TITLE: IDENTIFYING GENOMIC ARCHITECTURE OF BREAST CANCER IN NIGERIAN WOMEN

Collaborators: University of Chicago (UChicago), Novartis Institutes for Biomedical Research (NIBR), University College Hospital of the University of Ibadan (UCH/UI), Lagos State University Teaching Hospital (LASUTH), and the Broad Institute (BI).

OBJECTIVE: To describe the genomic architecture of breast cancer samples from Nigerian women and compare the type and frequency of the underlying genetic alterations to those of North American Caucasian and African-American breast cancers in publicly available dataset. Also, to help develop sustainable translational research infrastructure in Nigeria by training collaborators in sample preparation, genetic material extraction and genetic analysis.

METHODS: Genomic data will be generated using transcriptome and exome sequencing, which will comprehensively characterize both mutations and structural rearrangements. Whole exome sequencing will be performed on all tumor samples at 150X coverage and the data will be analyzed to identify genes with recurrent somatic mutations. Data sharing will be carried out and the list of candidate genes obtained will also be compared to data from other cohorts of tumor/normal pairs. Various logistic regression methods will be applied to model germline breast cancer risk and the development of specific subtypes, such as triple-negative breast cancer.

RESULTS: Translational medicine research infrastructures at the UI/UCH and LASUTH are being developed to ensure successful sample collection and translational research sustainability. The Laboratory in UI/UCH is fully operational and has capacity to perform DNA/RNA extraction and analysis, Immunohistochemistry, biosimilar/pharmacoequivalence studies as well as biochemical studies including HB Variant analysis for Sickle Cell and Diabetes monitoring.

CONCLUSIONS: With supply of critical equipment needed and personnel training on drug discovery topics, tissue handling, genomics and bioinformatics, African investigators will become fully equipped to participate in global cancer clinical trials.