

National Advisory Council for Human Genome Research

May 16, 2022

Concept Clearance for RFA

Diversity Genome Research Centers

Purpose: The purpose of this new initiative is to support the development of innovative genomic research projects through infrastructure building and the formation of interdisciplinary research teams at Minority Serving Institutions (MSIs) with a historical mission to serve underrepresented populations. Through this initiative, genomic research capacity will be increased in MSIs; the diversity of the genomics research workforce will be enhanced; innovation and creativity will be amplified by bringing new researchers and thus novel ideas into the field of genomics; and participation of underrepresented populations will be increased in genomics research.

Background: In 2020, the National Human Genome Research Institute engaged the community to identify future research priorities and opportunities in human genomics¹. In this plan, the guiding principles and values for human genomics include championing a diverse workforce, embracing interdisciplinary teams in genomic research, and increasing access to genomic medicine. Investigators from different backgrounds bring different perspectives, innovative ideas, and increase the objectivity in generating new data and in its interpretation, leading to knowledge that is more reliable,² but the scientific and biomedical workforce in the United States (U.S.) is not a reflection of the U.S. population^{3,4}, and this extends to the genomics research workforce. This lack of diversity negatively impacts the scope of research and integrity of the science overall⁵. In order to increase diversity in medicine, initiatives were put in place at research intensive institutions to support the recruitment and graduation of underrepresented students, but those initiatives were not very successful⁶. However, medical schools serving primarily minority students graduate a disproportionately high number of diverse physicians^{7,8,9} and MSIs produce one-fifth of the U.S. undergraduate STEM degrees¹⁰. Eighteen MSIs funded by the Research Centers in Minority Institutions (RCMI) program of the National Institute of Minority Health and Health Disparities awarded more than 22,000 science and health professions doctoral degrees between 2000 and 2015¹¹. Data from the National Science Foundation from 2002 and 2012 showed that RCMIIs contributed to almost 1 in 4 science doctoral degrees and health professions doctoral degrees awarded to Blacks and Hispanics each year¹¹. Together, these data suggest that efforts to enhance the diversity of the genomics workforce that target MSIs could be very impactful.

In addition, MSIs with a mission to serve underrepresented populations are often located within diverse communities and thus increasing the capacity for cutting edge genomics at these institutions will not only increase access to diverse populations but will allow diverse populations to have access to state-of-the-art genomics technology. Unfortunately, MSIs with a mission to serve historically underrepresented populations are not well represented as NHGRI grantees.

This initiative will champion a diverse genomics research workforce by supporting cutting-edge genomic research projects, as well as capacity building and training in genomics, at institutions that have traditionally not received appreciable NHGRI funding.

Proposed Scope and Objectives: The proposed initiative will enhance the opportunity to build a diverse genomics research workforce by supporting genomic research infrastructure enhancement, the formation of interdisciplinary research teams, and the facilitation of cutting-edge genomic research at MSIs with a mission to serve historically underrepresented populations. Eligible MSIs will have an explicitly stated mission or historical track records in graduating students from groups nationally underrepresented in biomedical research. To achieve these objectives, the Diversity Genome Research Centers would each develop 2-3 interrelated, innovative research projects that address critical issues in one or more of the following: genomic technology and methods development; genome structure; genome function; genomics of disease; use and impact of genomic information in clinical care; ethical, legal, and social implications of genomic research; genomics and health equity; and/or computational genomics.

The Centers' research projects should each have a strong focus in genomics. Projects may include applications to a particular disease area, but Centers must demonstrate that the methods and knowledge generated are broadly generalizable across disease areas. Studies focused on disease etiology or outcomes should examine the role of both genomic and non-genomic contributors to human health and disease. If the research project has areas of focus in clinical genomics, it should improve assessment and/or outcomes in all populations including underserved populations and/or include technological or computational methods for the production or analysis of diverse data sets.

Successful Diversity Genome Research Centers will: (1) carry out innovative, state-of-the-art genomic research studies; (2) enhance institutional genomic research capacity; (3) enable all levels of investigators at the recipient institution to become more successful in obtaining competitive extramural support for genomic research; (4) foster research career development and enhancement for students and investigators at all career levels; (5) enhance the genomic infrastructure, computational and analytical capability within their institutions; (6) establish sustainable partnerships with relevant stakeholders to increase collaboration in future research; (7) and disseminate resources and findings.

Two Funding Opportunity Announcements (FOAs) are planned. The first FOA will be for full-scale Diversity Genome Research Centers. Each Center will be structured around 2-3 interrelated genomic research projects, as described above. Each project should include a didactic or practicum opportunity to enhance student and faculty career development at the institution. Centers will also include cores for administration, research capacity, and community engagement but the cores will need to be aligned with the research projects. Each of the projects will need to be led and carried out by the lead MSI. Collaborations with research-intensive institutions and industry can be included but at least 70% of the funds will need to be at the lead MSI. Together, the collaborations must provide the complete capacity needed to carry out the genomic research projects and the didactic and practicum experiences.

The second FOA will be for institutions that do not yet have the infrastructure to be full-scale. This FOA will solicit applications to build research capacity and would allow a phased approach for MSIs to strengthen their infrastructure, training, and scientific collaborations. Phase I will provide funding for one to three years depending on the needs of the Center. During Phase I, the successful awardees will each: (a) develop plans for the organization, development, implementation and evaluation of a full-scale genomic research center, (b) formulate protocols, procedures and equipment needs, (c) recruit relevant faculty and trainees, (d) develop plans for capacity building including genomic didactic and practicum opportunities (e) identify and provide solutions for any logistical problems that can be

foreseen and (f) within the limits of the Phase I budget, test and implement as many of the protocols and procedures as possible. The objective of Phase I will be for the awardees to plan for and demonstrate their ability to fulfill the goal of operationalizing a full-scale Diversity Genome Research Center in Phase II. There will be clear criteria and metrics of success to assess the Centers ability to operationalize into a full-scale Diversity Genome Research Center. Criteria include the identification and commitment of staff for Center cores and proposed projects; completion of training for all planned equipment purchases; assessment of mechanisms proposed for regular communication and coordination among investigators; expert advisory committee review and approval of all procedures and protocols including strategies, methodologies, and analyses plans; etc. In addition, site visits will be performed to evaluate the appropriateness of the research and equipment space.

In Phase II, the awardees will implement the plans they developed during Phase I to operationalize a full-scale genomic research center. It is expected that each of the Diversity Genome Research Centers will be operating at full scale by no later than the end of the second year of Phase II. Phase I can last one to three years, however, the total project period (including both phases) must not exceed seven years. As in the full-scale Center FOA, collaborations with industry and research-intensive institutions can be included and used for capacity building but at least 70% of the funds will need to be spent at the lead MSI.

The initiative would require collaboration of investigators within the Research Center and encourage collaboration between Centers and other NHGRI Consortia, which would strengthen their scientific and genomic networks. To support collaboration, Diversity Genome Research Center investigators will be encouraged to join NHGRI grantee meetings and will meet as a consortium twice per year to present research progress and discuss challenges. It is hoped that this collaboration, Institutional development, and capacity building will enable MSIs with a mission to serve historically underrepresented populations to successfully compete for independent R01s or equivalent NHGRI funding opportunities.

This proposed initiative corresponds with the guiding principles and values for human genomics. It will maximize the usability of genomics for all members of the public, allow underrepresented populations access to genomics in healthcare, and build a diverse genomic workforce¹.

Relationship to Ongoing Activities: This proposed initiative complements efforts at other NIH ICs, including the [RCMI program](#) and the Centers for Biomedical Research Excellence ([COBRE](#)). The RCMI program has established research centers at MSIs focused on health disparity research. The Diversity Genome Research Centers program will target similar institutions but have a genomic focus. COBRE focuses on establishing state-of-the-art research centers within Institutional Development Award (IDeA)-eligible states. The Diversity Genome Centers will focus on MSIs, and again have a genomic focus.

Mechanism of Support: U54, UG3/UH3

Funds Anticipated: \$42.4M Total Costs (FY23 \$3.4M, FY24 \$5.4M, FY25 \$7.1, FY26 \$8.5M, FY27 \$8M, FY28 \$6M, FY29 \$4M), 4 full-scale centers, U54 awards – up to 5 years, UG3/UH3 awards - up to 7 years; Multiple receipt dates are expected.