

#### **Collaborative African Genomics Network**



### Overview of the Objectives CAfGEN in the context of H3Africa

## H3Africa Consortium Johannesburg, South Africa

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# Goals

- Background to CAfGEN: Mission/Vision
- Illustrate foundation basis of CAfGEN
- Highlight *CAfGEN* clinical and educational capacity
- Review scientific goals and approach
- Outline unique training and career development plan
- Describe contribution to H3Africa consortium
- Demonstrate capacity and sustainability



# Background



#### H3Africa Objectives:



To develop within Africa the study of genomic/genetic/environmental contributors of human health and disease using cutting-edge genomic research tools

To increase capacity for biomedical research in Africa, in terms of building infrastructure, including data and research resources

To increase the genomic proficiency of researchers and trainees in Africa.

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# **Background: HIV**

HIV/AIDS and associated co-morbidities remain a global plague with the greatest burden in SSA



#### THE HIV BURDEN



# Background: TB

- SSA in general and both Botswana and Uganda in particular, have some of the highest annual TB notification rates in the world:
  - Sub-Saharan Africa: 262/100,000
  - Uganda: 193/100,000
  - Botswana: 455/100,000

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- HIV-infected children differ from their adult counterparts and have more to ultimately contribute and gain from therapeutic advances, yet genetics studies of this population have been conspicuously absent.
- Why have these studies not been conducted, especially in Africa?
  - Too little genomics expertise
  - Insufficient and inadequate infrastructure
  - Difficulties in obtaining large cohorts with appropriate clinical phenotyping.

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### **CAfGEN** Overall Goal

To create a collaborative, multi-disciplinary, multiinstitutional, inter- and intra-country network of African scientists, clinicians, and researchers to use genomics approaches to study gene/pathogen interactions for HIV/AIDS, its co-morbidities, and other diseases among diverse paediatric African populations.





#### **Collaborative African Genomics Network**

**Baylor College of Medicine** 





**Makerere University** 



#### Baylor Uganda Children's Foundation



**University of Botswana** 



Botswana-Baylor Children's Clinical COE







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- **Aim 5:** Establish genetic and genomic technologies and supporting laboratory and physical infrastructure for large-scale genetic/genomic analyses of common diseases in Africa.



## **CAfGEN** Partnerships





### **Botswana and Uganda Centres of Excellence**

- State-of-the-art care and treatment for:
  - Over 6,000 HIV infected children at the main COEs
  - Over 14,000 HIV-infected children at their outreach sites
- Provide family education and outreach to the community
- Education and training to health professionals
- Will provide clinical expertise for patient recruitment & sample collection







# **Potential Expansion of the Clinical Network**



• This well-phenotyped paediatric cohort can be expanded to include the larger BIPAI Network

#### The BIPAI Children's Clinical Centers of Excellence Network



### **HIV-Infected Pediatric Cohorts**

 Genomic studies need a well-phenotyped cohorts



## **Two Paediatric Cohorts**

- 1. A **retrospective cohort** of HIV-infected children at the phenotypic extremes of HIV disease progression:
  - 500 long-term non-progressors (LTNPs)
  - 500 rapid progressors (RPs)

#### **Using WHO clinical criteria**





# **Two Paediatric Cohorts**

- 2. A **prospective cohort** of HIV-infected children with active TB disease:
  - 2,000 HIV-infected children without active TB disease (baseline)
  - 150 participants who subsequently develop active TB disease
  - A replication cohort of 100 patients with active TB disease without baseline samples will also be collected.



## **CAfGEN** Overview





# **Genomics Training and Research Program**



6 PhD trainees (3 from Makerere and 3 from University of Botswana will be eligible to participate

Successful trainees will be eligible to receive a Certificate in Genetics and Genomics from Baylor College of Medicine.



# **CAfGEN** Training Network



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# **Institutional Commitments**

- There is very strong commitment to *CAfGEN* by all participating institutions
- Strong support from the BIPAI leadership and 5 other COEs across Africa
- Support from respective Ministries of Health
- Protected time for faculty research and training at both UB and Makerere
- Commitment from BCM to allow trainees to take (for credit) graduate courses in genetics and genomics



# **Co-Pls**

- Moses Joloba, Makerere University, Uganda
- Addy Kekitiinwa, Baylor-Uganda CF, Uganda
- Wata Mpoloka, University of Botswana, Botswana
- Oathokwa Nkomasana, University of Botswana
- Graeme Mardon, Baylor College of Medicine, USA
- Gabriel Anabwani, Baylor-Botswana, Botswana



# If you want to go fast, go alone If you want to go far, go together

### **African Proverb**

