H3Africa Kidney Disease Research Network (U 1U54HG006939-01)

Dr. Dwomoa Adu and Professor Akinlolu Ojo

On behalf of the Network

The University of Ghana Medical School

The University of Michigan
Sub-Saharan Africa

- 50 African countries – pop ≈800 million
- Average life expectancy at birth - 48 years (cf U.S. 1902)
- GDP per capita – USD $1,500
- Living on <$1.00/day – 50%
- Health expenditure per capita - $2 to $26
- Cost of predialysis CKD treatment - $25/year
- Estimated prevalence of predialysis CKD – 50 million
- Cost of ESRD care - $20,000/year (ppp)
- Estimated annual incidence of ESRD – 500,000
- Prevalent dialysis/kidney transplant population - 79,000
## Characteristics of Countries with Participating Clinical Centers

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (million)</th>
<th>Prevalence of CKD</th>
<th>Life expectancy at Birth (years)</th>
<th>Per Capita GDP</th>
<th>Health expenditure per capita (% GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>90.8</td>
<td>12.0%</td>
<td>56.9</td>
<td>$1,000</td>
<td>$7 (3.6%)</td>
</tr>
<tr>
<td>Ghana</td>
<td>24.8</td>
<td>12.4%</td>
<td>60.9</td>
<td>$2,500</td>
<td>$9 (10.6%)</td>
</tr>
<tr>
<td>Kenya</td>
<td>41.1</td>
<td>13.3%</td>
<td>59.4</td>
<td>$1,600</td>
<td>$11 (12.2%)</td>
</tr>
<tr>
<td>Nigeria</td>
<td>155.3</td>
<td>10.4%</td>
<td>47.6</td>
<td>$2,500</td>
<td>$20 (5.8%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>312</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WHAT IS CHRONIC KIDNEY DISEASE

• The persistent and usually progressive reduction of kidney function as measured by the glomerular filtration rate
• Retention of urea and creatinine
• Proteinuria and/or haematuria
• Hypertension
• Late stage anaemia and bone disease
# K/DOQI Stages of CKD

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>GFR mL/min/1.73m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage with normal or ↑GFR</td>
<td>≥90</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage with mild ↓GFR</td>
<td>60-89</td>
</tr>
<tr>
<td>3</td>
<td>Moderate ↓GFR</td>
<td>30-59</td>
</tr>
<tr>
<td>4</td>
<td>Severe ↓GFR</td>
<td>15-29</td>
</tr>
<tr>
<td>5</td>
<td>Kidney failure</td>
<td>&lt;15 or dialysis</td>
</tr>
</tbody>
</table>
# CKD PREVALENCE WORLDWIDE

<table>
<thead>
<tr>
<th>Country</th>
<th>Study</th>
<th>CKD Prevalence</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Coresh et al. 2007</td>
<td>13.1%</td>
<td>12.0%-14.1%</td>
</tr>
<tr>
<td>Australia</td>
<td>White et al. 2010</td>
<td>13.4%</td>
<td>11.1-16.1</td>
</tr>
<tr>
<td>UK</td>
<td>Stevens et al. 2007</td>
<td>8.5% (ckd 3-5)</td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>Afolabi et al. 2009</td>
<td>10.4% (ckd 3-5)</td>
<td></td>
</tr>
<tr>
<td>DRC</td>
<td>Sumaili et al. 2008</td>
<td>12.4%</td>
<td>11-15.1</td>
</tr>
</tbody>
</table>
KIDNEY DISEASE AS A PROPORTION OF MEDICAL ADMISSIONS AT KORLE BU HOSPITAL

10% OF DEATHS ON MEDICAL WARDS DUE TO CKD
• Familial aggregation of CKD higher in African Americans than in White Americans
• African-Americans have a 3.7 times higher age adjusted risk of ESRF as compared with European Americans
• Studies using mapping by admixture-linked disequilibrium technique show polymorphisms in MYH9 and APOL1 genes are associated with ESRF
ESKD PHENOTYPES ASSOCIATED WITH APOL1 GENETIC VARIATION (G1 and G2) IN AFRICAN AMERICANS

• Hypertensive nephropathy
• Non-monogenic Focal Segmental Glomerulosclerosis
• HIV associated nephropathy
• Sickle cell nephropathy
• Earlier onset of ESKD
WHAT IS KNOWN IN AFRICA

• CKD is common in Africa and occurs at an earlier age than in the USA or Europe
• In Yoruba from Nigeria, the allele frequency of G1 and G2 is 46% and 7%, respectively
• In Ghana the allele frequency of G1 IS 41% and in Ethiopia is 0%
H3Africa Kidney Disease Research Network (U54): Objectives

1. Comprehensive phenotyping of the first ever kidney disease cohort of 8,000 cases and controls in four African countries

2. Genome science training and career development program for African scientists in tandem with the Michigan Predoctoral Training Program in Genetics (Dr. John Moran) and the U-M Genome Science Training Program (Dr. Michael Boehnke)

3. System biology training and U.S. platform extension to Africa (Dr. Matthias Kretzler)

4. Two genomic research laboratories in West Africa using sustainable, low capital-intensity laboratory technology platform (Dr. David Burke)

5. Mechanism for high throughput whole genomic sequencing (Dr. Rob Lyons and Dr. Michael Boehnke)

6. Conduct four genetic and translational research projects of CKD and childhood onset nephrotic syndrome
Functional Composition of the Research Network

**Research Projects**

- Project I
  Single gene mutations I

- Project II
  APOL1/MYH9

- Project III
  GWAS of disease loci

- Project IV
  Single gene mutations II

**Training & Career Development**

- **Track 1**
  Genomics-Focused Clinical Research

- **Track 2**
  Advanced Clinical Research

- **Track 3**
  PhD and MSc

- **Track 4**
  Laboratory Technicians

- **Track 5**
  Grant Management

- **Track 6**
  Short-term Faculty Sabbaticals

**Infrastructure**

- Genomics Research Labs
- Bioinformatics/Data Management
- Biorepository
- Central Biochemical Lab

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H3Africa: Timeline for Research Studies

Phase I
Case-Control Genetic Studies 2013-2015

Recruitment

Follow up

Phase II
Cohort Studies (“CRIC” & “NEPTUNE”) 2013-2018

07 / 2012
Grant Award & Protocol Dev.

01 / 2013
Commence Enrolment

12 / 2014
Complete Phase I Enrolment

12 / 2015
Complete Phase II Enrolment

End of Phase I 06 / 2017

Phase II: Not yet funded

07 / 2012 - Accra, Ghana Centralized Staff Training & Investigators Meeting

12/2012 - Accra, Ghana Centraized Staff Training & Investigators Meeting

07 / 2012
Grant Award & Protocol Dev.

01 / 2013
Commence Enrolment

12 / 2014
Complete Phase I Enrolment

12 / 2015
Complete Phase II Enrolment

End of Phase I 06 / 2017

Phase II: Not yet funded

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Operational Framework of the H3Africa Kidney Disease Research Network

**Phenotyping Core**
- Univ. of Ghana, Ghana
- Kwame Nkrumah Univ.
- Addis Ababa Univ., Ethiopia
- Univ. of Nairobi, Kenya
- Univ. of Nigeria, Enugu
- Univ. of Ilorin, Nigeria
- Univ. of Ibadan, Nigeria
- Obafemi Awolowo Univ., Nigeria

**Training & Career Dev.**
- Univ. of Ghana, Ghana
- Rappaport Institute, Israel

**Scientific & Operations Support**
- Duke University, Durham
- Loyola University, Chicago
- NIDDK
- Harvard University, Boston
- University of Toronto, Toronto
- Rappaport Institute, Israel
- University of Michigan

**Administration & Management**
- University of Ghana, Accra
- University of Michigan

**Genomics Research Laboratories**
- Univ. of Ghana, Ghana
- Univ. of Ibadan, Nigeria

**Bioinformatics & Data Management**
- Univ. of Western Cape, SA
- Univ. of Ilorin, Nigeria

**NHGRI/NIDDK**
- H3Africa Steering Comm.
  - Biorepository
  - Bioinformatics Network
Continuous Quality Control and Improvement

- Annual training of study personnel
- Quality Control Committee (comprised of investigators and study coordinators)
- Periodic assessment of 50 random samples of DNA materials and urine pellets for proteomics
  - Quarterly in Year 1
  - Twice yearly in Year 2 to 5
- Quarterly quality control reports to all clinical centers on
  - Phenotyping data
  - Biological specimen
Anticipated problems & solutions

• Insufficient enrollment
  - Recruit other clinical centers in West Africa

• Quality control (Data and Biospecimen)
  - Site visits to clinical sites
  - Retraining
  - On-site specimen storage

• Communication Break down and systemic disruptions (coup d’estat, strikes, Force Majeure)
  - Back up for data and biospecimen
  - Additional clinical centers
H3Africa Kidney Disease Research Network
(U 1U54HG006939-01)

Explanation of Collaborations & Projects
## Collaborations

<table>
<thead>
<tr>
<th>Center</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Ghana</td>
<td>PI – Dr. Adu</td>
</tr>
<tr>
<td></td>
<td>Dr. Osafo – Substantial clinical research experience in Ghana, 3 studies with &gt;1,000 CKD participants</td>
</tr>
<tr>
<td>Kwame Nkrumah University of Science and Technology</td>
<td>Dr. Plange-Rhule - well established investigator and genetic epidemiology program, MEPI program</td>
</tr>
<tr>
<td>University of Ibadan</td>
<td>Well established nephrology investigator (Tunde Salako), genomic science lab led by Dr. Amodu – Harvard postdoc, MEPI in place</td>
</tr>
<tr>
<td>Obafemi Awolowo University</td>
<td>Established nephrology investigators, access to sickle cell disease population</td>
</tr>
<tr>
<td>University of Abuja</td>
<td>Nephrology investigators, visibility and access to Federal Government officials</td>
</tr>
<tr>
<td>University of Nigeria</td>
<td>Leading nephrology investigators and access to CKD patients</td>
</tr>
</tbody>
</table>
# Collaborations

<table>
<thead>
<tr>
<th>Center</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Western Cape</td>
<td>Nicki Tiffin – Leading bioinformatics expertise, well established bioinformatics infrastructure and training program</td>
</tr>
<tr>
<td>University of Ilorin</td>
<td>Bioinformatics expertise (Bewaji), well established nephrology research program (Olanrewaju), access to pediatric population</td>
</tr>
<tr>
<td>Loyola University</td>
<td>Dr. Cooper - &gt;30 years experience of clinical and genetic epidemiology research in Africa; Dr. Tayo: Well established investigator in statistical genetics, significant research experience in Nigeria and Ghana</td>
</tr>
<tr>
<td>Duke University</td>
<td>Dr. Gbadegesin: Well established molecular geneticist &amp; pediatric nephrology research expertise</td>
</tr>
<tr>
<td>University of Michigan</td>
<td>Expertise in statistical genetics, human genetics, excellent training programs, expertise in clinical/translational research in kidney disease, grant management &amp; administrative support; Dr. David Burke - Innovative low cost and rugged genotyping platform MICHCR (Michigan CTSA) – RedCap, data management and storage, biorepository expertise</td>
</tr>
</tbody>
</table>
## Collaborations

<table>
<thead>
<tr>
<th>Center</th>
<th>Collaborator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Toronto Hospital for Sick Children</td>
<td>Rulan Parekh – Established pediatric/adult nephrology investigators, original group to discover the association between MYH9 and non-diabetic CKD in African Americans</td>
<td></td>
</tr>
<tr>
<td>Harvard University (Beth Israel Deaconess)</td>
<td>Martin Pollak – Renowned nephrologist/genetic research expertise, original discovery of the APOL1-FSGS association</td>
<td></td>
</tr>
<tr>
<td>NIDDK</td>
<td>Dr. Jeff Kopp – Renowned investigator, world wide collaboration, responsible for the original work on APOL1 and kidney disease</td>
<td></td>
</tr>
<tr>
<td>NHGRI</td>
<td>Dr. Debo Adeyemo - Well established investigator with expertise in statistical genetics of chronic diseases</td>
<td></td>
</tr>
<tr>
<td>Ruth and Bruce Rappaport Research Institute, Tel Aviv</td>
<td>Dr. Karl Skorecki and Dr. Walter Wasser: Expertise in molecular genetics, world class genetic research facility. Responsible for new findings on APOL1 in Ethiopian Jews.</td>
<td></td>
</tr>
</tbody>
</table>
Research Projects in the H3Africa Kidney Disease Research Network

H3Africa Initiative

H3Africa Kidney Disease Research Network

- Monogenic Disease Childhood Onset NS (N=50 families)
- GWAS
- Renal Candidate Genes (MYH9, APOL1, etc) Studies (N=8000)
- Longitudinal Cohort Study (N=3150)
H3Africa Kidney Disease Research Network (U54): Research Projects

1. Mutation analysis of known nephrotic syndrome/FSGS genes (*i.e.*, \textit{NPHS1}, \textit{NPHS2}, \textit{WT1}, \textit{PLCE1}, \textit{ACTN4}, \textit{TRPC6}, and \textit{INF2}) in patients with familial NS/FSGS. (Gbadegeesin & Hildebrandt)

2. Whole exome DNA sequencing in kidney disease families in whom mutations in key NS/FSGS have been excluded (Gbadegeesin & Hildebrandt)

3. Genetic typing and analysis of known variants in the \textit{APOL1} and \textit{MYH9} genes patients with sickle cell nephropathy, hypertensive nephrosclerosis, diabetic nephropathy, FSGS, HIV-associated nephropathy (Jeff Kopp, Martin Pollak & Rulan Parekh)

4. GWAS (Bamidele Tayo and Adebowale Adeyemo)

5. Kidney Disease Cohort Study (Adu, Ojo) \(\text{Pending R01 funding}\)
### Study Cohorts

#### Sample Sizes of the Participants and Controls

<table>
<thead>
<tr>
<th>Diagnosis-specific eligibility</th>
<th>Age</th>
<th>Cases</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steroid resistant nephrotic syndrome(^1)</td>
<td>&lt;18</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Focal Segmental Glomerulosclerosis</td>
<td>18-70</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>HIV nephropathy</td>
<td>18-70</td>
<td>500</td>
<td>500(^2)</td>
</tr>
<tr>
<td>Sickle cell nephropathy</td>
<td>18-70</td>
<td>500</td>
<td>500(^3)</td>
</tr>
<tr>
<td>Hypertensive non-diabetics with CKD</td>
<td>18-70</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>CKD due to diabetic nephropathy</td>
<td>18-70</td>
<td>800</td>
<td>800(^4)</td>
</tr>
<tr>
<td>CKD – Unknown etiology</td>
<td>18-70</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>4,000</td>
<td>4,000</td>
</tr>
</tbody>
</table>

\(^1\)Includes 50 families with index cases and affected family members  
\(^2\)Patients with HIV and no nephropathy  
\(^3\)Patients with sickle cell disease and no nephropathy  
\(^4\)Patient with diabetes mellitus and no nephropathy
## Phenotyping data to be collected

<table>
<thead>
<tr>
<th>Type of Procedure/Contact</th>
<th>Baseline Study Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligibility Assessment/Confirmation</td>
<td>X</td>
</tr>
<tr>
<td>Informed Consent</td>
<td>X</td>
</tr>
<tr>
<td>Medical Record Consent</td>
<td>X</td>
</tr>
<tr>
<td>Contact Information</td>
<td>X</td>
</tr>
<tr>
<td>Labs: Serum Creatinine, Serum Glucose, Hemoglobin, Demographic Information</td>
<td>X</td>
</tr>
<tr>
<td>Medical History [CV, Renal and Health Behaviors]</td>
<td>X</td>
</tr>
<tr>
<td>Genetic Blood Sample</td>
<td>X</td>
</tr>
<tr>
<td>Labs: CBC, Metabolic Panel, Lipids, etc.</td>
<td>X</td>
</tr>
<tr>
<td>Urinary Assay: Creatinine, Protein, Albumin, Urea Nitrogen</td>
<td>X</td>
</tr>
<tr>
<td>Urine sample collection</td>
<td>X</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>X</td>
</tr>
<tr>
<td>Ankle Brachial Index &amp; Anthropometric Measures</td>
<td>X</td>
</tr>
<tr>
<td>HCV, HBsAg, HIV, Hgb electrophoresis and HbA1c</td>
<td>X</td>
</tr>
<tr>
<td>Physical Activity and Physical Functioning Assessment</td>
<td>X</td>
</tr>
<tr>
<td>Concomitant Medications</td>
<td>X</td>
</tr>
<tr>
<td>MDRD Symptom Index</td>
<td>X</td>
</tr>
<tr>
<td>KDQOL - Quality of Life Questionnaire</td>
<td>X</td>
</tr>
<tr>
<td>Diet History Questionnaire</td>
<td>X</td>
</tr>
<tr>
<td>Recent Medical History – Event Data</td>
<td>X</td>
</tr>
</tbody>
</table>
REDCap: Data & Computing Environment Security

- Web-based clinical research data management system
- Developed at the Vanderbilt University & used by nearly all CTSA
- Interactive tools for:
  - Participant registration
  - Data entry and verification
  - Repository of all study forms
  - Individual participant calendars
  - Cumulative site calendars for expected study activities
  - Calculator of creatinine-based e-GFR
  - Access to the National Drug Data File (NDDF) in the Medication Reference
  - Link to the Network website
  - Generate individual participant and investigator-specific reports
  - Seamless data downloads to common statistical packages (SPSS, SAS, Stata, R)
REDCap: Data & Computing Environment Security

- Duplicate servers at University of Ghana & SANBI, Cape Town, SA
  - Professionally managed and equipped tier-2 data center with tightly controlled access.
  - Remote data access employs SSL encryption and 2-tier Level 1 and Level 2 password challenges via LDAP authentication
  - Compliance with HIPAA security and privacy requirements
  - Compliance with the HITECH Act
  - Audit trails on user access to and modification of data
  - Clinical centers BMCE required to meet best practices established in the Federal Information Security Management Act (FISMA)
H3Africa Kidney Disease Research Network
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Training & Career Development Plans
Administrative Structure of the Training & Career Development Component

**Principal Investigators**
- Dwomoa Adu, MD
- Akinlolu Ojo, MD

**Training Advisory Group**
- Dwomoa Adu, MD
- Frank Brosius, MD
- 3 Training Track Directors
- 2 External members

**Training Program Administrator**
(To be named)

**Component Co-Leaders**
- Richard Cooper, MD
- Babatunde Salako, MD

**Tracks**

**Track 1**
Genomics focused Clinical Research and Biostatistics
Jacob Plange-Rhule, MD, PhD
Bamidele Tayo, PhD

**Track 2**
Advanced Clinical Research Methods
Daniel Clauw, MD
Richard Cooper, MD

**Track 3**
Predoctoral Training in Human Genetics & Bioinformatics
John Moran, PhD
Michael Boehnke, PhD

**Track 4**
Research Administration & Grant Management
IEARD

**Track 5**
Genomics Laboratory Methods
David Burke, PhD
Robert Lyons, PhD

**Track 6**
Short-Term Faculty Sabbaticals
David Burke, PhD
Nicki Tiffin, PhD

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# Training & Career Development Component: Objectives

1. Develop expertise in clinical research and biostatistics (Track 1) and advanced clinical research methods (Track 2)
2. Develop a new cadre of experts in bioinformatics, human genetics and biostatistics (Track 3)
3. Train new cadre of grant administrators to enhance the extramural research grant management and administration capacity of African institutions (Track 4)
4. Increase the technical competence and promote the retention of African laboratory technicians through short-term training and on-the-ground collaborative support (Track 5)
5. Institute leadership training and foster research independence through the use of short-term faculty sabbatical exchange programs between the University of Michigan Genetics and Bioinformatics and African scientists (Track 6)
Training & Career Development Component: The Training Tracks

Plan for the trainees to return to their home institution in Africa

- Overseas training will be limited to individuals who have significant commitment in their own country
- Instead of the F1 student visa, all training components in the U.S. will be done under the J-1 Exchange Visitor Program

Tracking & Evaluation of the Training and Career Development Component

- Tracking database: Database captured information on trainees will be used to track retention of trainees at their original African institutions
- Qualitative Assessment: Structured surveys, focus groups & interviews will be used to obtain feedback
- Metrics of Trainee Success: Learning and perceived competence; career choices & satisfaction; career productivity & progression
H3Africa Kidney Disease Research Network (U 1U54HG006939-01)

Data Sharing, Human Research Participant & Ethics, Biorepository
Informed consent

- Adult participants
  - Comprehensive written informed consent
  - Must opt in for genetic research

- Pediatric participants
  - Written informed consent by at least one parent
    
    • Assent by child age 10-14 years
    
    • Written informed consent by child age >14 years
    
    • Must opt in for genetic research
Material Transfer Agreements

- Between each participating clinical center and the UGMS
- Between UGMS and University of Western Cape
- Between UGMS and the University of Michigan
- Letter from Ministry of Health of participating countries:
  - Support for H3Africa projects
  - Commitment to biomedical research
  - Consent to international transfer of DNA materials, other biological specimen and research data
Human Research Participant Protection

• Risk Level – Minor increase over minimal

• Potential risks
  - Injury and infection from phlebotomy
  - Loss of privacy and confidentiality
  - Psychological harm and discrimination from inadvertent release of PHI (insurability, employment)

• Benefits – Indirect benefits only
  - Information on treatment of hypertension, diabetes or kidney disease
  - Contributing to improved understanding of the genetics of kidney disease
Release of genetics and other research data

- The following results will be made available to the participants and treating physicians **THROUGH** the Clinical Center Principal Investigator:
  - HIV
  - HCV
  - Hepatitis B
  - Hemoglobin electrophoresis,
  - Serum creatinine
  - Urine albumin:creatinine ratio

- Critical laboratory results will be communicated to the Clinical Principal Investigator (within 7 business days of the assay)

- Genetic data will not be released or reported to the participants

- Only aggregate data will be published or presented in scientific fora
Measures to minimize risks to human research participants

• Thorough explanation and dialogue during the informed consent process to ensure:
   Full disclosure of the nature of the research and the participation being asked of the participant
   Adequate comprehension on the part of the potential participant
   That participant's decision to enroll is a voluntary choice
• Unfettered access to Human Research Participant Advocate if available
• Contact information of Clinical Center PI
• Security of research data, de-identification and publication of aggregate data
• Study procedures performed by trained personnel
H3Africa Kidney Disease Research Network - Data Sharing Plan

• Network investigators will have time-limited proprietary access to research data ensure ample “academic capital” for the investigators

• Research data will be shared worldwide through:
  - Provision of data files to the NHGRI (or other federal) data repositories
  - Provision of access to research data to scientists who engage in collaborative research relationships with the Network
• Website with portals for the public, potential collaborators and investigators

• Solicit collaborative projects through scientific meetings and media
Examples of Data Sharing and Collaboration

• Ancillary study proposal by Sarah Tishkoff and Duncan Johnstone, Department of Genetics and Biology, University of Pennsylvania
• Chronic Renal Insufficiency Cohort (CRIC) Study
• Nephrotic Syndrome Study Network (NEPTUNE)
• Weizmann Institute of Science, Rehovot, Israel – Whole Exome and NextGen Sequencing
Human Research Participant Advocate (Pending availability of funding)

- Perform random and “for cause” protocol audits to assist
- Promote collaborative efforts aimed at improving overall data integrity and participant safety
- Ensure adequate human subject protection staff training.
- Authority to suspend any research project
- Report directly to the Dean
- Work closely with the IRB/Ethic Boards
- Assist with Data Safety Monitoring Plans (DSMPs
- Review adverse event reports to identify issues or patterns that might require changes to the research project
- Consult IRB/Ethics Committee to address areas of mutual safety or ethical concerns
# H3Africa Kidney Disease Research Network

<table>
<thead>
<tr>
<th>Country</th>
<th>Institution</th>
<th>Key Personnel</th>
<th>Title</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td>Addis Ababa University</td>
<td>Y. Menghistu</td>
<td>Consultant Nephrologist/Assistant Professor</td>
<td>Center PI</td>
</tr>
<tr>
<td>Ghana</td>
<td>University of Ghana</td>
<td>Dwomoa Adu, Charlotte Osafo, Alexander Nyarko, Michael Mate-Kole, Ivy Ekem, Vincent Boima, Kwame Affram</td>
<td>Consultant Nephrologist, Lecturer in Nephrology, Professor, Consultant Nephrologist/Professor, Snr. Lecturer/Consultant Hematologist, Physician Specialist/Nephrologist, Consultant Nephrologist/Professor</td>
<td>PI</td>
</tr>
<tr>
<td></td>
<td>Kwame Nkrumah University of Science &amp; Technology</td>
<td>Jacob Plange-Rhule, Benjamin Eghan, Yaw Adu-Boakye, Elliot Tannor</td>
<td>Associate Professor, Senior Research Fellow, Specialist Physician/Int Med., Medical Practitioner</td>
<td>Center PI</td>
</tr>
<tr>
<td>Kenya</td>
<td>University of Nairobi</td>
<td>S.O. Mc'Ligeyo, James Ochanda, Joel W. Ocheng, Isabella Oyier</td>
<td>Consultant Nephrologist/Associate Professor, Associate Professor in Biochemistry &amp; Director, Center for Biotechnology &amp; Bioinformatics, Research Fellow &amp; Lecturer, Investigator</td>
<td>Center PI</td>
</tr>
</tbody>
</table>
# H3Africa Kidney Disease Research Network

<table>
<thead>
<tr>
<th>Country</th>
<th>Institution</th>
<th>Key Personnel</th>
<th>Title</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nigeria</strong></td>
<td>University of Ibadan</td>
<td>Tunde Salako</td>
<td>Professor/Consultant Physician</td>
<td>Center PI</td>
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<tr>
<td></td>
<td></td>
<td>Olukemi Amodu</td>
<td>Snr. Research Fellow</td>
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<td></td>
<td></td>
<td>Adebowale Ademola</td>
<td>Lecturer/Consultant Physician</td>
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<td></td>
<td></td>
<td>Akinkemi Fedipe</td>
<td>HOD, Family Medicine</td>
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<tr>
<td></td>
<td>University of Ilorin</td>
<td>Chijioke Adindu</td>
<td>Snr. Lecturer/Consultant Physician</td>
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<td></td>
<td>Timothy Olarenwaju</td>
<td>Consultant Physician</td>
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<td></td>
<td>C. O. Bewaji</td>
<td>Professor, Bioinformatics</td>
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<tr>
<td></td>
<td>University of Ilorin</td>
<td>Fatiu Arogundade</td>
<td>Assoc. Prof/Consultant Physician</td>
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<tr>
<td>Obafemi Awolowo University</td>
<td></td>
<td>Samuel Ajayi</td>
<td>Consultant Physician/Nephrologist</td>
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<td>Manmak Manven</td>
<td>Consultant Physician/Nephrologist</td>
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<tr>
<td>University of Abuja</td>
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<td>Ifeoma Ulasi</td>
<td>Snr. Lecturer/Consultant Physician</td>
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<td>Chuba Ijoma</td>
<td>Snr. Lecturer/Consultant Physician</td>
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<tr>
<td>University of Nigeria, Enugu</td>
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<td>Nicki Tiffin</td>
<td>Snr. Lecturer, Bioinformatics</td>
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<tr>
<td>South Africa</td>
<td>University of Western Cape (SANBI)</td>
<td>Junaid Gamiedien</td>
<td>Snr. Lecturer, Bioinformatics</td>
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<tr>
<td><strong>Israel</strong></td>
<td>Technion – Israel Institute of Technology, Rappaport Research Institute</td>
<td>Karl Skorecki, Walter Wasser</td>
<td>Professor &amp; Director, Professor</td>
<td></td>
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<tr>
<td><strong>U.S.</strong></td>
<td>Loyola University</td>
<td>Richard Cooper, Bamidele Tayo</td>
<td>Professor/HOD, Assistant Professor</td>
<td>Center PI, Stat. genetics</td>
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<tr>
<td></td>
<td>Duke University</td>
<td>Rasheed Gbadegesin</td>
<td></td>
<td>Molecular genetics</td>
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<td></td>
<td>University of Michigan</td>
<td>Akinlolu Ojo, Matthias Kretzler, Michael Boehnke, John Moran, David Burke, Daniel Clauw, Frank Brosius</td>
<td>Professor, Professor, Professor, Professor, Professor, Professor, Professor</td>
<td>PI, Stat. genetics, Genetics, Genetics, TAG, TAG</td>
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<td></td>
<td>NHGRI</td>
<td>Adebowale Adeyemo</td>
<td>Deputy Director, CRGGH</td>
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<td>NIDDK</td>
<td>Jeffrey Kopp</td>
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<td>Harvard University</td>
<td>Martin Pollak</td>
<td>Professor</td>
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<tr>
<td><strong>Canada</strong></td>
<td>University of Toronto</td>
<td>Rulan Parekh</td>
<td>Professor</td>
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H3Africa Kidney Disease Research Network (U 1U54HG006939-01)

DISCUSSION