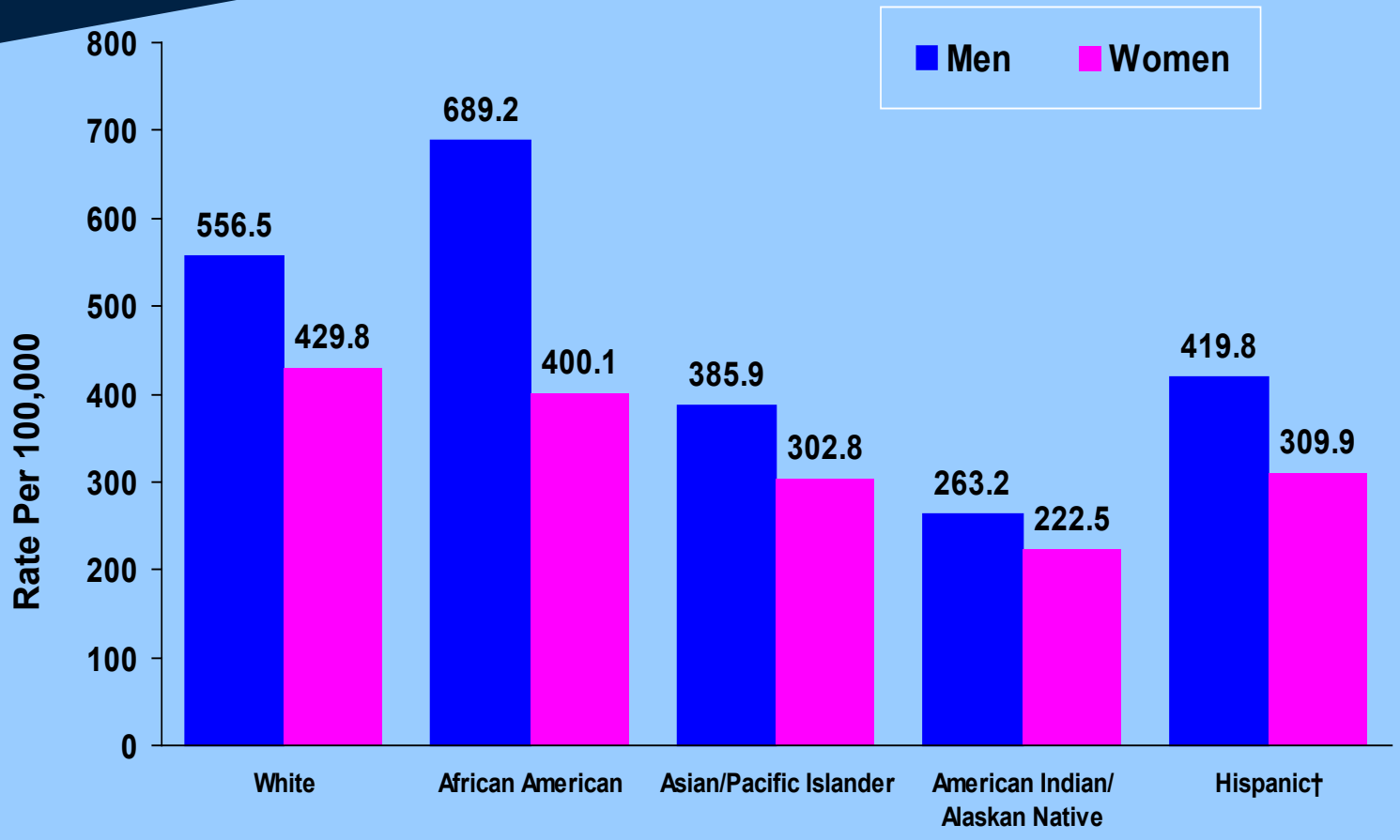
  -Saturated Fat, Omega-6 Fatty acids

  Suspected protective factors

  -Omega-6 fatty acids, antioxidants like lycopene

Cancer Incidence Rates* by Race & Ethnicity

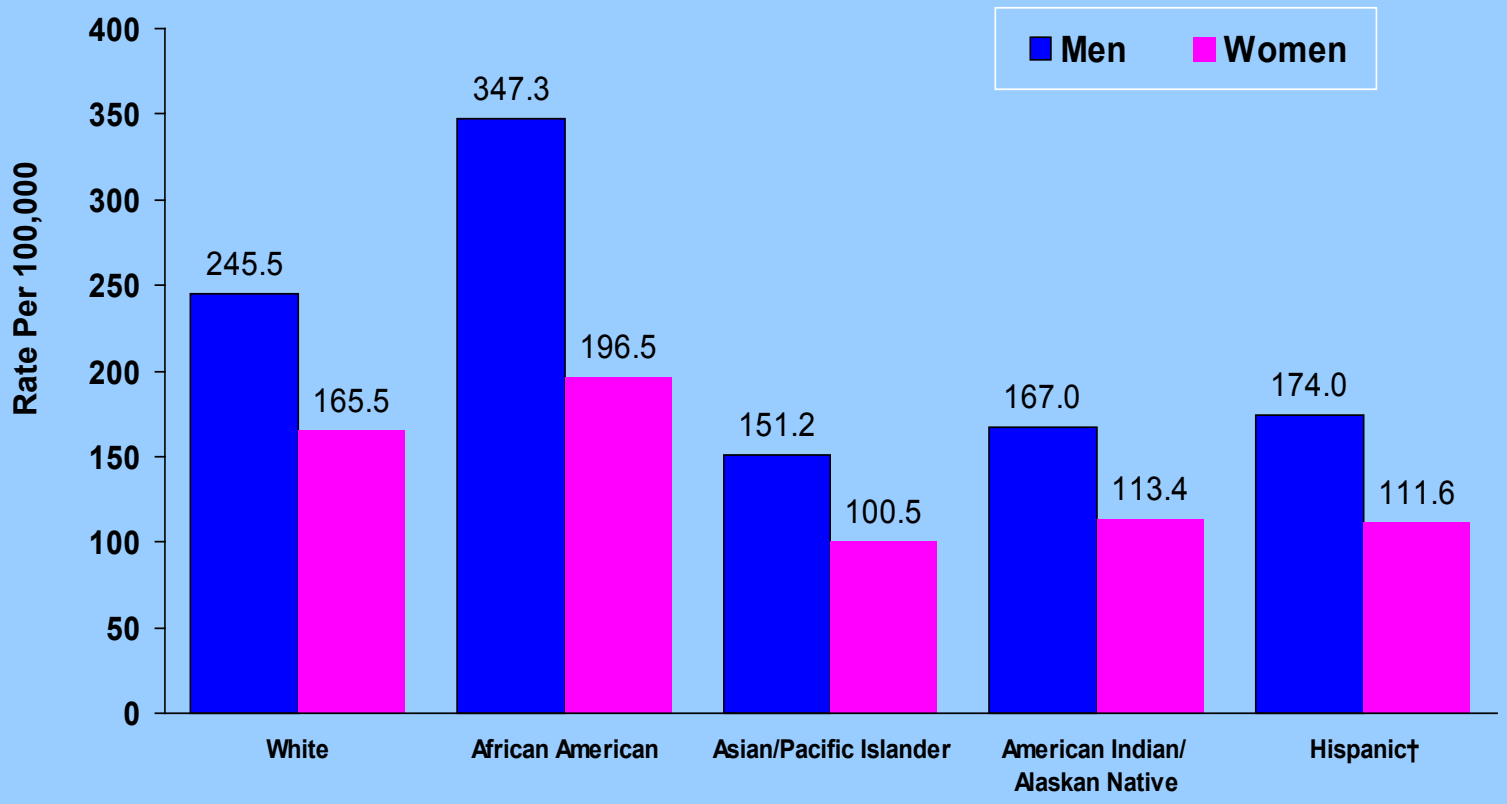
1997-2001



*Per 100,000 Age-adjusted to the 2000 US standard population.
†Hispanic is not mutually exclusive from others.
Source: Surveillance, Epidemiology, and End Results Program, 1975-2001, Division of Cancer Control and Population Sciences, National Cancer Institute, 2004.

Cancer Death Rates*, by Race & Ethnicity.

1997-2001



*Per 100,000, age-adjusted to the 2000 US standard population.
† Hispanic is not mutually exclusive from others.
Source: Surveillance, Epidemiology, and End Results Program, 1975-2001, Division of Cancer Control and Population Sciences, National Cancer Institute, 2004.

Research Goal

- To investigate dietary explanations for the disparity in prostate cancer incidence between African-Americans and Nigerians

&

- Suggest dietary modifications that may prevent or inhibit prostate carcinogenesis

Funded by the Department of Defense

The Role of Summer Student

- Assist in recruiting study participants
  - Outreach: Nashville community
  - Outreach: Selected urology and family practice clinics
  - Telephone recruitment
- Consent & Interview study participants
- Enter data into the database
- Determine the role of specific nutrients in prostate cancer risk using statistical techniques
- Develop a study poster

Already recruited 200 cases and 400 controls

Questions?

DUAL DEGREE PROGRAMS

Carlton Adams, Jr., MD
Chair, Clinical Skills & Competency
Associate Professor of Surgery
czadams@mmc.edu

The Neuroscience MD/PhD is a nationally acclaimed program

Sukhbir Mokha, Ph.D.
Professor, Meharry Medical College; Adjunct Professor of Pharmacology, Vanderbilt University
Department of Neurobiology and Neurotoxicology
Director of Graduate Studies, Neuroscience Program

Students receive full tuition support plus monthly stipend during PhD study

- The MD/PhD program is offered jointly by the School of Medicine and the School of Graduate Studies and Research.
- Students considered for admission to the combined degree program must meet the admission requirements of both the medical and graduate schools.
- Students enrolled in the MD/PhD program matriculate in the School of Medicine for the first two years of their training. After successful performance on the United States Medical Licensing Exam (USMLE)
- Once the PhD requirements are successfully completed, inclusive of publishing a manuscript and successfully defending a dissertation, students re-enter their medical studies and complete the medical school curriculum.

Douglas Robinson

Other dual degrees require separate enrollment

Dean Valerie Montgomery-Rice, MD

School of Medicine at Meharry Medical College

- MSPH
- Cancer Biology (PhD)
- Pharmacology (PhD)
- Microbiology & Immunology (PhD)

School of Medicine
Department of Surgery

Prostate Cancer Research Training in Health Disparities for HBCU Undergraduates (PCaRT Program)

2010 APPLICATION FORM
Due: By 4:00pm. Friday 26th of March, 2010.

Instructions: Complete the application to the best of your ability. Incomplete applications will **not** be considered. Type or print in blue or black ink. The recommendation letters should be enclosed in sealed envelops. Staple the essays, transcript, and envelops to the signed application form.

Last Name First Name Middle Name

SS # _____-____-_____ DOB ____/____/_____ Gender: ___Male ___Female
MM DD YY

Class Standing __ Fr __So __Jr __Sr Major Advisor _____ Phone # _____

Major: _____ GPA _____ Expected Graduation Date ____/____/____ Degree _____

Current Mailing Address & Phone	Permanent Address & Phone (Parent / Guardian)
Number/Street _____	Number/Street _____
City/State/Zip _____	City/State/Zip _____
Current Phone # (_____) _____-_____	Current Phone # (_____) _____-_____
School Email Address: _____	Parent Email Address: _____
Personal Email Address: _____	Parent Name: _____

High School Attended Address City State Zip

List Science related Courses that you have taken or that you are currently taking?

_____ _____ _____

_____ _____ _____

List extracurricular activities and special talents (include school, community, health, religious, and etc.):

1) _____ 3) _____ 5) _____

2) _____ 4) _____ 6) _____

1005 Dr. D. B. Todd, Jr., Blvd.
Nashville, TN 37208-3599
Phone: (615) 327-6342 Fax: (615) 327-5579

Are you: ___U.S. Citizen ___Permanent Resident ___Legal Alien Visa # _____

Self-Identification

___African-American/Black ___White ___ Specify Others _____

What health career are you planning to pursue? (Summary)

_____

_____

_____

_____

_____

_____

Check if you have ever been immunized for: Tuberculosis (TB) _____ If so, when _____

Hepatitis _____ If so, when _____

Provide your health insurance information:

Provider	Policy #	Telephone#

Emergency Contact Name	Phone#	Relation to You

Signature_____

Date_____

APPLICATION SUBMISSION

Important: Because of the large number of applicants, if all of the following **does not** accompany your completed application, you will **not** be considered for placement in this program.

1. One letter of recommendation: – Letter can be from a Fisk University faculty.
   – Letter **must** be received in a sealed envelope.
2. Personal Statement (1-2 pages) about your long term goals and why you think you deserve this award.
   – Typed in 12 fonts, single-spaced.
3. Official copy of your most recent transcript
4. One letter of recommendation from a community member (Volunteer center, religious organization, etc.)

Return or mail completed application packet to:

Dr. Shirley Rainey, Department of Sociology, Park Johnson Building, Room 311, Fisk University, 1000 7th Ave. North, Nashville, TN 37208 Office (615) 329-8756 E-Mail: srainey@fisk.edu

For additional information or questions: Contact Dr. Flora A. M. Ukoli, Program PI at fukoli@mmc.edu

PROGRAM EVALUATION FORM
The Prostate Cancer Research Training (PCaRT) Program

Summer Internship Year: _____

Course: Prostate Cancer Research Training Mentor: _____

Research Project: _____

_____

This questionnaire provides you with the opportunity to evaluate your cancer research training experience as a Summer Intern at Meharry. The results will be used to provide a basis for program improvement and overall effectiveness. Your invitation to a 2nd year of the program will depend on your performance during the summer internship period and your continuing interest in your project after the summer, and will not be based on your response on this form. ……*Thank You!!*

SECTION I: Items ***A-C*** should be answered according to the following scale:

E = Not Applicable
D = Strongly Disagree
C = Mildly Disagree
B = Mildly Agree
A = Strongly Agree

Section A - Organization

1. Learning objectives were clearly stated.	**A**	**B**	**C**	**D**	**E**
2. The syllabus/tasks were organized and clear.	**A**	**B**	**C**	**D**	**E**
3. Grading policy explained	**A**	**B**	**C**	**D**	**E**
4. Time allocated adequately covered the content/tasks appropriate.	**A**	**B**	**C**	**D**	**E**

Section B - Content

5. The application of principles and concepts to problem solving was emphasized.	**A**	**B**	**C**	**D**	**E**
6. The experience provided familiarization with the research topic area.	**A**	**B**	**C**	**D**	**E**
7. The experience provided professional insight into the research methods/techniques.	**A**	**B**	**C**	**D**	**E**
8. The program content was appropriate for the current level of student knowledge.	**A**	**B**	**C**	**D**	**E**
9. Hand out and other materials were up to date	**A**	**B**	**C**	**D**	**E**

Section C – Evaluation

10. Adequate discussion sessions were scheduled during the orientation week.	**A**	**B**	**C**	**D**	**E**
11. Discussion sessions with the mentor were adequate.	**A**	**B**	**C**	**D**	**E**
12. Feedback on my performance was provided in reasonable time.	**A**	**B**	**C**	**D**	**E**

PROGRAM EVALUATION FORM
The Prostate Cancer Research Training (PCaRT) Program

SECTION 2: Items **D-H** should be answered according to the following scale:

E = Not Applicable
D = Strongly Disagree
C = Mildly Disagree
B = Mildly Agree
A = Strongly Agree

D. Organizational Structure

1. The mentor attended all research activities	**A**	**B**	**C**	**D**	**E**
2. Materials presented by Guest Speakers addressed stated learning objectives.	**A**	**B**	**C**	**D**	**E**
3. Research activities began and ended on time.	**A**	**B**	**C**	**D**	**E**

E. Instructor-Student Interaction or Rapport

4. My mentor had office hours for consultations.	**A**	**B**	**C**	**D**	**E**
5. My mentor encouraged discussions and was open to my opinions.	**A**	**B**	**C**	**D**	**E**
6. I was given opportunities to ask questions.	**A**	**B**	**C**	**D**	**E**
7. My mentor actively helped men when I had difficulty.	**A**	**B**	**C**	**D**	**E**
8. My mentor responded to my concerns effectively.	**A**	**B**	**C**	**D**	**E**

F. Teaching Skill, Communication Ability

9. My mentor used language that was comprehensible and spoke clearly.	**A**	**B**	**C**	**D**	**E**
10. Overheads/Slides were readable and comprehensive.	**A**	**B**	**C**	**D**	**E**
11. My mentor actively engaged me in a learning process.	**A**	**B**	**C**	**D**	**E**
12. My mentor used examples or illustrations to clarify reading materials.	**A**	**B**	**C**	**D**	**E**
13. My mentor's presentations/discussions were almost always focused.	**A**	**B**	**C**	**D**	**E**
14. My mentor summarized or emphasized major points.	**A**	**B**	**C**	**D**	**E**

G. Workload, Program Difficulty & Evaluation

15. My mentor tried to cover too much material.	**A**	**B**	**C**	**D**	**E**
16. I needed help to understand most of the materials.	**A**	**B**	**C**	**D**	**E**
17. More time should have been allocated to this section / course.	**A**	**B**	**C**	**D**	**E**
18. The reading assignments were reasonably easy to understand.	**A**	**B**	**C**	**D**	**E**
19. My mentor expectations on the students were reasonable.	**A**	**B**	**C**	**D**	**E**
20. My mentor explained to me how I would be evaluated.	**A**	**B**	**C**	**D**	**E**

H. Impact on Students

21. My mentor enhanced my knowledge in Biomedical / Epidemiology / Health science research.	**A**	**B**	**C**	**D**	**E**
22. My interest in research increased as a result of this program experience.	**A**	**B**	**C**	**D**	**E**
23. I learned useful career enhancing skills in this program.	**A**	**B**	**C**	**D**	**E**

PROGRAM EVALUATION FORM
The Prostate Cancer Research Training (PCaRT) Program

Section 3: Open Remark/Suggestions.

Your comment on strengths, weaknesses you have observed and suggestions for improvements with regard to the following will be appreciated:

	Strengths	Weaknesses	Suggested Improvement
Mentor 1 At Meharry			
Mentor 2 At Meharry			
Fisk University Mentor			
Research Activities			
Research Reports			
Others			
In a grade of **A** (Excellent); **B** (Very good); **C** (Good); **D** (Fair); **E** (Poor), what grade would you give to this Summer Research Internship? _____			

Principal Investigator: Flora A. M. Ukoli

Collaborative Undergraduate HBCU Student Summer Training Program Award

Prostate Cancer Research Training in Health Disparities for HBCU Undergraduates
(PCaRT Program)

Program Development Plan:

1	Announcement Flyer	Draft
2	Application Form	Draft
3	Course Work	Draft
4	Course schedule	Draft

Summer Course: Prostate Cancer Disparity Research (1 Credit Load)

Required Coursework

This summer training program will include a core didactic scientifically sound curriculum designed at the undergraduate level to provide essential knowledge and skills needed to conceptualize research ideas, develop research hypotheses, select an appropriate method, statistical analysis, the fundamentals of data interpretation and presentation of results. The curriculum integrates selected topics from the MSPH, the Meharry Doctor of Science, and the Health Disparities/Culture and Health programs.

Introduction to Epidemiology	3		hours
Prostate Cancer Epidemiology		3	hours
Clinical Research Methods	3		hours
Cancer Biology: Biology of prostate cancer			3 hours
Genes associated with prostate cancer risk			3 hours
Health Disparities: Culture and Health			3 hours
Research Ethics	3		hours
Grant Writing	2		hour
Environmental Health	2		hours
Behavioral Methods	2		hours
Biostatistics: Data Analysis (Hands-On)		3	hours
		Total	30 hours

Description of units within the course:

Introduction to Epidemiology: Introduction to the basic concepts of epidemiology as the study of the distribution and determinants of disease in human populations. The historical roots and uses of epidemiology and the evolution of its methods will be described. The course will also focus on the application of the principles and tools of epidemiology in the decision-making process in the evaluation and planning of health programs. Three major subject areas are included – descriptive epidemiology and the calculation of rates, methods used in analyzing disease outbreaks, and methods of analytical epidemiology (case-control studies, cohort studies and clinical trials).

Prostate Cancer Epidemiology: Describe the trend in the incidence and mortality of prostate cancer in different parts of the world, with focus on the pattern for African-American population. Discuss environmental and genetic risk factors for prostate cancer.

Clinical Research Methodology: Introduction to a variety of research methods, especially the logic of research design and procedure, data analysis, and the reporting of research, both in theory and practice. Course objectives include discussion and application of principles, practices and methods associated with defining the research question, defining hypotheses, research design, sampling techniques, data collection, data analysis and data interpretations, All trainees will be required to present and critique an instructor-approved journal article that demonstrates research methodology as discussed in the course. Trainee's original research proposals will be reviewed, discussed and revised.

Cancer Biology: Biology of prostate cancer:
To be developed.

Genes associated with prostate cancer risk:
To be developed.

Health Disparities: A brief review of the complex subject of health disparities with a special emphasis on disparities in the incidence, prevalence, evaluation, treatment, control, and health outcomes of prostate cancer will be discussed. The strengths and limitations of current methodologies for evaluating health disparities will be discussed, introducing the national surveys and data collection systems available at the CDC to support epidemiological and public health research in chronic disease disparities. Current strategies designed to help eliminate health disparities in general will be addressed. The hypothesis-driven approach and a methodology-based approach will be described.

Culture and Health: An Ethnographic and Qualitative Approach: Briefly examine the roles of race and racism as powerful cultural constructs and ethnicity as a part of cultural identity in shaping individual and community health chances and choices at multiple levels. Emphasis will be placed on analysis of broader systems of culture, socioeconomic structures and psychological conditions that contribute to poverty and lack of health access.

Research Ethics: Introduction to the development of federal guidelines and regulations to protect human subjects who participate in research, including the historical perspectives of human subject protection.
1) Human subject protection and safety training (Online).
2) The IRB application process, Consent forms, HIPAA forms.
3) Regulations to protect research animals. .

Grant Writing: Funding agencies, Pre-doctoral grant application process (announcements and application instructions). Describe application process of various agencies such as DOD, NIH, ACS, Others.

Environmental Health: Introduction to environmental health from local to global perspectives and addressing environmental health issues that may be associated with prostate cancer. The overlap between environment and diet, toxicology, exposure assessment, risk assessment/risk management, air pollution, water pollution, and the built environment/urban sprawl will be discussed.

Health Education & Health Education (Behavioral Methods): Describe and demonstrate the use of a basic framework for systematically applying the behavioral and social sciences to address public health problems such as prostate cancer in the African-American population. Emphasis is placed on the delineation of risk behavior, their determinants, and the design and implementation of appropriately targeted health promotion and education interventions that are likely to impact critical health behaviors and health status.

Course Schedule: Week 1 – Week 12

Week	Day	8-10:00am	10-12:00nn	Lunch	1 – 2:00 pm	2 – 5:00 pm
1	Monday	Orientation	Epi		Epi	Orientation
	Tuesday	Stewart Project	Ca Biology		Ca Biology	Library
	Wednesday	Adam Project	Ethics		Ethics	Ukoli Project
	Thursday	Ogunkua Proj.	Behavior M		Biostatistics	HIV Center
	Friday	Primary Project	Env. Hlth		Grant Writing	Women Center
	Saturday	Community Outreach (All)				
Week	Day	8-10:00am	10-12:00nn	Lunch	1-2:00pm	2 – 5:00pm
2	Monday	Primary Project	PCa Epi		PCa Epi	Primary Project
	Tuesday	Stewart Project	PCa Genes		PCa Genes	Primary Project
	Wednesday	Ukoli Project	Methods		Methods	Ogunkua Project
	Thursday	Adam Project	Hlth Disparity		Hlth Disparity	Primary Project
	Friday	Primary Project	Biostatistics		Grant Writing	Primary Project
	Saturday					
	Sunday	Community Outreach (All)				
Week	Day	8-10:00am	10-12:00nn	Lunch	1-2:00pm	3 – 5:00pm
3 & 11	Monday	Primary Project			Primary Project	
	Tuesday	Primary Project			Primary Project	
	Wednesday	Primary Project	Community Outreach (Optional)			Primary Project
	Thursday	Primary Project	Seminar		Primary Project	
	Friday	Guest Speaker	Community Outreach (Optional)			
	Saturday	Community Outreach (Scheduled/Optional)				
Week	Day	8-10:00am	10-12:00nn	Lunch	1-2:00pm	3 – 5:00pm
12	Monday	Primary Project			Primary Project	
	Tuesday	Primary Project			Primary Project	
	Wednesday	Primary Project			Primary Project	
	Thursday	Presentations	Presentations		Presentations	
	Friday					Award Dinner

Week 1 & 2: Group Orientation: General & Projects
Daily Tutorials from 10:00am 200pm.

Week 3 – 11: Weekly Guest Speaker
Weekly Seminar
Project work with Primary mentor

Week 12: Round-up, Complete Reports, Presentations, Award Dinner

Meharry Medical College
Department of Surgery

Prostate Cancer Research Training Program
(PCaRT)

Summer Experience in Cancer Health Disparities Research

Basic Science, Translational, Clinical Research

Mission

To Eliminate Prostate Cancer Health Disparities

A collaborative partnership between Meharry Medical College and Fisk University

Tuesday, June 8, 2010
Room M202
West Basic Science Building

Searching for the determinants of disease requires that we research in the laboratory as well as in the community. If knocking on each door is what it will take to win the trust of the people we serve, then that is what we shall do. If they accept our greetings and provide the information we seek then we are one step closer to finding solutions that will eliminate the health disparities that plague our people.

Collaborative Undergraduate Historically Black Colleges and Universities (HBCU)
Student Summer Training Program Award

About The Program

This is one of the programs of the office of the Congressionally Directed Medical Research Programs (CDMRP) that manages Congressional Special Interest Medical Research Programs (CSI) encompassing breast, prostate, and ovarian cancers, neurofibromatosis, military health, and other specified areas. The Prostate Cancer Research Program (PCRP) was established in 1997 to promote innovative research focused on eradicating prostate cancer. The PCRP Collaborative Undergraduate HBCU Student Summer Training Program Award was introduced in 1994 to support the training of the next generation of prostate cancer researchers with emphasis on individuals who may be likely to focus their research on addressing prostate cancer health disparities.

Program Goal

To stimulate the interest of minority undergraduates to consider an academic career in prostate cancer research by providing role models as mentors and sources of encouragement, guidance and support. Program students will be expected to receive hands-on experience within existing research projects developed by mentors, and encouraged to develop individual pilot projects.

Training Objectives

1. Improve knowledge about the epidemiology of prostate cancer, and the existing ethnic disparity in both incidence and mortality statistics.
2. Enhance familiarization with research methods and the ability to critically evaluate scientific literature in the area of prostate cancer.
3. Improve the understanding of the dynamics of developing, maintaining and sustaining communication networks in the African-American community, and undergo Human Subject Protection and Safety training.
4. Improve laboratory and epidemiological methods and skills particularly related to the research projects of program mentors.

Program Plan

This is a collaborative partnership between two institutions with the specific mission and passion to serve the under privileged. Fisk University was established in 1867, a couple of years after the Emancipation Proclamation, to provide comprehensive and quality undergraduate education open to all, regardless of race, and has continued to meet its mission. Conveniently located on the opposite side of Dr. D.B. Todd, Jr. Blvd, Nashville, is Meharry Medical College that has maintained an impressive history of leadership in the education and training of minority physicians, and the provision of health services for minority populations in the United States since 1876. This program is built on the solid foundation of the Meharry-Vanderbilt Alliance since 1999, the NCI Comprehensive Minority Institution/Cancer Center Partnership (U-54) grant since 2000 in partnership with the Vanderbilt-Ingram Cancer Center, and several independently funded investigators at Meharry. The strong mentorship relationships are expected to continue beyond this period, building self-confidence, and preparing these undergraduates towards leadership in academic careers in biomedical research.

Prostate Cancer Summer Research Training in Health Disparities

Collaborative Undergraduate Historically Black Colleges and Universities (HBCU) Program

Meharry Medical College & Fisk University Nashville, TN.

PCaRT Summer Program Welcome & Award Luncheon

West Basic Science Building Room M202

Tuesday June 8, 2010		
11:15am	Registration	
11:30am	Program Introductions Program Mentors 2009 Summer Training Program 2010 Summer Interns	Dr. Flora A. Ukoli Program PI Bomadi Ogaga (Summer Intern)
11:50am	Welcome Address	Dr. Derrick Beech Professor & Chair of Surgery
12:00am	Welcome Address	Dr. Billy Ballard Dean of Medicine
12:10pm	Research & Graduate Studies at Meharry	Dr. Fatima Lima Dean of Graduate Studies
12:25pm	Vice-President Address	Dr. Russell Poland Vice-President for Research
12:40pm.	Clinical Research at Meharry	Dr. John Murray Vice-President for Clinical Research
12:50pm	Presentation of Awards	Dr. Derrick Beech Chair of Surgery
1:00pm	LUNCH	
1:30pm	Vote of Thanks	Pierre Moton (Summer Intern)
1:45pm	Closing Remarks	Dr. Shirley Rainey-Brown Co-PI: Fisk University

Funded by the Department of Defense Prostate Cancer Research Program (PCRP)

Grant # W81XWH-09-1-0161 (PI: F. Ukoli)

Prostate Cancer Summer Research Training in Health Disparities

Collaborative Undergraduate Historically Black Colleges and Universities (HBCU) Program

2009 Award Recipients

1. **Charlotte Goodin, BA.** 2010 Sociology, Fisk University.
The role of lycopene in prostate cancer risk among African-American men. (Poster)
Current: Applying to graduate schools/Preparing for GRE.
Part-time research assistant Meharry Prostate Cancer Program.
Goal: Doctoral program in Public Health.

2. **Liana Geddes, BA.** 2010 Biology, Fisk University.
Barriers to prostate cancer screening among low-income African-American men in Nashville/Davidson County. (Poster)
Current: Travelling abroad
Goal: Doctoral program in Physical Therapy

3. **Danielle Jones**, BA. magna cum laude. 2010 Biology, Fisk University.
Regulation of the Erk signaling pathway by the PPAR gamma ligand troglitazone. (PowerPoint)
Current: Applying to graduate schools/Preparing for GRE.
Goal: Doctoral program in Physical Therapy

4. **Marico Cheeks**, Fisk University.
The role of meat, fish, eggs and diary products in prostate cancer risk among African-Americans. (Poster)

5. **Robertino Simpson**, Fisk University.
PowerPoint Presentation:
The effect of Benzo Pyrene and Cadmium on the proliferation of prostate cancer cells. (PowerPoint)

6. **Curtis Fields**, Fisk University.
Evaluation of a culturally appropriate prostate cancer education intervention for low-income African-American men in Nashville. (Poster)

Conference Presentation.
To be presented at the Department of Defense (DOD) IMPACT conference in March 2011, Florida.

Recipient of The Star of Excellence Award.
At the 2010 NCI/CRCHD Professional Development Workshop. April 15-16. Rockville, MD.

Flora A. M. Ukoli, Kushal Patel, Liana Geddes, Charlette Goodin, Katina Beard, Rodney Davis, Derrick Beech, Margaret Hargreaves.
Personalized Prostate Cancer Education Program for Low-Income African-American Men: Impact on Knowledge and Screening. (Poster)

Prostate Cancer Research Program Community Navigators

Mr. Sean Henderson. (Second2None Enterprise)

Rev. John Vine, II. (Faith United Community Church)

Mr. Byron Brown. (Athletic Odyssey Association)

Meharry Medical College
Department of Surgery

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Flora Aroma Ukoli, MBBS.,DPH.,MPH.
Principal Investigator

Dr. Flora Ukoli, Professor of Community Medicine, joined the Department of Surgery at Meharry Medical College in 2003 as research faculty, with a secondary appointment in the Department of Medicine, Vanderbilt University. She received her medical degree at the University of Ibadan, Nigeria (1975), a public health Master's degree from the University of Glasgow, Scotland, and a master's degree in epidemiology from the University of Pittsburgh, PA. Training health professionals to implement health education programs and to conduct research at the community level continues to be her main passion. Over the years she has received guidance from mentors including Dr. Wole Alakija (Nigeria), Dr. Clareann Bunker (Pittsburgh, PA), and Dr. Lucille Adams-Campbell (Washington DC). As well as mentoring resident doctors and post-doctoral fellows, Dr. Ukoli sits on thesis committees and directly supervises students' research, and is a recipient of the Distinguished Graduate Educator Award at the Meharry Medical College. She has collaborated successfully with a wide range of experts as indicated by more than 60 publications in the field of preventive health and disease control, and received a Star of Excellence Award at the 2010 Center to Reduce Cancer Health Disparities (CRCHD) professional development workshop for the poster titled "Personalized Prostate Cancer Education Program for Low-Income African-American Men: Impact on Knowledge and Screening". This poster was developed with two 2009 Summer Interns, Charlette Gooding and Liana Geddes. Dr. Ukoli is a Fellow of the West African College of Physicians, member of the American Public Health Association, Association of Nigerian Physicians in the Americas, the American Cancer Society, and UsTOO International, a non-profit prostate cancer support group. Dr. Ukoli has been invited to present plenary lectures at national and international conferences, and conducts prostate cancer awareness events at local churches and health fairs. Her research projects are funded by the Department of Defense, the Centers for Medicare and Medicaid Services, and the National Institute for Health.

Shirley A. Rainey-Brown, Ph.D.
Co-Principal Investigator

Dr. Shirley Rainey received her philosophy degree from the University of Tennessee, located in Knoxville Tennessee in 2003; She holds two Master degrees, one is sociology (1987) and another master's degree in Student Personnel Services and Counseling (1988) from Western Kentucky University, Bowling Green, Kentucky. She joined the faculty in the Department of Sociology at Austin Peay State University, Clarksville, Tennessee in July 2003 as an Assistant Professor and worked extremely hard to publish scholarly research in professional sociological peer reviewed journals. Dr. Rainey also worked with student recruitment and retention initiatives of black students as well as serve as advisor to the sociology club and the Mu chapter of Alpha Kappa Delta International Honor Society. . She obtained tenure at APSU in 2004. To further her career and research goals, Dr. Rainey joined the faculty in the Department of Sociology and Anthropology at Fisk University, Nashville, Tennessee, and July, 2007. She has continued to publish scholarly works in the field of Environmental Justice in referred sociological journals in her field of study. In February 2009, Dr. Rainey was awarded tenure at Fisk University and promoted to the rank of Associate Professor. She was awarded a United Negro College Fund (UNCF) Mellon Program Fellowship to continue her Environmental Justice/Racism study in McIntosh Alabama in 2008. She is working on publishing this research as well as writing an educational textbook in Environmental Justice.

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Derrick J. Beech, M.D., F.A.C.S.

Professor and Chairman
Department of Surgery
Meharry Medical College

A native of Atlanta, Georgia, Dr. Derrick Beech earned his Bachelor's degree from Duke University with a major in Mathematics and received his Doctor of Medicine degree from the Medical College of Virginia in Richmond. During his Surgery residency training at Temple University Hospital and Clinics in Philadelphia, Pennsylvania, Dr. Beech developed a strong interest in cancer surgery and the compassionate care required in the care of cancer patients. As such, he went on to complete his fellowship training in Surgical Oncology at M.D. Anderson Cancer Center in Houston, Texas. He is currently Professor and Chairman of Surgery at Meharry Medical College, and Chief of Surgery at Nashville General Hospital at Meharry.

Dr. Beech has received numerous honors and awards including membership in the Phi Kappa Phi Honor Society, Alpha Omega Alpha Honor Medical Society and Who's Who in Medicine and Healthcare. He is a diplomat of the American Board of Surgery and a Fellow of the American College of Surgeons. He is a member of multiple national scientific organizations including the American College of Surgeons, American Association of Cancer Education and Cancer Research. He is a respected author in the field of surgery with over 170 manuscripts, book chapters, and abstracts. He has delivered over 90 local and national presentations and served as visiting professor at many leading institutions.

Dr. Beech's research has focused on cancer prevention and control, novel gene therapy for cancer and large scale clinical trials with a special emphasis on breast cancer, sarcoma and colorectal cancer. He has coordinated prostate cancer prevention programs in Western and Middle Tennessee and is an active investigator in prostate cancer prevention clinical trials.

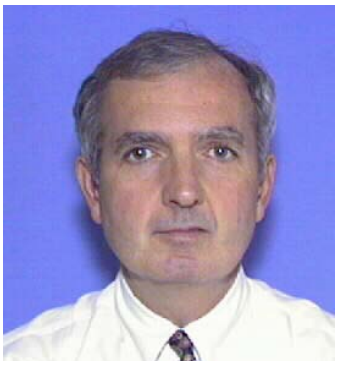
Rodney Davis, M.D.

Professor Department of Urologic Surgery at Vanderbilt University
Chief of Urology Meharry Medical College.

Dr. Rodney Davis earned his Bachelor's degree from Ouachita Baptist University, Arkadelphia, AR, with a major in biology and received his Medical Degree from Tulane University in New Orleans, Louisiana. He completed his Urology residency training at Madigan Army Medical Center, Tacoma, Washington, and his Fellowship in Urologic Oncology at M.D. Anderson, Houston, Texas. He was Chief of Urology, 4005th General hospital in Houston, Texas, served 30 years in the U.S. Army Reserve and retired as a Colonel. He is also Chief of Urology, Tennessee Valley Veterans Health Care System-Nashville

His clinical practice focus is on Minimally-Invasive Urologic Oncology. He has served as the Secretary of the Southern Medical Association, Urology section; and he currently is the Chair of the American Urological Association Hematuria Guidelines Update Committee. He serves as reviewer for the Journal of Urology and Urologic Oncology, and he has been a DOD program reviewer and a grant reviewer. He has been a faculty member of the American Urology Association update course on prostate cancer, and is currently the Chair of the AUA Hematuria Update Committee.

Dr. Davis is Chair of the Tennessee Valley Health Care Robotic Committee and the Developing Robotic Surgery Program. Embracing his passion for the elimination of health disparities he is involved in prostate cancer awareness activities in African-American communities, and in addition to his other research interests he provides urology consultation for the Meharry Medical College Prostate Cancer Research Program, supporting their dietary risk and prostate cancer education studies. He continues to be invited to deliver local and national presentations and has several publications.



John J. Murray, M.D., Ph.D.
Associate Vice President for Research

Dr. John Murray is Professor of Internal Medicine and Biomedical Sciences at Meharry Medical College and Professor of Medicine and Pharmacology at Vanderbilt Medical School, Nashville, TN. He has held the Elizabeth and John Murray Chair of Medicine at Vanderbilt University School of Medicine, and is attending physician at Vanderbilt University Hospital, the Veterans Administration Hospital, and Nashville General Hospital. After graduation from Harvard College, he received doctoral degrees in Medicine and Pharmacology from Vanderbilt University School of Medicine, where he was a National Institutes of Health (NIH) Doctoral fellow, a Vivian Allen Scholar, and an Exchange Fellow of the National Heart, Lung, and Blood Institute and the Soviet Academy of Sciences at the Myasnikov Research Institute of Cardiology in Moscow, Russia. Dr. Murray completed a residency and chief residency in internal medicine and a research fellowship in clinical pharmacology at Vanderbilt University School of Medicine. He subsequently completed postdoctoral fellowships in rheumatology/immunology and allergy/immunology/pulmonary medicine at Duke University School of Medicine in Durham, North Carolina where he remained on the faculty until his return to Vanderbilt Medical School and most recently assuming his roles at Meharry Medical College. He is a member of various organizations, including the American College of Physicians, the American Thoracic Society, and the American Academy of Allergy and Immunology.

In addition to being an associate editor for *Lipids*, Dr. Murray serves as an ad hoc reviewer for such journals as the *New England Journal of Medicine, Molecular and Cellular Cardiology,* and the *Journal of Immunology.* Dr. Murray is the author of 290 articles and abstracts and serves as an invited lecturer at national and international meetings. He has received various awards and is included in *Who's Who in Medicine and Healthcare* and *Best Doctors in America.* In addition to his active clinical practice, he lectures, participates in research supported by the NIH and private organizations, and has directed numerous clinical trials of novel therapies in a variety of disease conditions as well as respiratory and immunologic diseases focusing on his training in clinical pharmacology.

Maria F. Lima, Ph.D.
Dean School of Graduate Studies and Research

Dr. Maria Lima, Professor of Parasitology and Public Health, obtained her Ph.D. degree in Microbiology and Public Health at Michigan State University, and continued her post-doctoral education in the area of Molecular Parasitology at Meharry medical College. Her research is in tropical diseases; specifically in the area of host-parasite relationships, studying growth factor regulation of trypanosome proliferation. Dr. Lima has authored many peer-reviewed manuscripts, and received continuing funding from the National Institutes of Health and the National Science Foundation to support her research and enhance graduate training at Meharry. Under her leadership in the past eight years, the School of Graduate Studies at Meharry has graduated the highest number of African-American Biomedical Science Ph.D. students in the United States. Dr. Lima is intimately involved in minority student outreach at the high school and college levels, with the goal to increase the number of underrepresented students pursuing a career in biomedical research. She serves as consultant and advisor to the National Institutes of Health, was chair of the Minority Access Research Careers Study Session (MARC) at the National Institute of General Medical Sciences, a member of the Genome Research Study Section, National Human Genome Research Institute, and serves on numerous other national committees.

As recipient of the Outstanding Teacher of the Year Award at Meharry Medical College in addition to numerous teaching awards, Dr. Lima has touched many of the students' lives as they matriculate through the institution and nationally. Dr. Lima teaches in all Schools and Programs at Meharry. She is a student advocate and her door is always open to listen to students concerns. In this capacity, her interaction with students is a source of great joy for her.

Russell E. Poland, Ph.D.,
Vice-President for Research

Dr. Russell E. Poland was appointed Vice President for Research (VPR) at Meharry Medical College in April of 2009. Dr. Poland previously served as the President of The Research and Education Institute for Texas Health Resources and Senior Vice President of Texas Health Resources. Dr. Poland earned his Ph.D. in Pharmacology from the David Geffen School of Medicine at the University of California, Los Angeles after receiving the A.B. from the University of California, Berkeley. Dr. Poland currently serves as an ad hoc reviewer for the National Institutes of Health. He has served as a grant reviewer for the National Science Foundation and Veterans Administration and has secured a significant amount of funding as both an NIH RO1 and a Merit Award recipient and as a principal investigator and funded investigator of the NIH/National Institute of Mental Health, NIH/National Institute of Drug Abuse, Glaxo Smith Kline and as co-investigator with the NIH/National Institute of Neurological Disorders and Stroke, NIH/National Center for Complementary and Alternative Medicine, NIH/National Institute of Child Health and Human Development among others.

Billy R. Ballard, DDS., MD.
Interim Dean School of Medicine

Billy R. Ballard, DDS, MD, is Interim Senior Vice President and Dean of the School of Medicine at Meharry Medical College, Nashville, Tennessee; prior to this position he served as Professor and Chair of the Department of Pathology and Associate Dean for Graduate Medical Education. He has a Bachelor of Science degree from Southern University, Baton Rouge, Louisiana and a DDS and MD from Meharry Medical College. He completed residency training in pathology, fellowship in Surgical and Cytopathology, and received fellowships from the National Cancer Institute, the National Institutes of Health and the American Cancer Society.

Dr. Ballard is a Diplomat of the American Board of Oral Pathology and a Diplomat of the American Board of Pathology. His honors include Alpha Omega Alpha Honor Medical Society and Omicron Kappa Upsilon Honor Dental Society, Fellow of the American Society of Clinical Pathologists, Fellow of the College of American Pathologists, and the American Academy of Oral Pathology. Dr. Ballard has been a tenured professor since 1971 and has received teaching awards at the Schools of Medicine and Dentistry at Meharry Medical College, State University of New York, and the University of Mississippi. He is the recipient of the coveted Harris L. Kempner Award, and the Martin Luther King Award at the University of Texas Medical Branch at Galveston. The Texas State Legislature and the University of Texas Medical Branch Alumni Committee honored Dr. Ballard for his leadership in admissions and graduation of students from disadvantaged backgrounds.

Dr. Ballard is a well-respected pathologist and is the Chair of the Pathology Section of the National Medical Association and has chaired this section for the past 20 years. He has more than 110 publications including peer-reviewed journal articles and abstracts and more than 200 invited national and international presentations.

Prostate Cancer Summer Research Training in Health Disparities

Collaborative Undergraduate Historically Black Colleges and Universities (HBCU) Program

Meharry Medical College & Fisk University Nashville, TN.

PCaRT Summer Program Welcome & Award Luncheon

West Basic Science Building Room M202

Tuesday June 8, 2010		
11:15am	**Registration**	
11:30am	**Program Introductions** **Program Mentors** **2009 Summer Training Program** **2010 Summer Interns**	**Dr. Flora A. Ukoli** **Program PI** **Bomadi Ogaga**
11:50am	**Welcome Address**	**Dr. Derrick Beech** **Chair of Surgery**
12:00am	**Welcome Address**	**Dr. Billy Ballard** **Dean of Medicine**
12:15pm	**Research & Graduate Studies at Meharry**	**Dr. Fatima Lima** **Dean of Graduate Studies**
12:30pm	**Vice-President Address**	**Dr. Russell Poland** **Vice-President for Research**
12:45pm	**Clinical Research at Meharry**	**Dr. John Murray** **Vice-President for Clinical Research**
1:00pm	**LUNCH**	
1:30pm	**Vote of Thanks**	**Pierre Moton** **Summer Intern**
1:45pm	**Closing Remarks**	**Dr. Shirley Rainey-Brown** **Co-PI: Fisk University**

Funded by DOD Grant # W81XWH-09-1-0161 (PI: F. Ukoli)

LaMonica V. Stewart, Ph.D.
MENTOR

Dr. LaMonica Stewart is an Assistant Professor in the Department of Cancer Biology at Meharry Medical College and a member of the Vanderbilt Ingram Cancer Center. She completed her doctoral training in the Department of Pharmacology and Toxicology at the University of Texas Medical Branch (UTMB). Dr. Stewart also performed postdoctoral studies in the Laboratory of Cell Regulation and Carcinogenesis, NCI and the Department of Molecular and Cellular Biology at Baylor College of Medicine. Since 2004 she has been a faculty member at Meharry Medical College. She has experience in *in vitro* and *in vivo* studies of nuclear receptor function in prostate epithelial cells and assays designed to examine regulation of gene/protein expression and cell proliferation. She has published twelve peer reviewed papers, eleven of which are in the area of prostate cancer. In order to reduce the number of deaths and public health burden associated with prostate cancer, we must identify therapies that effectively decrease the spread of both early and late-stage prostate cancer. Compounds that activate the peroxisome proliferator activated receptor gamma (PPARγ) have been shown to reduce growth of cultured human prostate cancer cells *in vitro* as well as prostate tumors in mouse models of prostate cancer. However, little is known about the mechanisms that underlie PPARγ ligand-induced growth inhibition, making it difficult to identify patients that would benefit from therapies involving PPARγ ligands. The research goal of my laboratory is to further define the pathways by which PPARγ ligands reduce human prostate tumor growth and progression. We are currently using human prostate cancer cell lines and athymic mouse xenograft models to define the signaling pathways that mediate PPARγ ligand-induced alterations in prostate cancer gene expression and cell proliferation. In addition, we are conducting studies to determine whether PPARγ ligands decrease cancer cell invasion and other processes required for the formation of prostate cancer metastases.

Valexia Edwards
Fisk University Undergraduate

Getting braces was a turning point in my life. I had always possessed a keen interest in science and naturally contemplated a career in medicine. However, upon receiving my braces, I became more and more interested in dentistry. Oral healthcare is highly neglected in today's society, especially in minority communities. My ultimate goal is to combat these disparities and issues.

Many of the dental school to which I am interested in attending are involved in a number of research projects. There is also much research being conducted on the correlation between oral health and cardiovascular disease. If accepted to Case, I would like to get involved in their research projects. Also after conversing with some researchers in the field, I am now contemplating a career in the research aspect of dentistry, which would also allow me to provide adequate dental care and educate people. Participating in this Prostate Cancer Research Training Program would give me the research experience necessary to make a definitive decision as to whether or not I should pursue a career in research. This program would also help me to develop the skills needed to be successful in my endeavors.

Curtis Fields interviewing study participant.

Schrader Lane Church of Christ Health Fair 2009.

Marico Cheeks interviewing recruiting potential study participant.

Summer Interns, Volunteer Resident Dr. & Dr. Michael Okobia (Guest speaker from University of Pittsburgh)

Liana Geddes in the laboratory measuring plasma Vitamin E.

Dr. Flora Ukoli & Charlette Goodin at a local health fair

Alphonse Pasipanodya, M.D.
MENTOR

Dr. Alphonse Pasipanodya is an accomplished and experienced surgeon and faculty member of the Department of Surgery at Meharry. He sustains a vibrant clinical practice, teaches and mentors medical and MSPH students, and provides medical care at the Matthew Walker Comprehensive Health Center where the Meharry Prostate Cancer Education Program is based, volunteering time to offer free prostate cancer counseling and screening for study participants. He also provides the necessary medical consultation for the newly inaugurated UsTOO Meharry Chapter, a prostate cancer education and support group. He serves as a role model of a physician combining clinical work with community-based research. Dr. Pasipanodya is an Alumni of Meharry Medical College.

Pierre "PJ" Moton
Fisk University Undergraduate - Senior

I had never seen anyone in my family graduate from high school. When my teachers and mentors began to stress the importance of a college education, I immediately gained a keen interest in this quest. Although I was academically stable, it wasn't until individuals around me started to mention the opportunities afforded with a college education that I began to establish the mental mind frame that college was the next step. Upon acceptance into Fisk University all I knew is that I wanted to help people. I was simply elated that I had been accepted into a university which now meant that I had set a new milestone for my family. I also came to the conclusion that biology would be my major because I had done so well in all of my high school science courses. After taking a few courses in the natural sciences, I discovered my passion for counseling and youth development. Continuing to stand firm on my goal to help people, I changed my major to psychology and later added sociology as a part of my dual degree. I have since learned the essence of research including literature reviews, data entry, experiment design, and data analysis.

I became a member of the world-renowned Fisk Jubilee Singers® in the fall of 2007, granting me the opportunity to see the world, but also to share my gift with people of many different races, genders, and nationalities, bringing the universal gift of music to the hearts of people all over the country. This has given me a stepping stone to my greater purpose of helping people through an outlet that I never expected to utilize.

I listened to the presentations of the program mentors who came to Fisk University a few months ago and hoped that I would be selected to participate in the prostate cancer education program. I am indeed very glad that I will be working with my primary mentor, Dr. Flora Ukoli, and my secondary mentor Dr. Pasipanodya, to document the findings from this laudable project.

Olugbemiga Ben Ogunkua, M.D., Ph.D.
MENTOR

Dr. Ogunkua earned his M.D. from the University of Ibadan. He received his Ph.D. at Temple University, Philadelphia, PA. He was an adjunct professor in University of Pennsylvania, an adjunct Professor in Drexel University and also an adjunct Professor at Arcadia University, Glenside, Pennsylvania. He is currently an Associate Professor in the Department of Professional Education at Meharry Medical College and also an Associate Professor in Department of Cancer Biology. His laboratory interest is in cancer with emphasis of prostate cancer. He has developed a research program to study prostate cancer progression in a mouse model in collaboration with his mentor at Vanderbilt University, Robert Matusik, Ph.D. This transgenic mouse model is a novel method that mimics the carcinogenic process observed in humans, and can therefore be used to study the effect of environmental toxicants on prostate carcinogenesis. He is also working with novel cell lines that can unlock the intricacy of some of the molecular pathways of prostate cancer progression and metastasis. Among his present work is the impact of Benzo(a)pyrene [B(a)P], a lipophilic aromatic hydrocarbon present in environmental waste and in some foods, on prostate cancer initiation and progression. B(a)P has been implicated in toxicity and in increased incidence of cancer in various organs. To test whether B(a)P alters the rate or extent of cancer development, his laboratory is exploiting genetically engineered mice models that permit the study of prostate carcinogenesis in an experimentally amenable time frame to advance the knowledge about the role of environmental toxicants.

Bomadi Alfred Ogaga
Fisk University Undergraduate.

My name is Bomadi Oghenevwogaga. I am currently a rising junior at Fisk University and I am a biology and chemistry major. I have since discovered about the wonderful educational opportunity being offered through the means of this internship by Meharry, through recommendations from various friends. When I first arrived at Fisk University, I was told that Meharry was an institution dedicated to the provision and enrichment of the intellectually hungry African American minds. Although I am not an African American I believe that Meharry would have provided me with an invaluable experience if I am accepted into this summer internship program. I want to become a medical practitioner someday and as such medical research is going to be paramount to my success as a doctor. This research experience is going to equip me with the necessary skills I need to excel not just in the medical field, but also on my way to attaining my doctorate degree. I am aware of all the research required in medical school and also all the research that I must participate in if I want to specialize and become a surgeon and I believe that this opportunity will also help me towards such an end.

I hope I have been able to portray why I should be considered a major contender for a position on the team of researchers for this year's summer internship program. I look forward to hearing from you soon and I hope I will be permitted the opportunity to give my very best input towards the acquisition of solutions to the different interesting challenges the team is going to be faced with this summer.

Maureen Sanderson, Ph.D.
MENTOR

Dr. Maureen Sanderson earned her Bachelor's degree from Ohio State University with a major in nutrition, her Master's degree from University of Texas-Houston School of Public Health with a major in nutrition, and her PhD from University of Washington with a major in epidemiology. She is currently Professor of Obstetrics and Gynecology and Chair of the Institutional Review Board at Meharry Medical College.

Dr. Sanderson has received many honors and awards including membership in Sigma Xi and Delta Omega Honor Society's, the Texas Department of Health Friends of Public Health Award, and the American Association of Cancer Research Minority-Serving Institution Faculty Scholar in Cancer Research Award. She is a member of several national scientific organizations including the Society for Epidemiologic Research, the American Association of Cancer Research, and the American Public Health Association. She serves as a reviewer for Cancer Epidemiology Biomarkers and Prevention, Cancer Causes and Control, Journal of the National Cancer Institute and International Journal of Cancer, and has been a grant reviewer for DOD, CDC, and NIH.

Dr. Sanderson is a noted author in the field of cancer epidemiology with over 110 manuscripts and abstracts, and over 75 local and national presentations. Her research, which has been funded by DOD, CDC and NCI, has focused on cancer prevention and control with a special emphasis on prostate, breast and cervical cancer. She teaches epidemiologic methods in Meharry Medical College's Master's of Science in Public Health program and Vanderbilt University's PhD in Epidemiology program.

Mmekon-Abasi Ekon
Fisk University Undergraduate

As a physics and biomedical engineering major, I have come to realize that in order to be a successful scientist I need considerable amounts of not just formal classroom training but also active laboratory research. The latter, as I have found, serves to drives the concepts learned in the classroom more thoroughly "home." Therefore, I avail myself of every opportunity both in physics and biomedical engineering to acquire the valuable knowledge and experience that comes with a standard undergraduate research program.

I hope to gain more research experience in the biomedical engineering field and participating in the Pcart program will expose me to the methodology of research I seek. This research program will put me in an environment of teamwork and education in the mist of accomplished PhDs, and provide me with first-hand experience in the laboratory. I am more than delighted that I have been chosen for this program not only because it is a valuable hands-on experience but also because I believe that I will be a beneficial addition to the research team.

Carlton Adams Jr., M.D.
MENTOR

Dr. Carlton Adams is associate professor of surgery and chair of the Division of Clinical Skills & Competency. He has carefully balanced his role as a clinician, mentor, and educator while contributing significantly to the development of his medical students. His busy clinical practice in the specialties of Peripheral Vascular Surgery and General Surgery are vital contributions to the underserved communities in Davidson County and Meharry Medical College. He was recently featured on the front page of the Nashville Pride, a local newspaper that serves the minority community, where they honored him as a model physician during the celebrations for Black history month. He serves as a role model and secondary mentor for all the trainees such that they see first hand the blending of a career that straddles both clinical and scientific interests.

Jay H. Fowke, Ph.D., MPH.
CONSULTANT

Dr. Jay Fowke is an epidemiologist holding the position of Assistant Professor of Medicine at Vanderbilt University. He has received funding as PI for prostate cancer research from the NCI, American Institute of Cancer Research, Department of Defense, and the Prostate Cancer Foundation, and has published in leading journals on the relationships between race, obesity, and prostate cancer detection. He is currently conducting research investigating racial differences in prostate cancer detection. Dr. Fowke developed the Nashville Men's Health Study to permit investigation of prostate cancer molecular biomarkers while controlling for prostate cancer screening and detection practices, and conducted case-control and retrospective cohort investigations of the association between genetic polymorphisms in P-450 enzymes and PPAR-γ2 agonists (i.e.,thiazolidinediones) with prostate cancer or prostatic intraepithelial neoplasia. Dr. Fowke is co-investigator on the Meharry Prostate Cancer Research Program, serves as a consultant on this program, and collaborates with Dr. Ukoli on other prostate cancer research projects.

Flora Ukoli, Jay Fowke, LaMonica Stewart, Ben Okunkua, Shirley Rainey-Brown
Presenters at the 2010 Program Seminar at the Fisk University.

Salil K. Das, Sc.D., D.Sc.
MENTOR

Dr. Salil K. Das is a Professor of Biochemistry at Meharry Medical College. Dr. Das earned the Sc.D. degree from Massachusetts Institute of Technology, Cambridge, MA in 1966 and the D.Sc. degree from Calcutta University in 1974. After postdoctoral work at the University of Arizona, University of Arkansas and Duke University, he joined the faculty of Meharry Medical College in 1969, in the Department of Biochemistry where he rose to the position of professor in 1981. His research focuses on the elucidation of molecular mechanisms of pulmonary diseases (ARDS, COPD and cancer) associated with environmental toxicology. These studies include (a) reactive oxygen species- mediated signal transduction pathway, (b) expression of regulatory enzymes in phospholipid metabolism, (c) expression of mediators of vitamin A action, and (d) expression of beta-adrenergic and peripheral benzodiazepine receptors (PBRs). Dr.Das is a recipient of numerous research grants and has published several manuscripts in peer-reviewed journals.

Chace Franks
Union University Undergraduate

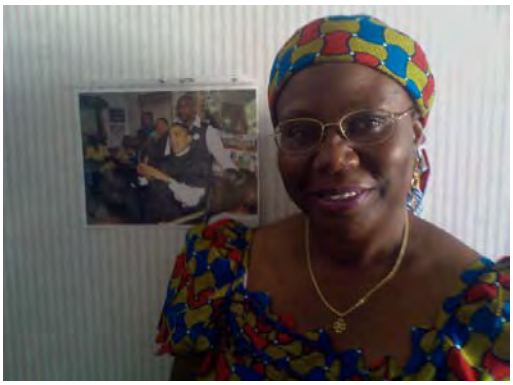
"You have not because you ask not" (James 4:2).

After hours of searching the Internet, I found Dr. Flora Ukoli and a research project that particularly interested me. After a personal interview with Dr. Ukoli, she presented to me the opportunity to be a research assistant. Since I do not go to school in Nashville the only time to do this would be in the summer. I am therefore very glad to have been selected to join this team of undergraduate summer interns.

I have many family members who have died from cancer, so I have a great determination to research and learn as much as possible about this devastating disease. I believe that education is the tool with which to initiate both preventative and curative measures. I am a senior with an intended graduation date of May 2011, and I am currently pursuing a degree in professional biology, with a minor in chemistry.

My family is not wealthy by financial standards, but is a family with a wealth of values and perseverance. They taught me that one works for what he wants, sets goals, and strives to achieve them. Having come from a rural community and an underserved area, I have a personal awareness of how limited access to healthcare is detrimental to individual persons and to the community as a whole. I intend to be a part of the solution to this problem by taking the negatives in life and turning them into positives. After working in the local government funded healthcare clinic along side Dr. Chad Smith, Dr. Gilbert Thayer, and Dr. Nancy Armetta, I developed an appreciation for those who are willing to provide care to those of low socioeconomic status. My goal is to one day become a physician and aid in the care and prevention of disease, specifically in underserved communities. With a compassion for people and a love of science, I hope to contribute to the prostate cancer research training program at Meharry Medical College. I hope to become familiar with some practical skills in community outreach and engagement, and to learn laboratory techniques.

Through my faith in Christ, I believe everyone is given a special gift or talent, and I believe mine lies in the study and practice of medicine. I look forward to being a part of the team, and to being surrounded by determined people all working towards a common goal.



Flora A. M. Ukoli, MD, MPH.
MENTOR

Dr. Flora Ukoli is professor in the Department of Surgery with over twenty years research experience in preventive medicine with a focus on primary health care utilization and epidemiology. She now directs community-based prostate cancer education, screening and research programs at Meharry. Her main research focus is to identify dietary risk and protective factors of prostate cancer in African-Americans and Nigerians. This theme will be expanded to investigate gene-nutrient risk associations in populations of African ancestry. One of her studies is investigating the role of lycopene, an antioxidant found in tomatoes, in prostate cancer risk reduction. Prostate carcinogenesis involves complex interactions of several environmental, hormonal and genetic predispositions, presenting numerous opportunities for student pilot projects that will focus on the role of selected vitamins and/or antioxidants in the target population. The second research area is developing and evaluating prostate cancer education intervention programs for African-Americans and minorities, with particular attention to low-income medically underserved populations. Mentees in her program will be fully involved in community outreach, developing strong community networks based on mutual respect and trust. By spreading awareness and unbiased information about prostate cancer, and emphasizing the regulation and safety of biomedical research, program interns will gain the trust of the people and this will positively impact the number of African-American participants in epidemiological research as well as in clinical trials.

Ms. Kerris Sease
Fisk University Undergraduate

A good teacher is like a candle –
It consumes itself to light the way for others.

My name is Kerris I. Sease, and I am a Biology Major from Buffalo, New York. After graduating in May of 2012, my goal is to earn my Ph. D. in Zoology in order to teach in the Biological Sciences at a HBCU. While teaching, I hope to excite my students about biology and motivate them to excel in their area of choice. I also hope to gain enough wisdom to give my students advice on life and be a helpful mentor. While teaching my dream is to also have the opportunity to conduct Colon Cancer research that will make way for new discoveries and innovative ways to detect the cancer and effectively treat patients.

While participating in the PCaRT program, I hope to learn more about the field of research. I also hope to learn much from the mentors of this internship, while collecting information that will help me determine how I can make I difference in the career of my choice. By working with the community I plan to better understand what it takes to really help people how they need to be helped, and by working in the lab I plan to learn the skills and procedures needed to be an effective researcher.

Prostate Cancer Summer Research Training in Health Disparities

Collaborative Undergraduate Historically Black Colleges and Universities (HBCU) Program

Meharry Medical College & Fisk University

PCaRT Short Cancer Course: May 2010

Day	8:00 – 10:00 am	10:00 – 12 noon	12 nn –1 pm	1 :00 – 2:00 pm	2:00 – 5:00 pm
Monday May 24	Community Outreach Ms. M. Reece	Cancer Biology I Dr. L. Stewart		Breast Cancer Research Dr. A. Malin-Fair	IRB Training Ms. C. Weaver
Tuesday May 25	The Patient Navigator Lovell A. Jones, Ph.D. * Research Ethics Dr. C. Freund	Hazard Communication Standard Training Mr. D. Powell Blood Borne Pathogen Standard Training Mr. Cedric Harville	L	Epidemiology of Prostate Cancer. Dr. J. Fowke	Cancer Biology I Dr. L. Stewart Project: Dr. L. Stewart Cell Study
Wednesday May 26	Project: Dr. O. Ogunkua Animal Model	Diabetes/Obesity Research Dr. S. Miller-Hughes Epidemiology: Data Collection Dr. Flora Ukoli	U	Project: Dr. M. Sanderson Prostate Cancer Research	Cancer Epidemiology Dr. A. Pasipanodya Project: Dr. A. Pasipanodya Prostate Cancer Education
Thursday May 27	Cohort Studies Dr. F. Ukoli	Health Disparity and CBPR Dr. Leah Alexander Case-Control Studies Dr. J. Fowke	N	Cancer Biology 2 Genes and Cancer Dr. O. Ogunkua	Project: Dr. F. Ukoli Vitamin E & Prostate Cancer
Friday May 28	Digital Library Mr. R. Dryden	Biostatistics: Introduction Mr. Tan Ding	C	Genomics Dr. S. Pratap Director	Diagnosis and Management of Cancer: General Principles Dr. C. Adams
Saturday To be Determined	Community Outreach: Community Health Fair ALL STUDENTS		H		
Sunday To be Determined	Community Outreach: Schrader Lane Christ Church ALL STUDENTS			Community Outreach ALL STUDENTS	

* Guest Speaker: Additional Guest Speakers, Workshops and Seminars to be announced: 12:00 – 1:00pm Weeks 4 - 9

Funded by DOD Grant # W81XWH-09-1-0161 (PI: F. Ukoli)

"The time is always right to do what is right"

Martin Luther King, Jr.

Collaborative Undergraduate Historically Black Colleges and Universities (HBCU)
Student Summer Research Training Program Award

Funded by the Department of Defense Prostate Cancer Research Program (PCRP)

· Dr. Flora A. Ukoli Posters for IMPACT March 2011.

Order of authors, and Institutional affiliation for all abstracts.

PC041176-2019

PLASMA LYCOPENE AND PROSTATE CANCER RISK AMONG AFRICAN AMERICANS AND NIGERIANS: A PILOT CASE-CONTROL STUDY

Flora A. Ukoli[1], Charlette Goodin[3], Kerris Sease[3], Temple Oguike[2], Myron Gross[5], Phillip Akumabor[2], Usifo Osime[2], Jay Fowke[4], and Derrick Beech[1].

[1]Meharry Medical College, Nashville, TN., [2]University of Benin Teaching Hospital, Nigeria, [3]Fisk University, Nashville, TN., [4]Vanderbilt University, Nashville, TN., and [5]University of Minnesota, Minneapolis, MN.

PC041176-2102

PATTERN OF UROLOGY SYMPTOMS AMONG NIGERIANS: HOSPITAL AND COMMUNITY EXPERIENCE

Bomadi A. Ogaga[5], Zuwaira Hassan[3], Chrsitiana O. Ukoli[3], Efosa Iyamu[2], Philip Oside[4], Temple Oguike[2], Usifo Osime[2], and Flora A. Ukoli[1].

[1]Meharry Medical College, Nashville, TN., [2]University of Benin Teaching Hospital, Nigeria, [3]University of Jos Teaching Hospital, Nigeria, [4]Specialist Hospital, Warri, Nigeria, and [5]Fisk University, Nashville, TN.

PC041176-2206

THE ROLES OF MEAT, FISH, EGGS AND DAIRY PRODUCTS IN PROSTATE CANCER RISK AMONG AFRICAN-AMERICAN MEN

Marico Chceks[2], Khandaker Taher[1], Mirabel Weriwoh[1], Tiffany Chambers[1], Alphonse Pasipanodya[1], and Flora Aroma Ukoli[1]

[1]Meharry Medical College, Nashville, TN., and [2]Fisk University, Nashville, TN.

PC080050-1959

PROSTATE CANCER RESEARCH TRAINING IN HEALTH DISPARITIES FOR UNDERGRADUATES

Flora A. Ukoli[1], LaMonica V. Stewart[1], Maureen Sanderson[1], Alphonse Pasipanodya[1], Salil K. Das[1], Olugbemiga Ogunkua[1], Shirley Rainey-Brown[2], Carlton Adams[1], Jay H. Fowke[3], Rodney Davis[3], and Derrick J. Beech[1].

[1]Meharry Medical College, Nashville, [2]Fisk University, Nashville, and [3]Vanderbilt University, Nashville, TN.

PC080050-2156

EVALUATING DECISIONAL CONFLICT IN A PROSTATE CANCER EDUCATION AND SCREENING PROGRAM FOR LOW-INCOME AFRICAN-AMERICANS

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PC080050-2161

REGULATION OF THE ERK SIGNALING PATHWAY BY THE PPAR GAMMA LIGAND TROGLITAZONE

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PC080050-2162

THE EFFECT OF THIAZOLIDINEDIONES ON PROSTATE CANCER CELL INVASION

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PC080050-2180

DEVELOPING A CULTURALLY APPROPRIATE PROSTATE CANCER SCREENING EDUCATION INTERVENTION FOR LOW-INCOME AFRICAN-AMERICAN MEN IN NASHVILLE, DAVIDSON COUNTY

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PC080050-2185

AGE AT CIRCUMCISION AND PROSTATE CANCER RISK

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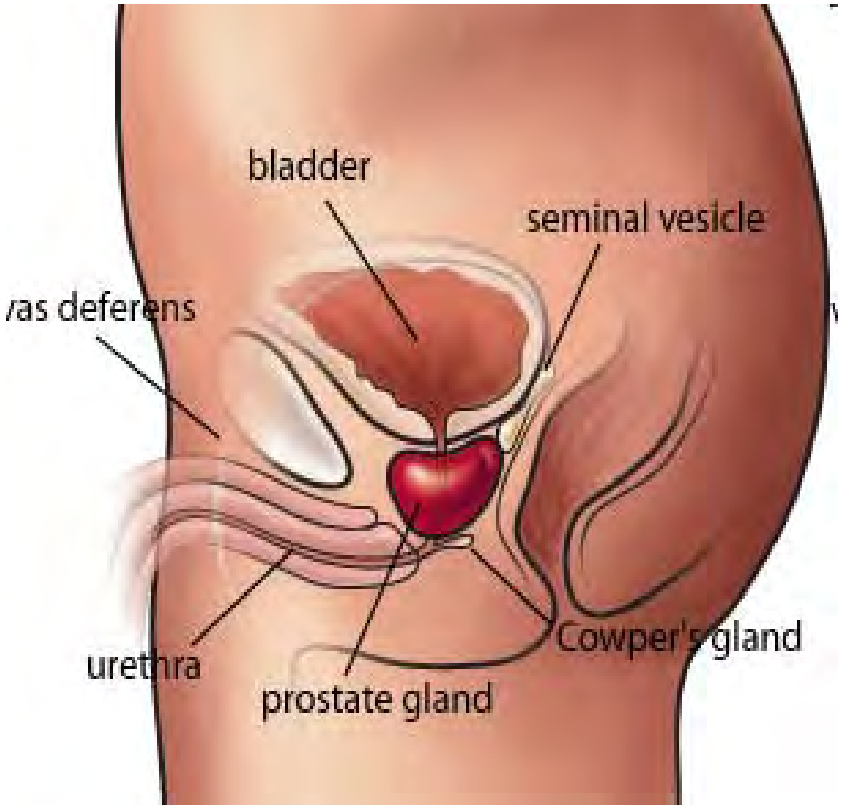
The Effect of TZDs on Prostate Cancer Cell Metastasis/ Invasion

Valexia Edwards
Laboratory of Dr. LaMonica Stewart
July 14, 2010

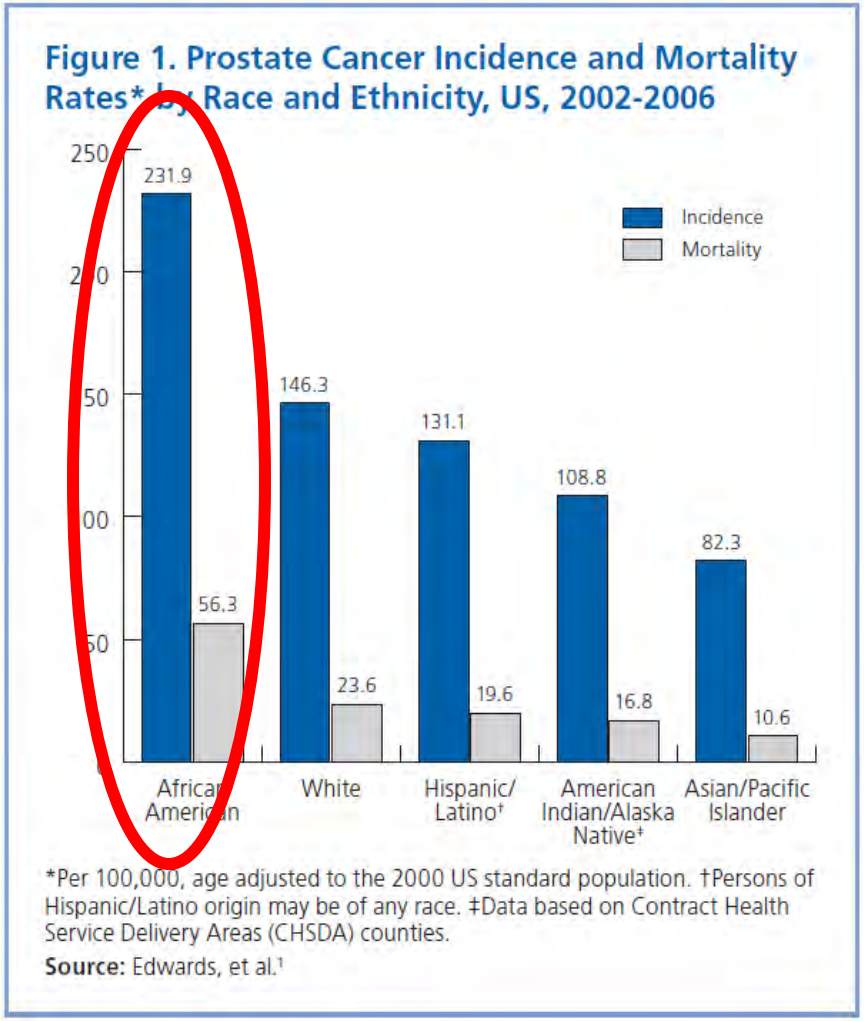
The Prostate

- A male organ/gland
- Located underneath the bladder
- Responsible for the composition and secretion of seminal fluid
- Dependent upon androgens for growth



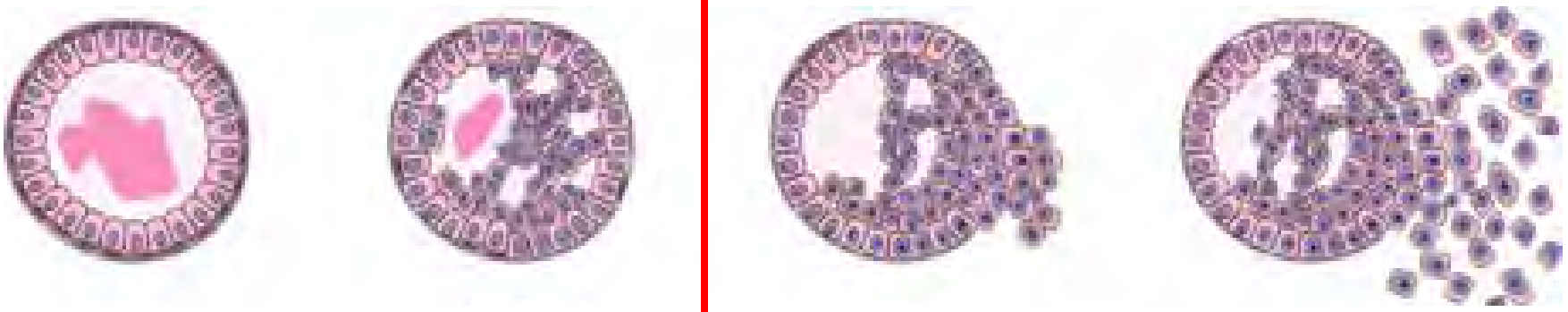
Prostate Cancer

- Most common cancer in American men
  - More than 186,000 men are diagnosed each year
- 2nd highest cause of cancer-related deaths in American men
- Risk Factors
  - Age
  - Family History
  - Race



American Cancer Society: Cancer Facts and Figures 2010

Prostate Cancer Development and Progression



Normal epithelium → Prostatic intraepithelial neoplasia (PIN) → Invasive carcinoma → Metastasis

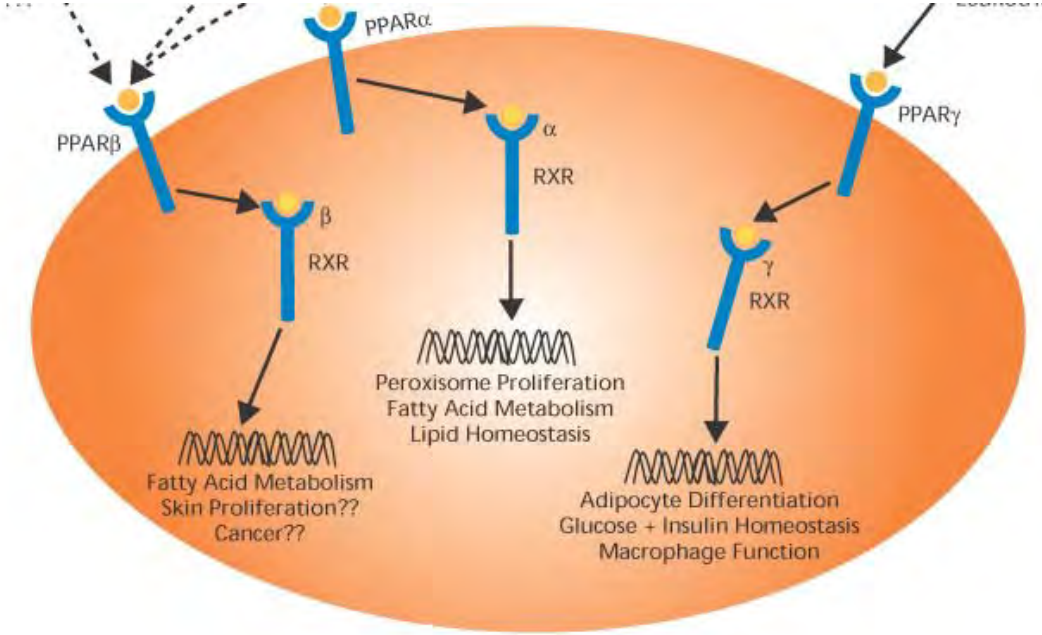
- **Cancer cells break through ECM to move away from primary tumor**
- **Cancer cells spread from one organ/tissue to another**

Treatment Options

- Early stage
  - Surgery (prostatectomy)
  - Radiation Therapy
- Advanced stage
  - Androgen Ablation Therapy (AAT)

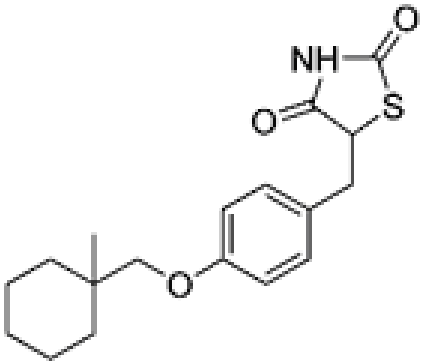
PPAR-γ

- Peroxisome Proliferator-Activated Receptor gamma (PPAR-©)
  - Member of the hormone nuclear receptor superfamily
  - Ligand- activated
  - Regulates adipocyte differentiation and glucose homeostasis



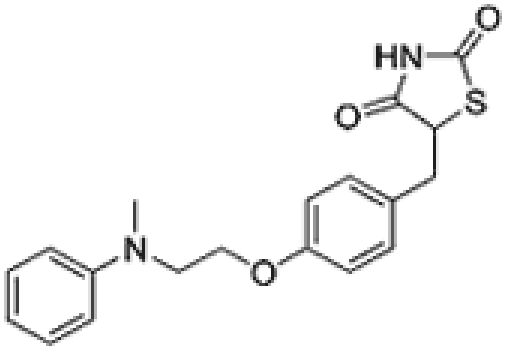
PPAR-γ Ligands

- Synthetic: thiazolidinediones (TZDs)



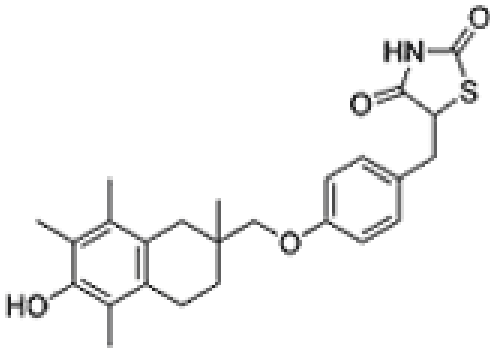
Ciglitazone
(cig)

Avandia



Rosiglitazone
(ros)

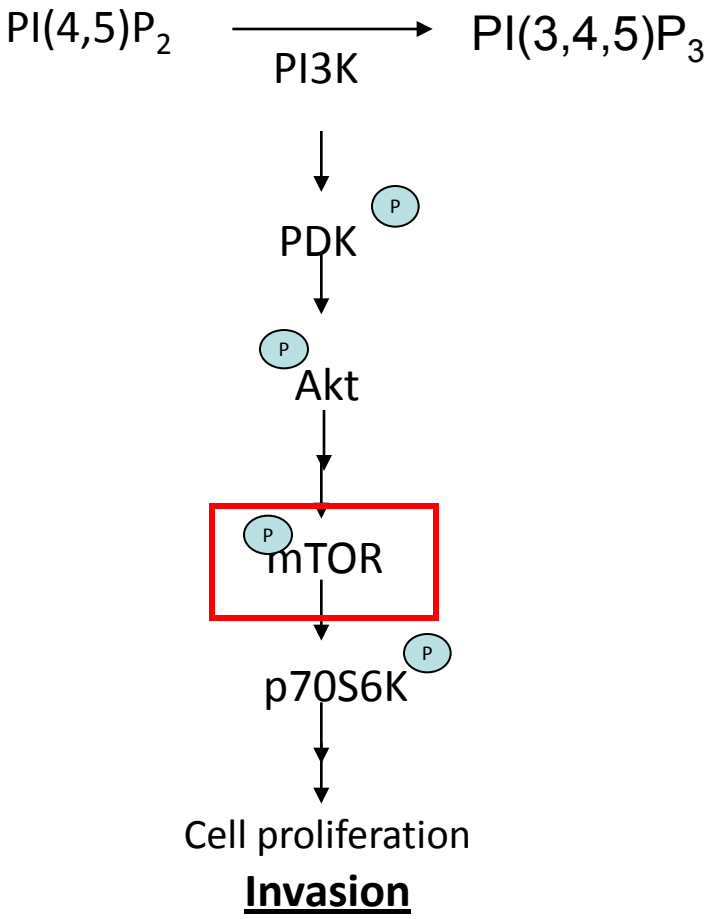
Rezulin



Troglitazone
(trg)

- Previous work in the lab shows that TZDs decrease invasion of prostate cancer cells.

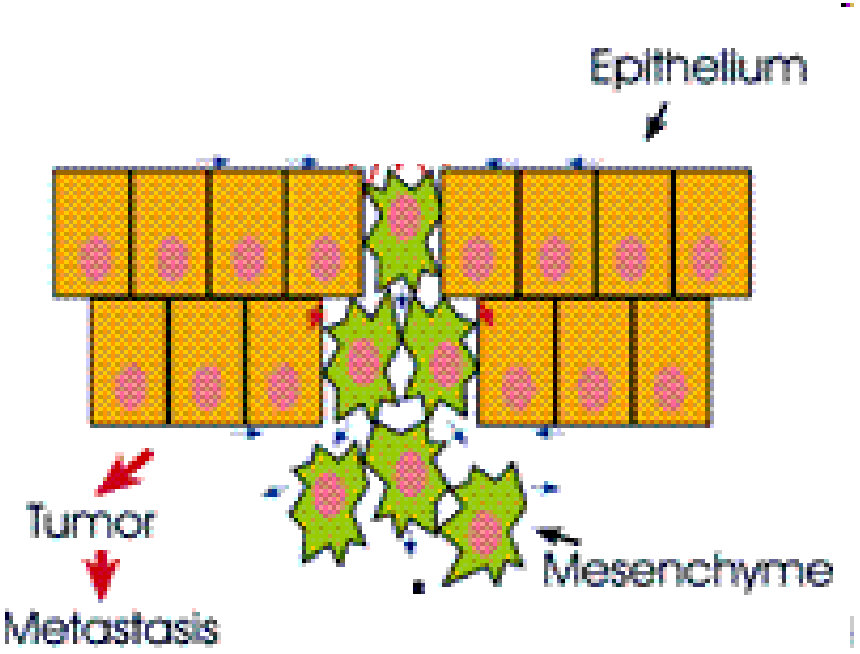
PI3K Signaling Cascade



- Up-regulated in cancer cells
- Induces cell proliferation and survival
- Has been linked to tumor cell invasion

Epithelial-Mesenchymal Transition (EMT)

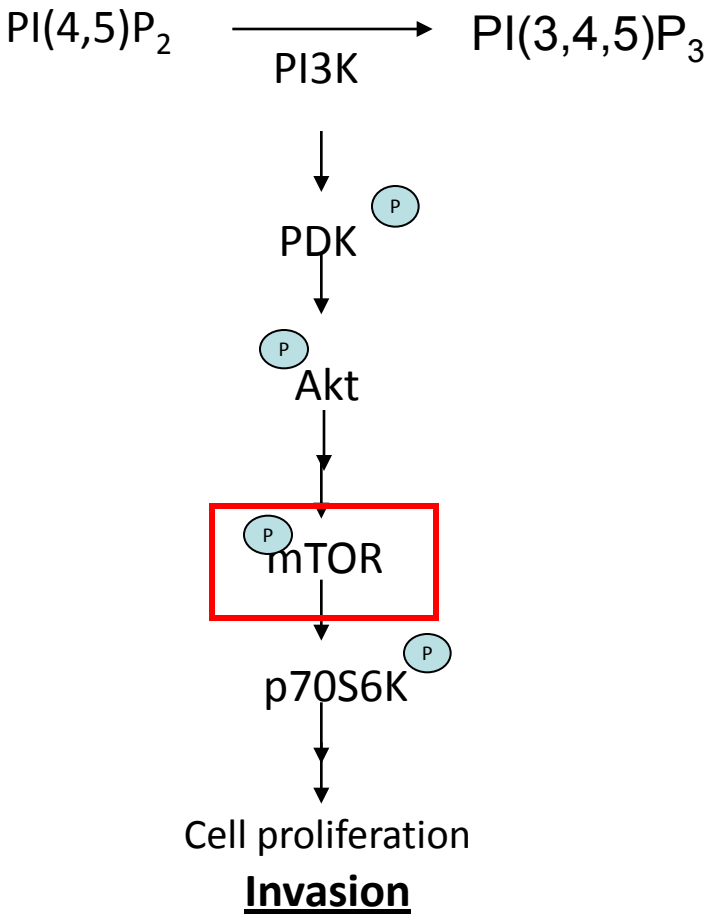
- **Metastatic tumors feature a loss in epithelial tissue and a gain of mesenchymal tissue**
- **Involves cellular changes**
  - Disruption in cellular contacts as well as the synthesis of ECM molecules



Hypothesis

- Treatment with TZDs inhibit prostate cancer cell invasion by regulating the PI3K signaling pathway as well as the EMT process.
  - PC-3: invasive, prostate cancer cell line
  - TZDs: Ciglitazone, Troglitazone, Rosiglitazone

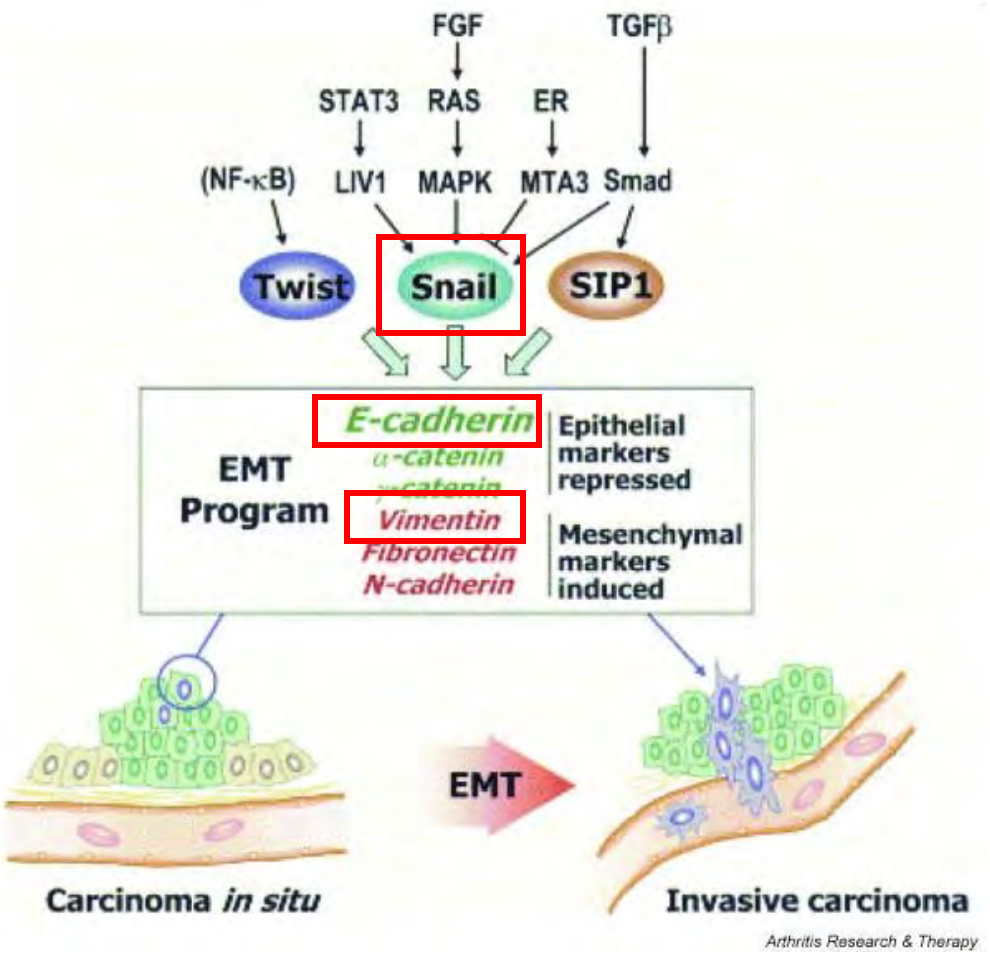
Proteins of Interest



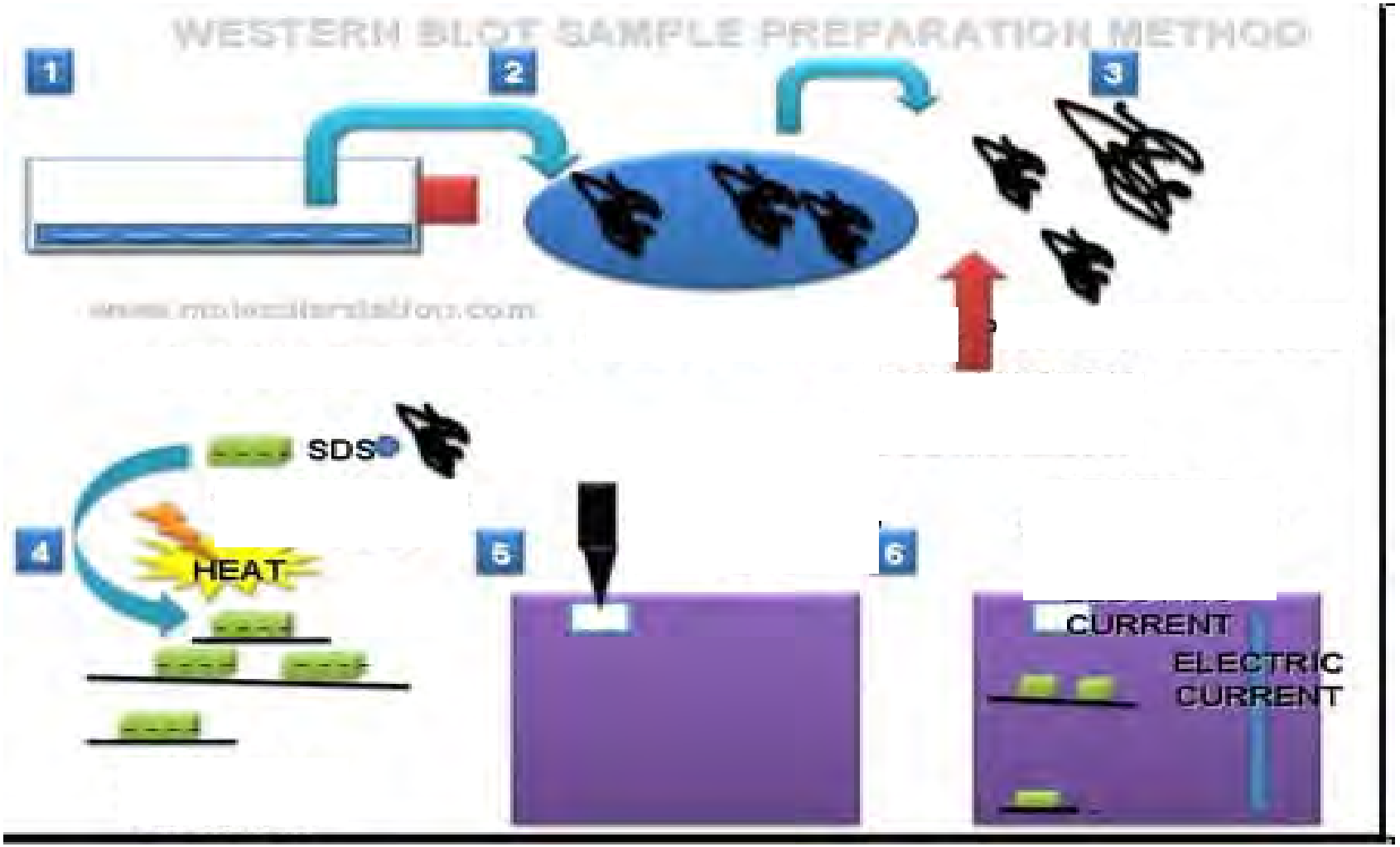
- mTOR
  - Regulates cell growth
  - Mediates cell survival responses

Proteins of Interest Cont.

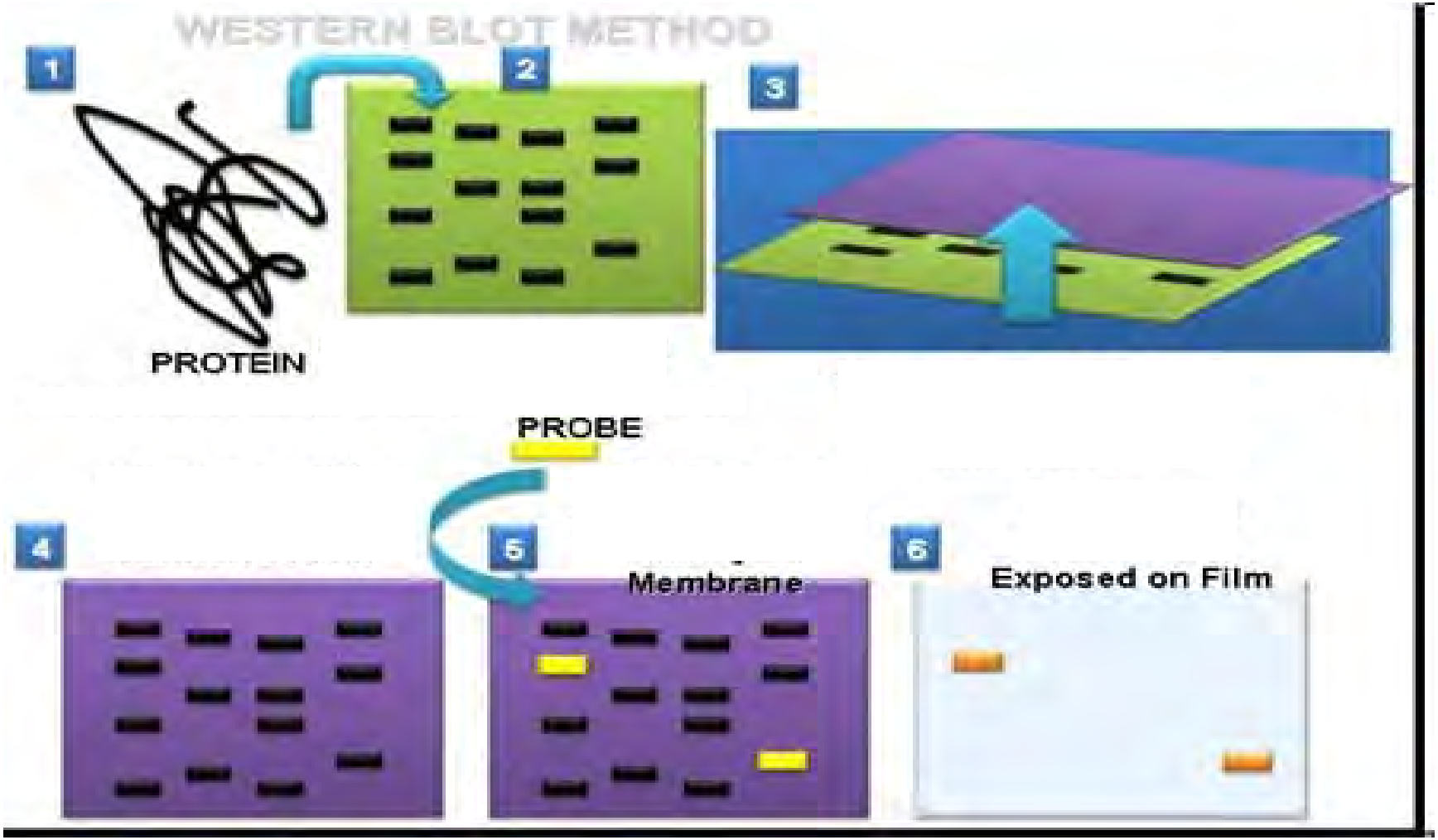
- SNAIL
  - Regulated by TZDS in lung cancer cells
- E-cadherin
  - Epithelial marker
- Vimentin
  - Mesenchymal marker



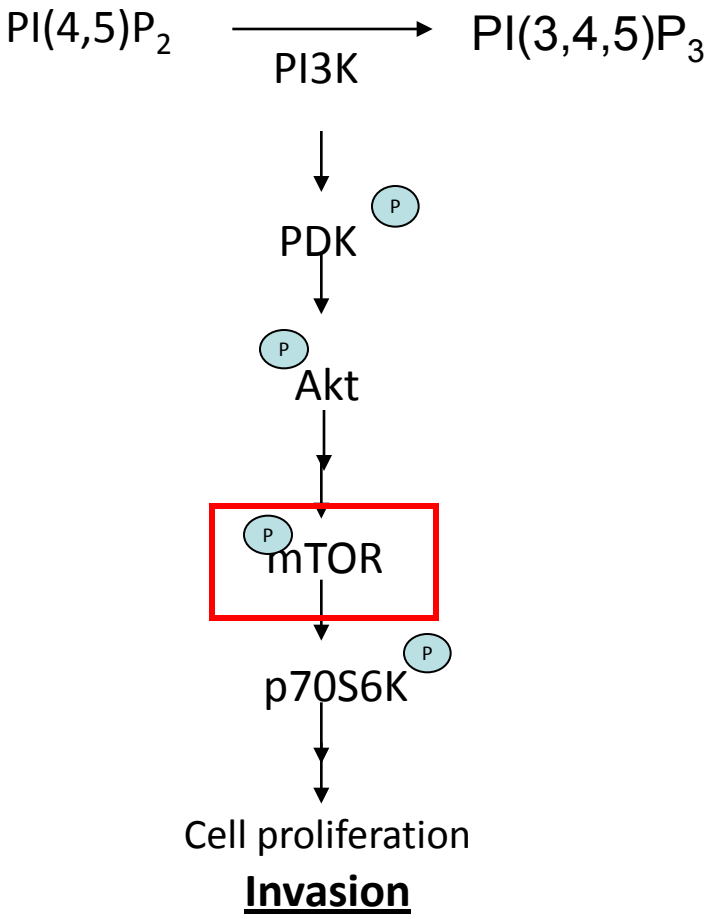
Western Blot Analysis



Western Blot Analysis Cont.



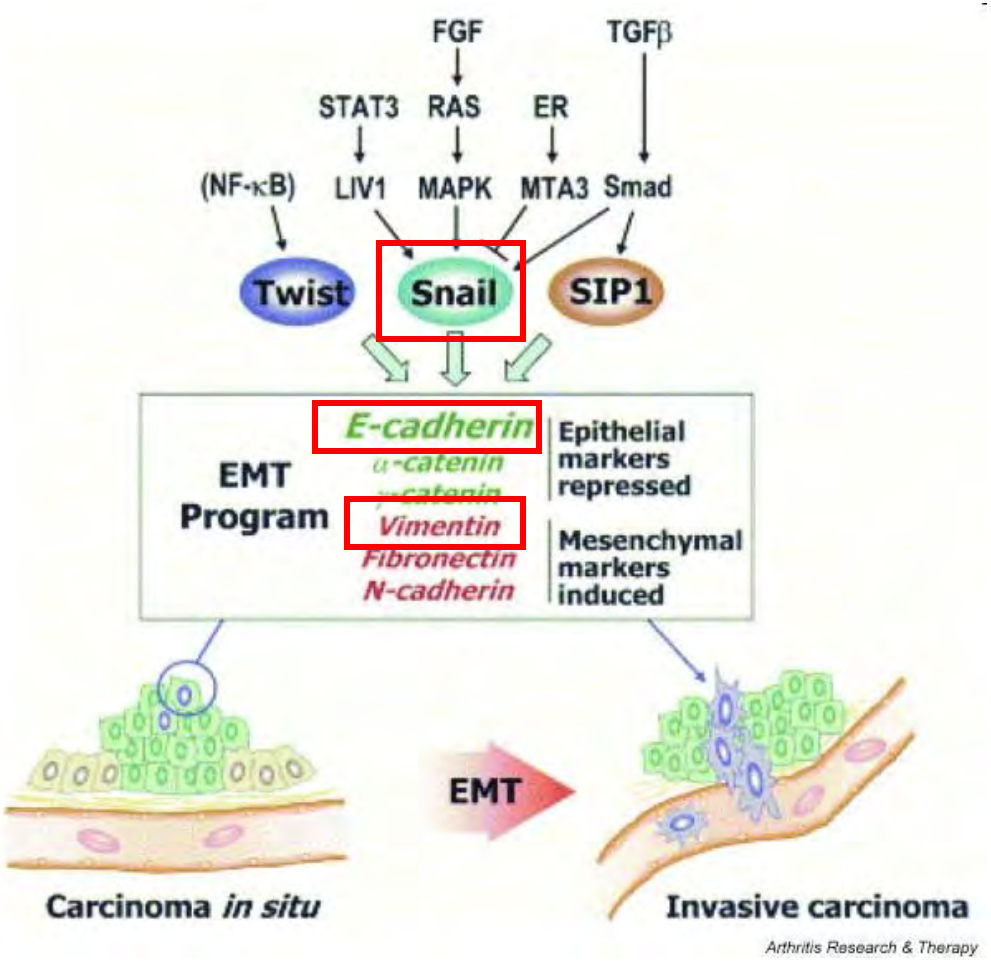
Expected Outcomes



- mTOR
  - Treatment with TZDs will decrease the activity of mTOR

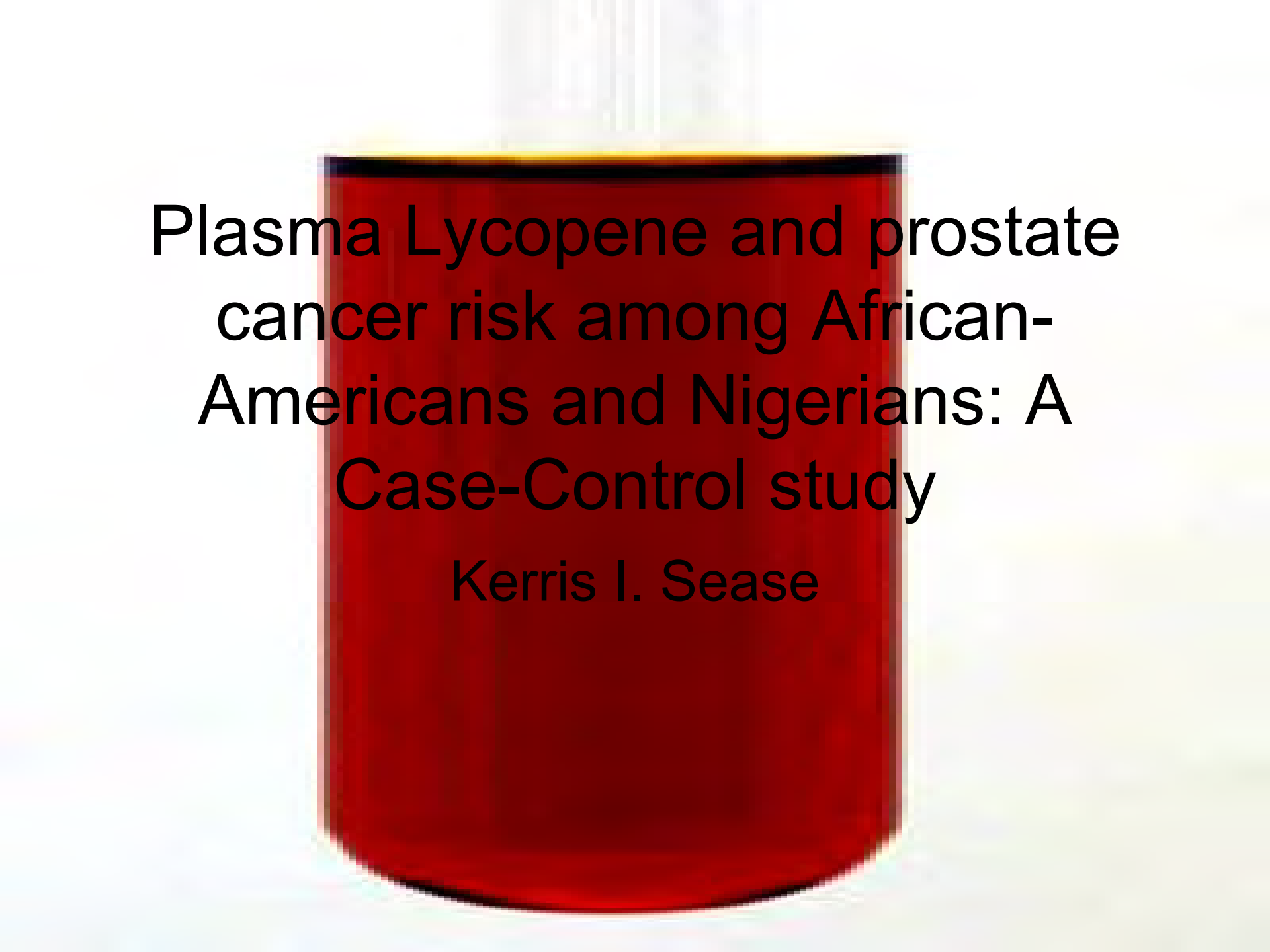
Expected Outcomes Cont.

- SNAIL
  - Decrease in expression
- E-cadherin
  - Increase in expression
- Vimentin
  - Decrease in expression



Acknowledgments

- Dr. Flora Ukoli
- Dr. LaMonica Stewart
- Patrice Moss
- Dr. Stewart's Lab Staff
- Prostate Cancer Research Training Program



Plasma Lycopene and prostate cancer risk among African-Americans and Nigerians: A Case-Control study

Kerris I. Sease

Background

- Although prostate cancer affects only 1 in 6 men, African American men are 60% more likely to develop prostate cancer compared with Caucasian men and are nearly 2.5 times as likely to die from the disease.
- Also, according to the SEER (Surveillance Epidemiology and End Results) Stat Fact Sheets on prostate cancer the incidence rate by race was highest for Blacks, and lowest for American Indian/Alaska Natives.
- According to research conducted in 1997 by Osegbe, “The clinical prostate cancer rate in Nigerians may be as great as that noted in black men in the United States, which may suggest a common enhancing genetic predisposition.”

Introduction

- Although the exact cause of this cancer is unknown, due to variation in the indicent rates of different populations and ethnic groups, many researchers believe that there is a link between prostate cancer and dietary habits.

Aim

- To find whether lycopene (a carotenoid antioxidant that gives tomatoes and other fruits and vegetables such as pink grapefruit and watermelon their red colour) found in is a protective agent, cancer causing agent, or has no effect on the prostate. This information would be used in order to correctly educate both African American and Nigerian men on dietary habits that can help prevent prostate cancer.

Objective 1

- Recruit 50 prostate cancer cases and 100 controls from both Nashville, TN and Benin-City, Nigeria. Then, collect demographic, urologic symptom history, dietary assessment information, and fasting blood samples from all study participants.

Objective 2

- Compare plasma lycopene levels of prostate cancer cases with those of the controls separately for both populations using the non-parametric Mann-Whitney statistical test.

Objective 3

- Evaluate the role of plasma lycopene in prostate cancer risk across quartiles by measuring the odds ratio (OR) of risk using unconditional logistic regression, controlling for demographic and anthropometric variables.

Materials and Methods
Target Population

- 50 cases and 100 controls each of Nigerians and African-Americans from Nashville, Tn.

Materials and Methods
Cases and Controls

- African American controls were recruited into the study from churches, work sites, social, recreational and other groups in Nashville.
- African American cases were recruited through urologists in Nashville.
- Nigerian controls were recruited by house-to-house contact in defined communities.
- Nigerian cases were recruited from hospitals.

- Controls were men 40 years and older who have normal DRE and normal PSA less than 2.5ng/ml.

Materials and Methods Procedure

- Participates were given an incentive of $20 for each of the two study visits to cover the cost of transportation and parking, the inconvenience of a blood draw and as a sign of appreciation for their time and possible lost earnings.
- Information on general demography, medical and cancer history, alcohol and tobacco use, anthropometric measurements, including skin fold thickness and body fat percentage and dietary/caloric intake assessment using 24-hour recall and average weekly consumption over the past year were collected..
- Blood was drawn as a non invasive way to predict lycopene levels throughout the body, and urine samples were collected.

Materials and Methods
Data Analysis

- Samples were sent to the University of Minnesota, so that the lycopene was assayed by a research laboratory headed by Myron Gross, Ph.D.
- Data will be collected and analyzed using SPSS data software.

Pattern of Urology Symptoms among Nigerians: Hospital & Community Experience

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Fisk University Summer Intern

Flora A. M. Ukoli, MD., MPH.
(Mentor)
Professor & Director prostate Research Program
Meharry Medical College

Introduction

- Prostate cancer is second leading cause of cancer death in the American population and is known to kill about 32000 people in the united state every year.
- Many sources, like GLOBOCAN and NCI, have identified the United States of America as the country that possesses the highest risk for prostate cancer.
- These authorities have also discovered and proclaimed countries in the east like, Japan and china, possess the lowest risk for prostate cancer.

- According to GLOBOCAN, the incidence rate of prostate cancer in America is 124.8 per 100,000 while the rate of prostate cancer in Nigeria, which is a country in West Africa, is 24.5 per 100,000.
- Although GLOBOCAN is a trusted source of information the lack of screening for prostate cancer in Nigeria, and other West African countries, might have led to the burden of prostate cancer being under played

- It has been observed, through the means of medical records, that the only cases of prostate cancer diagnosed in Nigeria are either accidentally discovered or seriously advanced cases of prostate cancer.
- These observations have led to the hypothesis that more incidences of the disease have not been diagnosed and are still in the public.
- This research is aimed at comparing the prostatism in the community and hospital patients, and using that to show the need for prostate cancer awareness in the African community to increase early diagnosis of the disease

Aims

- To study the pattern of urology symptom presentations as an indicator of prostate cancer awareness among Nigerian men

- To clearly show, by means of data collected from volunteers, the need for prostate cancer awareness

Objectives

- Recruit 200 Nigerian men 40 years and older from surgery/urology clinics presenting with prostatism or urological symptoms, and 500 apparently health age-comparable men from the community, to complete a urology symptom survey, undergo a digital rectal examination (DRE), and provide a blood sample for prostate specific antigen (PSA) analysis.
- Compare the urology symptom pattern, DRE and PSA results, age, level of education, and other demographic and anthropometric variables of the clinic and community populations.

- Describe their pattern of response to abnormal DRE and/or PSA and prostate biopsy in both populations, and compare the prevalence of prostate cancer diagnosed in both populations.

- Propose recommendations to improve the level of awareness and response to prostatism and prostate cancer among Nigerian men.

Materials & Methods

Study sample

- The target population for this study were self proclaimed indigenous Nigerian men aged 40 years or above.

Sample selection method

- Men were recruited from the hospitals and the rural-urban community, where the study took place, by direct door to door invitation.

Procedures

- Data about urinary symptoms where acquired from the participants using custom designed questionnaires

- Blood samples and urine samples were collected to confirm the status of the individual in the study

Data Analysis

- Participant characteristics, prostatic symptoms, and severity of these symptoms were compared across demographic groups, using Chi-square test.
- Unconditional logistic regression was used to calculate odds ratio and a software, SPSS, was used to calculate and compile a database for this study

Results

Hospital

Community

Table 1: Demographic Characteristics of the Nigerian Study Population

Characteristics	Hospital	Community
Age (Years):		
<54	35 (11.0)	189 (49.7)
55-64	91 (28.5)	93 (24.5)
65-74 years	121 (37.9)	56 (14.7)
≥75 years	70 (21.9)	34 (8.9)
Education:		
< Primary	67 (21.0)	100 (26.3)
Primary- Jnr. Secondary	107 (33.5)	147 (38.7)
Secondary & Post Sec.	74 (23.2)	78 (20.5)
College & Post-Graduate	53 (16.6)	38 (10.0)
Marital status:		
Single	2 (0.6)	8 (2.1)
Married	207 (64.9)	262 (68.9)
Married ≥ 2 wives	87 (27.3)	78 (20.5)
Divorced/Separated	11 (3.4)	19 (5.0)
Widowed	9 (2.8)	5 (1.3)
Not Stated	3 (0.9)	8 (2.1)

Table 2: Socio-Economic Characteristics of the Nigerian Study Population

Characteristics	Study Population: N(%)	
	Hospital	Community
Employment status:		
Unemployed	17 (5.3)	37 (9.7)
Retired	155 (48.6)	61 (16.1)
Employed	146 (45.8)	275 (72.4)
Income level:*		
Low	221 (69.3)	215 (56.6)
Medium	38 (11.9)	51 (13.4)
High	21 (6.6)	56 (14.7)
Not Stated	39 (12.2)	58 (15.3)

* Low: <N35,000, Medium: N35,000-N64,999, High: ≥N65,000

Table 3: Prostate Status on DRE, Urinary Symptoms and PSA Distribution of the Nigerian Hospital & Community Populations

	Hospital	Community
Prostate Status (DRE)		
Normal	24 (7.5)	208 (54.7)
Enlarged No Symptoms	13 (4.1)	94 (24.7)
Enlarged With Symptoms	107 (33.5)	23 (6.1)
Cancer Suspected	44 (13.8)	3 (0.8)
Not Recorded/Not Done	131 (41.1)	52 (13.7)
Urology History		
BPH	59 (18.5)	6 (1.6)
Prostate Cancer	18 (5.6)	1 (0.3)
PSA (µg/dl):		
< 3.9	87 (27.3)	303 (79.7)
4 – 19.9	74 (23.2)	24 (6.3)
20-99.9	42 (13.2)	10 (2.6)
≥100	44 (13.8)	1 (0.3)
After Prostatectomy	6 (1.9)	1 (0.3)

Table 4: Comparison of PSA Distribution by Prostate Status on DRE in the Nigerian Hospital & Community Populations

	DRE Status				
PSA (µg/dl)	**Normal**	**BPH No Symptom**	**BPH with Symptom**	**Cancer Suspected**	**Not Recorded***
Hospital	n = 24	n = 13	n = 107	n = 44	n = 131
<3.9	18(75.0)	4 (30.8)	34 (31.8)	6 (13.6)	25 (19.1)
4.0 -19.9	4 16.6)	4 (30.8)	29 (27.1)	8 (18.2)	29 (22.1)
20.0 - 99.9	1 (4.2)	0 (0.0)	16 (15.0)	7 (15.9)	18 (13.7)
≥100.0	0 (0.0)	2 (15.4)	13 (12.1)	17 (38.6)	12 (9.2)
Not Done	1 (4.2)	3 (23.1)	15 (14.0)	6 (13.6)	47 (35.9)
Community	n = 208	n = 94	n = 23	n = 3	n = 52
<3.9	191 (91.8)	74 (78.7)	11 (47.8)	1 (33.3)	26 (50.0)
4.0 - 19.9	8 (3.8)	7 (7.4)	7 (30.4)	0 (0.0)	2 (3.8)
20.0 - 99.9	1 (0.05)	5 (5.3)	3 (13.0)	1 (33.3)	0 (0.0)
≥100.0	0 (0.00)	0 (0.0)	0 (0.0)	1 (33.3)	0 (0.0)
Not Done	8 (3.8)	8 (8.5)	2 (2.1)	0 (0.0)	24 (46.2)

* Not Recorded: Hospital cohort: DRE information was not obtained from the case record.
Community cohort: DRE was not done

I think we need to remove all these people for whom we have no PSA or DRE information from this table.

Fig 2: Prevalence of Urinary Symptoms in Nigerian Hospital and Community Populations

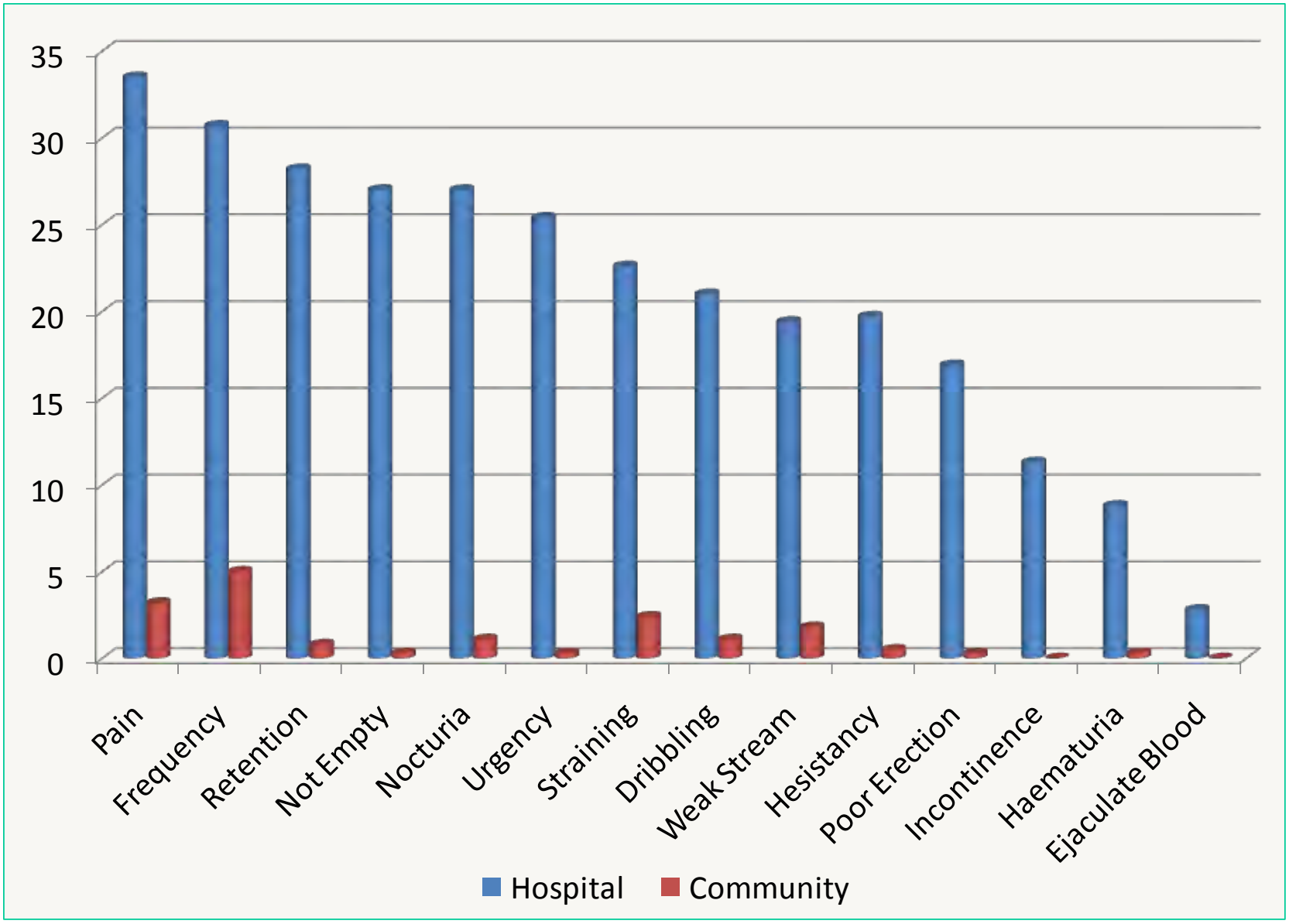


Table 5: Severity of Urinary Symptoms in Nigerian Hospital and Community Populations.

Symptoms	N (Frequency %)	
	Hospital	Community
Prostatic symptoms:		
None	53 (16.6)	331 (87.1)
Mild	34 (10.7)	24 (6.3)
Moderate	36 (11.3)	9 (2.4)
Severe	196 (61.4)	16 (4.2)
No. of Symptoms:		
None	53 (16.6)	331 (87.1)
1 – 2	121 (37.9)	47 (12.4)
3 – 5	89 (27.9)	2 (0.5)
≥ 6	56 (17.6)	0 (0.0)

Conclusion

- The study of the hospital and community populations in Nigeria was feasible.
- It can be deduced from the data that many people in the community with prostatic disease continue to lead a normal life as long as severe symptoms are not present.

- The prostatic statistics for Nigeria, that is based on hospital records, Might be an over estimation of the prostate cancer risk in the country
- Prostate cancer awareness is required in Nigeria to improve the level of diagnosis and prostate cancer screening

Acknowledgement

- Study participants in Benin-City, Warri, and Udo of Southern Nigeria, surgeons/urologists, patients and staff of the Department of Surgery, University of Benin Teaching Hospital, Warri Specialist Hospital, and Udo and Warri Health Centers. Project was funded by the Department of Defense IDEA AWARD # DAMD17-02-1-0068, HBCU Partnership. W81XWH-05-1-0229., and HBCU Summer Training grant W81XWH-09-1-0161.

Case-control study of pesticide exposure and prostate cancer in African American and Caucasian men

By
Mmekom Ekon
Dr Sanderson (research supervisor)
Dr Ukoli (P.I)
Prostate Cancer Research Training program

Background

- Eight studies investigating incidence of prostate cancer in North America found a modestly increased risk among farmers compared with non-farmers.
- Twelve studies of mortality rates in prostate cancer suggest an increase in mortality from prostate cancer among farmers compared with other occupations.
- Three studies have found positive associations between pesticide exposure and prostate cancer.
- Van Maele, et al. reported a marked increase in the risk of prostate cancer among pesticide applicators.

Background

- By reviewing toxicological studies, Keller – Byrne, et al. proposed that agents in pesticides could bind to steroid hormone receptors thereby inducing proliferation of prostate cancer cells.
- A review of environmental endocrine modulators such as pesticides and human health effects proposed a number of mechanisms of action that disrupt the endocrine system, including interactions of chemicals with endogenous hormones and carrier proteins to prevent receptor binding.

Objectives

- *To determine the risk of prostate cancer associated with pesticide exposure*

Methods

- *Population based case-control study of men with and without histologically confirmed prostate cancer who were residents of South Carolina between ages 65 and 79 years.*
- *A total of 2,700 cases were obtained from the South Carolina cancer registry, and 2,010 controls were acquired from the Health Care Financing Administration (HFCA) Medicare beneficiary file.*
- *Data on demographics, medical history and pesticide exposures were collected using computer assisted telephone interviewing.*
- *Pesticide exposure was assessed with the question, "Have you mixed or applied any of the following: herbicides, insecticides, fumigants, or fungicides?"*
- *Unconditional logistic regression was used to estimate the risk of prostate cancer associated with pesticide exposure while controlling for confounding.*

Evaluating Decisional Conflict in Prostate Cancer Education and Screening Program for low-income African Americans

Pierre J. Moton
Fisk University
Dr. Flora Ukoli- PI
Meharry Medical College
Prostate Cancer Training Intern

Introduction

- With more that 100 types of cancer in 7 major categories, prostate cancer has been the leading cause of incident and mortality cases in African Americans since the early 1900s.
- Prostate cancer rates are 30% higher among African-American men aged ≥65, compared with Caucasian man in the same group. African American men also are normally younger and have significantly higher clinical stage, and more symptoms of the disease when initially diagnosed.

2006 Estimated US Cancer Cases & Deaths

	Cases 720,280		Deaths 291,270	
Prostate	**33%**		Lung & bronchus	31%
Lung and bronchus	13%		Colon & rectum	10%
Colon and rectum	10%		**Prostate**	**9%**
Urinary bladder	6%		Pancreas	6%
Melanoma of skin	5%		Leukemia	4%
Non-Hodgkin lymphoma	4%		Liver & intrahepatic bile duct	4%
Kidney	3%		Esophagus	4%
Leukemia	3%		NHL	3%
Oral Cavity	3%		Urinary bladder	3%
Pancreas	2%		Kidney	3%
All Other Sites	18%		All other sites	23%

Excludes basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.
Adapted from: Source: American Cancer Society, 2006.

Decisional Conflict Scale (DCS)

- uncertainty in choosing option
- modifiable factors contributing to uncertainty such as feeling uninformed, unclear about personal values and unsupported in decision making
- effective decision making such as feeling the choice is informed, values-based, likely to be implemented and expressing satisfaction with choice
- *An* 8-item Decisional Conflict Scale (DCS) was extracted information concerning the decisions maker's 1) uncertainty in making a choice; 2) modifiable factors in contribution to uncertainty such as low income, education attained, and marital status.

Aims & Objectives

- Describe the development of a culturally appropriate prostate cancer intervention for low-income African-American
- Evaluate the effectiveness of this intervention on prostate cancer knowledge, attitude and screening
- Study the pattern of decisional conflict before and after the intervention

Study Goal

The goal of this study is to evaluate decisional conflict regarding screening for prostate cancer after implementing a culturally appropriate prostate cancer education intervention in a low-income African-American population.

Target Population

- African-American men in Nashville and surrounding counties.
- The target population was low-income African Americans males, over the age of 45 years, who have not had a prostate cancer screening for at least one year, and residents for Davidson County/Nashville, TN for at least 6 months.

Data collection

- The first section of the study survey collected demographic information, family history of cancer, and prostate cancer screening history, and was completed at baseline only.
- The second section measured prostate cancer knowledge and screening attitudes, barriers to cancer screening and health care access issues.
- The third section targeted decisional conflict to prostate cancer screening and was completed three times, at baseline (pre-intervention), and at 3-month (post-intervention) to document retention of information and prostate cancer screening action or decision

Study Population

Table 1: Characteristics of total study population					
Age of Population	**Strata**	**40-49 N= 171**	**50-64 N=203**	**≤ 65 N=140**	**Total N=514**
Educational Status	**< High School**	**43 (25.4)**	**82 (40.4)**	**37 (26.6)**	**162 (31.7)**
P< .004	**High School**	**60 (35.5)**	**72 (35.5)**	**57 (41.0)**	**189 (37.0)**
	College/Some College	**66 (39.1)**	**49 (24.1)**	**45 (32.4)**	**160 (31.3)**
	Not Reported				**3**
Marital Status	**Married**	**48 (28.7)**	**63 (31.8)**	**55 (39.6)**	**166 (32.9)**
P< .002	**Divorced/Separated**	**54 (32.3)**	**83 (41.9)**	**50 (36.0)**	**187 (37.1)**
	Widowed	**7 (4.2)**	**12 (6.1)**	**12 (8.6)**	**31 (6.2)**
	Single	**58 (34.7)**	**40 (20.2)**	**22 (15.8)**	**120 (23.8)**
	Not Stated				**10**
Employment status	**Employed**	**92 (53.8)**	**66 (32.5)**	**56 (40.0)**	**214 (41.6)**
P< .000	**Unemployed**	**52 (30.4)**	**76 (37.4)**	**25 (17.9)**	**153 (29.8)**
	Retired/Disability	**21 (12.3)**	**60 (29.6)**	**57 (40.7)**	**138 (26.8)**
	Not Stated	**6 (3.5)**	**1 (.5)**	**2 (1.4)**	**9 (1.8)**
Income	**< $25,000**	**115 (69.3)**	**148 (74.4)**	**55 (39.9)**	**318 (63.2)**
P< .000	**$25,000-$49,999**	**38 (22.9)**	**42 (21.1)**	**77 (55.8)**	**15 (31.2)**
	≥ $50,000	**13 (7.8)**	**9 (4.5)**	**6 (4.3)**	**28 (5.6)**
	Not Reported				

Pre-Intervention Survey

The pre-intervention survey focused four major sections, Demographics (Age, Income, Education, etc.), Medical History (last DRE, last PSA test, etc), Knowledge about Prostate Cancer, and Decisional conflict.

Assessment Domain	**Items**	**Adapted From**
Demographics	1 - 7	BRFSS
Health status and access	8 - 13	BRFSS
Family history of cancer	14	Meharry CHC-CNP Community Survey
PCa screening questions and intention to screen	15 - 24	BRFSS
Actual Knowledge of Prostate Cancer Subscale	25 - 45	Developed by Agho & Lewis, 2001[37]
Barrier to Cancer Screening	46	Meharry CHC-CNP Community Survey
Decisional Conflict Scale	47 - 54	Adapted by et. al [38]

Educational Intervention

The content of the interventional message included information about the importance of screening, what is involved in screening, and where to get screened (community health center). Participants were also provided handouts that will have the most salient messages from the intervention and a wallet-sized card with contact information for the health center for screening appointments. The intervention will be limited to being 10-15 minutes in presentation time to avoid participant fatigue.

Brochure: Easy to read, culturally appropriate pictures & content

Read together by Community Navigator (CN) & Participant

Q & A: CN to answer questions and address concerns raised by the participant

Myths: Discuss myths about prostate cancer, sexuality, and DRE

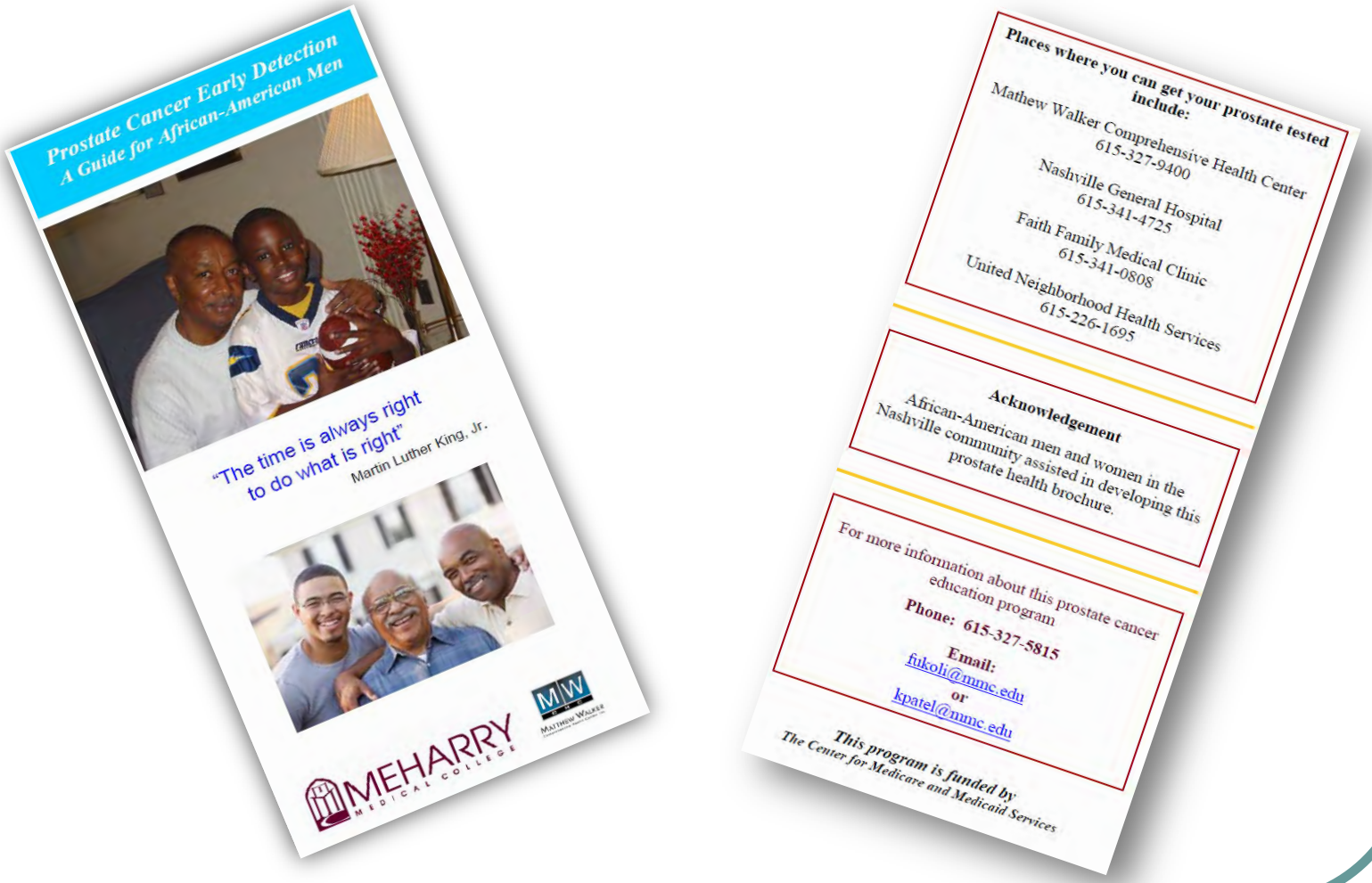
Explanations: Carefully describe:

-Process for redeeming the screening coupon

-Process for the 3-month study follow-up visit

-Follow-through of abnormal screening results

Intervention Tool



Post Intervention

The 2-page follow-up survey will be completed by interview. Participant will receive a $25 cash incentive at the end of completing this survey. Prostate Cancer screening action and a repeat of the knowledge, barriers to screening and health issues, and Decisional Conflict questions were evaluated by participant and interviewer.

Data Analysis

- Level of education
- Marital Status
- Current employment
- Annual Income
- Self-rating of health

V.S.

- Best Choice
- Feeling about decision
- Advantages
- Disadvantages
- Clear-Advantages
- Clear-Disadvantages
- Support
- Advice

Results

Of the 514 participants that were recruited for the pre-intervention survey and Prostate Cancer Education Intervention , only 350 returned for the post-survey and follow-up. Data that was collected fro the pre and post surveys was entered into SPSS and analyzed using multiple Chi-Square and Longitudinal Regression analysis tools. Results from the data outputs show that different demographic characteristics had no significant effect on Decisional Conflict. It is believed that the Pca Education Intervention actually created more conflict in most cases. This is explained by the fear of being diagnosed with the disease after participant find out more detail about the severity of Prostate Cancer. This creation of conflict could also possible arise from the contradiction of knowledge participants thought they might have known before they were given the facts.

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Blocker, Deborah E., Romocki, LaHoma Smith, Thomas, Kamilah B., Jones, Belinda L., Jackson, Ethel Jean, Reid, LaVerne, Campbell, Marci K. (2006). Knowledge, Beliefs and Barriers Associated with Prostate Cancer Prevention and Screening Behaviors among African-American Men. Journal of the National Medical Association, Vol. 98 (No. 8), 1286-1287

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Winterich Ph.D, Julie A., Grzywacz, Ph.D., Joseph G., Quandt, Ph.D, Sara A., et al. (2009). Men's Knowledge and Beliefs about Prostate Cancer: Education, Race, and Screening Status. National Institues of Health, 19(2), 199-203

Dietary intake of vitamin E and other selected antioxidants in prostate cancer risk among African-American men

Chace Franks
(Student Research Assistant)

Dr. Flora Ukoli
(PI & Mentor)
Meharry Medical College

Prostate

- Tubuloalveolar exocrine gland in males
- Produces the fluid part of semen
  - Produces PSA
  - Controls flow of urine
- Androgens (male hormones) aide in development and growth.

Prostate Cancer

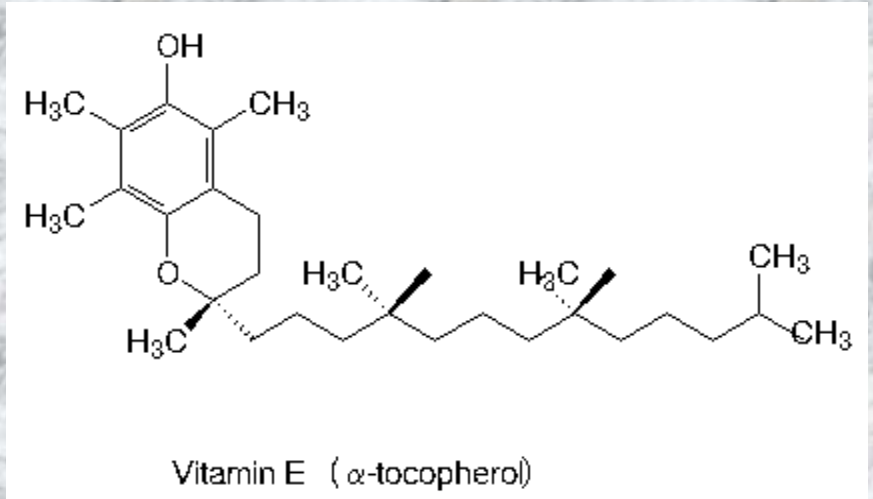
- Most commonly diagnosed form in U.S.
- 2 million american men living with prostate cancer
- potentially asymptomatic initially
- Risk factors: age, genetic makeup, diet
- African-Americans have nearly twice the risk of Caucasion conterparts.

Antioxidation

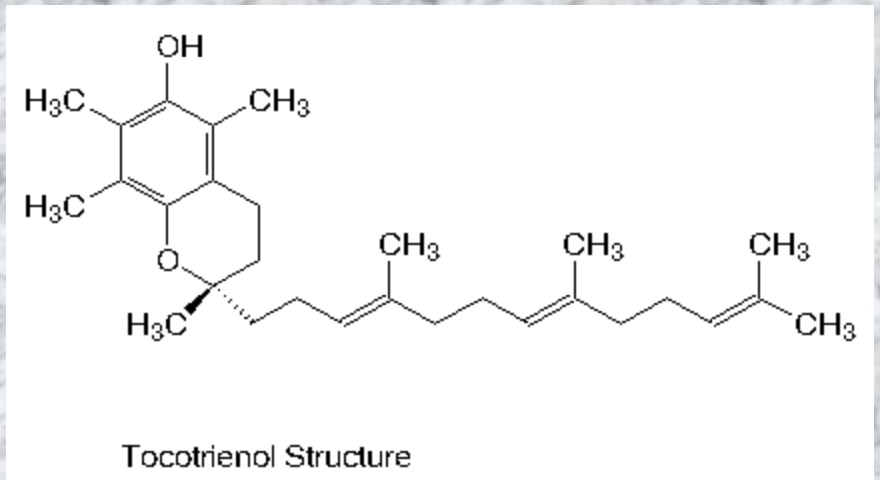
- Antioxidants are substances that protect cells from unstable free radicals
- Antioxidants react to stabilize and reduce cell damage
- Found in fruits, vegetables, nuts,grains, some poultry and fish

Vitamin E

- Fat Soluable antoxidant
- Found in nuts, seeds, corn, soybeans, and vegetable oil
- Exist in 8 chemical forms
- Serum concentration depends on liver
- Alpha-tocopherol most abundant in serum



Vitamin E (α-tocopherol)



Tocotrienol Structure

Related antioxidants to be considered

- **Vitamin C**- broccoli, strawberries, oranges, and many other fruits
- **Zinc-**oysters, shellfish, wheat bran
  - Important to prostate health, function unknown
- **Retinol(Vitamin A)-** fish oil, liver, many other meats
- **Glutathione-**all fruits and vegetables
  - **Most abundant natural antioxidant**
- **Selenium-**corn,wheat, rice,legumes

Objectives

- Complete a Case-Control study pertaining strictly to African-American men 45 years or older
- Attain dietary info from 100 cases and 200 controls in the Nashville area using voluntary food questionnaires
- Analyze data and statistically determine any correlation between Vitamin E/related antioxidant levels and the risk of prostate cancer

Target Population

- Target population: African-American males 40 years of age or older from Nashville and surrounding counties.
- 50 - “Cases”-diagnosed with prostate cancer within the last 5 years by urologist
- 100 - “Controls”- Screened and declared to be prostate cancer free in the last year
- Desired sample size was determined by the *PASS 6.0* program

Exclusions- Cases

- Diagnosed more than 5 years ago
- On chemotherapy or any hormonal treatment
- Severely ill or institutional
- Patients on any prescribed diet
- Men diagnosed with any other cancer

Exclusions-Controls

- Diagnosed with prostate cancer at any time
- Severely ill or institutionalized
- On prescribed diet
- Diagnosed with any other cancers
- Resides outside of study area.

Recruitment and Consent

- Self-refferal in response to advertisements
- Outreach awareness
  - Meharry Medical College Outreach Unit
- Consent interview conducted
- Patients Informed of rights to refuse/withdraw and privacy

Data Collection

- Personal and medical information by self-administered questionnaire
- Dietery info collected through BLOCK FFQ questionnaire
- Data analyzed by SPSS program to attain values

Data Analysis

- Case-Control difference using Mann-Whitney non-parametric test
- Antioxidant levels converted to tertiles and compared by chi-square test
- Associations between intake and risk level will be determined using unconditional logistic regression

Prostate Cancer Research Training in Health Disparities for Undergraduates (PCaRT)

Flora A. Ukoli[1], LaMonica V. Stewart[2], Olugbemiga B. Ogunkua[2], Maureen Sanderson[3], Carlton Adams Jr.[1], Alphonse Pasipanodya[1], Salil K. Das[2], Shirley A. Rainey-Brown[4], Jay H. Fowke[5], Rodney Davis[6], Derrick J. Beech[1].

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PC080050

INTRODUCTION

The disparity in prostate cancer (PCa) burden among African-Americans is reported to result from the complex interaction of factors including genetic susceptibility, disease biology, life-style, and lack of access to preventive and curative health care. PCa burden in this high-risk population can be impacted by providing adequate health education and access to health care. Minority researchers can be more culturally sensitive and be in the position to help them overcome the existing lack of trust and confidence in the health care system. Increasing the number of minority scientists to address PCa disparity is therefore a promising strategy to address PCa disparity. The Meharry Prostate Cancer Research Program funded by the Department of Defense PCRP utilizes a multidisciplinary approach to study PCa disparity issues that cuts across basic science, translational and clinical research. The long-term goal of this program is to increase the pool of qualified minority scientists interested in PCa research by introducing undergraduates to PCa health disparity research in a summer research training program .

PROGRAM GOALS

- ❖Stimulate interest & empower undergraduate scientists to consider and plan to pursue a career in biomedical research.
- ❖Introduce this next generation of minority researchers to the field of health disparity research geared at eliminating the disproportionate PCa burden borne by African-American men.

AIMS AND OBJECTIVES

- ➢Improve knowledge
  - ❑ Purpose of biomedical research
    - ▪ Cause, diagnosis, treatment, prevention and control of cancer.
    - ▪ Research ethics, Human subject safety & protection
  - ❑ Prostate carcinogenesis
  - ❑ Epidemiology of prostate cancer
    - ▪ Existing ethnic disparity in incidence & mortality
- ➢Enhance familiarity with research literature
  - ❑ Ability to critically evaluate scientific literature
- ➢Improve research skills
  - ❑ Laboratory methods & techniques
    - ▪ Conducting experiments
    - ▪ Interpreting and presenting results
  - ❑ Epidemiological methods
    - ▪ Community networking, Participant recruitment
    - ▪ Human subject protection and safety, Consenting participants
    - ▪ Data collection, management, analysis, presentation of results

PROGRAM STRATEGY

Recruiting Interns:

- ❑ Advertised for program applications by
  - o Flyers displayed on university notice boards
  - o Flyers distributed in the cafeteria
  - o Emails to Fisk University students
  - o Classroom announcements by faculty
- ❑ Research programs displayed and showcased
  - o Meharry Medical College web page
  - o Symposium at Fisk University
    -Presentations by PI, Co-PI, and each mentor

Training by Apprenticeship:

- ❑ 5-6 interns annually received hands-on prostate cancer research experience within existing mentor projects.

Pilot Project Development:

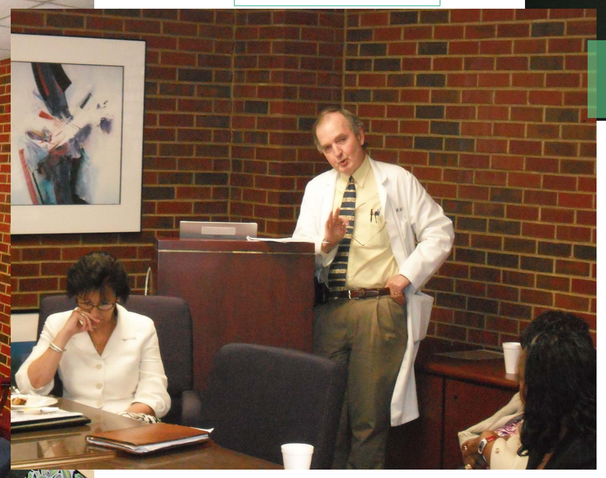
- ❑ Interns encouraged to develop individual pilot projects
  - o Basis for selection to 2nd program year
  - o Master's or Doctoral thesis in the future

PROGRAM MENTORS: RESEARCH PROJECTS

Mentor	Project Title	Secondary Mentors
Ukoli F.	Dietary risk factors of prostate cancer among African-Americans Nigerians: A case-control study. (Fatty acids, Lycopene, Vitamin E, Meat, fish, veg & fruit intake)	Fowke J., Adams C. SK. Das.
Stewart L.	Inhibition of prostate cancer cell growth by Thiazolidinediones. Regulation of Erk signaling pathway by PPAR gamma ligand troglitazone.	Matusik R.
Ogunkua O.	Benzopyrene B(a)P induced activation of prostatic specific genes.	Matusik R.
Ukoli F.	Prostate cancer education and screening program for low-income African-American men	Davis R., Beech D. Pasipanodya A.
Sanderson M.	A case-control study of pesticide exposure and prostate cancer in African-American and Caucasian men	Ukoli F.

PI: Flora A. M. Ukoli (Meharry Medical College)
Co-PI: Shirley A. Rainey-Brown (Fisk University)

Summer 2010 Welcome & Award Luncheon
Meharry & Fisk Faculty, Community Representatives, Summer Interns



Prostate Cancer Research Symposium at Fisk University April 2010
Cross-Section of Students

PROGRAM EVALUATION

Summer Interns at a Church Health Fair, 2009.

Summer Interns Trained
2009: 6 of 29 applicants 2010: 5 of 16 applicants
Research Conducted
Basic science research (4), Epidemiology research (7)

- ➢**Student Evaluation**
  - ❑ Program strength: Met objectives, increased knowledge of prostate cancer research, produced positive impact.
  - ❑ Program weakness: Too short, not enough mentor contact, covered 'too much', not enough emphasis on deadlines.
- ➢**Mentor Evaluation:**
  - ❑ Student strength: Intelligent, motivated, committed, hard working, willing to learn.
  - ❑ Distraction: Concern for finances for next academic year, Not able to find time after summer internship.
- ➢**Program Products:**
  - ❑ PowerPoint reports - 11, Oral presentations - 11, Posters - 8.
  - ❑ 2009: Medical School - 1, Graduate Program - 2.
  - ❑ 2010: Interest in Basic Science or Public Health program - 3.
  - ❑ Program Booklets: 2009 - 1, 2010 - 1.

CONCLUSION

- ❖Summer apprenticeship in a research project was an effective mentoring strategy for stimulating interest, improving knowledge, and building research skills among HBCU undergraduates.
  - ❖The long-term impact remains to be evaluated.
- ❖The summer period was too short for interns to conveniently complete their projects.

IMPACT STATEMENT

Extending the summer internship into the school year will maintain commitment on the part of the intern, strengthen the mentorship bond, and consolidate their interest and ability to pursue a graduate program in biomedical sciences. This will potentially increase the number of next generation minority health disparity researchers in the area of prostate cancer.

ACKNOWLEDGEMENT

African-American community of Nashville, Nashville study participants, Faculty & Staff Guest Speakers: A. Fair, C. Weaver, L Jones, C. Freud, D. Powell, C. Harville, S. Miller-Hughes, R. Dryden, T Ding, S Pratap (Meharry College, Nashville, TN.), M. Okobia (University of Pittsburgh/University of Benin, Nigeria.), Rev. J. Brown (Philadelphia, PA.), B. Rivers (Tampa, FL.). M. Reece (TSU, Nashville.). Funded by Department of Defense PCRP: IDEA Award DAMD17-02-1-0068, HBCU Partnership Award W81XWH-05-1-0229, and HBCU Summer Training Award W81XWH-09-1-0161.

Plasma Lycopene and Prostate Cancer Risks Among African-Americans and Nigerians: A Case Control Study

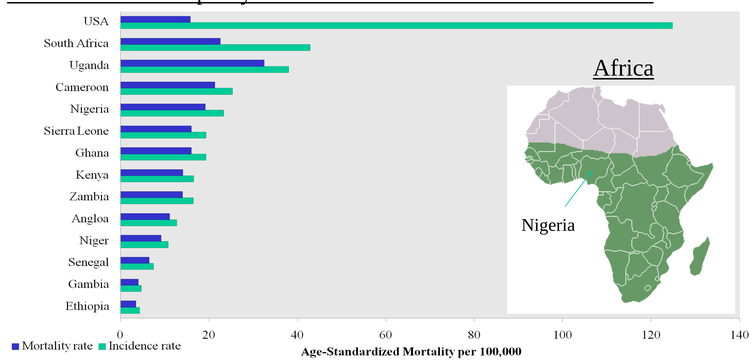
Flora A. Ukoli[1], Charlette Goodin[3], Kerris Sease[3], Temple Oguike[4], Myron Gross[5], Phillip Akumabor[4], Usifo Osime[4], Jay Fowke[2], Derrick Beech[1].

[1]Department of Surgery, Meharry Medical College, Nashville, TN. [2]Vanderbilt University, Nashville, TN. [3]Fisk University, Nashville, TN. [4]University of Benin Teaching Hospital, Nigeria. [5]University of Minnesota, Minneapolis, MN.

INTRODUCTION

Prostate cancer (PCa), the most common non-skin cancer in America men, affects African-Americans 60% more than Caucasians, with a 2.5 times higher mortality (1,2). Although some authors allude to similar high PCa rates in African blacks, suggesting an enhancing genetic predisposition, more recent studies indicate environmental reasons for the increasing rates of PCa in previously low incidence regions of Sub-Saharan African (3). The cause of PCa remains unknown, but researchers believe in the protective role of diets that are low in red meat and high in antioxidants from fruits and vegetables (4). Lycopene is a fat-soluble pigment synthesized by plants that gives tomatoes and other fruits their red color. Like other carotenoids lycopene inhibits prostate carcinogenesis in vitro demonstrated by a 4-fold reduction in the incidence of PCa in Lady transgenic mice fed on Lycopene-rich diet (5). The mechanisms of action include antioxidant ability to trap singlet oxygen and reduce DNA damage, and working via the IGF, androgen, and IL-6 signaling pathways (6). Several population studies that have shown that intake of diets high in tomato-based foods and higher plasma lycopene levels are associated with reduced PCa risk, include the Health Professionals Follow-up Study (HPFS) that recruited a cohort of 47,365 participants (7,8). The Third National Health and Nutrition Examination Survey (NHANES) observed that serum lycopene was inversely related to PCa risk in both US blacks and whites, and that the significantly lower serum lycopene levels in black men may contribute to the racial disparity in PCa incidence (9). Reviewers are therefore in agreement that lycopene, among other micronutrients, is a promising antioxidant in the control of PCa (10). Trans-lycopene accounts for 80-90% of total lycopene in tomato food items, 30-40% in serum, and 10-20% in prostate tissue, existing in the prostate mainly in the cis-form. The implication of this is not very clear especially as other carotenoids are also present in the prostate (11). This case-control pilot study evaluated the role of plasma lycopene in PCa risk in understudied African-American and Nigerian populations with diverse PCa risk. These populations have similar ancestry but different dietary styles, the Nigerian diet being characterized by higher levels of fruits and vegetables, but lower processed foods and animal fats. Plasma lycopene serves as a surrogate for prostate exposure levels.

Prostate Cancer Disparity Between African Countries and the USA.



AIMS AND OBJECTIVES

1. Recruit 50 PCa cases & 100 controls in Nashville, TN and Nigeria, collect demographic, urologic symptom information, and fasting blood sample for lycopene assay.
2. Compare plasma lycopene levels of cases & controls separately for both populations
3. Evaluate PCa risk association with plasma lycopene tertiles by Odds Ratio (OR).
4. Provide accurate information about lycopene for PCa nutrition education .

MATERIALS AND METHODS

❖ **Target Population**: Black men ≥40 years in Nashville, TN & Edo and Delta States, Nigeria.

African-American Sample: Controls recruited by flyers (churches, health fairs, barber shops, etc). Cases identified from the TN cancer register received mail invitations.

Nigerian Sample: Controls recruited by house-to-house invitation (Benin-City, Udo & Warri). Cases recruited in the waiting rooms of surgery and urology clinics of the University of Benin Teaching Hospital, and affiliated specialist hospitals.

❑ **Study Controls:** Normal prostate on digital rectal examination (DRE) and PSA <2.5ng/ml.

❑ **Study Cases:** Diagnosed with prostate cancer by a urologist within 5 years.

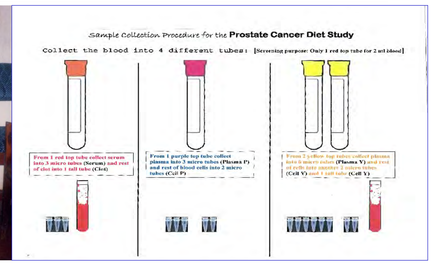
❖ **1st Study Visit:** Informed consent, Demographic, Medical & Cancer history, Alcohol & Tobacco use, Anthropometric measurements. Modified Block FFQ. Trained interviewer.

❖ **2nd Study Visit:** 30ml. fasting venous blood sample, DRE by surgeon, 24-hour dietary recall. Participants received $20 cash incentive and study gifts at the end of each study visit.

❖ **Blood Sample:** Centrifuged 15 minutes. Plasma separated into labeled 1.5ml microvials with pipette. Samples stored at -20ºC. Shipped quarterly on dry-ice to the US. Stored at -40ºC until shipped on dry-ice to research laboratory for carotenoid analysis.

❖ **Data Analysis:** Discrete data compared across sub-groups by Chi-Square test, plasma lycopene by independent sample median test, OR of PCa risk across plasma lycopene tertiles by unconditional logistic regression, controlling for demographic and anthropometric variables.

BLOOD SAMPLE COLLETION & LABORATORY METHOD



Laboratory Method: Plasma lycopene was measured using a modified High-Performance Liquid Chromatography (HPLC) technique developed in the Molecular Epidemiology and Biomarkers Research Laboratory of Myron Gross, Ph.D., University of Minnesota, MN. This method simultaneous determined concentrations of several carotenoids including trans-lycopene, 3 lycopene cis isomers, 15-cis, 13-cis, and 9-cis, and total plasma lycopene in µg/ml.

RESULTS

Table 1: Socio-Demographic and Prostate Status Related Characteristics of African-American and Nigerian Study Participants

Characteristics	African-Americans n = 88	Nigerians n = 89	Total n = 177
Age (years)			
< 54	25 (28.4)	18 (20.2)	43 (24.3)
55 - 74	53 (60.2)	56 (62.9)	109 (61.6)
≥ 75	10 (11.4)	15 (16.9)	25 (14.1)
Education**			
< High School	13 (15.1)	51 (59.3)	64 (37.2)
High School	34 (39.5)	10 (11.6)	44 (25.6)
> High School	39 (45.3)	25 (29.1)	64 (37.2)
Annual HH Income*			
Low	40 (45.5)	60 (67.4)	100 (56.5)
Middle	24 (27.3)	11 (12.4)	35 (19.8)
High	19 (21.6)	8 (9.0)	27 (15.3)
Not stated	5 (5.7)	10 (11.2)	15 (8.5)
Marital Status**			
Single	23 (26.1)	1 (1.1)	24 (13.7)
Married	32 (36.4)	82 (92.1)	114 (64.4)
Divorced/Separated	26 (29.5)	5 (5.6)	31 (17.5)
Widowed	7 (7.9)	1 (1.1)	8 (4.5)
Prostate Health			
Prostatism History**	28 (32.2)	61 (68.5)	89 (50.6)
Diagnosed BPH**	29 (33.3)	5 (5.6)	34 (19.3)
Diagnosed PCa	37 (42.0)	38 (42.7)	75 (42.4)

*p<0.01 **p <0.001

Table 2. Plasma Lycopene Pattern among African-Americans and Nigerians

Plasma Lycopene	Median (25th and 75th) µg/ml Africans-Americans	Nigerians	p-value
Trans-Lycopene	8.56 (5.26, 12.54)	4.51 (2.45, 7.13)	0.001
13-cis-Lycopene	3.73 (2.58, 6.19)	3.55 (2.33, 6.37)	0.130
9-cis-Lycopene A	0.73 (0.31, 1.58)	0.68 (0.46, 1.02)	0.305
9-cis-Lycopene B	1.64 (0.91, 2.87)	1.39 (1.03, 2.40)	0.291
Total Lycopene	14.80 (9.74, 21.29)	11.62 (6.72, 15.51)	0.002

Trans-Lycopene
African-Americans have a 2-fold higher plasma level than Nigerians

Table 3. Plasma Lycopene in African-American & Nigerian Prostate Cancer Cases & Control

Lycopene	Plasma Lycopene Median (25th and 75th) µg/ml Africans-Americans Cases	Africans-Americans Controls	Nigerians Cases	Nigerians Controls
Trans-Lycopene	7.23 (4.47, 10.94)	10.21 (6.10, 13.63)**	4.54 (1.65, 7.36)	4.42 (2.93, 6.15)
13-cis-Lycopene	3.42 (2.47, 5.94)	3.90 (2.63, 6.34)	2.92 (2.15, 4.85)	5.26 (2.40, 7.05)
9-cis-Lycopene A	0.47 (0.30, 0.87)	0.85 (0.31, 1.87) *	0.74 (0.52, 0.99)	0.61 (0.40, 0.90)
9-cis-Lycopene B	1.67 (0.93, 2.90)	1.57 (0.90, 2.85)	1.39 (1.02, 2.46)	1.32 (0.90, 2.03)
Total Lycopene	13.17 (6.60, 21.17)	17.91 (10.89, 22.2)	9.86 (6.31, 14.01)	11.90 (6.70, 15.24)

* p<0.025 ** p<0.006

Table 4. Adjusted Odds Ratios§ (95% CI) for Prostate Cancer Risk across Tertiles of Plasma Lycopene for African-American and Nigerian Study Populations

Lycopene Isomer	OR (95% CI) Comparing 3rd to 1st Tertile African-Americans	p-trend	Nigerians	p-trend
Trans-Lycopene	0.13 (0.02 - 0.90)*	0.06	45.1 (1.39 - 437)*	0.09
13-cis-Lycopene	5.24 (0.64 - 42.93)	0.21	0.30 (0.04 - 2.14)	0.16
9-cis-Lycopene A	0.14 (0.03 - 0.69)*	0.04	0.25 (0.03 - 2.25)	0.12
9-cis-Lycopene B	1.90 (0.23 - 15.70)	0.82	a0.02 (0.00 - 0.73)*	0.06

§ OR Adjusted for Age, Education and Income. * p<0.05 a OR estimate between 2nd & 3rd Tertiles

Risk Reduction
Trans-Lycopene African-Americans

Risk Reduction
9-cis Lyco A: African-Americans
9-cis Lyco B: Nigerians

CONCLUSION

- ❖ Trans-lycopene accounts for over half of total plasma lycopene, was associated with PCa risk reduction in Africans , and African-Americans had a 2-fold higher level than Nigerians.
- ❖ PCa risk reduction was also observed for:
  - ❖ 9-cis-lycopene A in African-Americans.
  - ❖ 9-cis-lycopene B in Nigerians.
- ❖ This observed PCa protective role for lycopene should be confirmed in a larger population study.
- ❖ The protective role of very low levels of cis-lycopene is particularly relevant in diet modification and supplement development.

IMPACT STATEMENT

The marked disparity in plasma trans-lycopene is probably a reflection of differences in dietary sources of lycopene in both populations. Modest dietary or lycopene supplement modifications to increase cis-isomers may provide additional PCa risk reduction benefits in high-risk populations.

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Pattern of Urology Symptoms among Nigerians: Hospital & Community Experience

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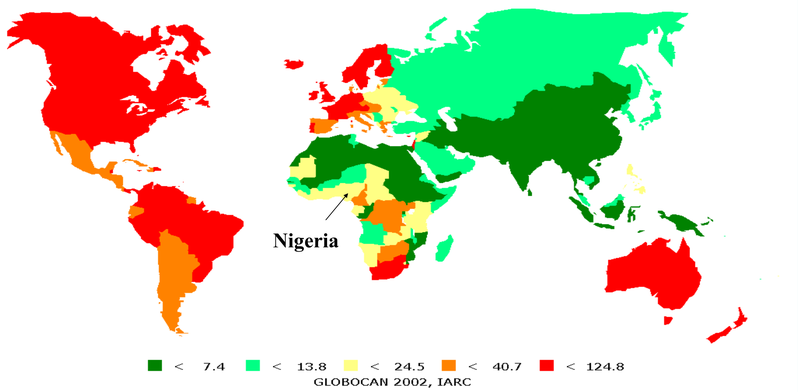
INTRODUCTION

Prostate cancer is second leading cause of cancer deaths among American men, with a estimated annual mortality of 32,000. African-American men are reported by the National Cancer Institute (NCI) and GLOBOCAN to have the highest prostate cancer incidence in the world. Very low rates are reported for Japan, 12.6/100,000, and China, 1.6/100,000. Nigeria, like other Sub-Saharan African countries, have an incidence of 24.5 per 100,000, and is therefore classified as a low-incidence region. Some authors describe this rate as an artifact of gross under-estimation, the inherent bias in hospital data, the absence of cancer registers, incomplete death certification, and the effect of competing mortality. Most prostate cancers are accidental findings in surgical specimens from symptomatic large prostates, or are diagnosed in very late stages with bone metastasis and neurological complications. More resent studies have estimated prostate cancer incidence rates between 60 – 127/100,000 for Nigeria. The authors recognize the possible but real influence of genetic predisposition in prostate carcinogenesis, and they also propose improved diagnosis and case-finding, increased longevity, and increased environmental exposure to dietary carcinogens among those now adopting more westernized diets. In the absence of accurate vital and health statistics, cancer registration, and routine screening for prostate cancer in Nigeria, more accurate estimates of prevalence can be calculated from population-based studies in defined communities. The goal of this study is to compare the rates of elevated serum prostate specific antigen (PSA) and prostatism in hospital and community-based Nigerian populations, and demonstrate the urgent need for the infrastructure for the estimation of accurate prostate cancer statistics and the necessity of prostate cancer awareness campaign in low-incidence prostate cancer regions such as Nigeria.

AIMS AND OBJECTIVES

1. Recruit 200 Nigerian men ≥40 years from surgery/urology clinics, and 400 apparently healthy age-comparable men from the community, to participate in a prostate health study.
2. Compare the demographics, urology symptom, DRE, and PSA patterns across both populations.
3. Describe their pattern of response to abnormal DRE and/or PSA and prostate biopsy in both populations, and compare the prevalence of prostate cancer diagnosed in both populations.
4. Propose recommendations to improve the level of awareness and response to prostate cancer among Nigerians.

Fig.1 Worldwide Prostate Cancer Incidence rates using the World Standard Population



Age-Standardized incidence rate per 100,000

MATERIALS AND METHODS

Target Population: Nigerian men ≥40 years residing in Edo, Delta, and Plateau States of Nigeria.

Study Sample Recruitment: Age-eligible men from the hospital clinic and selected communities.

Hospital population: Direct invitation in the waiting room of surgery and urology clinics of the University of Benin Teaching Hospital and affiliated hospitals.

Community Population: Door-to-door invitation in selected rural (2) and urban (2) communities.

Study Protocol: Participants signed informed consent, provided demographic and urology symptom information by a trained interviewer, allowed 30ml. fasting venous blood draw by a nurse, and had a consultation with a surgeon/urologist that included a digital rectal examination (DRE). Blood samples were processed and serum was stored in microvials at -20^{0}C, shipped on dry ice to the US quarterly, and stored at -40^{0}C until shipped to a commercial laboratory for PSA analysis within the week. Men with abnormal PSA and/or DRE were followed up by the urologist and prostate biopsy information provided.

Data Analysis: Demographic characteristics, urology symptoms history and severity were compared across hospital and community populations by Chi-square test using the SPSS version 14.0.

RESULTS

319 hospital and 380 community participants consented with response rates 80.0% vs 76.0%, and mean age of 66.8 ± 10.3 vs. 56.2 ± 13.3, p<0.001. Urology symptom history was reported in 266(83.4) vs. 49(12.9), p<0.001, enlarged prostate 120(37.6) vs. 117(30.8), abnormal prostate suspicious of cancer 44(13.8) vs. 3(0.8) respectively. Prevalence for pain, frequency, and urinary retention were 33.4%, 30.6% and 28.1% in hospital population, while rates for frequency, pain and straining were 5.0%, 3.2%, and 2.4% in the community.

Table 1. Socio-Demographic, Prostate Symptom History, and Prostate Status of Nigerian Men Recruited from the Hospital and Community

Characteristics		Hospital (N = 319)	Community (N = 380)	p-value
Age (yrs):	<54 years	35 (11.0)	189 (49.7)	<0.0001
	55-64 years	91 (28.5)	93 (24.5)	
	65-74 years	121 (37.9)	56 (14.7)	
	≥75 years	72 (22.5)	42 (11.0)	
Education:	< Primary	67(21.0)	100 (26.3)	<0.037
	Primary - Jnr. Sec.	107 (33.5)	147 (38.7)	
	High & Post-High	74 (23.2)	78 (20.5)	
	College & Graduate	53 (16.6)	38 (10.0)	
	Not Recorded	18 (5.6)	17 (4.5)	
Income: Annual	Low: < N25,000	221 (69.3)	215 (56.6)	<0.001
	Middle: N35-N64,999	38 (11.9)	51 (13.4)	
	High: ≥ N65000	21 (6.6)	56 (14.7)	
	Not Stated	39 (12.2)	58 (15.3)	
Marital: Status	Single	2 (0.6)	8 (2.1)	<0.05
	Married	207 (64.9)	262 (68.9)	
	Married ≥2 times	87 (27.3)	78 (20.5)	
	Divorced/Separated	14 (4.3)	27 (7.1)	
	Widowed	9 (2.8)	5 (1.3)	

Table 2: Number and Severity of Prostatic Symptoms among Study Participants

Prostatic Symptoms	Hospital	Community
Symptom Severity		
Mild	34 (10.7)	24 (6.3)
Moderate	36 (11.3)	9 (2.4)
Severe	196 (61.4)	16 (4.2)
No. of Symptoms		
1 - 2	121 (37.9)	47 (12.4)
3 - 5	89 (27.9)	2 (0.5)
≥ 6	56 (17.6)	0 (0.0)

Severe symptoms
- Retention
- Incontinence
- Pain/Dysuria
- Blood or Pus in the urine

Moderately severe symptoms
- Straining
- Nocturia
- Poor erection

Mild symptoms
- Frequency
- Dribbling
- Weak urinary stream

Giant Statue: Rural Village Square of Edo State

1st Study Visit Conducted by Interviewer at Home

Table 3 a: Pattern of PSA Distribution by Urology Symptom among Men at the Hospital

PSA (µg/dl)	None	Mild	Moderate	Severe	Total	%
< 3.9	23 (43.4)	9 (26.5)	18 (50.0)	37 (18.9)	87	27.3
4 - 19.9	10 (18.9)	11 (32.4)	5 (13.9)	48 (24.5)	74	23.2
20 - 99.9	1 (1.9)	6 (17.6)	3 (8.3)	32 (16.3)	42	13.2
≥ 100	11 (20.8)	4 (11.8)	3 (8.3)	32 (16.3)	50	15.7
Not Recorded	8 (15.1)	4 (11.8)	7 (19.4)	47 (24.0)	66	20.7
Total	53 (16.6)	34 (10.7)	36 (11.3)	196 (61.4)	319	100.0
%	16.6	10.7	11.3	61.4	100.0	

Table 3 b: Pattern of PSA Distribution by Urology Symptom among Men in the Community

PSA(µg/dl)	None	Mild	Moderate	Severe	Total	%
< 3.9	268 (81.0)	18 (75.0)	5 (55.6)	12 (75.0)	303	79.7
4 - 19.9	16 (4.8)	2 (8.3)	4 (44.4)	2 (12.5)	24	6.3
20 - 99.9	9 (2.7)	1 (4.2)	0 (0.0)	0 (0.0)	10	2.6
≥ 100	2 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	2	0.5
Not Done	36 (10.9)	3 (12.5)	0 (0.0)	2 (12.5)	41	10.8
Total	331	24	9	16	380	100.0
%	87.1	6.3	2.4	4.2	100.0	

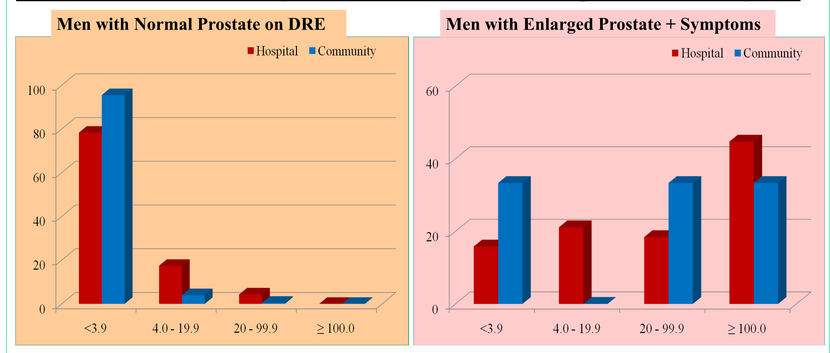
Prostate biopsy was ordered for men with PSA≥4µg/dl, 116(52.0%) hospital and 36(10.6%) community, and for 47 men with hard/nodular prostate on DRE suspicious of PCa. Prevalence of PCa in the hospital and community populations were 152(47.6) and 14(3.7), with histologically unresolved diagnosis of 72(22.6) and 22(5.8).

Table 4. Prevalence of Urology Symptoms in Nigerian Study Population by Age

Urology Symptoms	< 54 years	55 - 75 years	≥75 years	Total	%
No Symptoms	183 (81.7%)	145 (40.2)	41 (36.0)	369	52.9
Dysuria - Pain	12 (5.4)	80 (22.2)	27 (26.0)	119	17.0
Frequency	12 (5.4)	76 (21.1)	29 (27.9)	117	16.7
Retention	4 (1.8)	62 (17.2)	27 (23.7)	93	13.3
Urgency	7 (3.1)	56 (15.5)	19 (18.3)	82	11.7
Straining	8 (3.6)	62 (17.2)	11 (10.6)	81	11.6
Weak Stream	5 (2.2)	41 (11.4)	23 (22.1)	69	9.9
Incontinence	3 (1.3)	28 (7.8)	5 (4.8)	36	5.2
Blood/Pus in Urine*	4 (1.8)	20 (5.5)	5 (4.8)	29	4.1

* Differences in rates by age not statistically significant.

Distribution Pattern of PSA by Prostate Status on DRE for Hospital & Community Men



CONCLUSION

- Participants recruited from the hospital were older and recorded more symptoms than men recruited from the community. They also had more severe symptoms as expected.
- PCa incidence rate based on the hospital data will be a gross overestimation of the true rate.
- A third of the men recruited from the community had urological symptoms and or enlarged prostate on DRE for which they did not seek medical attention.
- A majority of men recruited in the clinic had very high PSA, DRE findings suspicious of PCa, and clinical status suggestive of advanced stage PCa cancer .

IMPACT STATEMENT

A community-based prostate cancer campaign will be an ideal strategy to improve awareness about the prostate, encourage early consultation for urological symptoms, facilitate early detection of PCa, and provide data to determine the true prevalence of PCa in this potentially high-risk population. This is a necessary first step for accurate international comparisons.

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ID# _____

Throughout this interview I will ask you how often you ate certain foods in the past year. Please tell me the number of times you ate the mentioned item in a day, a week, a month, a year or not all. You also need to tell me the usual quantity or serving size you ate.

Meat, Fish, Egg, and Dairy Products in Prostate Cancer Risk among African-Americans

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INTRODUCTION

African-American men currently have the highest incidence and mortality rates for prostate cancer than any other ethnic group. The American Cancer Society projected about 192,280 new cases and 27,360 deaths from prostate cancer in 2009. All though prostate cancer can run in families it is generally accepted that environmental factors are more important that genetic factors in prostate carcinogenesis. The fact that Sub-Saharan Africans who share a common ancestry with African-Americans record very low prostate cancer risk further underscores the importance of environmental exposures in prostate cancer risk. Studies of diet and nutritional risk factors of prostate cancer are challenging for three major reasons: 1). Accurately measuring the nutrient/food exposure. 2.). Identifying ethnic-specific food assessment tools. 3). Misclassification of study cases and controls because of the long latent period of the disease. Although reports from studies are inconsistent, certain food items such as diary products, red meats, and processed meats (sausages, bacon, and hot dogs) appear to be associated with increased risk, while other foods such as fish, vegetables and fruits are associated with reduced risk for prostate cancer. Food preparation methods including diets high in animal fats and fried foods are also associated with increased risk, and may also be responsible for inconsistencies reported across studies from different countries. A study in Sweden reported a 2.3 times higher risk of prostate cancer among men who ate no fish compared to those who did. On the contrary, a study in Japan found an increased risk with fish intake. It may therefore be premature to suggest generalized diet modifications and restrictions for prostate cancer prevention on the basis of data collected from other populations.

The goal of this pilot study is to investigate the feasibility of evaluating the role of dietary meat, fish, egg and diary products in prostate cancer risk using a modified BLOCK food frequency questionnaire (MFFQ) with life-size food models designed specifically for low literacy populations with.

AIMS AND OBJECTIVES

1. Accrue 50 African-American prostate cancer cases, 50 hospital-based age-comparable controls, and 50 community-based age comparable controls in Nashville, TN and in the surrounding counties, and collect their demographic and prostate cancer information, anthropometric measurements, and diet assessment using the study MFFQ.
2. Compare the demographics, anthropometric measurements, and meat, fish, egg, and diary product intake of the prostate cancer cases and controls.
3. Determine the association of meat, fish, egg, and dairy products intake with prostate cancer risk in the study population by odds ratio (OR) estimation.

HYPOTHESES

- Prostate cancer cases have a higher intake of meat and dairy products than the controls.
- Prostate cancer cases have a lower intake of fish and eggs than the controls.
- Red meat, processed meat and dairy product are associated with increased prostate cancer risk after controlling for anthropometric measurements, fish and egg intake.

MATERIALS AND METHODS

Target Population: African-American men ≥40 years in Nashville and surrounding counties.

Study Cases: Diagnosed with prostate cancer within the past 5 years. N = 50

Study Controls: Free of prostate cancer. Screened by PSA & DRE within the past 12 months. Age-matched controls selected from a data base of 200 controls with PSA<2.5ng/dl.

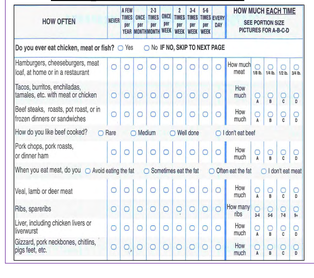
Excluded: Severely ill patients, Men on chemotherapy, Hormone treatment including Insulin, Anti-retroviral treatment, diet modification (other than low-salt diet).

Recruitment: Response to radio announcement, Flyers distributed at health outreach programs, Referral from physician/urologist clinics.

Procedure: Informed consent, Personal and medical information by interview. MFFQ by interview, BLOCK FFQ self-administered. Physical measurements: Height, Weight, Waist & Hip circumference, Body fat %.

Diet Assessment Tools

Sample BLOCK FFQ

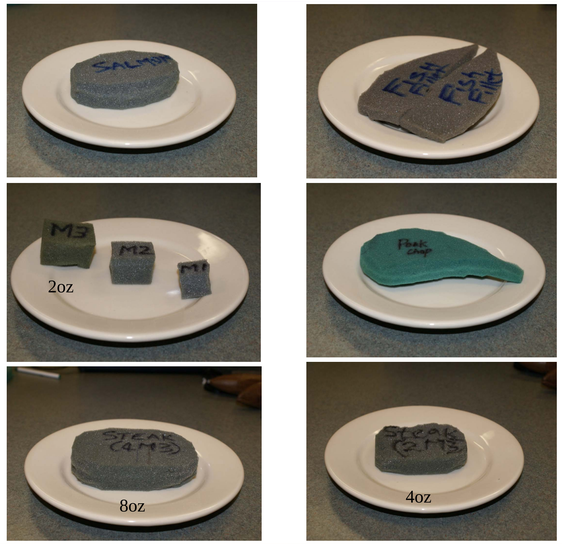


HOW OFTEN	NEVER	A FEW TIMES PER YEAR	1-2 PER MONTH	ONCE A WEEK	2 TIMES PER WEEK	3-4 TIMES PER WEEK	5-6 TIMES PER WEEK	EVERY DAY	HOW MUCH EACH TIME — SEE PORTION SIZE PICTURES FOR A-B-C-D
Do you ever eat chicken, meat or fish? ○ Yes ○ No IF NO, SKIP TO NEXT PAGE									
Hamburgers, cheeseburgers, meat loaf, at home or in a restaurant	○	○	○	○	○	○	○	○	How much meat: ○ 1/8 lb. ○ 1/4 lb. ○ 1/2 lb. ○ 3/4 lb.
Tacos, burritos, enchiladas, tamales, etc. with meat or chicken	○	○	○	○	○	○	○	○	How much: ○ A ○ B ○ C ○ D
Beef steaks, roasts, pot roast, or in frozen dinners or sandwiches	○	○	○	○	○	○	○	○	How much: ○ A ○ B ○ C ○ D
How do you like beef cooked? ○ Rare ○ Medium ○ Well done ○ I don't eat beef									
Pork chops, pork roasts, or dinner ham	○	○	○	○	○	○	○	○	How much: ○ A ○ B ○ C ○ D
When you eat meat, do you ○ Avoid eating the fat ○ Sometimes eat the fat ○ Often eat the fat ○ I don't eat meat									
Veal, lamb or deer meat	○	○	○	○	○	○	○	○	How much: ○ A ○ B ○ C ○ D
Ribs, spareribs	○	○	○	○	○	○	○	○	How many ribs: ○ 1/4 ○ 1/2 ○ 3/4 ○ whole
Liver, including chicken livers or liverwurst	○	○	○	○	○	○	○	○	How much: ○ A ○ B ○ C ○ D
Gizzard, pork neckbones, chitlins, pigs feet, etc.	○	○	○	○	○	○	○	○	How much: ○ A ○ B ○ C ○ D

Sample MFFQ

FOOD	NEVER	FEW TIMES A YEAR	1-2 TIMES A MONTH	1-2 TIMES A WEEK	3-4 TIMES A WEEK	5-7 TIMES A WEEK	2 OR MORE TIMES A DAY	QUANTITY OR PORTION SIZE EACH TIME
	NIL NO	RARE	OCCASIONS	SOME TIMES	OTHER DAY	DAILY	MANY TIMES	
Chicken, Hen Turkey / Roast Turkey Smoked Poultry Duck								1/16 1/8 ¼ ½ # pc
Beef/Steak, Roast beef Lamb, Goat Pork, Pork chop, Ham Smoked pork ***Bush meat ****								# M1/M3/Pc, # Kp
Pig feet, *Cow leg, Skin,* * Kidney, Liver, Gizzard Tripe Chitlins Oxtail (with Skin?)								# pcs
Ground beef stew Meat balls / Meatloaf Ground turkey, Picadillo								# pt # K3 # balls / # Slice # slices
Sausage, Hotdog, Bacon Eggs								# # slices # Boiled / Fried
Lunch meat ham Turkey lunch meat Bologna, Salami Pepperoni								# slices

Life-Size Food Portion-Size Models



Annual Food Intake Computed as a Product of Annual Frequency & Portion Size

Annual Intake Pattern	Never	Rarely	Occasionally	Sometimes	Frequently	Every Day (Daily)	Many Times (A Lot)
Reference	0/Year	≤6/Year	1-2/Month	1-2/Week	3-4/Week	5-7/Week (1 / Day)	≥ 2/Day
Interval Boundary	0	6 2	(12+24) 2	(52+104) 2	(156+208) 2	(260+364) 2	365 x 2
Mid-Interval Value	0	3	18	78	182	312	730
Frequency (3 Groups)		Rarely		Sometimes		Frequently	
Annual Intake		Mid-Interval Frequency x Unit Portion Size					
Annual Intake (4 Groups)		Transform to Quartiles					

DATA ANALYSIS

Cases and controls were compared by Chi-square test for discrete data and Mann-Whitney non-parametric test for continuous data. Patterns of quartile distribution food intake for cases and controls were compared by Chi-squared test in a 2 by 3 contingency table. Prostate cancer risk association for each food item was determined by odds ratio (OR) estimated across quartiles of annual intake by unconditional logistic regression, unadjusted and adjusted by age, education, income, and body fat parameters. Data analysis: SPSS Version 14.0

RESULTS

Table 1: Demographic Characteristics, Obesity Status, and Prostate Health Status of African-American Study Sample by Age Group

Characteristics	< 54 years	55 – 64 years	≥ 65 years	Total
Education *	11 (9.2)	14 (16.1)	11 (19.3)	36 (13.6)
< High School	55 (45.8)	34 (39.1)	18 (31.6)	107 (40.5)
High School	54 (45.0)	39 (44.8)	28 (49.1)	121 (45.8)
Some/College				
Work ***	48 (40.0)	20 (23.0)	5 (8.8)	73 (27.6)
Not Working	3 (2.5)	21 (24.1)	48 (84.2)	72 (27.3)
Retired	24 (20.0)	12 (13.8)	2 (3.5)	38 (14.4)
Working Part-Time	45 (37.5)	34 (39.1)	2 (3.5)	81 (30.7)
Working Full-Time				
Marital ***	27 (22.5)	39 (44.8)	32 (56.2)	98 (37.1)
Married	33 (27.5)	29 (33.3)	8 (14.0)	70 (26.5)
Divorced	5 (4.2)	5 (5.7)	8 (14.0)	18 (14.0)
Widowed	55 (45.8)	14 (16.1)	9 (15.8)	78 (29.5)
Single				
Income *	76 (63.3)	42 (48.3)	22 (38.6)	140 (53.0)
<$25,000	18 (15.0)	17 (19.5)	18 (31.6)	53 (20.1)
$25 - $49,999	10 (8.3)	12 (13.8)	9 (15.8)	31 (11.7)
$50 - $74,999	10 (8.3)	15 (17.2)	7 (12.3)	32 (12.1)
≥ $75,000	6 (5.0)	1 (1.1)	1 (1.8)	8 (3.0)
Not Stated				
Obesity (BMI)	n = 117	n = 86	n = 55	n = 258
Underweight (<18.5)	2 (1.7)	2 (2.3)	0 (0.0)	4 (1.6)
Normal (18.5 - 24.9)	36 (30.8)	20 (23.3)	14 (25.5)	70 (27.1)
Over-weight (25.0 - 29.9)	33 (28.2)	29 (33.7)	21 (38.2)	83 (32.2)
Obese I (30.0 – 34.9)	28 (23.9)	23 (26.7)	15 (27.3)	66 (25.6)
Obese II/III (≥ 35.0)	18 (14.4)	12 (14.0)	5 (9.1)	35 (13.6)
Prostate *** Cancer (Cases)	7 (5.8)	26 (29.9)	27 (47.4)	60 (22.7)
Controls	104 (86.7)	46 (52.9)	16 (28.1)	166 (62.9)
Elevated PSA	5 (4.2)	15 (17.2)	13 (22.8)	33 (12.5)
Not Recorded	4 (3.3)	0 (0.0))	1 (1.8)	5 (1.9)

* p<0.05 ** p<0.01 *** p<0.001

RESULTS

Table 2: Food Intake Frequency by Age Group

Food Item	< 54 years	55 – 64 years	≥ 65 years
Chicken			
Rarely	3(2.8)	5 (6.7)	0 (0.0)
Sometimes	57 (52.3)	36 (48.0)	30 (55.6)
Frequently	49 (45.0)	34 (45.3)	24 (44.4)
Beef **			
Rarely	22 (20.2)	19 (25.3)	20 (37.0)
Sometimes	69 (63.3)	49 (65.3)	34 (63.0)
Frequently	18 (16.5)	7 (9.3)	0 (0.0)
Hot Dog**			
Rarely	18 (16.5)	20 (26.7)	23 (42.6)
Sometimes	67 (61.5)	38 (50.7)	27 (50.0)
Frequently	24 (22.0)	17 (22.7)	4 (7.4)
Fish			
Rarely	34 (31.2)	25 (33.3)	14 (25.9)
Sometimes	72 (66.1)	45 (60.0)	39 (73.6)
Frequently	3 (2.8)	5 (6.7)	1 (1.9)
Tuna**			
Rarely	28 (25.7)	37 (49.3)	20 (37.0)
Sometimes	74 (67.9)	32 (42.7)	33 (61.1)
Frequently	7 (5.8)	6 (6.9)	1 (1.9)
Egg			
Rarely	9 (8.3)	12 (16.0)	9 (16.7)
Sometimes	44 (40.4)	28 (37.3)	29 (53.7)
Frequently	56 (51.4)	35 (46.7)	16 (29.6)
Milk			
Rarely	28 (25.9)	26 (35.6)	12 (22.6)
Sometimes	37 (34.3)	16 (21.9)	13 (24.5)
Frequently	43 (39.8)	31 (42.5)	28 (52.8)
Ice cream			
Rarely	32 (29.3)	27 (36.0)	19 (35.2)
Sometimes	66 (60.6)	41 (54.7)	26 (48.1)
Frequently	11 (10.1)	7 (9.3)	9 (16.7)
Cheese Burger***			
Rarely	19 (17.4)	29 (38.6)	33 (61.1)
Sometimes	74 (67.9)	40 (53.3)	20 (37.0)
Frequently	16 (14.7)	6 (8.0)	1 (1.9)

N = 238 * p<0.05 ** p<0.01 *** p<0.001

Table 3: Food Intake Pattern of Cases & Controls

Food Item	Cases	Control
Chicken		
Rarely	1(1.2)	7 (4.5)
Sometimes	46 (55.4)	77 (49.7)
Frequently	36 (43.4)	71 (45.8)
Beef ***		
Rarely	32 (38.6)	29 (18.7)
Sometimes	49 (59.0)	103 (66.5)
Frequently	2 (2.4)	23 (14.8)
Hot Dog**		
Rarely	28 (33.7)	33 (21.3)
Sometimes	48 (57.8)	84 (54.2)
Frequently	7 (8.4)	38 (24.5)
Fish*		
Rarely	17 (20.7)	55 (35.5)
Sometimes	59 (72.0)	97 (62.6)
Frequently	6 (7.3)	3 (1.9)
Tuna		
Rarely	35 (42.2)	50 (32.3)
Sometimes	43 (51.8)	96 (61.9)
Frequently	5 (6.0)	9 (5.8)
Egg*		
Rarely	12 (14.5)	18 (11.6)
Sometimes	43 (51.8)	58 (37.4)
Frequently	28 (33.7)	79 (51.0)
Milk		
Rarely	21 (25.9)	45 (29.4)
Sometimes	17 (21.0)	49 (32.0)
Frequently	43 (53.1)	59 (38.6)
Ice Cream		
Rarely	23 (27.7)	55 (35.5)
Sometimes	48 (57.8)	85 (54.8)
Frequently	12 (14.5)	15 (9.7)
Cheese Burger***		
Rarely	50 (60.2)	31 (20.0)
Sometimes	30 (36.1)	104 (67.1)
Frequently	3 (3.6)	20 (12.9)

N = 238 * p<0.05 ** p<0.01 *** p<0.001

Table 4. Odds Ratio (95% CI) for Prostate Cancer Risk Comparing 4th to 1st Quartile of Selected Food Intake

	Unadjusted OR_{Q2-1}	Unadjusted OR_{Q3-1}	Unadjusted OR_{Q4-1}	Adjusted OR_{Q4-1}
Red Meat [d]	0.16 (0.07 - 0.38)***	0.25 (0.10 - 0.60)**	0.44 (0.18 - 1.08)	0.21 (0.05 - 0.84)* Q2-1
White Meat	0.74 (0.34 - 1.59)	0.70 (0.33 - 1.48)	0.90 (0.41 - 1.97)	1.26 (0.43 - 3.73)
Processed Meat [d]	0.20 (0.09 - 0.46)***	0.27 (0.12 - 0.62)**	0.83 (0.34 - 2.03)	0.95 (0.28 - 3.20)
Fish	1.41 (0.66 - 3.01)	1.41 (0.66 - 3.01)*	0.83 (0.40 - 1.74)	1.35 (0.48 - 3.79)
Shrimp	0.90 (0.44 -1.83)	0.44 (0.18 - 1.09)	1.13 (0.52 - 2.48)	1.32 (0.43 - 4.01)
Milk Products	1.97 (0.91 - 4.23)	1.24 (0.59 - 2.61)	1.12 (0.53 - 2.36)	3.05 (1.10 – 8.48)* Q2-1
Egg [e]	0.39 (0.17 - 0.91)*	0.27 (0.12 - 0.63)**	0.61 (0.26 - 1.42)	1.58 (0.47 - 5.32)
Income [f]	0.38 (0.05 - 3.22)	0.15 (0.02 - 1.31)	0.14 (0.02 - 1.32)	0.20 (0.01 - 4.21)
Age [d,a]	23.2 (9.78 - 54.9)***	3.31 (1.56 - 7.01)**		18.3 (6.74 – 49.6)*** Q2-1

OR (95% CI) *p<0.05 **p<0.01 ***p<0.001 Unadjusted $OR_{p\text{-trend}}$ [d]p<0.001 [e]p<0.01 [f]p<0.05

OR Adjusted for Age, Income, BMI. Adjusted $OR_{p\text{-trend}}$ [d]p<0.001 [b]p<0.01 [c]p<0.05

CONCLUSION

- Red meat, processed meat, and eggs, not fish, were associated with modest prostate cancer risk reduction.
- These unexpected finding are not consistent with previous reports.
  - Due to dietary modifications post diagnosis; Limitations of the modified FFQ.
- Findings should be confirmed in a large population-based study limited to
  - Newly diagnosed PCa cases and men who have not modified their diet in the last two decades.

IMPACT STATEMENT

Dietary recommendations for prostate cancer prevention should be provided with caution until risk associations are confirmed. Consumers need to interpret study results carefully before considering dietary modification.

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Evaluating Decisional Conflict in a Prostate Cancer Education and Screening Program for Low-income African Americans

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INTRODUCTION

Prostate Cancer Epidemiology: Prostate cancer is the second leading cause of cancer mortality in the US, and African Americans bearing the greatest burden, with a mortality rate of 68.1 per 100,000 deaths (1998-2002). African-American patients are younger, present at a later clinical stage than their Caucasian counterparts, warranting education interventions.

Education and Screening: Low education, low literacy, and lack of adequate knowledge about prostate cancer are well documented predictors of failure to screen than race. Limited access to continuity of medical care related to low socioeconomic position is a major obstacle[9]. Culturally sensitive materials that provide balanced information about prostate cancer screening have been successful in increasing awareness and screening action.

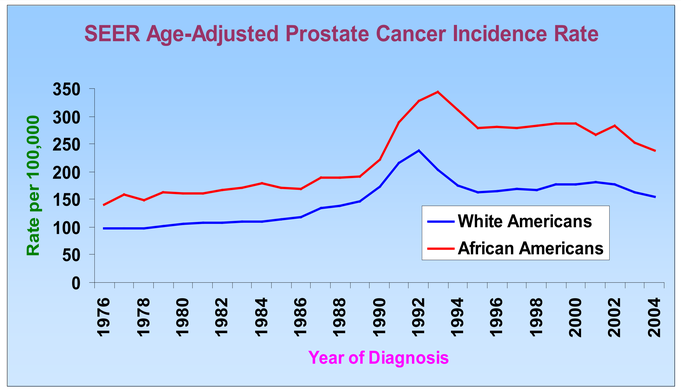
Decisional Conflict: Informed Decision Making has become an important aspect of the current prostate cancer screening guideline because of the ongoing controversy about its benefits and risks. Decisional conflict (DC) can therefore arise at any point in the continuum.

- Deciding to screen or not to screen
- Follow-through screening result and obtaining a prostate biopsy if ordered
- Deciding to choose a treatment option if diagnosed with prostate cancer
- Living with treatment side effects

Men may entertain guilt or regret for acts of omission or commission for present situation.

The Study Goal is to evaluate decisional conflict regarding screening for prostate cancer after implementing a culturally appropriate prostate cancer education intervention developed in partnership with the community for low-income African-American men.

Ethnic Disparity in Prostate Cancer Incidence and Mortality



AIMS AND OBJECTIVES

1. Evaluate the effectiveness of a culturally appropriate prostate cancer education intervention developed for low-income African-American men.
2. Describe the pattern of decisional conflict before and after the intervention.
3. Investigate demographic correlates of decisional conflict in this population.

MATERIALS AND METHODS

➢**Target Population: Resident ≥6 months in Nashville, TN & Surrounding Counties**
- African-American Men
- 45 years and older
- Not screened for at least one year.

➢**Participant Recruitment:**
- Advertisement: Flyers, Poster, Word-of-Mouth.
- Locations: Churches, Health Fairs, Barbershops, Matthew Walker Comprehensive Health Center, Urban Housing Developments.

➢**Study Protocol:**
- Informed Consent: Read or Read to
- Pre-Intervention 5-page Survey by Interview
- Education Intervention
  - In private by Community Navigator
- Post-Intervention 2-page Survey by Interview
  - 3-6 months after intervention

Community Navigators Recruiting Participants Community Health Fair

➢**Data Analysis:** By SPSS Version 14.0.
- Discrete data comparison across groups by Chi-Square test; Odds Ratio estimate by unconditional logistic regression adjusted for age, education, PCa knowledge score, and health insurance status.
- Knowledge score: 21 Max. (Wrong answer = 0; Correct answer = 1)
  Poor (≤10), Good (11 - 15), Excellent (≥16)
- Decisional Conflict score: 16 Max. (Yes = 0; Unsure = 1; No =2)
  Low (0-9), Some (10 - 49), High(≥50)

MATERIALS AND METHODS

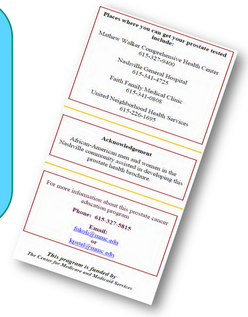
➢**Decisional Conflict Scale.** 4th Edition by O'Connor AM. 1999. "My difficulty in making this choice"
Adapted for prostate cancer screening by K. Taylor, 2006.

Informed Consent by Summer Intern

--------SECTION 3--------
The next questions are about Decisional Conflict to Screen
As you know, your choices are to either get tested or to not get tested.
You can answer yes or no to each question.

27.	Are you clear about which choice is best for you?	No	Yes	Unsure
28.	Do you feel sure about your decision?	No	Yes	Unsure
29.	Do you know the advantages of each of the choices?	No	Yes	Unsure
30.	Do you know the disadvantages of each of the choices?	No	Yes	Unsure
31.	Are you clear about which of the advantages to getting screened are most important to you?	No	Yes	Unsure
32.	Are you clear about which of the disadvantages to getting screened are most important to you?	No	Yes	Unsure
33.	Do you have enough support from others in order to make a decision to get screened?	No	Yes	Unsure
34.	Do you have enough advice to make a decision?	No	Yes	Unsure

➢**15-Minute Education Intervention By Lay Community Navigator**
➢Culturally appropriate brochure
Read together by CN & Participant
➢ CN addressed all Questions & Concerns
➢ Myths about Prostate cancer, Sexuality, and DRE discussed.
➢ Described process for redeeming the screening coupon, 3-month follow-up, follow-through of abnormal screening results



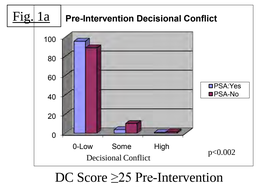
RESULTS

Table 1: Socio-Demographic Characteristics of Study Participants by Age Group

Characteristics	42 - 49 n=182	50 - 64 n=215	≥ 65 n=142	p-value
Education				<0.006
< High School	52 (28.6)	92 (42.8)	38 (26.8)	
High School	62 (34.1)	73 (34.0)	58 (40.8)	
> High School	65 (35.7)	49 (22.8)	45 (31.7)	
Not stated	3 (1.6)	1 (0.5)	1 (0.7)	
Employment				<0.001
Employed	92 (50.5)	68 (31.6)	56 (39.4)	
Not-Employed	63 (34.6)	80 (37.2)	25 (17.6)	
Retried / Disabled	21 (11.5)	64 (29.7)	59 (41.5)	
Not stated	6 (3.3)	3 (1.4)	2 (1.4)	
Annual HH Income				<0.001
<$25,000	126 (69.2)	159 (74.0)	56 (39.4)	
$25-$49,999	38 (20.9)	43 (20.0)	78 (54.9)	
≥$50,000	13 (7.1)	9 (4.2)	6 (4.2)	
Not stated	5 (2.7)	4 (1.9)	2 (1.4)	
Marital Status				<0.003
Married	49 (26.9)	67 (31.2)	57 (40.1)	
Divorced/Separated	58 (31.9)	86 (40.0)	50 (35.2)	
Widowed	8 (4.4)	14 (6.5)	12 (8.5)	
Single	63 (34.6)	43 (20.0)	22 (15.6)	
Not Stated	4 (2.2)	5 (2.3)	1 (0.7)	
Health Insurance				<0.001
Yes	55 (30.2)	87 (40.5)	76 (53.5)	
No	127 (69.8)	128 (59.5)	66 (46.5)	

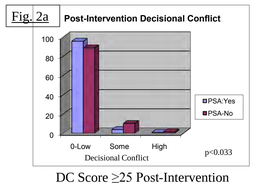
Prevalence of Decisional Conflict among Study Participants Pre-Intervention and Post-Intervention

Fig. 1a



DC Score ≥25 Pre-Intervention
29 (5.4%)

Fig. 2a



DC Score ≥25 Post-Intervention
12 (3.1%)

Fig. 1b

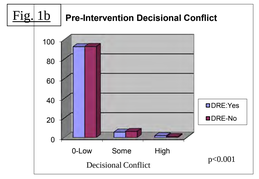


Fig. 2b

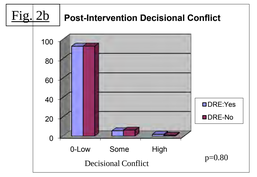


Table 2: Sub-Group Prevalence of Decisional Conflict*

Characteristics	Pre-Intervention		Post-Intervention	
Participants	N= 539		N= 392 (72.7%)	
Education				
< High School	13.7		12.6	
High School	7.3		8.1	
> High School	5.0	p<0.05	1.6	p<0.02
Income				
<$25,000	12.3		9.4	
$25 - $49,999	1.9		3.2	
≥$50,000	0.0	p<0.001	8.3	ns
Knowledge				
Poor	4.2		12.7	
Good	8.9		11.5	
Excellent	12.2	p<0.06	2.1	p<0.003
PSA Screening				
Yes	14.0		4.6	
No	8.6	p<0.06	10.2	p<0.03

* More than minimal decisional conflict (DC Score ≥10)

Table 3. Demographic Predictors of Decisional Conflict Regarding Screening & Not Screening for Prostate Cancer: Unadjusted & Adjusted Odds Ratios[δ] (95% CI) Estimates across Sub-Groups of Study Population

	Screened by PSA		Not Screened by PSA	
Pre-Intervention	**Unadjusted OR**	**Adjusted OR**	**Unadjusted OR**	**Adjusted OR**
Age				
42 - 49	1.00	1.00	1.00	1.00
50 - 64	0.68 (0.13 - 3.65)	0.53 (0.09 - 3.25)	0.67 (0.24 - 1.81)	0.55 (0.19 - 1.60)
≥ 65	0.39 (0.10 - 1.52)	0.37 (0.08 - 1.63)	0.49 (0.19 - 1.29)	0.48 (0.17 - 1.32)
Education				
<High School	1.00	1.00	1.00[b]	1.00[b]
High School	0.72 (0.21 - 2.54)	0.53 (0.11 - 2.54)	0.29 (0.11 - 0.76)**	0.24 (0.09 - 0.68)**
>High School	1.69 (0.35 - 8.24)	1.72 (0.31 - 9.37)	0.59 (0.22 - 1.62)	0.55 (0.19 - 1.58)
Prostate Knowledge				
Poor	1.00	1.00[c]	1.00	1.00
Good	2.59 (0.51 - 13.3)	4.86 (0.74 - 32.2)	3.21 (0.84 - 12.2)	3.21 (0.84 - 12.2)
Excellent	2.46 (0.80 - 7.52)	4.33 (1.19 - 15.8)*	0.84 (0.38 - 1.89)	0.84 (0.38 - 1.89)
Health Insurance				
Yes	1.00	1.00	1.00	1.00
No	1.78 (0.64 - 4.99)	1.38 (0.42 - 4.50)	0.44 (0.22 - 0.88)*	0.44 (0.22 - 0.88)*
Post-Intervention				
Age				
42 - 49	1.00	1.00	1.00	1.00
50 - 64	0.59 (0.11 - 3.34)	0.48 (0.08 - 2.92)	0.23 (0.03 - 1.95)	0.23 (0.02 - 2.18)
≥ 65	0.46 (0.09 - 2.44)	0.51 (0.09 - 2.81)	0.26 (0.03 - 2.19)	0.33 (0.04 - 2.99)
Education				
<High School	1.00	1.00	1.00[b]	1.00[b]
≥High School	1.32 (0.28 - 6.30)	1.06 (0.21 - 5.35)	0.27 (0.09 - 0.83)*	0.27 (0.08 - 0.89)*
Prostate Knowledge				
Poor	1.00	1.00	1.00	1.00
Good/Excellent	0.57 (0.12 - 2.80)	0.54 (0.10 - 2.94)	0.75 (0.24 - 2.35)	0.94 (0.29 - 3.12)
Health Insurance				
Yes	1.00[a]	1.00[a]	1.00	1.00
No	0.07 (0.01 - 0.53)**	0.06 (0.01 - 0.52)**	1.57 (0.47 - 5.20)	1.04 (0.28 - 3.82)

Risk Trend: [c]p_{trend} <0.10 [b]p_{trend} <0.05 [a]p_{trend} <0.01 OR (95% CI): *p <0.05 **p <0.01

Pre-Int: N = 539 (PSA = 121; No PSA = 418) Post-Int: N = 392 (PSA = 243; No PSA = 149)

CONCLUSION

- ❖Screening by PSA increased from 121(22.4%) to 243(62.0%) at 6-month follow-up.
- ❖Over 90% of study participants had no Decisional Conflict (DC) about PSA screening.
  - ❖DC existed in: 53(9.8%) pre-intervention; 30(7.7) post-intervention.
  - ❖DC increased post-intervention especially for men who did not screen.
    - ❖4(1.7%) screened; 12(8.2%) did not screen.
- ❖Men with low education recorded the highest rate of DC pre- and post-intervention.
  - ❖Excellent PCa knowledge resulted in a 6-fold DC reduction.
  - ❖⇧ DC associated with high PCa knowledge score was eliminated post-intervention.
  - ❖⇩ DC among men with High school diploma remained post-intervention.
- ❖Lack of health insurance was associated with reduced risk for DC.
  - ❖Pre-intervention: Those who did not screen. Post-intervention: Those who screened.

IMPACT STATEMENT

Men with low education may be at increased risk for DC post-intervention especially when they failed to get screened. This Education Intervention improved knowledge about the importance of early detection of PCa but may not have addressed how to overcome other barriers to screening such as fear of cancer diagnosis in the absence of health insurance. This aspect should be included in future interventions.

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Regulation of the Erk signaling pathway by the PPAR gamma ligand troglitazone.

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BACKGROUND

Prostate cancer is the most frequently diagnosed cancer among men in the United States, and the second most common cause of cancer death. According to the American Cancer Society, in 2010 there were 217,730 new cases and 32,050 deaths due to prostate cancer. Several risk factors for prostate cancer have been identified. Risk factors include: age (men that are over the age of 45 are at a greater risk), family history, and race. African American men are at a greater risk of having prostate cancer than any other race. The reasons underlying the high incidence rate of prostate cancer among African American men are unknown. Today, many researchers are conducting studies to determine the causes of prostate cancer and identify more effective methods of treating this disease.

One possible treatment for prostate cancer may be compounds that activate the peroxisome proliferator activated receptor gamma (PPAR gamma). PPAR gamma is a nuclear receptor protein that functions as a transcription factor. PPAR gamma is highly expressed in adipose tissue and plays a role in the activation of genes that stimulate lipid uptake and adipogenesis by fat cells. PPAR gamma can be activated by using the compound troglitazone. Troglitazone is an oral medication that was once used to treat diabetes mellitus. Troglitazone also reduces prostate cancer cell proliferation by inducing apoptosis.

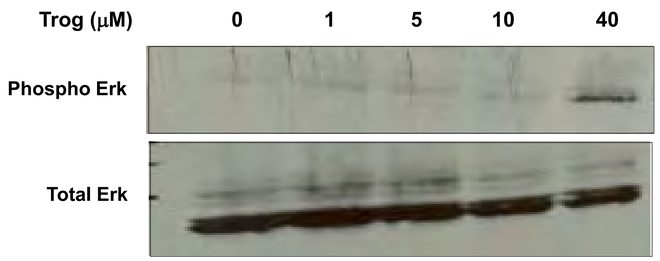
We have previously shown that troglitazone increases phosphorylation of extracellular signal regulated kinase 1/2 (Erk 1/2) in human prostate cancer cells. Erk 1/2 belongs to the mitogen activated protein kinase (MAPK) family. MAPKs function to phosphorylate transcription factors that regulate gene expression. Erk 1/2 is activated following its phosphorylation by MEK1/2. Upon its activation Erk 1/2 contributes to the proliferation of many cell types, and is responsible for the growth of prostate cancer cells. It is not known whether troglitazone stimulated increases in Erk phosphorylation contribute to the anti-tumor effects of troglitazone.

AIMS/OBJECTIVES

The objective of this study was to determine whether there is a relationship between the decrease in prostate cancer cell proliferation produced by troglitazone and troglitazone-induced increases in Erk 1/2 phosphorylation. The PC3 human prostate cells were used as a model for prostate cancer throughout this study.

RESULTS

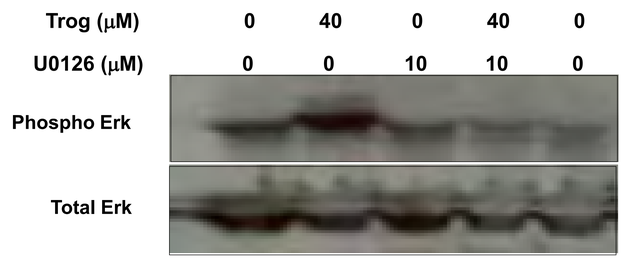
Figure 1. High concentrations of troglitazone stimulate Erk 1/2 phosphorylation.



Methodology: PC-3 cells were plated in 10 cm culture dishes in DMEM/F-12 media containing 10% FBS and 1% penicillin/streptomycin. The cells were plated at a density of 750,000 cells per dish. After three days, the media was changed to serum free DMEM/F-12 media and allowed to adapt for 24 hours. The cells were then treated with DMSO vehicle or different concentrations of troglitazone. Two hours after the addition of the drugs, the cells were harvested by scraping. The cell pellets were then lysed in RIPA buffer. Western blot analysis was used to determine the level of phospho-Erk 1/2 and total Erk 1/2 in each cell lysate.

Summary: Western blot analysis showed that Erk 1/2 was expressed in PC-3 cells. Troglitazone produced a dose-dependent increase in Erk phosphorylation. The greatest increase in the level of phospho-Erk was produced by a concentration of troglitazone 40 μM.

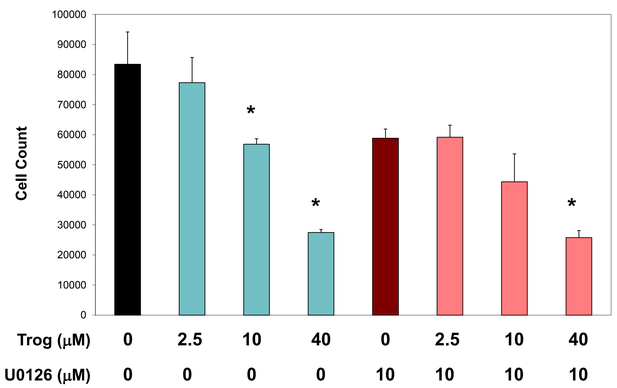
Figure 2 . The MEK inhibitor U0126 blocks troglitazone-induced increases in phospho–Erk 1/2 levels.



Methodology: PC-3 cells were plated in 10 cm culture dishes in DMEM/F-12 media containing 10% FBS and 1% penicillin/streptomycin. The cells were plated at a density of 750, 000 cells per dish. After three days, the media was changed to serum free DMEM/F-12 media and allowed to adapt for 24 hours. Following a one hour pretreatment with either DMSO or U0126, the cells were treated with DMSO vehicle or 40 μM troglitazone. Two hours after the addition of the drugs, the cells were harvested by scraping. The cell pellets were then lysed in RIPA buffer. Western blot analysis was used to determine the level of phospho-Erk 1/2 and total Erk 1/2 in each cell lysate..

Summary:
Western blots demonstrated PC-3 cells treated with only troglitazone 40 μM had a greater level of Erk1/2 phosphorylation than cells exposed to troglitazone 40 μM plus U0126. U0126 alone had a minimal effect of Erk phosphorylation in PC-3 cells.

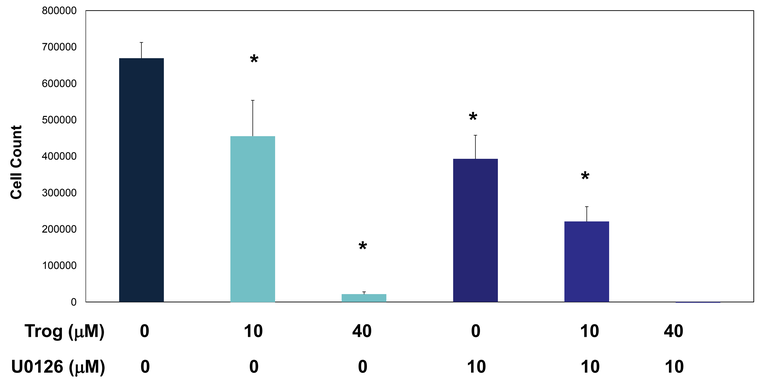
Figure 3. Troglitazone and U0126 suppress PC-3 cell proliferation (3 Day Treatment).



Methodology: PC-3 cells were plated at a density of 10,000 cells/well in 6 well culture plates. One day after the cells were plated, the cells were pretreated with either DMSO or U0126 for one hour. The cells were then exposed to DMSO or increasing amounts of troglitazone for three days. After treatment, the cells were detached from the plate with trypsin-EDTA and counted using a Coulter counter. Each bar represents the mean ± SD for three wells. *, $P < 0.05$ compared to the control group (Trog 0 μM, DMSO 0 μM).

Summary: Troglitazone alone produced a dose-dependent decrease in cell proliferation, as measured by a decrease in cell number. U0126 alone also slightly reduced proliferation of PC-3 cells. However, combination treatment of troglitazone and the MEK inhibitor U0126 produced a decrease in cell proliferation that was comparable to or greater than that seen with either drug alone.

Figure 4. Troglitazone and U0126 suppress PC-3 cell proliferation (6 Day Treatment).



Methodology: PC-3 cells were plated at a density of 10,000 cells/well in 6 well culture plates. One day after the cells were plated, the cells were pretreated with either DMSO or U0126 for one hour. The cells were then exposed to DMSO or increasing amounts of troglitazone for six days. Every three days, the culture media was changed and fresh drug was added. After treatment, the cells were detached from the plate with trypsin-EDTA and counted using a Coulter counter. Each bar represents the mean ± SD for three wells. *, $P < 0.05$ compared to the control group (Trog 0 μM, DMSO 0 μM).

Summary:
Both troglitazone and U0126 alone reduced proliferation of PC-3 cells. After six days of exposure. However, the combination treatment of troglitazone and the MEK inhibitor U0126 showed a greater decrease in cell proliferation compared to either drug alone.

CONCLUSIONS

- The MEK inhibitor U0126 blocks the phosphorylation of Erk 1/2 by troglitazone in PC-3 prostate cancer cells.
- U0126 does not block the ability of troglitazone to reduce cell proliferation. In fact, at some concentrations combination treatment of PC-3 cells with U0126 and troglitazone decreased the proliferation of the PC-3 cells more than either drug alone.
- Troglitazone-induced increases in Erk phosphorylation are not required for troglitazone to reduce cell proliferation.

IMPACT

The results of this study provide new insight into the mechanism by which the PPAR gamma agonist reduces prostate cancer cell proliferation. In addition, our data suggest the anti-proliferative effect of troglitazone can be enhanced via inhibition of the MEK/Erk signaling pathway.

LITERATURE CITED

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ACKNOWLEDGEMENTS

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The Effect of TZDs on Prostate Cancer Cell Invasion

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ABSTRACT

BACKGROUND AND OBJECTIVES: The peroxisome proliferator activated receptor gamma (PPAR gamma) is a ligand-activated nuclear receptor that is expressed in normal and malignant prostate tissue. Our laboratory and others have shown that PPAR gamma ligands reduce growth and invasion of human prostate cancer cells. However, the mechanisms by which PPAR gamma ligands reduce prostate cancer cell invasion have yet to be defined. The goal of this study was to determine how one group of synthetic PPAR gamma ligands, the thiazolidinediones (TZDs), reduces invasion of human prostate cancer cells. As tumor cells become invasive, epithelial features are lost and mesenchymal properties are gained, a process known as epithelial-mesenchymal transition (EMT). The EMT process is promoted by the transcription factor SNAIL. In this project, we tested the hypothesis that TZDs regulate expression of SNAIL and other proteins involved in the EMT process.

METHODOLOGY: In this study, the PC-3 cell line served as our model of invasive human prostate cancer cells. Western blot analysis was used to detect alterations in SNAIL protein levels following TZD exposure.

RESULTS: The TZD rosiglitazone reduced SNAIL protein levels in PC-3 cells. This decrease was time-dependent, and could be noted within hours of rosiglitazone exposure. The concentration of rosiglitazone that reduced expression of SNAIL within PC-3 cells (40 mM) was also effective at reducing PC-3 cell invasion. We are currently testing whether rosiglitazone increases expression of E-cadherin, an epithelial marker that is negatively regulated by SNAIL.

SUMMARY AND CONCLUSIONS: The PPAR gamma ligand rosiglitazone not only reduces prostate cancer cell invasion, but also represses expression of SNAIL. Since SNAIL plays a key role in promoting tumor cell invasion, our data would suggest that rosiglitazone inhibits prostate cancer cell invasion by reducing expression of SNAIL and possibly other proteins critical for EMT.

IMPaCT: This study provides new insight into the anti-tumor effects of PPAR gamma agonists. Our data indicate that PPAR gamma ligands reduce the invasive nature of prostate cancer cells by regulating the process of EMT. As a result, these compounds could be used to prevent or reduce EMT, and ultimately reduce the number of metastatic lesions that develop in patients.

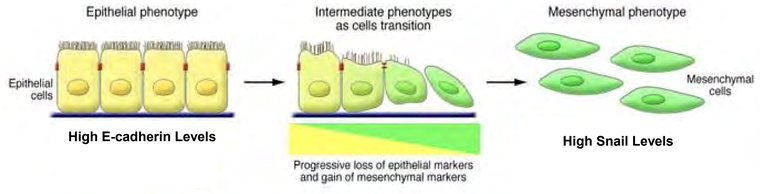
INTRODUCTION

Prostate cancer is the most common cancer and the second leading cause of cancer death in American men. [1] An estimated 2 million men currently live with the disease in the United States. Prostate is initially androgen-dependent, requiring androgens for growth. Patients are treated with androgen ablation therapy, which reduces the levels of circulating androgens in the body. This therapy works only for early stage, androgen-dependent prostate cancer. As the cancer advances, some tumor cells become androgen-independent and are able to grow without the aid of androgens. There are currently no treatment options for advanced, invasive androgen-independent prostate cancer.

The peroxisome proliferator activated receptor gamma (PPARγ) is a ligand-activated nuclear receptor. It serves as a transcription factor and is primarily involved in the differentiation of adipocytes. [2] PPARγ is also expressed in both normal and cancerous prostate tissue. The receptor is activated by both naturally occurring and synthetic ligands. Thiazolidinediones (TZDs) are synthetic PPARγ ligands that are currently used to treat Type II diabetes patients. This class of PPARγ agonists includes the compounds Ciglitazone (Cig), Troglitazone (Trg) and Rosiglitazone (Ros).

PPARγ ligands have been shown to inhibit growth and reduce the invasion and metastasis of androgen-independent prostate cancer cells. However, the mechanism by which these drugs produce this response is unknown. Therefore, the focus of this study was to determine how TZDs stop invasion and metastasis in PC-3 human prostate cancer cells. The epithelial-mesenchymal transition (EMT) process has been shown to be involved in the invasive and metastatic properties of tumor cells. [3,4] Therefore, western blot analysis was used to determine the effect of PPARγ ligands on proteins involved in the EMT process.

Figure 1. Diagram of proteins involved in EMT.



From The basics of epithelial-mesenchymal transition. Kalluri, Raghu & Robert A. Weinberg. J Clin Invest. 2009;119(6):1420-1428. <http://www.jci.org/articles/view/39104/figure/1>

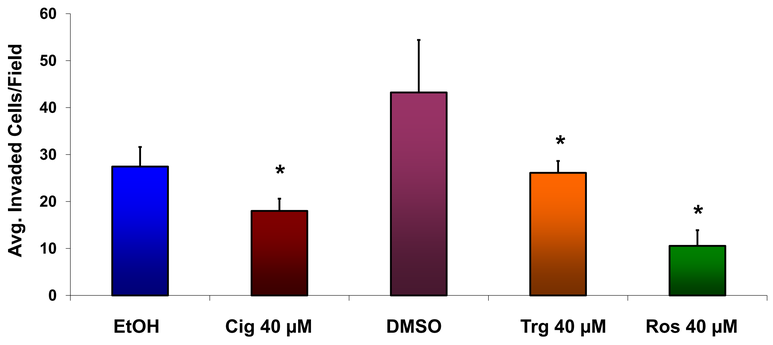
MATERIALS AND METHODS

Invasion assay. PC-3 cells were plated in 10 cm dishes at a density of 500,000 cells per dish in PC-3 culture media and allowed to adhere overnight. Cells were treated with either vehicle control (EtOH or DMSO), Ciglitazone (40 μM), Troglitazone (40 μM) or Rosiglitazone (40 μM) for 24h. Cells were removed with 0.25% trypsin-EDTA and resuspended in PC-3 invasion media (DMEM-F12 supplemented with 1% bovine serum albumin (BSA)). A final cell suspension of 200,000 cells/ 500 μl media was added to the upper chamber insert of the Transwell migration chamber, while PC-3 culture media supplemented with 5% FBS was added to the lower chamber. The invasion chambers were then incubated at 37 C, 5% CO_2 for 24h. After incubation, the cells that did not invade through the Matrigel were removed. The inserts containing the invaded cells were fixed with 100% methanol and stained with 0.5% crystal violet solution. The stained cells were quantified by cell counts using an Olympus BX41 Microscope. Three different fields were counted per treatment slide.

Western blot analysis. PC-3 cells were plated in 10x10cm dishes at a density of 500,000 cells/plate and allowed to adhere overnight. The cells were then treated with either vehicle control (EtOH or DMSO), Ciglitazone (40 μM), Troglitazone (40 μM), Pioglitazone (30 μM) or Rosiglitazone (40μM) over a 24-hour time period. The cells were harvested and lysed with RIPA lysis buffer containing protease inhibitors. Protein concentrations were determined by the Bradford reagent assay. Protein samples were separated by SDS-PAGE and then transferred to a nitrocellulose membrane. Western blot analysis was performed with a primary antibody against Snail, E-cadherin, total FAK or phospho-FAK (Y925). The membranes were then stripped and reprobed for actin to assess equal loading.

RESULTS

Figure 2. Multiple ligands for PPARγ inhibit the invasion of PC-3 human prostate cancer cells.



Each bar represents the mean SD of three invasion chambers. *, *P*<0.001 compared to EtOH or DMSO vehicle control.

Figure 3. TZDs decrease Snail protein expression in PC-3 cells.

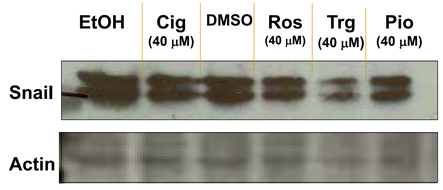


Figure 4. Rosiglitazone decreases Snail protein expression in a time- dependent manner in PC-3 cells.

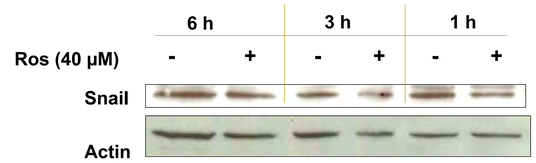
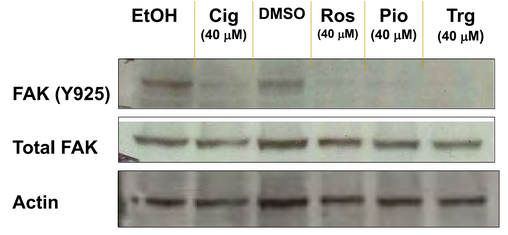


Figure 5. TZDs reduce phosphorylation of focal adhesion kinase (FAK) in PC-3 cells.



SUMMARY/CONCLUSIONS

- TZDs decrease the invasion of androgen- independent PC-3 cells.
- Snail protein expression was decreased in PC-3 cells upon treatment with rosiglitazone and other TZDs.
- TZDs decrease the phosphorylation of focal adhesion kinase (FAK), a protein that plays an important role in cell migration and invasion.
- TZDs may inhibit invasion of androgen- independent human prostate cancer cells via regulation of proteins involved in the EMT process as well as FAK.

IMPACT

This study provides new insight into the anti-tumor effects of PPAR gamma agonists. Our data indicate that PPAR gamma ligands reduce the invasive nature of prostate cancer cells by regulating the process of EMT. As a result, these compounds could be used to prevent or reduce EMT, and ultimately reduce the number of metastatic lesions that develop in patients.

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Developing a Culturally Appropriate Prostate Cancer Screening Education Intervention for Low-Income African-American Men in Nashville, Davidson County.

Curtis Fields[2], Liana A. Geddes[2] , Kushal Patel[3], Khandekar Taher[1], Katina Beard[4], Carlton Adams[1], Derrick Beech[1], Flora A. M. Ukoli[1].

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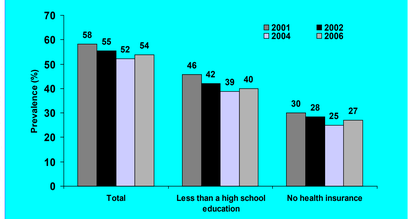
INTRODUCTION

African-Americans have limited access to health care and a negative perception of the healthcare system that is reflected in their low prostate cancer (PCa) screening rates. Other contributing factors include lack of knowledge, difficulty with transportation, poor relationships with primary healthcare providers, financial constraints, and lack of health insurance coverage. Low rates of PCa screening is particularly worrisome as African-American men are disproportionately affected by PCa, with a 34% greater incidence and a 123% greater mortality from PCa compared to their white counterparts. The **goal** of this pilot project is to positively impact the attitude of African-Americans towards early detection of PCa by prostate specific antigen (PSA) and digital rectal examination (DRE) screening, by improving their knowledge about PCa.

PSA Test Prevalence (%), by Education & Health Insurance Status among Men 50 Years and Older, US, 2001-2006



Source: Behavioral Risk Factor Surveillance System Public Use Data Tape (2001, 2002, 2004, 2006), National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2002, 2003, 2005, 2007.

Barriers contributing to low PCa screening rates low-income African-Americans in Nashville need to be identified so that an appropriate education intervention can be developed to address them. Such a program need to be developed in partnership with the intended program recipients to increase acceptance and promote informed decision making (IDM) regarding screening.

AIMS AND OBJECTIVES

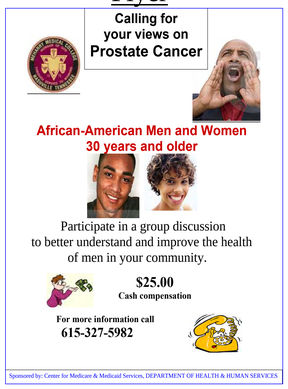
- ❑ Health Issue Assessment:
  Convene three distinct focus groups to identify and catalog perceived barriers to PCa screening among low-income African-American men at the individual and interpersonal levels.
- ❑ Development of an Education Intervention:
  Assemble a Community Advisory Board (CAB) to provide solutions to the barriers identified, and to develop a culturally appropriate PCa education intervention program for this population.

MATERIALS AND METHODS

Target Population: Nashville TN.
African-American Men and Women ≥30 years

- Flyers were posted/distributed in strategic community sites
  Health Centers, Business Sites
  Churches, Mosques
  Grocery Stores, Other Stores
  Barbershops, Recreation Centers
- Prostate cancer survivors were contacted through a local cancer support group and by word-of-mouth.
- Participants screened for eligibility by project coordinator, and were assigned to appropriate focus group.

Flyer



FOCUS GROUPS & CAB

MODERATED BY
LAY TRAINED COMMUNITY NAVIGATOR

Focus Group 1
10 Men: Screened Regularly for PCa
≥40 years old
Included 3 PCa Survivors

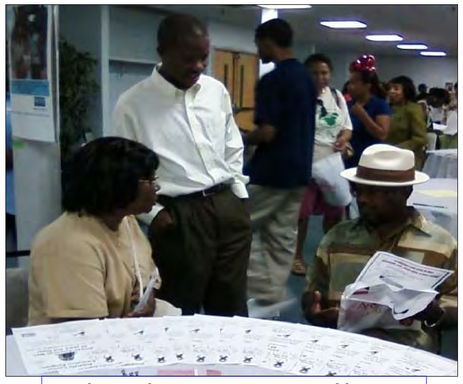
Focus Group 2
10 Men: Never Screened for PCa
≥30 years old

Focus Group 3
10 Family Members/Providers
Men & Women ≥25 years old
Included 1 Provider &
2 Community Leaders

CAB
5 Lay men + 2 females
1 Health Provider
2 Community Leaders
(3 Sessions)

In Partnership with Research Team

Culturally Appropriate Prostate Cancer Education Intervention



Distributing Flyers at a Community Health Fair

Consenting Participants

Procedure

Informed Consent: Individual. Video and/or audio taped .
FG Sessions: Introductions. Light dinner. Ground rules: Respect. $25 cash incentive. Participants addressed by name.

Data Analysis: Professional transcriber. Atlas.ti software.

CAB: Representing 3 levels of the socio-ecological model.
Studied barriers indentified by the focus groups.
Proposed solutions to overcome barriers.
Recommended Intervention (Format, Content, Style),
Developed Study Brochure and Flyer.
Modest meal, $25 cash incentive for each of 3 sessions. Moderated by Rev. Vine & Dr. Patel. Notes: Dr. Taher. In attendance: Dr. Ukoli

EDUCATION INTERVENTION

By Male Community Navigator in Private.
Use Grandfather – Father – Grandson Pictures
"The time is always right to do what is right" Quote by MLK.
Read the culturally appropriate brochure with participant.
Answer questions & address concerns raised by participant.
Open dialogue: Myths about prostate cancer, sexuality, & DRE

Detailed description of the following
Research procedure
How to redeem screening coupon
Scheduling 3-month follow-up visit
Follow-through of abnormal screening results

DRE MYRHS & PSA CONTROVERSY

Double-Edge Sword

POTENTIAL BENEFITS
Early detection
Treatment effective (Maybe)
May contribute to decline in mortality
(Insufficient evidence)

Over treating some detected Unimportant cancer

POTENTIAL HARMS
False positive tests (Unnecessary biopsy)
Diagnosis of clinically insignificant cancers
Treatment side effects (ED, Incontinence)

Not treating some undetected Important cancer

RESULTS

Table 1: Prostate Cancer Screening Barriers Identified by Demographically Distinct African-American Focus Groups in Nashville Stratified by Themes

FG1: Men Screen Regularly	FG2: Men Never Screened	FG3: Family Members
Barriers to Testing		
Fear of Cancer / Fear of surgery Lack of insurance / Cost Uncomfortable /Offensive/ Invasive Never heard about it No father-figure to talk about it Healthy so no need to see Dr. Too busy	Lack of health insurance Degrading Lack of knowledge / Lack of information Lack of understanding / Ignorance No need if you're in good health Doctor doesn't suggest PSA testing Told they were too young to get tested Don't think about going to the doctor Just don't care	Fear Lack of insurance Too invasive Lack of knowledge Not talked about Not knowing where to get tested Disease not hereditary
Doctor's Influence		
Explain exam options Build relationship with patient Talk about it with patient Call patient when its time Stress awareness in the community Tell patients its curable Pictures of people with prostate cancer (scare tactics)	Stress importance during office visits Build relationship with patients Emphasize severity amongst blacks DVD in doctors waiting room Build relationship with community Send information via e-mail Give good information sooner than later Educate wives and girlfriends	Explain procedures Use language patient understands Inform patients of symptoms Be compassionate Promotions & Screening fairs Radio/TV/ Commercials/Ads Make patient relaxed
Church Influence		
Talk to pastor Involve churches	Free prostate cancer events -Screening, Health fairs, Parties Offer free food and money Focus Groups & Seminars	Make testing affordable Put info in church bulletin Offer bags/brochures Seminars
Health Center Influence		
Offer free testing Distribute Flyers & Brochures Word of mouth Free food and money Prostate month celebration Advertisements & Commercials More Focus Groups & Seminars		Monthly health fair Have street teams Go to churches & Spread the Word Offer free food Prostate marathon Prostate month, Prostate hand band Offer visuals
The Role of Support Groups (Family & Friends)		
Share personal experiences Talk to friends, family, club members	Talk with family/Tell them the truth Take relatives and friends to doctor	Fundraisers

CONCLUSION

- ❖ The Focus Groups provided useful and sufficient information for developing a prostate cancer education intervention.
- ❖ The CAB developed an Education Intervention that was readily implemented in Nashville, TN.
- ❖ The brochure was culturally relevant, easy to read, easy to understand, and interactive

IMPACT STATEMENT

- ❖ Similar programs feasibility and effectiveness in the development of culturally appropriate interventions in low-income populations.

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ACKNOWLEDGEMENT

African-American community, Nashville, TN. Men and women who participated in the focus groups, Rev. John T. Vine, the Community Navigator, and Staff of the Matthew Walker Comprehensive Health Center. This study was funded by DHHS/CMS 1I0CMS030208/0 and the HBCU Summer Training grant W81XWH-09-1-0161.

Age at Circumcision and Prostate Cancer Risk

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[1]Fisk University, Nashville, TN, [2]Meharry Medical College, Nashville, TN

ABSTRACT

Introduction: Studies of circumcision and prostate cancer have identified a protective effect of newborn circumcision on prostate cancer risk. We investigated whether circumcision during adulthood was also protective against prostate cancer.
Materials and Methods: This population-based case-control study of prostate cancer among men aged 65-79 years was conducted between 2000 and 2002 in South Carolina. Telephone interviews were completed with 416 incident prostate cancer cases ascertained through the South Carolina Central Cancer Registry, and 429 controls identified through the Health Care Financing Administration Medicare beneficiary file (with respective response rates of 71% and 64%). Men circumcised as infants were excluded from the adult analysis.
Results: After adjustment for age, race, region and prostate-specific antigen testing, men who were circumcised as infants were at significantly reduced risk of prostate cancer (odds ratio [OR] 0.71, 95% confidence interval [CI] 0.52-0.97), while men who were circumcised as adults were at significantly increased risk of prostate cancer (OR 1.63, 95% CI 1.04-2.57). Both of these findings were more pronounced among Caucasian men (infant OR 0.69, adult OR 2.62) than African American men (infant OR 0.76, adult OR 1.01).
Conclusion: Our results lend support to the hypothesis that prostate cancer may have an infectious etiology.
Impact: If confirmed, circumcision should be encouraged at birth to reduce prostate cancer risk, but discouraged during adulthood as it possibly leads to increased risk of prostate cancer.

BACKGROUND

Studies of circumcision and prostate cancer have identified a protective effect of newborn circumcision; however, no studies have investigated circumcision during adulthood and prostate cancer risk

METHODS

Subject Selection

Cases were South Carolina residents aged 65 through 79 diagnosed with primary invasive prostate cancer between 1999 and 2001 ascertained through South Carolina Central Cancer Registry (n=407) and controls were randomly sampled from 1999 Health Care Financing Administration Medicare beneficiary file (n=393), with respective response rates of 71% and 64%

METHODS (continued)

Study Design

Computer-assisted telephone interviews collected information on suspected prostate cancer risk factors such as physical activity, diet, and medical history including age at circumcision

Data Analysis

Unconditional logistic regression used to estimate relative risk of prostate cancer associated with age at circumcision while controlling for race, age, geographic region, and annual prostate cancer screening

RESULTS

Circumcision and Prostate Cancer

Circumcision	Cases (n=389)	Controls (n=375)	OR*	(95% CI)*
No	199	196	1.00	(referent)
Yes	190	179	0.97	(0.73-1.30)

*Odds ratio (OR) and 95% confidence interval (CI) adjusted for race, age, region and prostate-specific antigen testing

Neonatal Circumcision and Prostate Cancer

Neonatal Circumcision	Cases (n=389)	Controls (n=375)	OR*	(95% CI)*
No	265	236	1.00	(referent)
Yes	124	139	0.71	(0.52-0.97)

*Odds ratio (OR) and 95% confidence interval (CI) adjusted for race, age, region and prostate-specific antigen testing

Adult Circumcision and Prostate Cancer

Adult Circumcision	Cases (n=265)	Controls (n=236)	OR*	(95% CI)*
No	199	196	1.00	(referent)
Yes	66	40	1.63	(1.04-2.57)

*Odds ratio (OR) and 95% confidence interval (CI) adjusted for race, age, region and prostate-specific antigen testing

LIMITATIONS

Response rates were lower than desired somewhat limiting the generalizability of results

Misclassification may have occurred due to the length of time between diagnosis and interview, and to the memory problems of older persons

Power was limited, especially for circumcision during adulthood since men circumcised neonatally were excluded

STRENGTHS

This is the first population-based case-control study to assess age at circumcision on prostate cancer risk

We had sufficient numbers of men to investigate these associations in Caucasian and African American men separately

We adjusted for annual prostate cancer screening to isolate the effect of circumcision on prostate cancer apart from its potential influence on access to care

CONCLUSIONS

Our results lend support to the hypothesis that prostate cancer may have an infectious etiology

The more pronounced effect of circumcision on prostate cancer in Caucasian men than in African American men was unexpected and will require confirmation

IMPACT STATEMENT

If confirmed, circumcision should be encouraged at birth to reduce prostate cancer risk, but discouraged during adulthood as it possibly leads to increased risk of prostate cancer

ACKNOWLEDGEMENTS

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The effect of Benzo Pyrene and Cadmium on the Proliferation of Prostate Cancer cells

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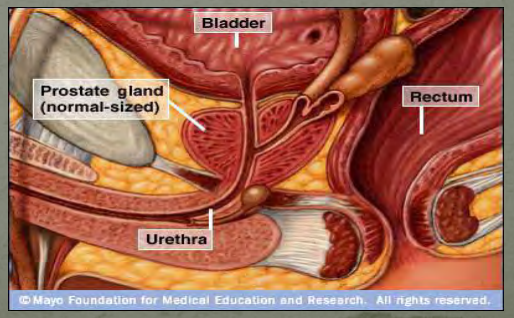
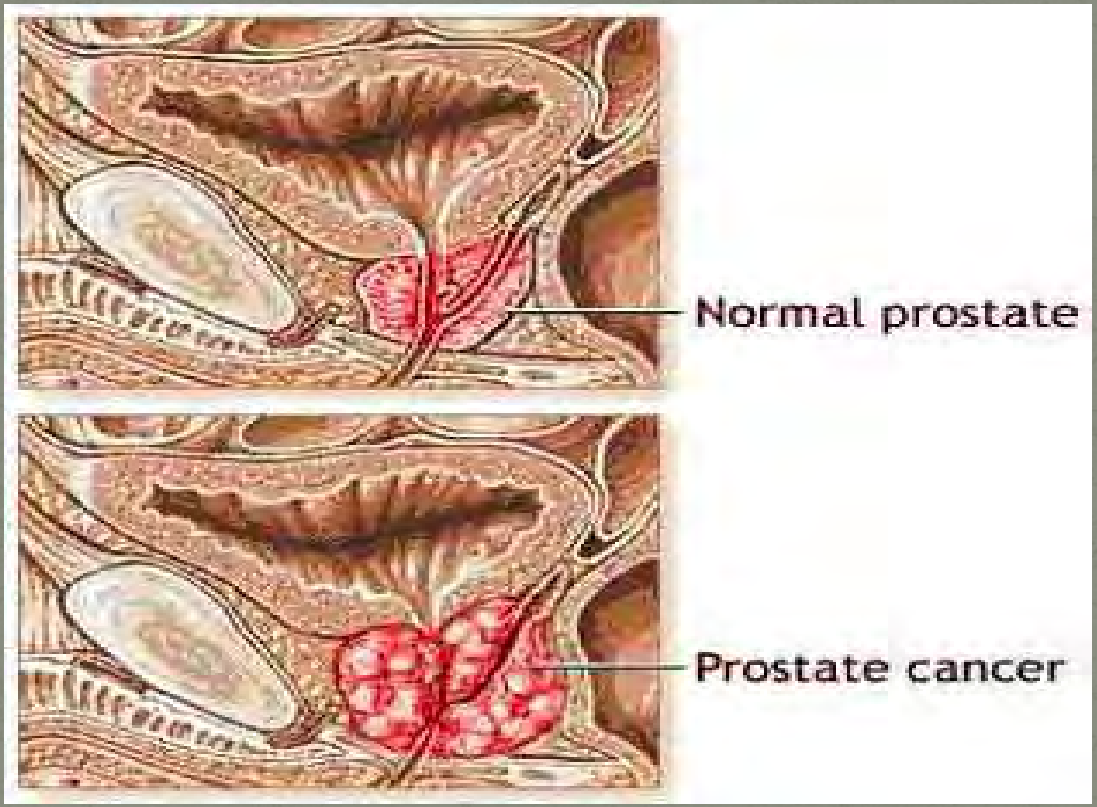
Background

The prostate is a part of the male reproductive organ that helps make and store seminal fluid. In adult men, a typical prostate is about three centimeters long and weighs about twenty grams, It is located in the pelvis, under the urinary bladder and in front of the rectum. The prostate surrounds part of the urethra, the tube that carries urine from the bladder during urination and semen during ejaculation. Because of its location, prostate diseases often affect urination, ejaculation, and rarely defecation.

Prostate cancer is a malignant (cancerous) tumor (growth) that consists of cells from the prostate gland. The tumor usually grows slowly and remains confined to the gland for many years. During this time, the tumor produces little or no symptoms or outward signs (abnormalities on physical examination). As the cancer advances, however, it can spread beyond the prostate into the surrounding tissues (local spread). Moreover, the cancer also can metastasize (spread even farther) throughout other areas of the body, such as the bones, lungs, and liver. Symptoms and signs, therefore, are more often associated with advanced prostate cancer



The Prostate

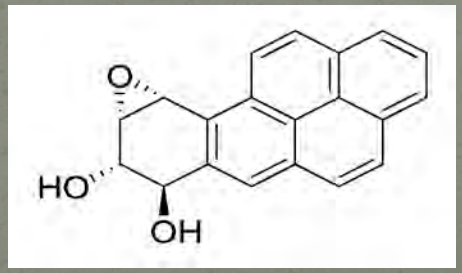


Background

- African American men may have the highest rate of prostate cancer incidence in the world. In addition, their prostate cancer mortality rate is twice as high as the rate for white Americans. In 1991, mortality rates were 24.7 cases per 100,000 white men, and 55.1 cases per 100,000 African American men. Mortality rates also are increasing much more rapidly among African American men (about 1.8 percent annually from 1973 to 1991) than among whites (about 1.0 percent annually).
- The causes of higher rates of prostate cancer among African American males are largely unknown

Background

- **Cadmium (Cd)** is a metallic toxin of major environmental and occupational concern. It is a suspected human prostatic carcinogen and has been shown to induce prostatic tumors and proliferative lesions in rats. Some studies have indicated that tissue levels of Cd in the human prostate correlate with malignant disease. Therefore, Cd has a possible role as an etiological agent in human prostate cancer
- **Benzo (a) Pyrene** is found in nature from the eruption of volcanoes and forest fires. Yet this chemical compound is also man-made. Benzo(a) Pyrene can be found in surface water, tap water, rainwater, groundwater, waste water and sewage sludge. Man-made releases of benzo (a) Pyrene are to the air, where sunlight turns the chemical into a dry form that falls to the ground and breaks down in the soil. This chemical results from burning plants, wood, coal, and operating cars, trucks and other vehicles, and even or the burned portions of meat.The major indoor sources of benzo(a) Pyrene in the air are wood-burning fireplaces and stoves, and tobacco smoking. There is no known industry production or use of benzo(a) Pyrene



Introduction

- Cadmium (Cd) causes various genitourinary disorders and is a carcinogen for Prostate cancer,so is does Benzo Pyrene. The purpose of this experiment is to identify the relationship between various concentrations of these two chemicals and asses their effect on cell growth and Proliferation of regular Prostate cells and cancerous Prostate cells.

Methods/Materials

- Lncap cells were bought and plated using the specified media. A serial dilution of Benzo Pyrene was made starting at a concentration of 20um to 9.76nm. A serial dilution of Cadmium was also made starting at a concentration of 0.0097pm to 20 um. Using different sets of 96 well plates, groups of three wells were given to each concentration and controls were also given for each well set. After the cells were treated they were allowed an incubation time of 24 hours . After this each 96 well plate was treated with 200ul of Alamar Blue reagent. A Spectrophotometer was used to test for cell viability over a four hour period.

- The Cell Proliferation Assay was repeated using different concentrations of both Benzo Pyrene and Cadmium. For cadmium a serial dilution was done for concentrations starting at 40um to 0.125um. Benzo Pyrene has concentrations ranging from 9.76 nm to 38.125pm. After a 24 hour period 200ul of Alamar Blue reagent was added to each well plate. The Spectrophotometer was used to test for cell Viability over a four hour period

Results

Conclusion

References

- Prostate Cancer in African-American Men." *The Ohio State University Medical Center*. Web. 17 Jan. 2010. <http://medicalcenter.osu.edu/patientcare/healthcare_services/prostate_health/prostate_cancer/prostate_cancer_african_americans/Pages/index.aspx