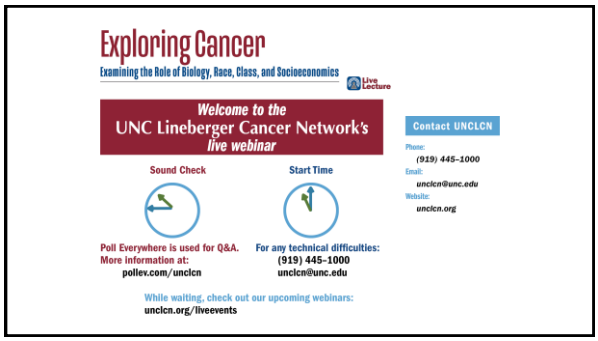
Exploring Cancer
Examining the Role of Biology, Race, Class, and Socioeconomics
Live Lecture
Welcome to the
UNC Lineberger Cancer Network's
live webinar
Sound Check
Start Time
Poll Everywhere is used for Q&A.
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unclcn@unc.edu
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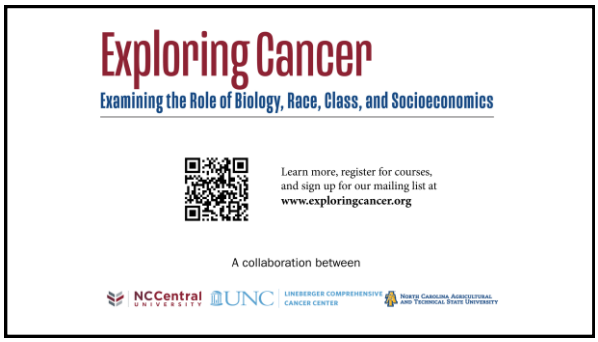
1


Join by Web
1 Go to PollEv.com
2 Enter UNCLCN
3 Respond to activity

2


Exploring Cancer
Examining the Role of Biology, Race, Class, and Socioeconomics
Learn more, register for courses,
and sign up for our mailing list at
www.exploringcancer.org
A collaboration between
NCCentral University
UNC Lineberger Comprehensive Cancer Center
North Carolina Agricultural and Technical State University

3

Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics

Fridays
11:00 - 11:50 AM EST/EDT

August 29
Welcome to Cancer(s) and Health Disparities 101 - The Introduction

September 5
Patient Navigation: The Nurse, Patient & Advocate

September 12
Achieving Excellence and Equity in Difficult Times

October 3
Breast Cancer Health Disparities

October 17
Cancer From a Public Health Perspective

October 31
The impact of Race, Ancestry and social Determinants on Black men with Prostate cancer

November 7
Health Disparities

November 14
Precision Medicine and Immunotherapy

November 21
Cancer Care for All: Challenges and Opportunities in Low-Resource Settings

4

Exploring Cancer

Examining the Role of Biology, Race, Class, and Socioeconomics

October 31, 2025

The impact of Race, Ancestry and social Determinants on Black men with Prostate cancer

Clayton Yates, PhD
John R. Lewis Endowed Professor of Pathology and Oncology
Director of Translational Health Disparities and Global Health Equity
Johns Hopkins School of Medicine

5

Clayton Yates, PhD

Dr. Clayton Yates is a recognized expert in health disparity research. Dr. Yates earned his Ph.D. from the University of Pittsburgh School of Medicine in molecular pathology, as well as a certificate of training in Tissue Engineering and Regenerative medicine from the McGowan Institute of Regenerative Medicine. He then went on to complete a postdoctoral fellowship at Emory University School of Medicine, Department of Urology. After completing his post-doctoral training, Dr. Yates started as a tenure-track Assistant Professor at Tuskegee University in the Department of Biology and the Center for Cancer Research. Dr. Yates was promoted through the ranks to Full Professor. Cell-MENTOR recognized Dr. Yates (an online resource from Cell Press and Cell Signaling Technology) among the 100 most inspiring Black Scientists in America. Dr. Yates's lab focuses on prostate and breast cancer, particularly in African Americans. His lab has established several models derived from African American and Native African prostate cancer patients. Additionally, Dr. Yates identified a subtype of Breast cancer called "Quadruple Negative Breast Cancer" (QNBC), which is more frequent in women of African Ancestry. This novel approach used genetic admixture analysis and identified a specific ancestry-associated immune-related signature in both Breast and Prostate Cancers.

Dr. Yates was featured on NCI's website for the NCI Annual Plan & Budget Proposal for Fiscal Year 2023, which was provided to Congress, President Joe Biden, and the public. He has also received numerous research honors and awards totaling over 50 million. He has authored over 100+ peer-reviewed publications and is a member of the editorial board of Scientific Reports and AACR-Cancer Research Communications. Dr. Yates also serves as Co-Director for the Transatlantic Prostate Cancer Consortium, which focuses on understanding the tumor biology in native African men in Nigeria.

In addition, Dr. Yates was the 2022-2023 Chair of the Minorities in Cancer Research Council (MICR) within (AACR), which serves 7,000+ minority cancer-focused scientists. Dr. Yates currently serves as MPI of U54- NCI CPACHE-Cancer Health Disparities Partnership with Johns Hopkins Sidney Kimmel Cancer Center and the Howard University Cancer Center.

6

Professional Highlights

7

Professional Highlights

5. Dr. Clayton Yates is an internationally recognized expert in prostate cancer health disparities research, cell biology, molecular biology, and molecular pathology.

8

Professional Highlights

5. Dr. Clayton Yates is an internationally recognized expert in prostate cancer health disparities research, cell biology, molecular biology, and molecular pathology.
4. Dr. Yates earned his PhD from the University of Pittsburgh School of Medicine Department of Pathology in 2005.

9

Professional Highlights

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3. He is the is the John R. Lewis Professor in Pathology and Director for Translational Health Disparities and Global Health Equity Research at the Johns Hopkins University.

10

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11

Professional Highlights

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2. He has received numerous honors and awards, has authored more than 80 peer-reviewed publications, and serves on the editorial board of Scientific Reports.
1. Dr. Yates has trained more than 50 Ph.D. and master's-level students, and postdoctoral trainees.

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The Impact of Race, Ancestry and Social Determinants on Black men with Prostate cancer

Exploring Cancer webinar series
October 31st 2025

Clayton Yates PhD
John R. Lewis Endowed Professor of Pathology
Director of Translational Health Disparities and Global Health Equity Research
Department of Pathology, Oncology, and Urology
Co-Leader Genomics and Epigenomics Core
Sidney Kimmel Comprehensive Cancer Center

JOHNS HOPKINS MEDICINE | THE SIDNEY KIMMEL COMPREHENSIVE CANCER CENTER

JOHNS HOPKINS MEDICINE PATHOLOGY

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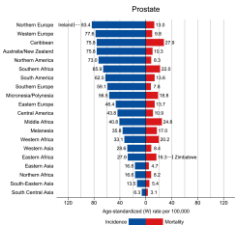
Disclosure Summary

Relationships:	
Consulting Fee	• Riptide Biosciences • PreludeDX
Honoraria	• QED Therapeutics • Amgen • Regeneron

Off-label Disclosure
This activity may include presentations on drugs or devices, or use of drugs or devices, that have not been approved by the Food and Drug Administration (FDA) or have been approved by the FDA for specific uses only. The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or device he or she wishes to use in clinical practice.

14

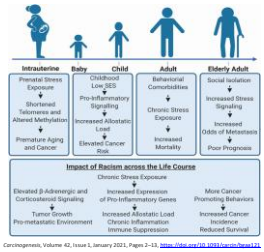
Prostate Cancer Background

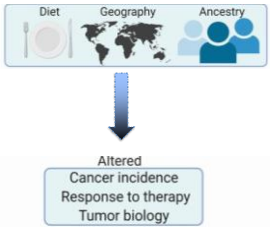


15

15

Stress exposure over the life course and its potential impact on socially deprived and minority populations



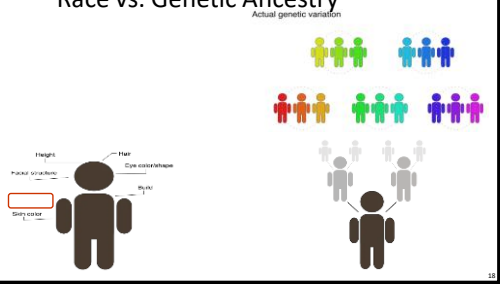


16

Understanding Health Disparities:
Race vs. Genetic Ancestry
Implications for Cancer Research and ~~Equity~~
Precision Health

17

Understanding Health Disparities:
Race vs. Genetic Ancestry



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Key Definitions

Race:

- Socially constructed categories
- Based on physical traits, culture, history, self-identification
- Context-dependent; changes across time and geography

Genetic Ancestry:

- Biological inheritance traced through DNA
- Measured via genetic markers (e.g., SNPs, haplotypes)
- Continuous, not categorical

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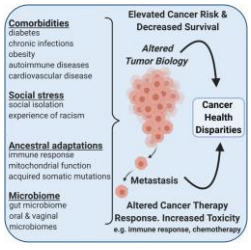
Why the Distinction Matters

- Race ≠ Biology, but shapes social determinants of health
- Genetic ancestry explains population-level biological variation
- Conflating the two risks:
  - Misattribution of disparities to genetics
  - Ignoring structural inequities

20

The Impact of Environmental Stressors on Tumor Biology

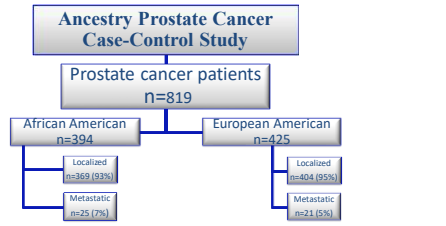
- Comorbid chronic diseases, stress exposure, population differences in immune response, and dysbiosis are factors that contribute to cancer health disparities



Carcinogenesis, Volume 42, Issue 1, January 2021, Pages 2–13, https://doi.org/10.1093/carcin/bgaa121

21

We sought out to identify an immune-oncology protein signature predictive marker of lethal prostate cancer using NCI-MD study

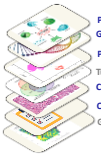


- Median of 5 months between disease diagnosis and blood collection
- Median survival follow-up of 8.6 years during which 57 died of prostate cancer while 202 died of all causes.

NIH NATIONAL CANCER INSTITUTE 22

22

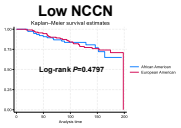
Integration of multilayered data NCI-Maryland and NCI-Ghana Cohort

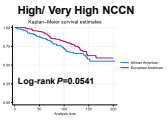


Proteomics (to demine the level of circulating chemokines)
GWAS (to determine DARC genotype)
PBMCscRNAseq (to determine circulating immune cell composition in circulation)
Tumor RNAseq (to determine immune cell composition in the tumor)
Clinical and Pathology data (e.g. stage and NCCN risk score)
Questionnaire data (e.g. education, smoking status, income, diabetes status, aspirin use,)
Geographical data (e.g. Neighborhood Deprivation Index,)

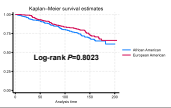
23

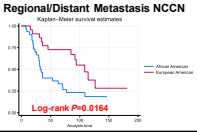
Prostate cancer racial survival disparity is limited to those diagnosed with Regional/ Distant Metastasis





Tsion Minas PhD
Johns Hopkins





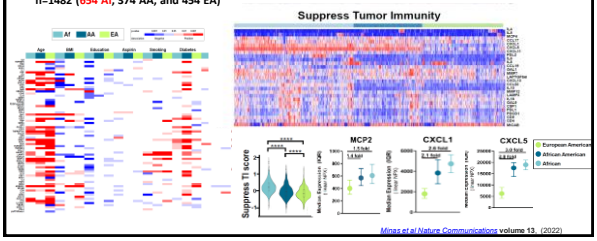
24

Serum Markers Correlate with Immunogenicity in Healthy Controls

Tsion Minas PhD
Johns Hopkins

Stefan Ambs PhD
NCI

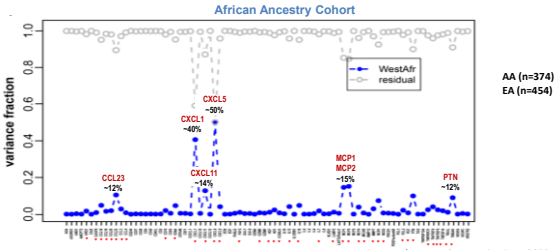
n=1482 (654 Af, 374 AA, and 454 EA)



Minas et al Nature Communications volume 13, (2022)

25

Immune genes that are significantly influenced by West African Ancestry

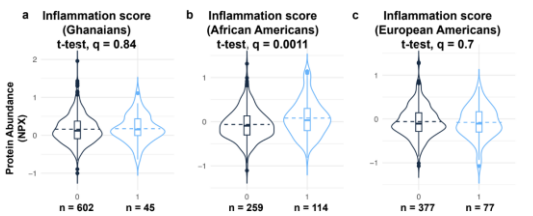


AA (n=374)
EA (n=454)

Minas et al. Nature Communications 2022

26

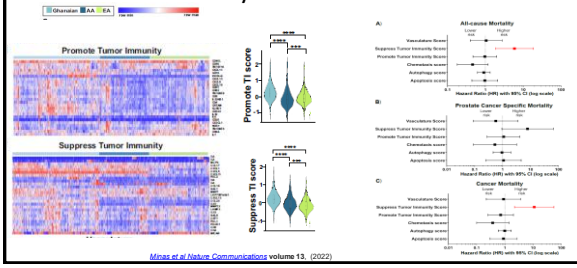
Race verses Ancestry Analysis



Unpublished data

27

Tumor Suppressive Signature Correlates in African Ancestry Prostate Cancer Patients



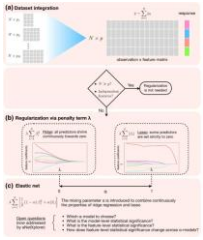
Minas et al Nature Communications volume 13. (2022)

28

A multi-analyte proteomic signature that is predictive of prostate cancer mortality in Black Men

- **Features:** 82 proteins, 6 demographic/clinical variables (“education”, “age”, “BMI”, “smoke”, “diabetes”, “aspirin”)
- **Outcome:** Prostate cancer-specific mortality
- **Method:** Cross validated regularized cox regression models with elastic net mixture parameters from ridge (alpha=0) to lasso (alpha=1)

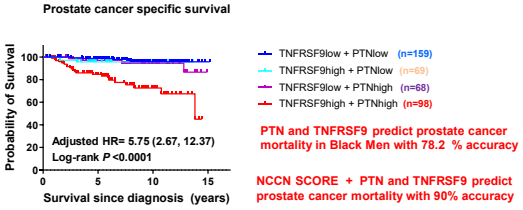
- **We found a robust predictive signature of lethal prostate cancer for African American (AA) prostate cancer patients but not for European American (EA) prostate cancer patients**



Candia et al. BMC Bioinformatics (2019)

29

TNFRSF9 and PTN can be used for risk stratification of AA patients at the time of diagnosis



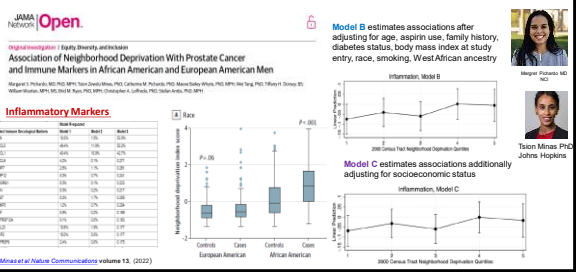
PTN and TNFRSF9 predict prostate cancer mortality in Black Men with 78.2 % accuracy

NCCN SCORE + PTN and TNFRSF9 predict prostate cancer mortality with 90% accuracy

Minas et al. Nature Communications. 2022

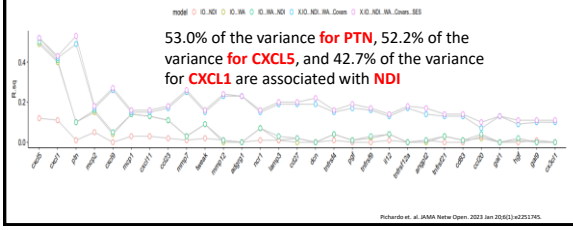
30

Immune Markers correlate with NDI



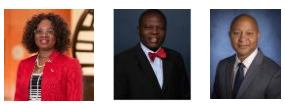
31

Neighborhood Deprivation (NDI) is associated with Ancestry Specific Markers



32

PROSTATE CANCER TRANSATLANTIC CONSORTIUM PROGRAM



Folakemi Odedina, PhD
Consortium co-PI & Director

Solomon Rotimi PhD
Consortium co-PI & Director

Clayton Yates PhD
Consortium co-PI & Director

CaPTC | | https://epi.grants.cancer.gov/captc/ | | captc@cop.ufl.edu

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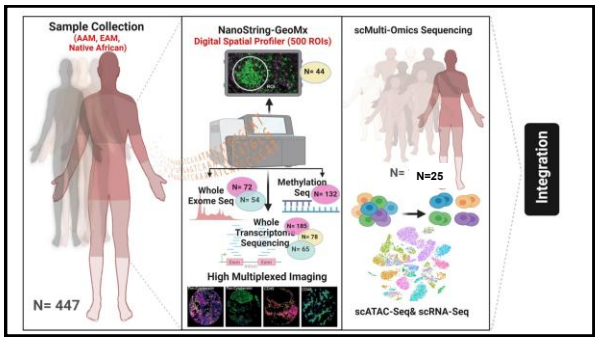
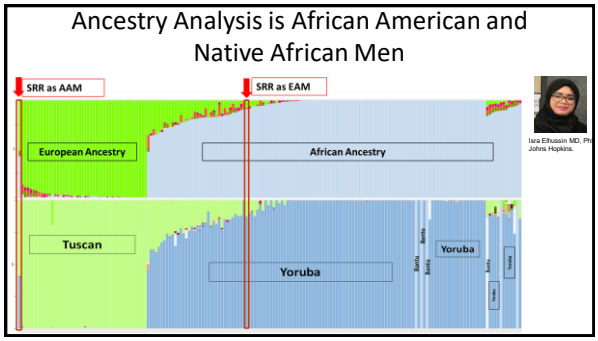
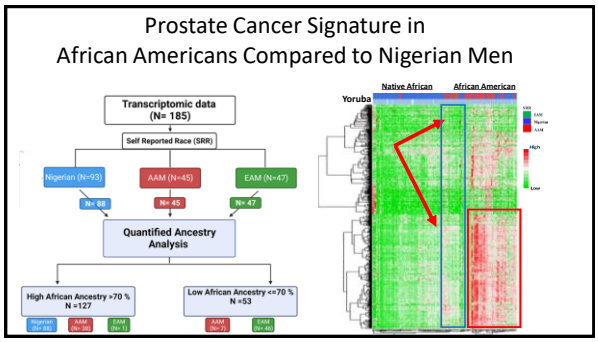

Sample Collection
(AAM, EAM, Native African)
N= 447
NanoString-GeoMx
Digital Spatial Profiler (500 ROIs)
N= 44
Whole Exome Seq
N= 72
N= 54
Methylation Seq
N= 132
Whole Transcriptome Sequencing
N= 185
N= 78
N= 65
High Multiplexed Imaging
scMulti-Omics Sequencing
N=
N=25
scATAC-Seq& scRNA-Seq
Integration

34


Ancestry Analysis is African American and Native African Men
SRR as AAM
SRR as EAM
European Ancestry
African Ancestry
Tuscan
Yoruba
Yoruba
Isra Elhussin MD, Ph
Johns Hopkins.

35


Prostate Cancer Signature in
African Americans Compared to Nigerian Men
Transcriptomic data
(N= 185)
Self Reported Race (SRR)
Nigerian (N=93)
AAM (N=45)
EAM (N=47)
N= 68
N= 45
N= 47
Quantified Ancestry Analysis
High African Ancestry >70 %
N =127
Low African Ancestry <=70 %
N =53
Native African
African American
Yoruba

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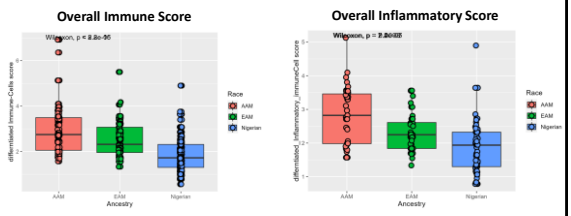
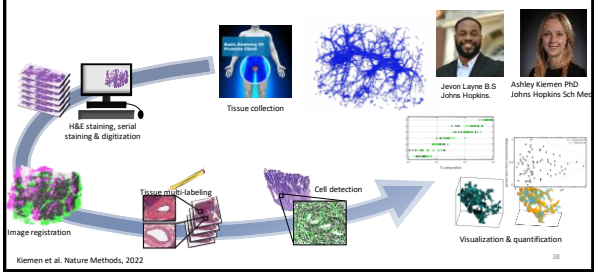
Race verses Ancestry Analysis

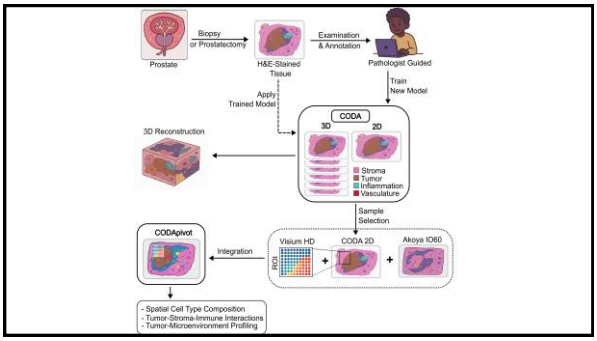


37

AI/Machine Learning Inflammatory Model



38



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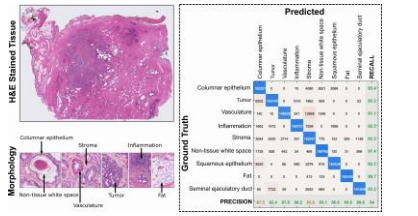
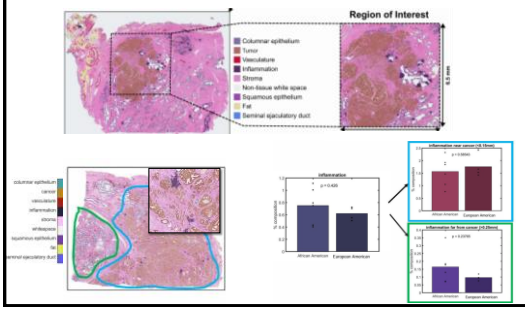
CODA AI/Machine Learning Model



Trained a segmentation model to label tissue types in all 595 images

40

AI Machine learning to map Inflammation



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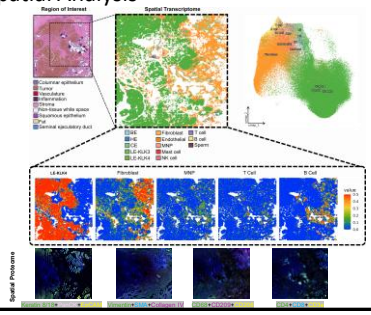
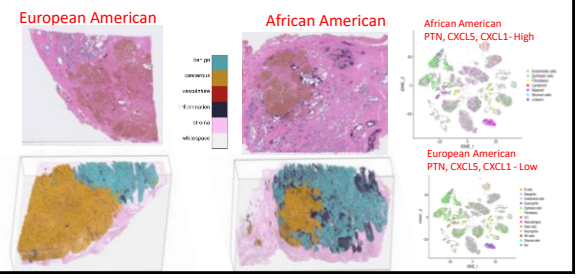
Spatial Analysis



42

Increased Inflammation in African American Tumors



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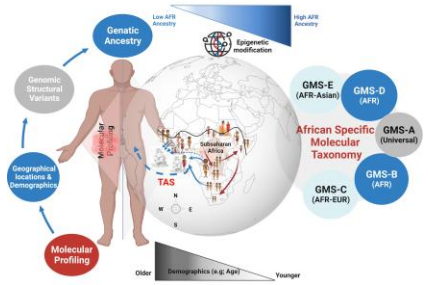
FRAMEWORK TO STUDY PRECISION HEALTH



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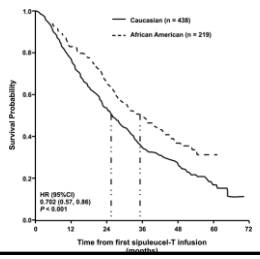
Why Research Matters!!!!

Several **recent clinical studies** have demonstrated that while **Black patients with prostate cancer** may enroll in the trials with more advanced disease, they **respond better to treatments** such as immunotherapy, molecularly targeted therapy, chemotherapy, and radiotherapy and have better outcomes compared to White patients.

American Association for Cancer Research® (AACR) Cancer Disparities Progress Report 2022

Provenge (Sipuleucel-T)



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Major Collaborators

CaPTC- Transatlantic Prostate Consortium
Dr Folake Odedina - Mayo Clinic-Jacksonville
Dr. Faruk Mohammed - Ahmadu Bello University
Dr Solomon Rotimi - Covenant University, Nigeria
Dr. Paul Jibrin - National Hospital Abuja
Dr. Chidiebere N. Ogo - National Hospital Abeokuta
Dr. Ademola Popoola - University of Ilorin

Tuskegee University
Windy Dean-Colomb MD, PhD
Deepa Bedi MD PhD

Morehouse School of Medicine
Melissa Davis PhD
Rick Kittles PhD
Jabril Johnson PhD

National Cancer Institute
Stefan Ambs PhD
Wei Tan, PhD
Huaitian Liu, Ph.D

Cedars Siani Medical Center
Moray Campbell PhD
Lara Sucheston PhD

Johns Hopkins School of Medicine
Ashley Kiemen PhD
Tamara Lotan MD
David E Sanin PhD
Ezra Baraban MD
Jelani Zarif PhD

46

The SAMBAI Cohort

Societal, Ancestry and Molecular Biology Analyses of Inequities

CANCER GRAND CHALLENGES

- Target population-40K African Ancestry Patients. (15K Prostate, 15K Breast, 8K Pancreatic)
- Specific Sites - Recruitment
- Intersection between Biology and Social Determinants of Health

Institutions 14 **Countries**- Nigeria, Ghana, South Africa, US, UK

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Questions/Comments?

Nobody has responded yet.

Hang tight! Responses are coming in.

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Exploring Cancer
Examining the Role of Biology, Race, Class, and Socioeconomics

Upcoming Live Webinar

Live Lecture
November 7
11:00 AM

Health Disparities

Angelo Moore, PhD, RN, NE-BC, FADLN, FAAN
Executive Director, Center of Excellence for Integrative Health Disparities & Equity Research (CIHDER)
Associate Professor - School of Nursing
The John R. & Kathy R. Hairston College of Health and Human Sciences
North Carolina Agricultural and Technical State University

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Exploring Cancer
Examining the Role of Biology, Race, Class, and Socioeconomics

Exploring Cancer is a webinar series taught by cancer biologists, physicians, public health experts, and other cancer specialists from **NCCU**, **UNC-Chapel Hill**, and **NC A&T.**

For a full list of courses, visit: exploringcancer.org/courses

UNC Lineberger Cancer Network

NCCentral University | UNC Lineberger Comprehensive Cancer Center | North Carolina Agricultural and Technical State University

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Exploring Cancer
Examining the Role of Biology, Race, Class, and Socioeconomics

Thank you for participating!

You may now proceed to the class evaluation and assessment to earn your certificate of completion.

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