

Biosciences at IITA

IITA Bioscience Center as a platform for applying genomics to crop improvement

Established in the early 1990s, the Bioscience Center of IITA at Ibadan, Nigeria is one of the pioneer labs in sub-Saharan Africa and has served as a vanguard center of excellence for harnessing DNA technologies for improvement of African crops including cassava, yam, plantain/banana, legumes, maize, and cocoa.

Recent technological advances in bioscience technologies offer unprecedented opportunities for tackling the myriad challenges that constrain agriculture in developing countries. In order to address these challenges, we are applying molecular tools to discover and efficiently utilize genes and genomic regions that have a favorable impact on target traits. To this end, we are applying a combination of genomic technologies to assess genetic diversity of germplasm collection and experimental populations that are used in linkage mapping and QTL analysis. More recently, we have started using marker-assisted breeding to complement the process of variety improvement. Whereas next-generation

genotyping such as genotyping-by-sequencing (GBS), a highly automated and miniaturized assay, are outsourced to external service providers, we are in the process of establishing medium throughput single nucleotide polymorphism (SNP) genotyping capacity in-house (Fig. 1).

Partnerships, capacity development, and service provision

In addition to research, the IITA Bioscience Center is heavily involved in training and capacity building through regular workshops, customized individual trainings, and hosting graduate students. Our genotyping services lab is equipped with a wide array of laboratory equipment

Welcome...

to the first newsletter describing news, events, and activities in Biosciences at the International Institute of Tropical Agriculture.

necessary for nucleic acid isolation, quantification, and analysis as well as amplification of DNA fragment for fingerprinting and sequencing. Likewise, world-class instruments and facilities for gene expression studies, genotyping, and ploidy analysis are available. Presently, the laboratory, bioinformatics lab as well as the tissue culture facilities provide ample laboratory bench space that can accommodate over 60 persons. The Bioscience Center



Figure 1. Workflow of DNA isolation and in-house SNP genotyping using KASP assay for marker-assisted breeding.

team comprises multidisciplinary scientists and a network of partners from advanced research institutes and national programs including bio-supply companies.

For additional information please contact Melaku Gedil m.gedil@cgiar.org

Web site: <http://bioscience.iita.org>; www.iita.org

Teaching bioinformatics in Africa

We have acquired an internet-independent and portable teaching infrastructure composed of a high-performance portable computer, an external disc with 6TB data installed, and a router to create a local Wi-Fi for the students to connect to the system. No need for a fast and stable Internet connection for data and tools!! The system allows running any kind of bioinformatics task for a group of up to 20 students to access the most important public repositories and data analysis tools—all locally installed.

For more information contact *Andreas Gisel* (A.Gisel@cgiar.org)

Fast and performant R installation at Bioscience

The Bioinformatics Unit offers graphical access to the free statistics environment R. The latest distribution allows you to run up to 16 parallel processes with a lot of RAM for your heavy and data-intensive statistical analysis.

For more information contact *Andreas Gisel* (A.Gisel@cgiar.org)



Completed biosafety level 2 (BL2) screen house

Building of the biosafety level 2 (BL2) screen house is completed

The facility is organized into four separate rooms with light and temperature conditions independently adjustable. This is designed to safely contain genetically modified plants and microorganisms. Construction of the adjacent BL2 laboratory will start soon.

For more information contact *Livia Stavolone* (L.Stavolone@cgiar.org)

Upcoming courses in Genebank Management and In vitro Conservation

The Genetic Resources Center (GRC) and Germplasm Health Unit (GHU) of IITA at Ibadan are running

two training courses for staff of national programs, universities, and the private sector.

Training course on Genebank Management including conservation of seed and clonal crops, characterization of germplasm, safety duplication, and phytosanitary and policy issues. Date: **26–30 September 2016**

Training course on *in vitro* conservation including the theory and practice of *in vitro* techniques for conservation and the production of high quality cleaning materials. Date: **3–7 October 2016**

Both courses will be held at the Genetic Resources Center, IITA, Ibadan, Nigeria

For more details contact IITA-TrainingUnit@cgiar.org