Project Goals

(1) Develop African **research capacity in genomics** by building a critical mass of well-trained scientists;

(2) Empower African researchers to **utilize genomics-based tools** towards the control and elimination of infectious diseases;

(3) Create **genomics curricula** to support and promote cutting-edge genomics-based research; and

(4) **Engage communities** in prevention efforts and public health education.

**World Bank funded Project**
Characterizing Fevers of Unknown Origin through Microbial Metagenomics

Project goals:

1. Use field-deployed and state-of-the-art genomic technology to **identify pathogens** driving febrile illness.

2. Create a **foundation for African scientists** to carry out tractable and important genetic research projects entirely in country.
Meeting Africa’s Critical Needs for Genomics Education and Research
<table>
<thead>
<tr>
<th>S/N</th>
<th>WORKSHOP TITLE</th>
<th>TARGET PARTICIPANTS</th>
<th>NO</th>
<th>DURATION</th>
<th>VENUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Foundation Training Courses</td>
<td>PG Students &amp; Faculty</td>
<td>25</td>
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</tr>
<tr>
<td>6</td>
<td>Good Clinical &amp; Laboratory Practice</td>
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</tr>
<tr>
<td>7</td>
<td>Next Generation Sequencing</td>
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<td>30</td>
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<td>RUN, Ede Nigeria</td>
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<td>Thesis Supervision &amp; Mentorship</td>
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</tr>
</tbody>
</table>
Training Objectives

Overall Goal

• Develop African research capacity in genomics by building a critical mass of well-trained scientists;

Objectives

• Expose participants in basic and advanced genomics.

• Train participants on the application of the various molecular biology and genomics tools.

• Train participants on Bioinformatics and its application

• Train scientists on writing manuscript and proposals for grants

• Train faculty on good supervision and mentoring
SUMMER GENOMICS TRAINING PROGRAM

FOUNDATIONAL TRAINING
Annual two-month training for ACEGID members with the Sabeti lab at Harvard University and the Broad Institute in Cambridge, MA, USA

ADVANCED TRAINING
Annual two-month advanced genomic sequencing training for PIs held at Broad Institute

ON-SITE WORKSHOPS
Annual two-week trainings at each of the 4 ACEGID sites for the larger scientific community
Foundational training

• Duration: 5 - 7 weeks
• Target: Postgraduate students
• Venue: Harvard University/Broad Institute.
• Countries: Nigeria, Ghana, Sierra Leone, Senegal, Liberia, USA, Bangladesh
• Time: Summer period (July – August)
Training Preparation

Survey
• Project team and Collaborators conducted survey of teaching topics most relevant and of interest to African trainees.

Outcome
• Determined desired education outcomes, learning goals

Determined final visiting trainee list
• Necessary for training logistics planning

Lab Space
• Broad and Harvard’s full support to provide lab space for African scientists

Housing Possibilities
• Hostel accommodation for students/participants

Post Training Survey
• Access the success of the training
ACEGID Summer Genomics Training Programs

2014
11 students
2 countries
4 institutions

2015
15 students
3 countries
6 institutions

2016
21 students
5 countries
8 institutions
Focus:

- Basic Biological Processes
- Microbiology Theory
- Genetics Theory
- Genomic Diagnostic Tools
  - PCR
  - Deep Sequencing
  - Bioinformatics
- Teaching pedagogy
- Biosafety Training
- Science Communication
Training-of-Trainers

Courses Developed:

- Foundations of Genomic Technology
- Lassa Diagnostics: Clinical
- Applications of molecular technology
- Foundations of PCR
- Intro to Molecular Cloning
EDUCATIONAL VIDEOS

• Donning and Doffing of PPEs
• Applications of molecular technology in Malaria Research
• The Cloning Technology
• Molecular diagnosis of VHFs

ACEGID 2015 Summer Genomics Foundational Training

https://www.youtube.com/results?search_query=sabeti+lab
http://sabetilab.org/education
2016: STUDENT-PRODUCED OUTREACH VIDEOS

- Sanger Sequencing Technique
- Polymerase Chain Reaction
- Understanding Lassa fever
- Safe Processing and Disposal of Biological Waste

Derek Bok Center for Teaching and Learning, Harvard
http://sabetilab.org/education
ADVANCED TRAINING WORKSHOP IN GENOMICS

- Library Construction Techniques
- MiSeq Next Generation sequencing
- Sequencing Data Analysis
- Independent Research
Program Goals

Learn Library Construction Techniques

- Students prepared “mock libraries” to practice and solidify library construction methods
- Final Project: Students sequence 32 “unknown” samples from a “small lab in Nigeria”

Operate MiSeq and Analyze Sequencing Data

Gain Extra Expertise

- Eppendorf Pipette Calibration Training
- Dimagi Training
- Illumina MiSeq Training
- DNAnexus Training
- Special lectures on hybrid select and FUO sample processing
ADVANCED TRAINING WORKSHOP IN GENOMICS
Lesson Learned

• New methods of teaching

• Start the organisation and planning early

• Flexibility to meet the needs

• Interactions and Collaborations among participants across countries

• Direct meeting with the experts (illumina, Dimagi, DNA Nexus).

• Certified Training
ACEGID Collaboration with CETIC

ACEGID

African Centre of Excellence for Genomics of Infectious Disease
Redeemer's University, Nigeria

Genomics, Bioinformatics

TRAINING

MODELLING AND ICT

CETIC

Centre d'Excellence Africain en Technologie de l'Information et de la Communication
Université de Yaoundé I
Certificate of Completion

This award certifies that

Bolajoko Emiola Bankole

has successfully completed the

Advanced Training Workshop in Genomics

Sponsored by the African Centre of Excellence for Genomics of Infectious Diseases

Summer 2016

Hosted by the Sabaté Lab

FAS Center for Systems Biology
Harvard University

Dr. Christian Happi, Ph.D.
ACEGID Director

Dr. Pardis Sabeti, MD, Ph.D.
Principal Investigator
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GENOMICS FOUNDATIONAL TRAINING SERIES: NEXT GENERATION SEQUENCING WORKSHOP

For Whom
Post-graduate Students, Faculty Members, Researchers, Clinicians and Laboratory Scientists

Training Fee
₦150,000

Application Deadline
30th November 2016

Venue
ACEGID, Redeemer’s University, Ede, Osun State, Nigeria

Date
16th-20th January 2017

Application Method/Enquiries
Visit www.acegid.org
Program Activities and their Disbursement Linked Results
### DLR 2.1 -2.3: Short Courses, Master’s and Doctoral Training

<table>
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<tr>
<th>TRAININGS</th>
<th>May 2016</th>
<th>October 2016</th>
<th>TOTAL</th>
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<tr>
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<td><strong>Doctoral Degree</strong></td>
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<td>Regional Female</td>
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<tr>
<td>National Total</td>
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<tr>
<td>National Female</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>3</td>
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</table>
Procurement

- Illumina MiSeqFGX sequencer
- ABI 3500XL Automatic Sanger Sequencer
- Oligosynthesizer
- Automatic DNA Analyzer
- Hybridization Oven
- MagCore HF 16
- Autoclaves
- Fluoremeter
- Laser cell Sorter
- Biotek ELISA Plate washer & Reader
- Biosafety Class II Laminar flow hoods
- Air Jacketed Incubator
Outreach Program/Internships – DLR 2.4

Outreach program for high school science students.

Exposure to Molecular biology and Genomics
Visit to the ACEGID laboratories
Stimulate interest in Genomics
Audit

- External Audit for 2015 completed
  - On ACEGID Website

  Procurement Audit Completed
## Accreditation – 2.5

<table>
<thead>
<tr>
<th>ACCREDITATING BODIES</th>
<th>COUNTRY</th>
<th>STATUS</th>
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<tbody>
<tr>
<td>NUC</td>
<td>Nigeria</td>
<td>In Progress</td>
</tr>
<tr>
<td>Center for Appraisal of Tertiary Education Studies (CAPES)</td>
<td>Brazil</td>
<td>In Progress</td>
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## Published Articles – DLR 2.6

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<tbody>
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<td>Publications as of November 2015</td>
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<td>1.01 – 55.87</td>
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<tr>
<td>Publications between Nov 2015 and March 2016</td>
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<td>1.44 – 44.45</td>
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<td><strong>Publications between March 2016 and October 2016</strong></td>
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<td><strong>6.344 – 32.24</strong></td>
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<tr>
<td>Total Publications as of October 2016</td>
<td>32</td>
<td>1.01 – 55.87</td>
</tr>
</tbody>
</table>
# Revenue Generated – DLR 2.7

**Revenue Generated as of March 2016**  $1,118,232  

**Revenue Generated as of October 2016**  $1,450,464

<table>
<thead>
<tr>
<th>REVENUE</th>
<th>SOURCES</th>
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<tbody>
<tr>
<td>Grants</td>
<td>NIH - H3Africa Genomics project</td>
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<tr>
<td></td>
<td>NIH – New Telephone base device for diagnosis of malaria</td>
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<tr>
<td></td>
<td>US Department of Defence – HIV Research Program/Acute febrile illness surveillance</td>
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<tr>
<td>Royalties</td>
<td>Lassa virus and Ebola Virus RDT kits and ELISA kits</td>
</tr>
<tr>
<td>Tuition Fees</td>
<td>Students</td>
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<tr>
<td>Laboratory Training and Lab spaces for students project</td>
<td>Bench fees</td>
</tr>
<tr>
<td>Program Fees</td>
<td>Short term programs</td>
</tr>
<tr>
<td>Sales of Reagents</td>
<td>Individual Researchers, Companies, institutions</td>
</tr>
<tr>
<td>Consultancy &amp; Services</td>
<td>Individual Researchers, Companies, institutions</td>
</tr>
</tbody>
</table>
Programming Challenges

• Regional students admission

• Identification of local Biotechnology industry partners for Internship for students and faculties
Top Goal/Hope for the next year

• Increase number of Students and Faculties intake (regional and Female)

• Identify local and international Biotechnology industries for internship

• Increase IGR

• Obtain National and International Accreditation
More Information

- www.ACEGID.org
Thank You