

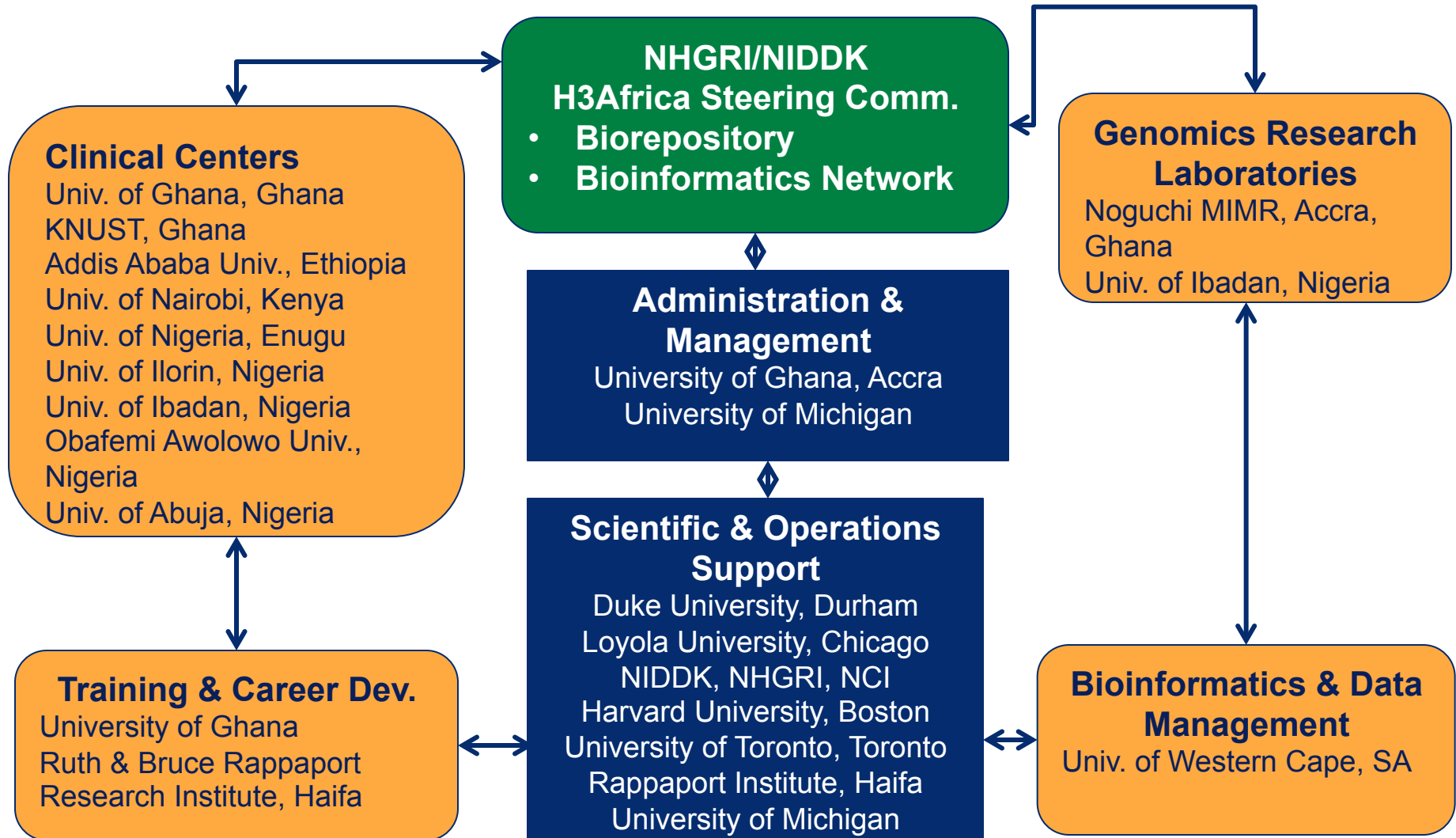
# **H3Africa Kidney Disease Research Network**

**A U54 H3A Collaborative Clinical Center Award**

**The University of Ghana & The Noguchi Memorial  
Institute for Medical Research, Accra, Ghana**

---

# H3A Kidney Disease Research Network: Organizational structure



# H3A Kidney Disease Research Network: **Research objectives**

---

1. Enroll 4000 cases with kidney disease and 4000 controls
2. Comprehensive phenotyping of the first ever kidney disease cohort of 8000 cases and controls in four African countries (Ethiopia, Ghana, Kenya, Nigeria)
3. Conduct four genetic and translational research projects on chronic kidney disease and glomerular diseases including childhood onset nephrotic syndrome

# H3Africa Kidney Disease Research Network: Infrastructure/Capacity Building

---

1. Two genomic research laboratories in West Africa using sustainable, low capital-intensity laboratory technology platform (Dr. David Burke)
2. Develop mechanism for high throughput whole genomic sequencing in collaboration with overseas institutions (Dr. Rob Lyons, Dr. David Burke and Dr. Michael Boehnke)

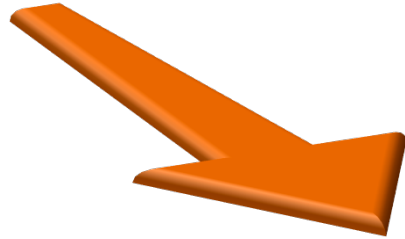
# H3A Kidney Disease Research Network: Training & Career development goals

---

1. Training programs in genetics and genomics science for laboratory technicians, research scientists and research coordinators in Africa (Dr. David Burke/Dr. Bamidele Tayo)
2. Genomics 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 through U.S. platform extension to Africa (Dr. Matthias Kretzler)

# H3A Kidney Disease Research Network: Research projects

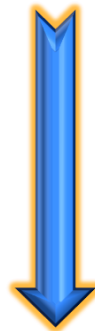
## H3Africa Initiative



## H3Africa Kidney Disease Research Network



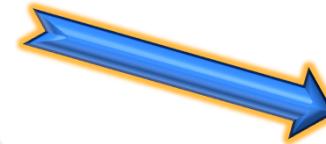
Ancillary Studies



Renal Candidate Genes  
(MYH9, APOL1, etc)  
Studies  
(N=8000)



GWAS  
(N=2000)

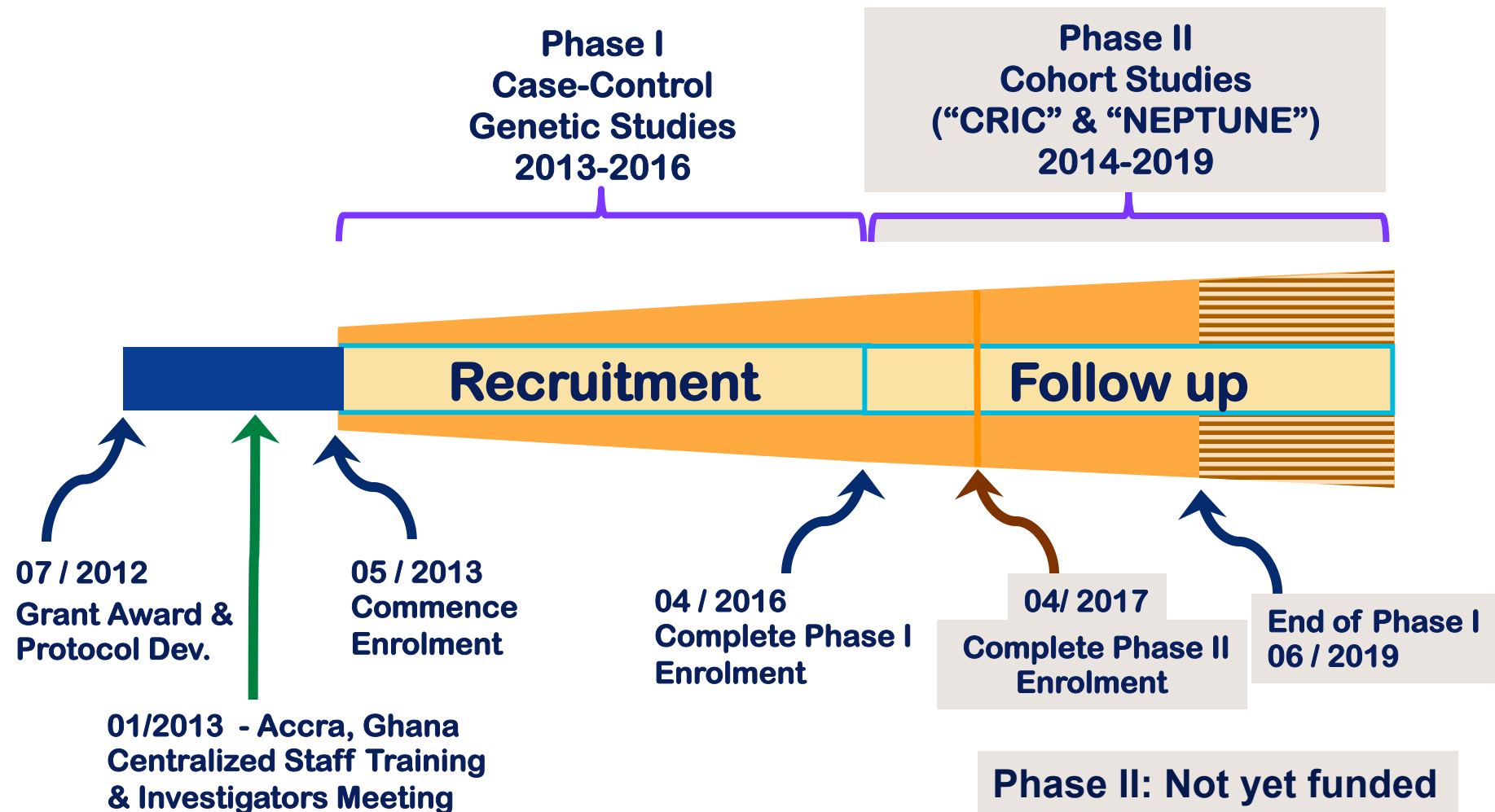


Monogenic  
Disease  
Childhood Onset NS  
(N=50 families)

# H3A Kidney Disease Study: Recruitment goals

Recruitment Goals by Clinical Center		
Clinical Center	Number of Participants	
	Kidney Disease	Controls
Addis Ababa University	750	750
Kwame Nkrumah University of Science and Technology	500	500
Obafemi Awolowo University, Ile-Ife	500	500
University of Abuja	250	250
University of Ghana	750	750
University of Ibadan	925	925
University of Ilorin	250	250
University of Nairobi	750	750
University of Nigeria, Enugu	500	500
<b>Total</b>	<b>5,175</b>	<b>5,175</b>

# H3A Kidney Disease Study: Timeline





# Case Report Forms (CRFs)

---

## **11 Participant CRFs (640 phenotyping variables, 3288 levels)**

- 640 phenotype variables on 11 CRFs:
- Medical History
- Blood Pressure Form
- Concomitant Medications
- SF 12
- Environmental History
- Kansas City Questionnaire
- Physical Assessment
- Symptoms List
- Medical Events Questionnaire
- Renal Replacement Therapy – Primary Survey
- Renal Replacement Therapy – Follow-up Survey

## **11 Administrative CRFs**

## PHYSICAL ASSESSMENT

Participant ID:

\_\_\_\_\_  
(Example: Site 04 Participant 0001 Enter: 040001)

CRF Date:

\_\_\_\_\_  
(dd-mm-yy)

---

---

CRF Version V1.0.20130805

RC ID:

\_\_\_\_\_

---

---

### ANTHROPOMETRY:

1. Date of measurement:

\_\_\_\_\_  
(dd-mm-yy)

2. Time of measurement:

\_\_\_\_\_  
(hh:mm)

---

---

**A. Height and Weight:** Height and weight are measured at follow-up clinic visits only. (Baseline height and weight are measured at screening visit and recorded on the Eligibility Assessment (ELIG) case report form.)

3. Standing height: (measured in cm)

\_\_\_\_\_  
(cm)

4. Weight: (measured in kg)

\_\_\_\_\_  
(kg)

---

---

## BIOSPECIMEN COLLECTION Adult - 57 ML

Participant ID:

\_\_\_\_\_  
(Example: Site 04 Participant 0001 Enter: 040001)

CRF Date:

\_\_\_\_\_  
(dd-mm-yy)

---

---

CRF Version V1.0.20130805

RC ID:

\_\_\_\_\_

1. Type of specimen(s):

- Blood  
 Urine  
 Both  
 Unable to collect blood or urine

2. Date of birth:

\_\_\_\_\_  
(dd-mm-yy)

2a. Gender:

- Male  Female

3. Does the participant have a diagnosis of diabetes mellitus?

- Yes  No

3b. Is the participant on dialysis?

- Yes  No

---

---

### Blood Specimens:

4. Collection Date:

\_\_\_\_\_  
(dd-mm-yy)

# 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)



Logged in as **donnasm** | [Log out](#)

- My Projects
  - Project Home
  - Project Setup
- Project status: **Development**

### Data Collection [Edit instruments](#)

- Scheduling  
- Generate schedules for the calendar using your defined events
- Data Entry

### Applications

- Calendar
- Data Export Tool
- Data Import Tool
- Data Comparison Tool
- Logging
- File Repository
- User Rights
- Graphical Data View & Stats
- Data Quality
- Report Builder

### Help & Information

- Help & FAQ
- Video Tutorials
- Suggest a New Feature

If you are experiencing problems, please contact your [REDCap administrator](#).

University of Michigan  
Michigan Institute for Clinical & Health Research

## H3Africa

### Data Entry

You may view an existing record/response by selecting it from the drop-down lists below. To create a new record/response, type a new value in the text box below and hit Tab or Enter. To quickly find a record without using the drop-downs, the text box will auto-populate with existing record names as you begin to type in it, allowing you to select it.

Total records: **0**

Choose an existing Participant ID:

-- select record --

Enter a new or existing Participant ID:

### Data Search

Choose a field to search

(excludes multiple choice fields)

-- select search field --

Search query

Begin typing to search the project data, then click an item in the list to navigate to that record.

#### NOTICE:

This project is currently in Development status. **Real data should NOT be entered** until the project has been moved to Production status.

- DEMO**
- DPCS
- PTCONT
- HPCONT
- BP
- CMED
- KDQOL
- SPEC90
- LABCBC
- SSHIP
- ELIG
- RRTPRIM
- MEDHX

**Applications**

- Calendar
- Data Export Tool
- Data Import Tool
- Data Comparison Tool
- Logging
- File Repository
- User Rights
- Graphical Data View & Stats
- Data Quality
- Report Builder

**Help & Information**

- Help & FAQ
- Video Tutorials

### H3Africa

**DEMO** [Modify this instrument](#)

Download PDF of - select PDF download option -

Adding new Participant ID: **1**

Event Name: **Visit 01: Screening**

**Participant ID:**

1

**CRF Date:**

(H)



Today

M-D-Y

**RC ID:**

(H)

#### Demographics Information

#### Clinical Centers and Sites

\* must provide value

(H)

- University of Ghana Medical School: Accra, Ghana
- Kwame Nkrumah University of Science and Technology: Kumasi, Ghana
- University of Ibadan: Ibadan, Nigeria
- University of Ilorin: Ilorin, Nigeria
- University of Abuja Teaching Hospital: Abuja, Nigeria
- Obafemi Awolowo University: Ile-Ife, Nigeria
- University of Nigeria Teaching Hospital, Enugu: Ituku-Ozalla, Nigeria
- University of Nairobi: Nairobi, Kenya
- Addis Ababa University: Addis Ababa, Ethiopia

[reset value](#)

**First Name:**

(H)

**Last Name:**

(H)

**Date of Birth:**

(H)



Today

M-D-Y

**Gender:**

(H)

**Street Address:**

**Town/City, Province/State, Zip code**

(H)

[Expand](#)

**Phone number:**

(H)

**Form Status**

# Phenotyping and specimen acquisition resources

---

- Digital Blood Pressure Monitor – Omron HEM 907XL IntelliSense
- Blood Pressure Monitor Mounting Stand - Omron Floor stand Kit for 907XL
- Digital Floor Scale - SECA 813
- Centrifuge – BD Clay Adams Compact II Centrifuge
- Freezerworks Label Printer - Zebra GX420t
- Freezerworks Hand held barcode label scanner - Symbol 6707
- Portable EKG machine - GE Medical Systems MAC 1200
- Anthropometric Tape Measures - Gulick II Plus G7019
- Bioelectrode Body Composition Analyzer – RJL Systems Quantum II BIA Analyzer System
- Laptop - HP EliteBook 8470p Notebook PC
- Desktop Scanner - HP Scanjet N6350 networked
- Ultrasound Probe – Summit L250 Display Hand Held Doppler (Probe: SD8 8 MHz Vascular)
- Stadiometer - SECA 216

# H3A Kidney Disease Study: Biospecimen collection scheme (total blood volume = 57cc/adult)

Specimen	Tube	Overnight ship (cold pack) from CC to MDS Lancet Laboratory	Store in Freeze -80 at MDS Lancet Laboratory
A	10ml SST (Yellow Top)		(A1, A2, A3) Light sensitive aliquots (A4, A5, A6) Serum aliquots Stored for future testing
B	5ml SST Yellow top	(B1) Serum aliquot-- Serum creatinine. Serum aliquots stored for Hepatitis B & C, HIV antibody	
C	5ml SST Yellow top		(C1, C2, C3) Serum aliquot Stored for future testing
D	5ml SST Yellow top		(D1) Serum Creatinine
E	3ml Purple (EDTA)	(E1) FBC	
F	6.5ML DNAgard	(F1) DNAgard	
G	10ml purple top (EDTA)	(G1, G2, G3, +1 Buffy Coat) DNA Plasma aliquots Stored for future testing	
H	10ml purple top (EDTA)	(H1, H2, H3, +1 Buffy Coat) Plasma aliquots. Stored for future testing	
I	4.5ml Blue top (NaCitrate)		(I1, I2, I3) Plasma aliquots Stored for future testing
S	DNA Mouthwash 50ml	**Per Dr. Burke's Saliva Protocol**	S1, S2, S3
U	Random Spot urine 50ml	(U1) Urine aliquot creatinine, albumin	(U2, U3, U4) Urine aliquot stored for future testing



# Freezerworks data entry interface

Search Samples: # 1 of 1 -- Internal Bar Code ID 108918

Samples | DNA | Notes | Transact | Aud Trail | Attachments

Sample ID: 4501    Sample Date: 12/09/2003    Pt. ID#: 13126

Pt. Initials:    Pt. Source: EDIC    Clinic/Center #: 13

New Pt.: no    Transfer Pt.: no    Protocol Type: 4A

D Kit Requested: 01/23/2004    D Kit Mailed: 01/23/2004    D Samp. Collect: 03/08/2004

D PIF Received: 03/11/2004    D Sample Rec'd: 03/10/2004    D Check Mailed: 04/16/2004

SubAliquot:

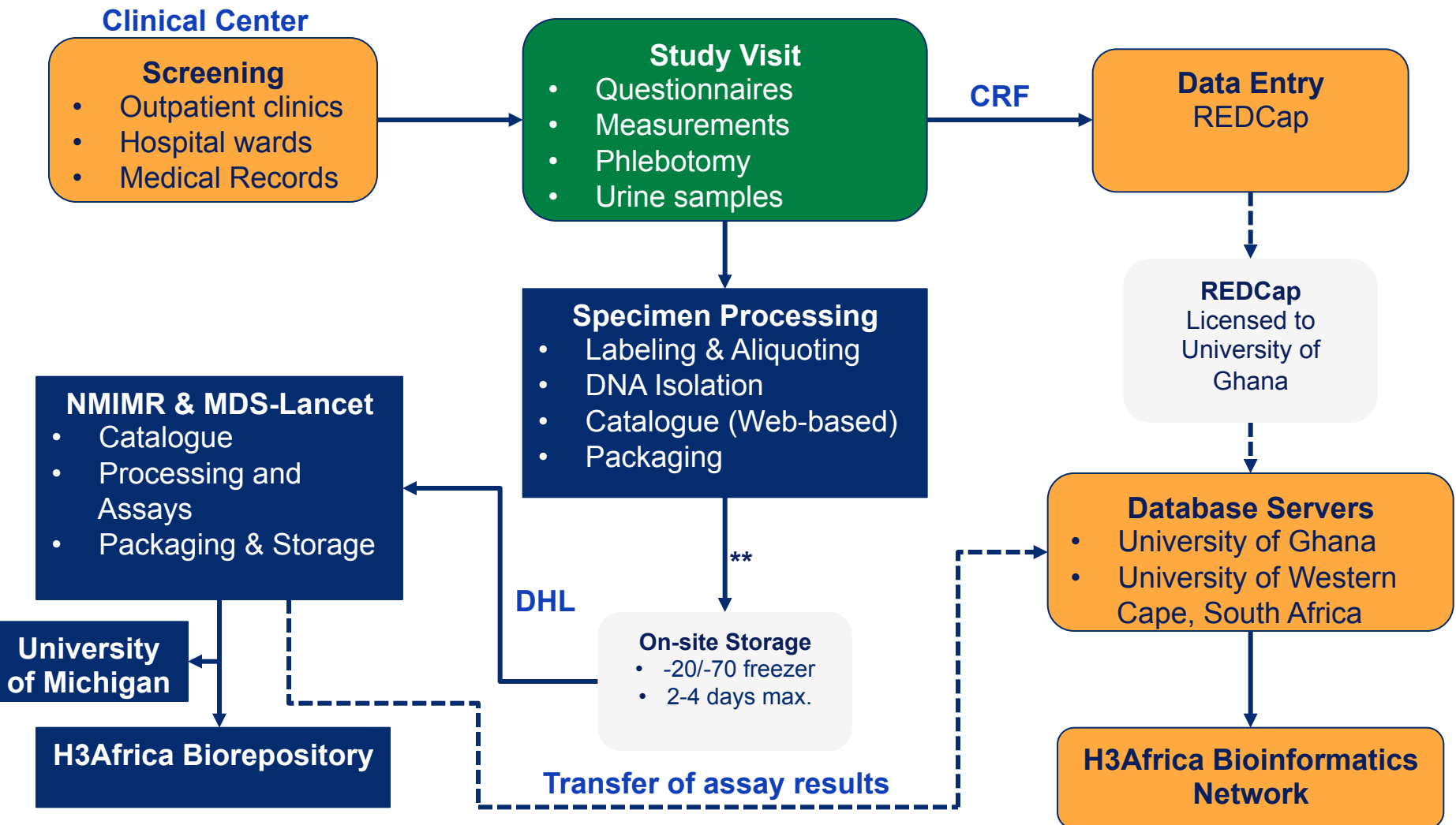
---

Positions | Status

Total Number of Aliquots: 7    Number of Aliquots with Positions: 7    Total Current Amount is 27

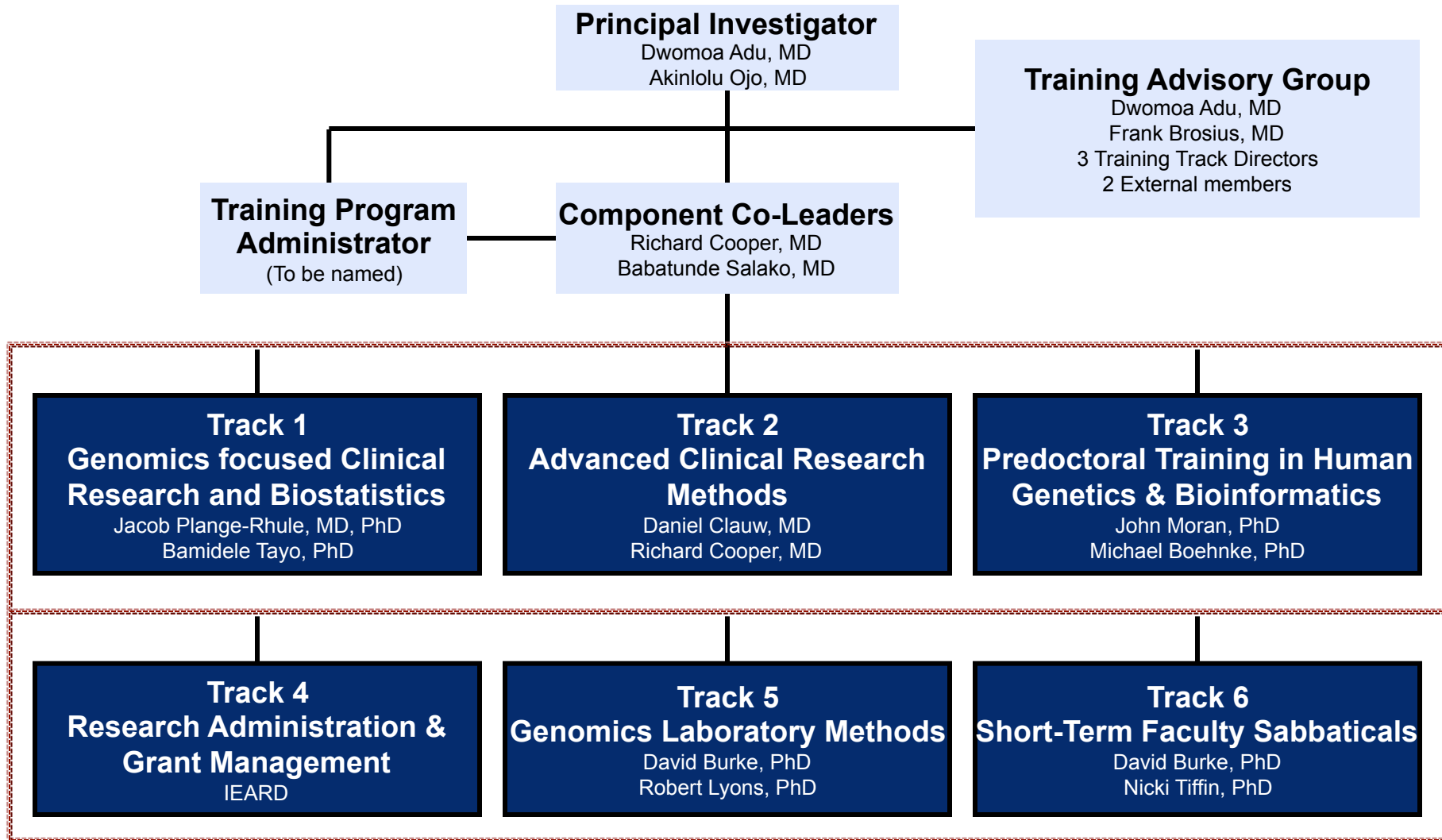
Vial	FreezerName	Position1	Position2	Position3	Position4	Position5	Aliquot Type
Tube		Shelf	Stack	Box	Row	Column	
1	PPG Freezer 4	4	K	3	B	5	4th C-PurpV1
2	PPG Freezer 4	2	K	2	C	1	4th P-Orange1
3	PPG Freezer 4	2	K	2	C	2	4th P-Orange2
4	PPG Freezer 4	3	A	1	F	3	4th S-Red1
5	PPG Freezer 4	2	O	2	C	1	4th P-Plas1
6	PPG Freezer 4	2	O	2	C	2	4th P-Plas2
7	PPG Freezer 4	5	A	1	E	5	4th Urine1

# H3A Kidney Disease Research Network: Data & biospecimen processing and pathways



CRF = Case Report Forms; DHL = DHL Express; \*\*= Hand transfer by trained technician

# Training & Career Development



# H3Africa Kidney Disease Research Network: Infrastructure/Capacity Building

---

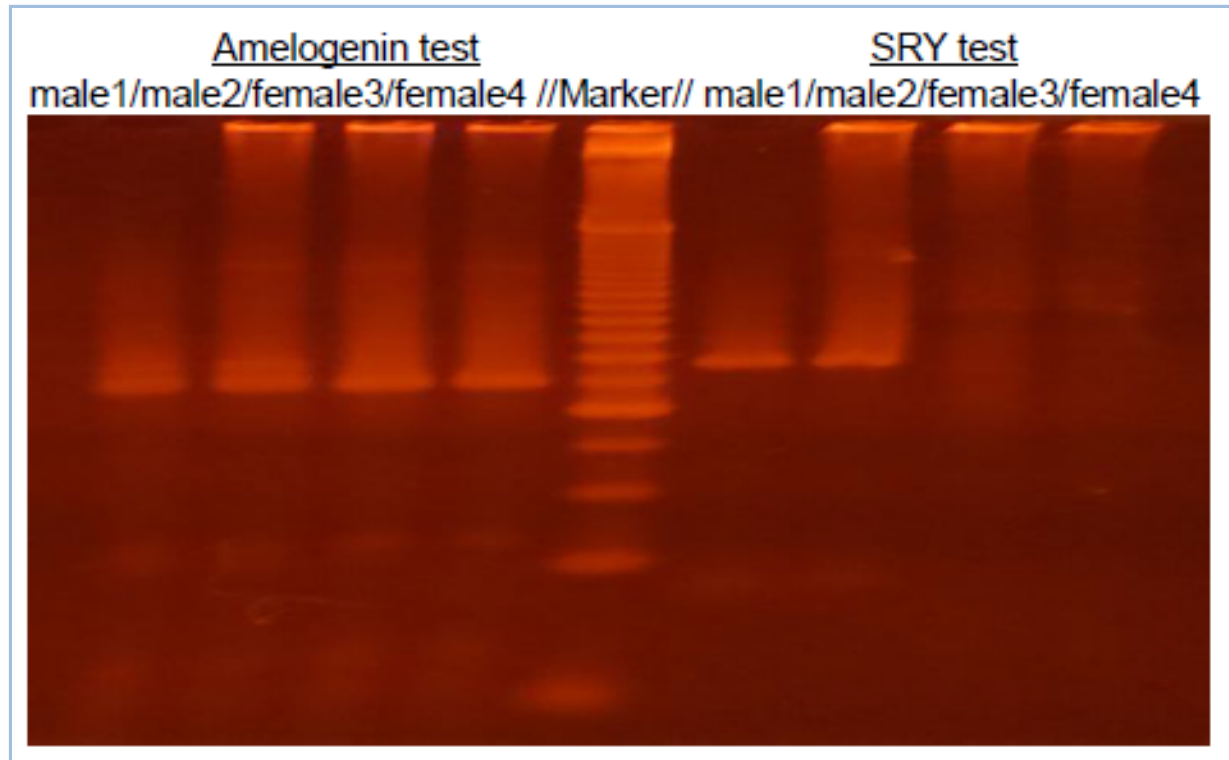
1. Two genomic research laboratories in West Africa using sustainable, low capital-intensity laboratory technology platform (Dr. David Burke)
2. Develop mechanism for high throughput whole genomic sequencing in collaboration with overseas institutions (Dr. Rob Lyons, Dr. David Burke and Dr. Michael Boehnke)

# Genomics Research Laboratory at the Noguchi Memorial Institute for Medical Research (NMIMR)

---

- Assessment of laboratory infrastructure at the NMIMR (Dr. Burke, Dr. Nyarko, Dr. Anita Ghansah, Mr Richard Oppong and Ms. Javada Appenteng)
- Protocols for sample acquisition, shipping, labeling, and processing
- Development of DNA preparation and genetic typing procedures matched to NMIMR infrastructure
- Development of genotyping reagents to provide initial assessments of clinical DNA samples

# Genomics Research Laboratory at the NMIMR



Agarose gel SNP genotyping to monitor DNA preparation quality and to assess H3Africa samples for sex. The LDR tests sex-specific genomic sequences in each sample, and size separated on a agarose gel, stained for DNA. Human male (2) and female (2) test samples are shown. The left 4 lanes show the amelogenin test. The **AmelogeninX** PCR band is specific for the X chromosomal variant, and appears, as expected, in both male and female samples. The **AmelogeninY** band is specific for the amelogenin gene Y chromosomal variant. The male samples have both peaks appear, female only one. The right 4 lanes show the SRY sequence test. The male samples have one band appear, females show no PCR product, as expected

## Additional Notes

---

- Submission of IRB application (7 centers)
- IRB approval (3 centers)
- Recruitment (1 center)

# Acknowledgement

---

- H3A Kidney Disease Research Network Staff & Investigators
- Jeffrey Struewing (NHGRI)
- Jane Peterson (NHGRI)
- Ebony Bookman (NHGRI)
- Chengetai Mahomva (NHGRI)
- Paul Kimmel (NIDDK)
- Marva Moxey-Mims (NIDDK)
- Rebekah Rasooly (NIDDK)
- Mark Guyer (NHGRI)

## **Observational Study Monitoring Board (OSMB) Members**

- David Warnock, MD (Chair), Susan Furth, MD, PhD,
- Jennifer Gassman, PhD,
- Ali Gharavi, MD,
- Maureen Kelley, PhD,



---

**THANK YOU**

---

---

**EXTRA SLIDES FOR DISCUSSIONS**

---

# Specific aim 1 (N=50 families)

---

- Perform mutation analysis in key nephrotic syndrome/FSGS genes (*NPHS1*, *NPHS2*, *WT1*, *PLCE1*, *ACTN4*, *TRPC6* & *INF2*) in a cohort of patients with familial NS/FSGS
- Perform genome wide linkage study (GWLS) and whole exome sequencing in a cohort of families in whom mutations in key NS/FSGS have been excluded

## Specific aim 2 (N=3000 cases & 3,000 controls)

---

- Screen for known disease susceptible variants in *APOL1* and *MYH9* in a cohort of patients with
  - HIV associated nephropathy
  - Sickle cell disease nephropathy and controls without nephropathy and normal controls
  - HIV Nephropathy vs. HIV without nephropathy vs. controls
  - Sickle cell disease nephropathy vs. Sickle cell disease without nephropathy vs. controls

# H3A Kidney Disease Study Progress & Updates I

---

- Consent documents finalized and approved by NIH
- 7 out of 9 clinical centers submitted IRB application
- 3 out of 9 clinical centers have received IRB approval
- Revised protocol to be completed in Feb 2013

# Specific aims 1-3

---

Enrollment and high level phenotypic characterization of 4,000 cases and 4,000 controls to enable genetics studies in four cohorts of patients with kidney disease:

1. Childhood/Adolescent-onset nephrotic syndrome
2. Sickle cell disease and sickle cell trait
3. HIV nephropathy
4. Chronic kidney disease of due to hypertension, diabetes mellitus and chronic glomerulonephritis

# REDCap: Data & Computing Environment Security

- Duplicate servers at University of Ghana & SANBI, Cape Town, SA
- Application and database servers are on virtual machines (VM).
- The VM servers: Red Hat Enterprise Linux Server 5.5 (64-bit, 2.6.18.194.el5-smp kernel), 2 x Dual Core Intel Xeon CPU 3.06GHz with 4GB RAM, running Apache 2.2.3 (application servers) and MySQL 5.0.77 (database servers)
- Physical security for the databases:
  - 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)

## ENVIRONMENTAL HISTORY

Participant ID:

\_\_\_\_\_  
(Example: Site 04 Participant 0001 Enter: 040001)

CRF Date:

\_\_\_\_\_  
(dd-mm-yy)

---

---

CRF Version V1.0.20130805

RC ID:

\_\_\_\_\_

1. During the past two weeks did you work at any time at a job or business, not counting work around the house?  
[INCLUDE UNPAID WORK IN THE FAMILY FARM OR BUSINESS]

Yes  No

2. Even though you did not work during those two weeks, did you have a job or business?

Yes  No

3. For whom do/did you work last in a full time job or business lasting two weeks or more?

- Never employed ?
- Self-employed [GO TO 5]
- Refused

If worked, please enter name of employer

\_\_\_\_\_

4. What kind of industry is/was this?

- manufacturing
- chemical
- mining
- public service, including teaching
- commercial and retail
- agricultural and farming
- self employed professional (doctor, lawyer, accountant etc)



# H3Africa Kidney Disease Research Network (U54): Training & Career Development Goals

---

1. 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)
2. System biology training and U.S. platform extension to Africa (Dr. Matthias Kretzler)

# H3Africa Kidney Disease Research Network

## Research Projects

Project I  
Single gene mutations I

Project II  
APOL1/MYH9

Project III  
GWAS of disease loci

Project IV  
NEPTUNE-AFRICA

## 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

## Research Infrastructure

Genomics Research Labs

Bioinformatics/Data Management

Biorepository

Central Biochemical Lab

# The H3Africa Kidney Disease Study (U54 HG 006939-01)

Dwomoa Adu, MD, FRCP  
*Principal Investigator (Contact)*  
*University of Ghana, Accra*

Akinlolu Ojo, MD, PhD, MBA  
*Principal Investigator*  
*University of Michigan, Ann Arbor, MI*

## **Specific aim 3 (N=1,000 cases and 1,000 controls)**

---

- Perform GWAS in a cohort of subjects with CKD of varying etiology including hypertension, diabetes mellitus, chronic glomerulonephritis

# (Clinical Centers: Nine Centers in Four Countries

Country	Institution	Location
Ethiopia	Addis Ababa University	Addis Ababa
Ghana	University of Ghana	Accra
	Kwame Nkrumah University of Science and Technology	Kumasi
Kenya	University of Nairobi	Nairobi
Nigeria	University of Abuja	Abuja
	Obafemi Awolowo University	Ile Ife
	University of Ibadan	Ibadan
	University of Ilorin	Ilorin
	University of Nigeria	Enugu

# Participating Clinical Centers



# Study Subgroups

<b>Sample Sizes of the Participants and Controls</b>			
<b>Diagnosis-specific eligibility</b>	<b>Age</b>	<b>Cases</b>	<b>Controls</b>
<b>Steroid resistant nephrotic syndrome<sup>1</sup></b>	<18	200	200
<b>FSGS/MCD &amp; MN</b>	18-70	200	200
<b>HIV nephropathy</b>	18-70	500	500 <sup>2</sup>
<b>Sickle cell nephropathy</b>	18-70	500	500 <sup>3</sup>
<b>Hypertensive non-diabetics with CKD</b>	18-70	800	800
<b>CKD due to diabetic nephropathy</b>	18-70	800	800 <sup>4</sup>
<b>CKD – Unknown etiology</b>	18-70	1,000	1,000
<b>Total</b>		<b>4,000</b>	<b>4,000</b>
<sup>1</sup> Includes 50 families with index cases and affected family members <sup>2</sup> Patients with HIV and no nephropathy <sup>3</sup> Patients with sickle cell disease and no nephropathy <sup>4</sup> Patient with diabetes mellitus and no nephropathy			

# H3A Kidney Disease Study

## Research Methods

Framework for the Infrastructure Enhancement for Genomics Research in the H3Africa Kidney Disease Research Network					
Project Period	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Genomics Laboratory Methods</b>					
Single gene mutation analysis & Genome Wide Linkage Studies	→				
Whole exome sequencing		→			
SNPs genotyping					
GWAS				→	
Site of genomics laboratory studies	Israel/U.S.	Israel/U.S.	Africa, Israel & U.S.		
Site of genomics data analysis	Africa →				



# H3A Kidney Disease Study Investigators

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

# H3A Kidney Disease Study Investigators

Country	Institution	Key Personnel	Title	Role
Nigeria	University of Ibadan	Tunde Salako	Professor/Consultant Physician	Center PI
		Olukemi Amodu	Snr. Research Fellow	
		Adebowale Ademola	Lecturer/Consultant Physician	
		Akinkemi Fedipe	HOD, Family Medicine	
	University of Ilorin	Chijioke Adindu	Snr. Lecturer/Consultant Physician	
		Timothy Olarenwaju	Consultant Physician	
		C. O. Bewaji	Professor, Bioinformatics	
Obafemi Awolowo University	Fatiu Arogundade	Assoc. Prof/Consultant Physician		
University of Abuja	Samuel Ajayi	Consultant Physician/Nephrologist		
	Manmak Manven	Consultant Physician/Nephrologist		
University of Nigeria, Enugu	Ifeoma Ulasi	Snr. Lecturer/Consultant Physician		
	Chuba Ijoma	Snr. Lecturer/Consultant Physician		
South Africa	University of Western Cape (SANBI)	Nicki Tiffin	Snr. Lecturer, Bioinformatics	
		Junaid Gamiedien	Snr. Lecturer, Bioinformatics	

# H3A Kidney Disease Study Investigators

Country	Institution	Key Personnel	Title	Role
<b>Israel</b>	Technion – Israel Institute of Technology, Rappaport Research Institute	Karl Skorecki Walter Wasser	Professor & Director Professor	
<b>U.S.</b>	Loyola University	Richard Cooper Bamidele Tayo	Professor/HOD Assistant Professor	Center PI Stat. genetics
	Duke University	Rasheed Gbadegesin		Molecular genetics
	University of Michigan	Akinlolu Ojo Matthias Kretzler Michael Boehnke John Moran David Burke Daniel Clauw Frank Brosius	Professor Professor Professor Professor Professor Professor Professor	PI  Stat. genetics Genetics Genetics TAG TAG
	NHGRI	Adebowale Adeyemo	Deputy Director, CRGGH	
	NIDDK	Jeffrey Kopp		
	Harvard University	Martin Pollak	Professor	
<b>Canada</b>	University of Toronto	Rulan Parekh	Professor	

# Success factors for H3A the Kidney Disease Study

---

- Ability to rapidly to establish kidney disease cohorts for:
  - Relevant major kidney disease phenotypes
  - High risk pediatric cohort
- Access to existing genomic science and bioinformatics infrastructure
- Leading experts in kidney disease on the African continent
- Catchment population of collaborating centers >350 million
- Supportive involvement of U.S. institutions with expertise in genomic science, statistical genetics & kidney disease
- Supportive involvement of African diaspora with relevant multidisciplinary expertise