

Concept Clearance

Branch: Genes, Environment, and Health Branch

Council Period: 201601

Concept Title: H3Africa Phase II

Introduction

The Human Heredity and Health in Africa (H3Africa) Initiative is currently planning Stage 2 (years 6-10; FY17-FY21) and is requesting NIEHS participation. H3Africa is a joint effort of the NIH (part of the Common Fund Global Health Program) and the Wellcome Trust, in partnership with the African Society for Human Genetics that aims to contribute to the establishment of a sustainable African research infrastructure for the study of the genetic and environmental contributors to disease and health. The overall vision of the H3Africa program is: "To enhance capacity for using contemporary research approaches, in Africa by African scientists, to understand the genetic and environmental factors which determine disease susceptibility and drug responses in African populations". The NIH involvement includes four components designed to contribute to realizing this overall goal. These are 1.) Infrastructure-Bioinformatics Network (BioNet), 2.) Infrastructure-Biorepositories, 3.) Research Projects, and 4.) Societal Implications Research in Africa.

A lot of effort in the initial phase of this program has gone into building capacity and genomic infrastructure with research as well as the establishment of a bioinformatics network, biorepositories, an ELSI (Ethical, legal, and social implications) program, and training. NIEHS did not contribute financially to this initial phase but both Kim McAllister and Bonnie Joubert are on the H3Africa NIH Working Group, and Kim McAllister is also the science officer for Michelle Ramsay's research grant, which is focused on the understanding of the interplay between genetic, epigenetic, and environmental risk factors for obesity and related cardio-metabolic diseases. Additional current funded H3Africa grants that have a strong environmental component include: an ELSI grant focused on enhancing Ethiopian youth's literacy about the gene and environment (irritant particles in volcanic soil) contributions to health for the Podoconiosis disorder, a systems biology approach for tuberculosis in Ethiopia, which is exploring many of the genetic and environmental (primarily infections) factors influencing susceptibility to tuberculosis, and an African collaborative center for microbiome and genomics research, which is focused on the associations between high risk HPV infections, vaginal microenvironment, and HPV genomics for the etiology of cervical cancer.

Research Goals and Scope

The first stage of the H3Africa initiative has been successful in establishing much of the basic infrastructure needed for a thriving consortium effort including the Bioinformatics Network, the Biorepositories, and the launching of many Biomedical and ELSI research projects focused on genomics, environment, and disease. During the five years of stage II, H3ABioNet and the H3ABiorepositories are expected to finalize a sustainability plan in order to transition to fee for service models, attract additional users, and apply for additional sources of funding. Many research projects started in phase I will need additional time for data collection, analysis, and publication before they will be prepared to compete in the standard R01 pool. Additional research projects will be funded with the specific interests of individual NIH ICs incorporated. Three additional areas of support needed to provide the consortium the ability to grow and flourish are an Administrative Coordinating Center, additional ELSI research, and a structured training program. There will be more interaction between H3Africa and other ongoing and planned IC Global Health initiatives in Africa during the second phase of H3Africa as well.

Mechanism and Justification

Common Fund determination of their funding level for the second phase of H3Africa will be received on April 9th. If approval is received, new FOAs should be released in late spring with receipt dates in November and funding to go to May 2017 council. The proposal presented to Common Fund includes funding opportunities for Collaborative Centers, Research Grants, Ethical Legal and Societal Implications Centers and Research Grants, a Bioinformatics Network, a Coordinating Center, and some training grants in the area of Genetics/Genomics and Bioinformatics. Both renewal and new applications will be accepted. Biorepositories are currently funded through FY18, so are not up for renewal at this time. NIEHS is invited to include statements of scientific interests that can be included in the FOAs being planned for the second phase of this program and commit upfront funds if possible.

There will be a lot of potential in the next iteration of the program for many of the research projects to explore gene-environment interactions now that much of the genomic infrastructure is established, and NIEHS contribution will be critical to ensure that H3Africa has an environmental slant for the second phase of the program. The genetic diversity available in Africa combined with some unique exposures could identify unique gene-environment interactions that could not be found elsewhere, even for common complex diseases. Broad representation of different ethno-linguistic, environmental, and cultural backgrounds is present in many of H3Africa's collaborative center projects which are looking at both rural and urban populations, as well as traditional tribal populations and many populations that are in rapidly transitioning states. In addition, the biorepositories which are currently focused on DNA samples for genomic analyses are now fully functional and scaling up to expand their operations; there is potential to expand their capability to investigate the effective collection, shipment, storage, and analysis of other biosamples (such as urine, serum, etc.), which would allow H3Africa to move beyond just genomics. (Biorepository-specific language will be added to the Research Grants to encourage research related to this). Finally, the Bionet Centers are collecting phenotypic information, such as lifestyle factors, and this could also be expanded to include more environmental factors in the next phase of BioNet. NIEHS could also contribute further to efforts to harmonize core phenotypes and environmental measures for the research projects funded in the next phase. The further involvement of NIEHS in the second phase of H3Africa will also allow integration and synchronization of this Common Fund program with current and past NIEHS-supported research in Africa focused on many environmental exposures of interest (including metals, toxicants, social stressors, air pollution, e-waste, etc.), for which there will be many opportunities for co-funding with other ICs.