# Part 1. Overview Information

**Participating Organization(s)**

National Institutes of Health (NIH (http://www.nih.gov))

**Components of Participating Organizations**

National Institute of Biomedical Imaging and Bioengineering (NIBIB (https://www.nibib.nih.gov/))

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD (https://www.nichd.nih.gov/))

**Funding Opportunity Title**

## Enhancing Science, Technology, EnginEering, and Math Educational Diversity (ESTEEMED) Research Education Experiences (R25 Clinical Trial Not Allowed)

**Activity Code**

R25 (https://grants.nih.gov/grants/funding/ac_search_results.htm?text_curr=r25) Education Projects

**Announcement Type**

Reissue of PAR-20-223 (https://grants.nih.gov/grants/guide/pa-files/PAR-20-223.html)

**Related Notices**

**April 16, 2024** - Notice of Extension of the Expiration Date of PAR-23-114, "Enhancing Science, Technology, EnginEering, and Math Educational Diversity (ESTEEMED) Research Education Experiences (R25 Clinical Trial Not Allowed)". See Notice NOT-EB-24-007 (https://grants.nih.gov/grants/guide/notice-files/NOT-EB-24-007.html)

**December 19, 2023** - Notice of Clarification and Change to Budget Limits for PAR-23-114, "Enhancing Science, Technology, EnginEering, and Math Educational Diversity (ESTEEMED) Research Education Experiences (R25 Clinical Trial Not Allowed)". See Notice NOT-EB-23-024 (//grants.nih.gov/grants/guide/notice-files/NOT-EB-23-024.html)

**June 01, 2023** - Notice of Clarification Regarding Participant Costs for PAR-23-114, "Enhancing Science, Technology, EnginEering, and Math Educational Diversity (ESTEEMED) Research Education Experiences (R25 Clinical Trial Not Allowed)". See Notice NOT-EB-23-009 (//grants.nih.gov/grants/guide/notice-files/NOT-EB-23-009.html)

NOT-OD-22-189 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-189.html) - Implementation Details for the NIH Data Management and Sharing Policy

NOT-OD-22-195 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-195.html) - New NIH "FORMS-H" Grant Application Forms and Instructions Coming for Due Dates on or after January 25, 2023

NOT-OD-22-198 (https://grants.nih.gov/grants/guide/notice-files/not-od-22-198.html) - Implementation Changes for Genomic Data Sharing Plans Included with Applications Due on or after January 25, 2023

NOT-OD-19-109 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-19-109.html) - Requirement for ORCID iDs for Individuals Supported by Research Training, Fellowship, Research Education, and Career Development Awards Beginning in FY 2020.

NOT-OD-23-012 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-23-012.html) Reminder: FORMS-H Grant Application Forms & Instructions Must be Used for Due Dates On or After January 25, 2023 - New Grant Application Instructions Now Available

**Funding Opportunity Announcement (FOA) Number**

PAR-23-114

**Companion Funding Opportunity**

None

**Number of Applications**

Only one application per institution is allowed as defined in See Section III. 3. Additional Information on Eligibility.

**Assistance Listing Number(s)**

93.286, 93.865

**Funding Opportunity Purpose**

The NIH Research Education Program (R25) supports research education activities in the mission areas of the NIH. The overarching goal of this R25 program is to support educational activities that encourage individuals from diverse backgrounds, including those from groups underrepresented in the biomedical and behavioral sciences, to pursue further studies or careers in research.
To accomplish the stated over-arching goal, this FOA will support educational activities with a primary focus on:

- ***Courses for Skills Development***
- ***Research Experiences***

The ESTEEMED program is designed to foster the development of undergraduate freshmen and sophomores from diverse backgrounds to pursue further studies and careers in bioengineering or STEM fields relevant to NIBIB's scientific mission. Applications are encouraged to propose integrated educational activities that include 3 elements: a summer bridge program for incoming freshmen, and in the freshman and sophomore years, academic year activities and summer research experiences. The ESTEEMED program is intended to expose students to bioengineering research early in their college careers while also providing students didactic, mentoring and career development opportunities. This will prepare students to join, in their junior and senior years, an honors program that promotes STEM and entrance into a Ph.D. program. The ultimate goal is for the participants to pursue a doctoral degree and a subsequent research career in bioengineering or NIBIB-relevant field.

## Key Dates

**Posted Date**

April 05, 2023

**Open Date (Earliest Submission Date)**

May 07, 2023

**Letter of Intent Due Date(s)**

May 7, 2023; December 17, 2023; December 17, 2024

| Application Due Dates | | | Review and Award Cycles | | |
|---|---|---|---|---|---|
| New | Renewal / Resubmission / Revision (as allowed) | AIDS | Scientific Merit Review | Advisory Council Review | Earliest Start Date |
| June 07, 2023 | June 07, 2023 | Not Applicable | November 2023 | January 2024 | April 2024 |
| January 17, 2024 | January 17, 2024 | Not Applicable | July 2024 | October 2024 | December 2024 |
| January 17, 2025 | January 17, 2025 | Not Applicable | July 2025 | October 2025 | December 2025 |

Additional dates added per NOT-EB-24-007 (https://grants.nih.gov/grants/guide/notice-files/NOT-EB-24-007.html)

| Application Due Dates | | | Review and Award Cycles | | |
|---|---|---|---|---|---|
| New | Renewal / Resubmission / Revision (as allowed) | AIDS | Scientific Merit Review | Advisory Council Review | Earliest Start Date |
| ***January 16, 2026*** | ***January 16, 2026*** | ***Not applicable*** | ***July 2026*** | ***October 2026*** | ***December 2026*** |

All applications are due by 5:00 PM local time of applicant organization.

Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

**Expiration Date**

**New Date** January 17, 2026 per issuance of NOT-EB-24-007 (https://grants.nih.gov/grants/guide/notice-files/NOT-EB-24-007.html). (Original Expiration Date: January 18, 2025 )

**Due Dates for E.O. 12372**

Not Applicable

### Required Application Instructions

It is critical that applicants follow the instructions in the Research (R) Instructions in the SF424 (R&R) Application Guide (https://grants.nih.gov/grants/guide/url_redirect.php?id=82400), except where instructed to do otherwise (in this FOA or in a Notice from NIH Guide for Grants and Contracts (//grants.nih.gov/grants/guide/url_redirect.php?id=11164)).

Conformance to all requirements (both in the Application Guide and the FOA) is required and strictly enforced. Applicants must read and follow all application instructions in the Application Guide as well as any program-specific instructions noted in Section IV. When the program-specific instructions deviate from those in the Application Guide, follow the program-specific instructions.

**Applications that do not comply with these instructions may be delayed or not accepted for review.**

There are several options available to submit your application through Grants.gov to NIH and Department of Health and Human Services partners. You **must** use one of these submission options to access the application forms for this opportunity.

1. Use the NIH ASSIST system to prepare, submit and track your application online.

   Apply Online Using ASSIST

2. Use an institutional system-to-system (S2S) solution to prepare and submit your application to Grants.gov and eRA Commons (https://public.era.nih.gov/commons/) to track your application. Check with your institutional officials regarding availability.

3. Use Grants.gov (https://grants.gov/search-grants?oppStatuses=closed|archived|posted|forecasted&fon=PAR-23-114) Workspace to prepare and submit your application and eRA Commons (http://public.era.nih.gov/commons/) to track your application.

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# Part 2. Full Text of Announcement

## Section I. Funding Opportunity Description

The NIH Research Education Program (R25) supports research educational activities that complement other formal training programs in the mission areas of the NIH Institutes and Centers.

The overarching goal of this R25 program is to support educational activities that encourage individuals from diverse backgrounds, including those from groups underrepresented in the biomedical and behavioral sciences, to pursue further studies or careers in research.

With the ESTEEMED Program (https://www.nibib.nih.gov/training-careers/training-opportunities/enhancing-science-technology-engineering-and-math-educational-diversity-esteemed-research-education-experiences-r25), the National Institute of Biomedical Imaging and Bioengineering (NIBIB) focuses on early preparation of undergraduate students in bioengineering or STEM fields relevant to NIBIB's scientific mission. Applicants should recruit prospective participants from diverse backgrounds, including those from groups underrepresented in biomedical and behavioral sciences, and participants should be interested in ultimately pursuing a Ph.D. or M.D./Ph.D. degree and a research career integrating engineering and the physical sciences with medicine and biology. Upon completion of the ESTEEMED program, student participants will be expected to enter an honors program that prepares STEM students for doctoral programs in biomedical research fields. Therefore, only institutions with an honors program that is open to students in the junior and senior years and that promotes STEM and entrance into a Ph.D. program are eligible to apply.

**Programmatic Approach of the ESTEEMED Program**

The ESTEEMED program seeks to facilitate the transition to college by providing research and educational experiences to early-stage undergraduates and to interest them in pursuing further studies as in bioengineering or other STEM fields relevant to NIBIB's scientific mission. The over-arching goal is for student participants to ultimately pursue a doctoral degree and a subsequent research career in bioengineering or NIBIB-relevant field. To accomplish this goal, this FOA will support educational activities with a primary focus on:

- ***Research Experiences***: For example, to provide hands-on exposure to bioengineering research or physical/computational sciences research within the scope of NIBIB's scientific interest.
- ***Courses for Skills Development***: For example, to provide preparation for hands-on exposure to research for freshmen and sophomores. At a minimum, this preparation must include a summer bridge program (or summer bootcamp) for incoming freshmen and additional activities during the freshman and sophomore academic years, including, but not limited to, seminars and/or workshops that enhance skills in the basic sciences, computation, and scientific communication as well as introduce students to the laboratory environment. Depending on the strength of the applicant institution, it is expected that academic and curriculum enhancement activities may vary in how they are formalized and integrated; various strategies, rooted in education research, may be utilized.

The program is open to incoming freshmen at the applicant institution or community college students starting their first or second year, if a collaboration with a community college is proposed. At the applicant institution, participation in ESTEEMED would begin with a Summer Bridge Program for incoming freshman and continue with two years of academic year activities followed by summer research experiences. Following the completion of the ESTEEMED program at the end of the summer after the sophomore year, participants are expected to join an honors program at the applicant institution that prepares students for graduate studies.

The ESTEEMED program is open to partnerships with community colleges. Proposed programs that focus on community college students must include all three required components (summer bridge, academic year activities for two years and summer research experiences for the following summers) and provide strong mentorship. Programs may be structured to hold any portion of the activities at the community college and/or the applicant institution. Such programs may allow students to either:

- participate in the ESTEEMED program for one year at the community college (in their first or second year), transfer to the applicant institution and continue their participation in the ESTEEMED program as a sophomore there, or
- participate in the ESTEEMED program for two years at the community college and then transfer to the applicant institution.

In both cases, after completing the two-year ESTEEMED program, the students are expected to join an honors program and complete a bachelor's degree program at the applicant institution.

A program supported by this FOA must contain the following three elements:

**1. Summer Bridge Program**

A Summer Bridge Program is to occur before the start of the freshman year to prepare student participants, in bootcamp-style, for their first year of college. The bootcamp should introduce students to the ESTEEMED program and provide a review of basic topics and skills necessary for success. It must take place during the summer before the freshman year, last at least five weeks, emphasize basic sciences, computation, and science communication, and provide survival skills to help participants transition from high school to college, such as socialization/networking and strong time management and organizational skills. Summer Bridge Programs are encouraged to incorporate mentoring of incoming freshman participants by rising sophomores in the ESTEEMED program.

**2. Academic Year Activities**

In addition to continuing to emphasize basic sciences, computation, and science communication during the freshman and sophomore academic years, the Academic Year Activities should help participants maximize their academic performance and prepare them for summer research experiences and eventual entry into an honors program. Academic year activities should include, but are not limited to, courses, journal clubs, individual development plans for each participant, seminars/workshops, professional development programs, internal and external speakers to introduce the students to different career paths, and participation in national scientific meetings. Activities such as workshops on scientific presentation and writing that promote scientific communication skills are highly encouraged. There should be an increasing sophistication in these activities as participants proceed from the freshman to the sophomore year.

**3. Summer Research Experience**

At the end of their freshman and sophomore years, participants are required to take part in hands-on summer research experiences that involve a defined research project and includes a final oral presentation and written report of their work. Research experiences can take place in an on-campus laboratory or can be an off-campus research experience in an academic or industrial or NIH/NIBIB laboratory research setting. The Summer Research Experience is expected to last at least eight weeks or most of the summer.

In addition, applications to this FOA must address the following two elements:

**Mentoring**

The research education supported by the ESTEEMED program is expected to provide not only technical expertise, but advice, individual coaching, professional development, and career guidance to the participants. As discussed in The Science of Effective Mentorship in STEMM (https://www.nap.edu/read/25568), mentorship that recognizes a person's identity and sociodemographic background is critical for students in STEMM. Programs should ideally include mentoring by faculty, peers, and alumni, and encourage family engagement. For institutions with graduate degree programs, Ph.D. candidates may also participate as mentors.

**Honors Program**

The ESTEEMED program to be supported with this FOA is intended to expose students to bioengineering research in their freshman and sophomore years and interest them in pursuing advanced studies in bioengineering or a related field. In their junior and senior years, the students are expected to enter an honors program that promotes graduate study in STEM fields. For the purposes of this FOA, an honors program is defined as a program, typically offered to exceptionally-motivated students at the institution, consisting of in-class and extracurricular activities that are broader, deeper, or more complex than comparable learning experiences at the institution. The availability of the honors program makes it possible for ESTEEMED participants to have a full four years of research preparation throughout their undergraduate education. Applicants are therefore required to describe the ESTEEMED program, the honors program, and the conditions for ESTEEMED students to enter and remain in the honors program in their final two years of college. A support letter from the honors program leader is required.

**NIBIB's Interest in Diversity**

The mission of the NIBIB is to transform through engineering the understanding of disease and its prevention, detection, diagnosis and treatment. NIBIB is committed to fostering diversity in its training programs since there are many benefits that flow from a diverse scientific workforce, including fostering technological innovations for healthcare and advancing the likelihood that underserved or health disparity populations participate in, and benefit from health research. To this end, the institute develops and supports programs, across the career continuum, that foster the recruitment, retention, training, and career development of individuals from diverse backgrounds, including those from groups underrepresented in the biomedical and behavioral sciences (e.g., see Notice of NIH's Interest in Diversity. NIBIB's proactive approach to promoting a sustainable biomedical workforce (https://www.nibib.nih.gov/about-nibib/diversity-equity-inclusion-accessibility-programs-activities (https://www.nibib.nih.gov/about-nibib/diversity-equity-inclusion-accessibility-programs-activities)) includes the development of programs targeting roadblocks at critical transition points in the biomedical research pipeline that hinder the participation of individuals from diverse backgrounds. The ESTEEMED program seeks to facilitate the transition to college by supporting freshmen and sophomores from diverse backgrounds, including those groups underrepresented in the biomedical and behavioral sciences, majoring in STEM fields critical to the mission of NIBIB.

**NICHD's Interest in Diversity**

The NICHD is committed to supporting a diverse workforce. For the purposes of this Funding Opportunity, the Institute will accept applications focused on the mission of the National Center for Medical Rehabilitation Research (NCMRR), which supports research to enhance the health, productivity, independence, and quality of life of people with physical disabilities. STEM education and the training of bioengineers is particularly relevant to the development of assistive technologies and environmental supports for people with disabilities.

**Need for the Program**

Science, technology, engineering, and mathematics (STEM) proficiency in United States has been declining since the 1980s and is falling behind other leading countries (*TIMSS 2019 U.S. Highlights Web Report*, NCES 2021-021, U.S. Department of Education. Institute of Education Sciences, National Center for Education Statistics (https://nces.ed.gov/timss/results19/index.asp). Fewer students are choosing to pursue degrees in STEM. There have been many national calls to increase the retention of students in STEM and to enhance the diversity of the STEM workforce. (Associa tion for the Advancement of Science Annual Report (https://www.aaas.org/resources/aaas-annual-re) 2021; President's Council of Advisors on Science and Technology, 2012 (http://files.eric.ed.gov/fulltext/ED541511.pdf); Charting a Course for Success: America's Strategy for STEM Education (archives.gov) National Science Technology Council (https://trumpwhitehouse.archives.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf); and The Time is Now: Advancing Equity in Science and Technology Ideation Challenge, White House OSTP, 2021 (https://www.whitehouse.gov/ostp/news-updates/2021/10/14/the-white-house-office-of-science-and-technology-policy-launches-the-time-is-now-advancing-equity-in-science-and-technology-ideation-challenge/))

Many STEM educators have turned to summer bridge programs to help bridge the gap between high school and college to better prepare incoming college students to meet the challenging academic demands and to address factors that may contribute to the attrition of students in STEM (Ashley et al., CBE - Life Sciences Education, 16:es3, 1 18, 2017 (https://www.lifescied.org/doi/10.1187/cbe.17-05-0085)). The effect of summer bridge programs on college degree attainment was found to be positive and statistically significant (WWC Intervention Report, Summer Bridge Programs, 2016 (https://ies.ed.gov/ncee/wwc/Docs/InterventionReports/wwc_summerbridge_071916.pdf)).

Once in college, students who had declared a STEM major changed their major more often than their non-STEM counterparts (Beginning College Students Who Change Their Majors Within 3 Years of Enrollment, NCES 2018-434 Report, U.S. Department of Education, 2017 (https://nih.sharepoint.com/sites/NIBIB-ESP-DIDT/Shared%20Documents/General/Portfolios/R25%20ESTEEMED/2023%20reissue/Beginning%20College%20Students%20Who%20Change%20Their%20Majors%20Within%203 434%20Report,%20U.S.%20Department%20of%20Education,%202017)) within 3 years of matriculation. Therefore, interventions are needed to support students in the early part of their college education to enhance persistence in STEM majors.

To address these gap areas (transition from high school to college and retention in STEM), the ESTEEMED Program is designed to 1) support summer bridge programs for incoming undergraduate students, and 2) provide 2 years of educational activities and bioengineering research experiences to early-stage undergraduates to help students remain in STEM, obtain a STEM college degree and to ultimately proceed to pursue doctoral degrees

The NSF Survey of Women, Minorities, and Persons with Disabilities in Science and Engineering (https://ncses.nsf.gov/pubs/nsf21321/data-tables) reported that of the U.S. citizens and permanent residents who were awarded bachelor's degrees in science or engineering, 25% were from underrepresented race/ethnic groups, and this dropped to 15% for those awarded doctoral degrees. NSF data (https://ncses.nsf.gov/pubs/nsf20301/assets/data-tables/tables/nsf20301-tab024.pdf) also showed that of those who are specifically enrolled in their doctoral degree in the bioengineering field, only 12% were from underrepresented race/ethnic groups. This demonstrates an acute need for interventions to encourage more students from underrepresented groups to continue on to doctorate degrees and successful research careers in science and engineering fields, and particularly bioengineering.

Numerous reports recommend supporting programs to recruit, train, and mentor students from nationally underrepresented groups who have an interest in STEM as a means to effectively build a diverse and competitive scientific workforce. (See for example, ACD Working Group on Diversity in the Biomedical Workforce, 2012 (https://acd.od.nih.gov/documents/reports/DiversityBiomedicalResearchWorkforceReport.pdf); PCAST Report, 2012 (https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/pcast-engage-to-excel-final_2-25-12.pdf); From College to Careers: Fostering Inclusion of Persons with Disabilities in STEM, 2014 (http://www.sciencemag.org/booklets/college-careers); Increasing College Opportunity for Low Income Students, 2014 (https://obamawhitehouse.archives.gov/sites/default/files/docs/increasing_college_opportunity_for_low-income_students_report.pdf); Barriers and Opportunities for 2-Year and 4-Year STEM Degrees, 2016 (https://www.nap.edu/catalog/21739/barriers-and-opportunities-for-2-year-and-4-year-stem-degrees);Indicators for Monitoring Undergraduate STEM Education, 2018 (https://www.nap.edu/read/24943/chapter/1); Understanding the Educational and Career Pathways of Engineers, 2018

(https://www.nap.edu/catalog/25284/understanding-the-educational-and-career-pathways-of-engineers); and Minority Serving Institutions: America's Underutilized Resource for Strengthening the STEM Workforce, 2019 (https://www.nap.edu/catalog/25257/minority-serving-institutions-americas-underutilized-resource-for-strengthening-the-stem).)

**NICHD Areas of Specific Interest:**

For the purposes of this announcement, NICHD is focused on supporting research within the mission of the National Center for Medical Rehabilitation Research (NCMRR). This may include exposing bioengineers to the lived experience of people with disabilities and specific opportunities to support their productivity, independence, and full potential. This may include support for rehabilitative interventions, assistive technologies, stimulation and neuroengineering approaches, mobility aids, prosthetics and orthotics, exercise and health promotion, managing secondary conditions, and environmental modifications and supports.

See Section VIII. Other Information for award authorities and regulations.

## Section II. Award Information

**Funding Instrument**

Grant: A support mechanism providing money, property, or both to an eligible entity to carry out an approved project or activity.

**Application Types Allowed**

New
Renewal
Resubmission

The OER Glossary (//grants.nih.gov/grants/guide/url_redirect.php?id=11116) and the SF424 (R&R) Application Guide provide details on these application types. Only those application types listed here are allowed for this FOA.

**Clinical Trial?**

Not Allowed: Only accepting applications that do not propose clinical trial(s).

Note: Appointed participants are permitted to obtain research experience in a clinical trial led by a mentor or co-mentor.

Need help determining whether you are doing a clinical trial? (https://grants.nih.gov/grants/guide/url_redirect.php?id=82370)

**Funds Available and Anticipated Number of Awards**

The number of awards is contingent upon NIH appropriations and the submission of a sufficient number of meritorious applications.

**Award Budget**

An applicant may request direct costs of up to $325,000 per year. Because the nature and scope of the proposed research education program will vary from application to application, it is anticipated that the size of each award will vary.

**Award Project Period**

The total project period for an application submitted in response to this funding opportunity may not exceed 4 years.

## Other Award Budget Information

**Personnel Costs**

Individuals designing, directing, and implementing the research education program may request salary and fringe benefits appropriate for the person months devoted to the program. Salaries requested may not exceed the levels commensurate with the institution's policy for similar positions and may not exceed the congressionally mandated cap. (If mentoring interactions and other activities with participants are considered a regular part of an individual's academic duties, then any costs associated with the mentoring and other interactions with participants are not allowable costs from grant funds).

Program coordinators are encouraged and allowed as long as their role is clearly defined and significantly different from the roles of the PDs/PIs. The duties and responsibilities of the program coordinators must be included in the budget justification.

Administrative and clerical salary costs distinctly associated with the program that are not normally provided by the applicant organization may be directly charged to the grant only when specifically identified and justified.

Salaries and fringe benefits for program faculty mentors may NOT be requested.

Total personnel salary requested for PI(s), program coordinators, and administrative/clerical costs, etc., may not exceed $80,000 per year.

**Participant Costs**

Participants may be compensated for participation in activities specifically required by the proposed research education program, if sufficiently justified. Participant costs must be itemized in the proposed budget.

Salary support is allowed for undergraduate students participating in a research experience, as long as there is an employee-employer relationship between the students and the institution. Any salary and fringe provided to the participants must be commensurate with compensation paid by the institution to other students under similar circumstances.

During the academic year, participants may be compensated for part-time work directly related to ESTEEMED program research educational goals. Examples of such work include but are not limited to: assistance with work in research labs; attending workshops/seminars/conferences outside the regular curriculum; data entry, processing and analysis; peer-mentoring; tutoring; producing supplementary materials to be used for program evaluation or dissemination; and leading discussion or study sessions. The total compensation (salary and fringe) during the academic year cannot exceed $12,000 per student.

Participants may be compensated for performing necessary work during the summer bridge program and the two research experiences in the summers following the freshman and sophomore years. Participants may be provided funds for per diem and modest housing arrangements. The total compensation cannot exceed $4,000 during the summer.

Students participating in federally- or privately-funded summer research programs that offer compensation may choose to receive compensation from ESTEEMED or the external program, but not both.

Because the R25 program is not intended as a substitute for an NRSA institutional training program (e.g.,T32), costs to support full-time participants (supported for 40 hours/week for a continuous, 12-month period) are not allowable.

Participants, while in the program, will be allowed $1000 per year to travel to relevant scientific meetings. In addition, participants undertaking an off-campus summer research experience will be allowed an additional $500 for travel to the site if this cost is not covered by other sources. Expenses for local and foreign travel are not allowed.

**Other Program-Related Expenses**

Consultant costs, equipment, supplies, travel for key persons, and other program-related expenses may be included in the proposed budget. These expenses must be justified as specifically required by the proposed program and must not duplicate items generally available at the applicant institution.

Consultant costs for program evaluation are limited to $3,000 direct costs per year.

All other program-related expenses may not exceed $25,000 direct costs per year. This includes personnel travel (do not include a separate line item for travel).

Please see Section IV.2 R&R Budget for more specifics including unallowable costs.

**Indirect Costs**

Indirect Costs (also known as Facilities & Administrative [F&A] Costs) are reimbursed at 8% of modified total direct costs (exclusive of tuition and fees, expenditures for equipment and consortium costs in excess of $25,000), rather than on the basis of a negotiated rate agreement.

NIH grants policies as described in the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11120) will apply to the applications submitted and awards made from this FOA.

# Section III. Eligibility Information

### 1. Eligible Applicants

### Eligible Organizations

Higher Education Institutions

- Public/State Controlled Institutions of Higher Education
- Private Institutions of Higher Education

The following types of Higher Education Institutions are always encouraged to apply for NIH support as Public or Private Institutions of Higher Education:

- Hispanic-serving Institutions
- Historically Black Colleges and Universities (HBCUs)
- Tribally Controlled Colleges and Universities (TCCUs)
- Alaska Native and Native Hawaiian Serving Institutions
- Asian American Native American Pacific Islander Serving Institutions (AANAPISIs)

The applicant institution must be an accredited public or non-profit private school that grants baccalaureate degrees in engineering or the physical/computational sciences. The institution must either have a bioengineering or biomedical engineering department (or concentration/track) or must have a critical mass of faculty with background in above areas and experience in the application of engineering and the physical/computational sciences in medicine and/or biology. At the time of application, the applicant institution must have an honors program promoting graduate studies and open to students in their junior and senior years. Community colleges (CCs) are not eligible to apply, however they may be supported via subaward as a collaborator/partner of the applicant institution.

The sponsoring institution must assure support for the proposed program. Appropriate institutional commitment to the program includes the provision of adequate staff, facilities, and educational resources that can contribute to the planned program.

Institutions with existing Ruth L. Kirschstein National Research Service Award (NRSA) institutional training grants (e.g., T32) or other Federally funded training programs may apply for a research education grant provided that the proposed educational experiences are distinct from those training programs receiving federal support. In many cases, it is anticipated that the proposed research education program will complement ongoing research training occurring at the applicant institution.

### Foreign Institutions

Non-domestic (non-U.S.) Entities (Foreign Institutions) **are not** eligible to apply

Non-domestic (non-U.S.) components of U.S. Organizations **are not** eligible to apply.

Foreign components, as defined in the *NIH Grants Policy Statement* (//grants.nih.gov/grants/guide/url_redirect.php?id=11118), **are not** allowed.

### Required Registrations

**Applicant Organizations**

Applicant organizations must complete and maintain the following registrations as described in the SF 424 (R&R) Application Guide to be eligible to apply for or receive an award. All registrations must be completed prior to the application being submitted. Registration can take 6 weeks or more, so applicants should begin the registration process as soon as possible. The NIH Policy on Late Submission of Grant Applications (//grants.nih.gov/grants/guide/notice-files/NOT-OD-15-039.html) states that failure to complete registrations in advance of a due date is not a valid reason for a late submission.

- System for Award Management (SAM) (https://grants.nih.gov/grants/guide/url_redirect.php?id=82390) Applicants must complete and maintain an active registration, **which requires renewal at least annually**. The renewal process may require as much time as the initial registration. SAM registration includes the assignment of a Commercial and Government Entity (CAGE) Code for domestic organizations which have not already been assigned a CAGE Code.
- NATO Commercial and Government Entity (NCAGE) Code (//grants.nih.gov/grants/guide/url_redirect.php?id=11176) Foreign organizations must obtain an NCAGE code (in lieu of a CAGE code) in order to register in SAM.
- Unique Entity Identifier (UEI) A UEI is issued as part of the SAM.gov registration process. The same UEI must be used for all registrations, as well as on the grant application.
- eRA Commons (https://grants.nih.gov/grants/guide/url_redirect.php?id=11123) - Once the unique organization identifier is established, organizations can register with eRA Commons in tandem with completing their Grants.gov registration; all registrations must be in place by time of submission. eRA Commons requires organizations to identify at least one Signing Official (SO) and at least one Program Director/Principal Investigator (PD/PI) account in order to submit an application.
- Grants.gov (//grants.nih.gov/grants/guide/url_redirect.php?id=82300) Applicants must have an active SAM registration in order to complete the Grants.gov registration.

**Program Directors/Principal Investigators (PD(s)/PI(s))**

All PD(s)/PI(s) must have an eRA Commons account. PD(s)/PI(s) should work with their organizational officials to either create a new account or to affiliate their existing account with the applicant organization in eRA Commons. If the PD/PI is also the organizational Signing Official, they must have two distinct eRA Commons accounts, one for each role. Obtaining an eRA Commons account can take up to 2 weeks.

### Eligible Individuals (Program Director/Principal Investigator)

Any individual(s) with the skills, knowledge, and resources necessary to carry out the proposed research as the Program Director(s)/Principal Investigator(s) (PD(s)/PI(s)) is invited to work with their organization to develop an application for support. Individuals from diverse backgrounds, including underrepresented racial and ethnic groups, individuals with disabilities, and women are always encouraged to apply for NIH support. See, Reminder: Notice of NIH's Encouragement of Applications Supporting Individuals from Underrepresented Ethnic and Racial Groups as well as Individuals with Disabilities, NOT-OD-22-019 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-019.html).

For institutions/organizations proposing multiple PDs/PIs, visit the Multiple Program Director/Principal Investigator Policy and submission details in the Senior/Key Person Profile (Expanded) Component of the SF424 (R&R) Application Guide.

The PD(s)/PI(s) should have a background in bioengineering or a closely related field in engineering or the physical/computational sciences and should have demonstrated experience in the applications of these fields in medicine and/or biology.? The PD(s)/PI)(s) should be capable of providing both administrative and scientific leadership to the development and implementation of the proposed program. The PD/PI will be expected to monitor and assess the program and submit all documents and reports as required.

The proposed PD(s)/PI(s) should hold a research or clinical doctoral degree (e.g., Ph.D., M.D., or equivalent), and have clearly demonstrated training/mentoring credentials, particularly of individuals from diverse backgrounds, including students from underrepresented groups. The PD/PI must have a regular, full-time appointment (i.e., not adjunct, part-time, retired, or emeritus) at the applicant institution.

### 2. Cost Sharing

This FOA does not require cost sharing as defined in the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11126).

### 3. Additional Information on Eligibility

### Number of Applications

Only one application per institution (normally identified by having a UEI number or NIH IPF number) is allowed.

The NIH will not accept duplicate or highly overlapping applications under review at the same time per 2.3.7.4 Submission of Resubmission Application. This means that the NIH will not accept:

- A new (A0) application that is submitted before issuance of the summary statement from the review of an overlapping new (A0) or resubmission (A1) application.
- A resubmission (A1) application that is submitted before issuance of the summary statement from the review of the previous new (A0) application.
- An application that has substantial overlap with another application pending appeal of initial peer review.

### Program Faculty

Mentors should have research expertise and experience relevant to the proposed program. Mentors must be committed to continue their involvement throughout the total period of the mentee's participation in this award. Mentors are expected to have a history of training students from diverse backgrounds, including individuals from underrepresented groups. Programs are encouraged to build a broadly diverse team of program faculty that includes, for example, faculty at different career stages (i.e., junior as well as senior faculty). Individuals from diverse backgrounds, including underrepresented racial and ethnic groups, individuals with disabilities, and women are always encouraged to apply for NIH support. See, Reminder: Notice of NIH's Encouragement of Applications Supporting Individuals from Underrepresented Ethnic and Racial Groups as well as Individuals with Disabilities, NOT-OD-22-019 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-019.html).

### Participants

Participants must be full-time undergraduate students and majoring in a STEM field relevant to NIBIB's mission such as bioengineering, engineering or the physical/computational sciences. Undergraduate participants may enter the ESTEEMED program as incoming freshman (after graduating high school) or as community college students. Community college students may participate in ESTEEMED activities at the community college and/or applicant institution, depending on the structure of the proposed ESTEEMED program. Community college students must intend to transfer to the applicant institution during or after the ESTEEMED program and with the expectation of joining an honors program and completing a bachelor's degree program at the applicant institution.

Participants must be citizens or noncitizen nationals of the United States or have been lawfully admitted for permanent residence at the time of appointment.

## Section IV. Application and Submission Information

### 1. Requesting an Application Package

The application forms package specific to this opportunity must be accessed through ASSIST, Grants.gov Workspace or an institutional system-to-system solution. Links to apply using ASSIST or Grants.gov Workspace are available in Part 1 of this FOA. See your administrative office for instructions if you plan to use an institutional system-to-system solution.

### 2. Content and Form of Application Submission

It is critical that applicants follow the instructions in the Research (R) Instructions in the SF424 (R&R) Application Guide (https://grants.nih.gov/grants/guide/url_redirect.php?id=82400), except where instructed in this funding opportunity announcement to do otherwise. Conformance to the requirements in the Application Guide is required and strictly enforced. Applications that are out of compliance with these instructions will not be reviewed.

### Letter of Intent

Although a letter of intent is not required, is not binding, and does not enter into the review of a subsequent application, the information that it contains allows IC staff to estimate the potential review workload and plan the review.

By the date listed in Part 1. Overview Information, prospective applicants are asked to submit a letter of intent that includes the following information:

- Descriptive title of proposed activity
- Name(s), address(es), and telephone number(s) of the PD(s)/PI(s)
- Names of other key personnel
- Participating institution(s)
- Number and title of this funding opportunity

The letter of intent should be sent to:

Tina Gatlin, Ph.D.
National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Email: gatlincl@nih.gov (mailto:gatlincl@nih.gov)

### Page Limitations

All page limitations described in the SF424 Application Guide and the Table of Page Limits (https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/page-limits.htm#train) must be followed.

### Instructions for Application Submission

The following section supplements the instructions found in the SF424 (R&R) Application Guide and should be used for preparing an application to this FOA.

### SF424(R&R) Cover

Follow all instructions provided in the SF424 (R&R) Application Guide.

### SF424(R&R) Project/Performance Site Locations

Follow all instructions provided in the SF424 (R&R) Application Guide.

### SF424(R&R) Other Project Information Component

Follow all instructions provided in the SF424 (R&R) Application Guide with the following additional modifications:

**Facilities & Other Resources.** Describe the educational environment, including the facilities, laboratories, participating departments, computer services, and any other resources to be used in the development and implementation of the proposed program. List all thematically related sources of support for research training and education following the format for Current and Pending Support.

**Other Attachments.**

An Advisory Committee is not a required component of a Research Education program. However, if an Advisory Committee is intended, provide a plan for the appointment of an Advisory Committee to monitor progress of the research education program. The composition, roles, responsibilities, and desired expertise of committee members, frequency of committee meetings, and other relevant information should be included. Describe how the Advisory Committee will evaluate the overall effectiveness of the program.

For New applications, potential Advisory Committee members should not be contacted or appointed prior to completion of the review process; however, the scientific disciplines and relevant expertise of anticipated committee members should be described. The application should not list the names of potential members of the Advisory Committee.

All applications (new, resubmission, renewal) need to include Undergraduate Training Tables 2, 3, 4, and 8D (https://grants.nih.gov/grants/funding/datatables/Instruc_New_Undergrad_Training.pdf) as Other Attachments. Renewal applications need to include Table 5C (//grants.nih.gov/grants/funding/datatables/Instruc_New_Undergrad_Training.pdf) in addition.

The filename provided for each Other Attachment will be the name used for the bookmark in the electronic application in eRA Commons.

### SF424(R&R) Senior/Key Person Profile Expanded

Follow all instructions provided in the SF424 (R&R) Application Guide.

### R&R Budget

Follow all instructions provided in the SF424 (R&R) Application Guide with the following additional modifications:

- Include all personnel other than the PD(s)/PI(s) in the Other Personnel section, including clerical and administrative staff.
- Applicant must break down each cost item in the budget and provide a clear justification in the Budget Justification section.
- All allowable categories of funds requested to support participants in the program, including trainee travel and trainee salary must be listed under the Participant/Trainee Support Costs section. Do not include trainee costs/salary in the Personnel Costs section.
- Student participants must be compensated by salary as this is an allowable compensation for employee services rendered to the grant-supported project. Paid salary must reasonably reflect the percentage of time actually devoted to the NIH-funded project. (See: https://grants.nih.gov/grants/policy/nihgps/HTML5/section_7/7.9_allowability_of_costs_activities.tm#Salaries_and_Wages) (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_7/7.9_allowability_of_costs_activities.htm#Salaries_and_Wages))
- Participant costs are restricted and cannot be rebudgeted to non-participant costs.
- Personnel travel is to be included as part of the $25,000 cap in "Other Program-Related Expenses."
- Subawards are allowable.
- The following summarizes some of the UNALLOWABLE costs under the ESTEEMED Program but it is not an all-inclusive list:
    - Undergraduate tuition, housing or food during the academic year (Note: Partial tuition to defray costs for ESTEEMED-relevant courses not available at the applicant institution and taken at an external institution is permissible).
    - Foreign travel outside the US or US territories.
    - Food and beverage costs at events (Note: Meal expenses for non-local participants to attend summer bridge and summer research experiences is permissible. Also, travel per diem costs provided in accordance with an institution's written travel policies to cover incidental meal expenses at conferences is permissible).
    - Costs for incentives, memberships, or subscriptions to journals.
    - Salary support for faculty research.
    - Costs to attend existing seminars, meetings, workshops or courses for a wider audience. (Note: Registration fee costs for ESTEEMED participants to attend such events are allowable if the subject matter is directly related to the ESTEEMED program goals. Costs for DEVELOPMENT of such events are allowable if the target audience is primarily for ESTEEMED participants.)
    - Student support in the form of a stipend since stipend is only allowable for trainees and fellows supported under Kirschstein-NRSA individual fellowships and institutional research training grants (i.e., T32) and not research education grants (R25). (See:

https://grants.nih.gov/grants/policy/nihgps/HTML5/section_7/7.9_allowability_of_costs_activities.htm#Salaries_and_Wages) (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_7/7.9_allowability_of_costs_activities.htm#Salaries_and_Wages)).

### PHS 398 Cover Page Supplement

Follow all instructions provided in the SF424 (R&R) Application Guide.

### PHS 398 Research Plan

All instructions in the SF424 (R&R) Application Guide must be followed, with the following additional instructions:

#### Research Strategy

**Research Strategy** section must be used to upload the **Research Education Program Plan**, which must include the following components described below:

- Proposed Research Education Program
- Program Director/Principal Investigator
- Program Faculty
- Program Participants
- Institutional Environment and Commitment
- Recruitment Plan to Enhance Diversity
- Plan for Instruction in the Responsible Conduct of Research
- Evaluation Plan
- Dissemination Plan

#### Research Education Program Plan

**Proposed Research Education Program.** While the proposed research education program may complement ongoing research training and education occurring at the applicant institution, the proposed educational experiences must be distinct from those research training and research education programs currently receiving federal support. When research training programs are on-going in the same department, the applicant organization should clearly distinguish between the activities in the proposed research education program and the research training supported by the training program.

Applications must:

- Provide an overview of the research education plan and describe how it will provide added value to the participants' education and achieve the goals of the FOA.
- Describe the Summer Bridge program, Academic Year Activities, and Summer Research Experiences, providing details on the specific activities planned, including their duration, timing and the faculty and personnel involved.
- Describe how the activities in the Summer Bridge Program will ensure a successful transition of rising freshman to college and applicant institution.
- Describe the Summer Research Experiences, and any collaborations with other institutions to place the students in research labs, especially if such opportunities are limited on campus.
- Describe the Academic Year Activities in the freshman and sophomore years and discuss how they differ from one another. Discuss why each activity proposed will be useful to the participants and how the proposed components build upon one another.
- Provide detail and rationale on Courses for Skills Development and describe how these activities will enrich the research skills and/or competence of participants so that they may further engage in bioengineering and related research.
- If applicable, describe how community college students will participate in the ESTEEMED program and how they will transition to the academic institution.
- If applicable, describe the partnership arrangement of the community college with the applicant institution and how the proposed research education plan will be integrated across the partnering institutions, including plans for coordination and communication between the sites.
- Provide the number of participants to be supported and concise information on the selection and retention process for the participants in the proposed program.
- Demonstrate that participants will have authentic, meaningful research experiences in the laboratories of investigators who are actively engaged in bioengineering or NIBIB mission related research.
- Provide a Mentoring Plan comprising details of mentoring that will be provided to the participants, including matching of students to faculty, any training on mentoring that will be offered to faculty or peer mentors, and use of individual development plans (IDPs) and/or mentoring contracts.
- Provide a brief description of the honors program, its size and history, and how participants from the ESTEEMED program are expected to transition to the honors program and/or interact with honors students in the course of the ESTEEMED program.
- Discuss any perceived impediments to implementing the proposed activities and alternative strategies to achieve the measurable objectives.
- Include a timetable for completing the planned activities.

For all components of the program, provide sufficient detail to address the review criteria listed below.

Particular attention must be given to the required Undergraduate Training Data Tables (https://grants.nih.gov/grants/funding/datatables-f/Undergraduate_Training_Tables.pdf) (2, 3, 4 and 8D). These tables should be included as Other Attachments. (Table 5C is an additional requirement for renewal applications.) Applicants should summarize, in the body of the application, key data from the tables that highlight the characteristics of the applicant pool, faculty mentors, the educational and career outcomes of participants, and other factors that contribute to the overall environment of the program.

**Program Director/Principal Investigator.** Describe arrangements for administration of the program. Provide evidence that the Program Director/Principal Investigator is actively engaged in research and/or teaching in an area related to the mission of NIH, and can organize, administer, monitor, and evaluate the research education program. For programs proposing multiple PDs/PIs, describe the complementary and integrated expertise of the PDs/PIs, their leadership approach, and governance appropriate for the planned project.

Describe the PD/PI's history of mentoring students/trainees from diverse backgrounds, including individuals from underrepresented groups, and if the PD/PI has experience in developing and leading similar programs. Discuss why the PD/PI is appropriate to lead an ESTEEMED program designed to support participation of students from diverse backgrounds in bioengineering and related fields.

Describe how the PD(s)/PI(s) will assume responsibility for the overall execution of the proposed program, including placement of students in research laboratories, and coordination and implementation of developmental education and mentoring activities. Describe how the PD(s)/PI(s) will work with program faculty and, if applicable, program coordinator(s) to monitor and evaluate the progress of the individual program elements and the overall functioning of the program.

PDs/PIs and any program coordinators will be expected to participate in regular program meetings hosted by NIBIB staff. Program meetings are expected to take place virtually three times a year.

**Program Faculty.** Provide a description of the faculty mentors and their intended roles.

Biosketches of program faculty are not necessary to include in the application unless they have a significant administrative role in the proposed program beyond research mentoring.

Using the Training Data Tables, summarize in this section the key data on program faculty (Table 2 (https://grants.nih.gov/grants/funding/datatables-f/Table_2_Undergraduate_Blank.docx)) and their external funding (Tables 3 (https://grants.nih.gov/grants/funding/datatables-f/Table_3_Undergraduate_Blank.docx)and 4

(https://grants.nih.gov/grants/funding/datatables-f/Table_4_Undergraduate_Blank.docx)), if any. Lack of Tables 3 or 4 will be interpreted as lack of external funding for training and/or research.

**Program Participants.** Applications must describe the intended participants, and the selection or admission criteria and/or specific educational background characteristics that are essential for participation in the proposed research education program.

Describe in detail the procedures and requirements for 1) Admission of students, and 2) Retention of students, including remedies/interventions for struggling students. It is the responsibility of the institutions to establish the selection criteria for the students to participate in the program, and to take steps to recruit a diverse applicant pool. Institutions are encouraged to consider the overall goals/objectives of the NIBIB ESTEEMED Program, which is to foster the development of a diverse pool of undergraduate participants who may pursue further studies and careers in bioengineering or STEM fields relevant to NIBIB's or NICHD's scientific missions.

Programs are encouraged to use admission and retention criteria in the spirit of the ESTEEMED program to support students that may not have had exposures and resources to meet requirements based on standardized tests, strict GPA levels, or a history of research involvement. Teachers' recommendations and class rankings may represent more suitable criteria for admission while recommendations and comments from faculty advisors, mentors, and program monitors should be taken into consideration along with GPAs in the determination of continued participation in the program. Use Table 8D (https://grants.nih.gov/grants/funding/datatables-f/Table_8D_Undergraduate_Blank.docx) to provide information on student outcomes. For New programs, Table 8D should list students who would have been eligible for the proposed ESTEEMED program; while Renewal applicants should list students that were appointed to the program in the previous funding period(s).

**Institutional Environment and Commitment.** Describe any additional aspects of the Institutional Environment and Commitment not addressed under Facilities & Other Resources or the required Institutional Commitment Letter of Support, described below. Appropriate institutional commitment should include the provision of adequate staff, facilities, and educational resources that can contribute to the planned research education program. This section should not duplicate information provided elsewhere.

Describe other undergraduate programs designed to foster diversity in STEM at the institution. Describe how the proposed research education program differs from or complements these programs. Describe the resources the institution provides to accommodate persons with disabilities.

If the proposed ESTEEMED program will partner with other institution (such as a community college), describe the benefits of the partnership to the program and for the program participants. If the applicant institution does not have a sufficient number of on-campus research opportunities for students, partnerships for off-site research experiences are encouraged. Describe any partnerships with academics or industry that may benefit the program and/or the participants, for instance by providing externships, site visits or staff to participate as speakers or advisory board members.

The application must include a description of specific support (financial, in-kind, cost sharing or otherwise) to be provided to the program. This could include support of course implementation, support for additional participants in the program, release time for the Program Director(s) and participating faculty, or any other ways to improve and enhance the research education program. Institutions should clearly state the alignment of enhancing scientific workforce diversity to its mission and accountability to promoting an environment which is inclusive, safe and supportive for students while participating in the program. All collaborative and partnership arrangements must be clearly described; and agreements must be included in the application as letters of support. Cost-sharing or in-kind support for summer travel, food and modest housing arrangements for participants in any off-site summer programs by partnering institutions is encouraged.

**Recruitment Plan to Enhance Diversity (**NOT-OD-20-031 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-20-031.html)**):** Every facet of the United States scientific research enterprise from basic laboratory research to clinical and translational research to policy formation requires superior intellect, creativity and a wide range of skill sets and viewpoints. NIH's ability to help ensure that the nation remains a global leader in scientific discovery and innovation is dependent upon a pool of highly talented scientists from diverse backgrounds who will help to further NIH's mission.

Research shows that diverse teams working together and capitalizing on innovative ideas and distinct perspectives outperform homogenous teams. Scientists and trainees from diverse backgrounds and life experiences bring different perspectives, creativity, and individual enterprise to address complex scientific problems. There are many benefits that flow from a diverse NIH-supported scientific workforce, including: fostering scientific innovation, enhancing global competitiveness, contributing to robust learning environments, improving the quality of the research, advancing the likelihood that underserved or health disparity populations participate in, and benefit from health research, and enhancing public trust.

The applicant must provide a recruitment plan to enhance diversity. Include outreach strategies and activities designed to recruit prospective participants from diverse backgrounds, including those from underrepresented groups (e.g., those described in the Notice of NIH's Interest in Diversity (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-20-031.html)). Describe the specific efforts to be undertaken by the program and how the proposed plan reflects past experiences in recruiting individuals from underrepresented groups.

Renewal applications must include a detailed account of experiences in recruiting prospective individuals from underrepresented groups during the previous funding period, including successful and unsuccessful recruitment strategies. Information should be included on how the proposed plan reflects the program's past experiences in recruiting prospective individuals from underrepresented groups.

For those individuals who participated in the research education program, the report should include information about the duration of education and aggregate information on the number of individuals who finished the program in good standing.

Applications lacking a diversity recruitment plan will not be reviewed.

**Plan for Instruction in the Responsible Conduct of Research.** All applications must include a plan to fulfill NIH requirements for instruction in the Responsible Conduct of Research (RCR). The plan must address the five, required instructional components outlined in the NIH policy: 1) *Format* - the required format of instruction, i.e., face-to-face lectures, coursework, and/or real-time discussion groups (a plan with only on-line instruction is not acceptable); 2) *Subject Matter* - the breadth of subject matter, e.g., conflict of interest, authorship, data management, human subjects and animal use, laboratory safety, research misconduct, research ethics; 3) *Faculty Participation* - the role of the program faculty in the instruction; 4) *Duration of Instruction* - the number of contact hours of instruction, taking into consideration the duration of the program; and 5) *Frequency of Instruction* instruction must occur during each career stage and at least once every four years. See also NOT-OD-10-019 (//grants.nih.gov/grants/guide/url_redirect.php?id=41159). The plan should be appropriate and reasonable for the nature and duration of the proposed program. Renewal (Type 2) applications must, in addition, describe any changes in formal instruction over the past project period and plans to address any weaknesses in the current instruction plan. All participating faculty who served as course directors, speakers, lecturers, and/or discussion leaders during the past project period must be named in the application.

Applications lacking a plan for instruction in responsible conduct of research will not be reviewed.

**Evaluation Plan.** Applications must include a plan for evaluating the activities supported by the award. The application must specify baseline metrics (e.g., numbers, educational levels, and demographic characteristics of participants and any comparator groups), as well as measures to gauge the short or long-term success of the research education award in achieving its objectives. Applicants are strongly encouraged to assess the impact of the program using the hallmarks of success listed at https://www.nigms.nih.gov/training/dpc/Pages/success.aspx (https://www.nigms.nih.gov/training/dpc/Pages/success.aspx). Applications must describe a comparator group (a similar group not in the program), and the timepoints when data will be acquired from the participant and comparator groups (e.g., baseline, after freshman year, after sophomore year, at graduation, etc.) and the means to do so. Wherever appropriate, applicants are encouraged to obtain feedback from participants to help identify weaknesses and provide suggestions for improvements, as well as to identify the strengths of the program to expand on and share with the education community.

Applications lacking a detailed evaluation plan addressing the above points will not be reviewed.

**Dissemination Plan.** A specific plan must be provided to disseminate nationally any findings resulting from or materials developed under the auspices of the research education program, e.g., sharing course curricula and related materials via web postings, presentations at scientific meetings, workshops.

More information on program requirements, application requirements and award information can be found on the NIBIB ESTEEMED FAQ (https://www.nibib.nih.gov/training-careers/training-opportunities/enhancing-science-technology-engineering-and-math-educational-diversity-esteemed-research-education-experiences-r25/FAQ) page.

### Letters of Support

A letter of institutional commitment must be attached as part of Letters of Support (see section above: **"Institutional Environment and Commitment."** Applicants should also include letters of support from the directors of any existing Summer Bridge and honors programs. Any outside individual or entity involved in the program must provide a letter of support stating their willingness to collaborate/partner and describing how their background relates to the program and the specific responsibilities they will assume.

**Resource Sharing Plan**

Note: Effective for due dates on or after January 25, 2023, a Data Management and Sharing Plan is not applicable for this FOA.

Individuals are required to comply with the instructions for the Resource Sharing Plans as provided in the SF424 (R&R) Application Guide, with the following modification:

When relevant, applications are expected to include a software dissemination plan if support for development, maintenance, or enhancement of software is requested in the application. There is no prescribed single license for software produced. However, the software dissemination plan should address, as appropriate, the following goals:

- Software source code should be freely available to biomedical researchers and educators in the non-profit sector, such as institutions of education, research institutions, and government laboratories. Users should be permitted to modify the code and share their modifications with others.
- The terms of software availability should permit the commercialization of enhanced or customized versions of the software, or incorporation of the software or pieces of it into other software packages.
- To preserve utility to the community, the software should be transferable such that another individual or team can continue development in the event that the original investigators are unwilling or unable to do so.

### Appendix

Only limited Appendix materials are allowed. Follow the instructions for the Appendix as described in the SF424 (R&R) Application Guide.

### PHS Human Subjects and Clinical Trials Information

When involving human subjects research, clinical research, and/or NIH-defined clinical trials (and when applicable, clinical trials research experience) follow all instructions for the PHS Human Subjects and Clinical Trials Information form in the SF424 (R&R) Application Guide, with the following additional instructions:

If you answered Yes to the question Are Human Subjects Involved? on the R&R Other Project Information form, you must include at least one human subjects study record using the **Study Record: PHS Human Subjects and Clinical Trials Information** form or **Delayed Onset Study** record.

**Study Record: PHS Human Subjects and Clinical Trials Information**

All instructions in the SF424 (R&R) Application Guide must be followed.

Although participants may engage in research experiences that involve human subjects research, the research must be covered by the mentor's existing IRB approvals. If applicable, the only human subjects research allowed by this FOA is related to the educational research where the ESTEEMED participants are the human subjects.

**Delayed Onset Study**

Note: Delayed onset (https://grants.nih.gov/grants/glossary.htm#DelayedOnsetStudy) does NOT apply to a study that can be described but will not start immediately (i.e., delayed start). All instructions in the SF424 (R&R) Application Guide must be followed.

### PHS Assignment Request Form

All instructions in the SF424 (R&R) Application Guide must be followed.

### 3. Unique Entity Identifier and System for Award Management (SAM)

See Part 1. Section III.1 for information regarding the requirement for obtaining a unique entity identifier and for completing and maintaining active registrations in System for Award Management (SAM), NATO Commercial and Government Entity (NCAGE) Code (if applicable), eRA Commons, and Grants.gov

### 4. Submission Dates and Times

Part I. Overview Information contains information about Key Dates and times. Applicants are encouraged to submit applications before the due date to ensure they have time to make any application corrections that might be necessary for successful submission. When a submission date falls on a weekend or Federal holiday (https://www.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/), the application deadline is automatically extended to the next business day.

Organizations must submit applications to Grants.gov (//grants.nih.gov/grants/guide/url_redirect.php?id=11128) (the online portal to find and apply for grants across all Federal agencies). Applicants must then complete the submission process by tracking the status of the application in the eRA Commons (https://grants.nih.gov/grants/guide/url_redirect.php?id=11123), NIH's electronic system for grants administration. NIH and Grants.gov systems check the application against many of the application instructions upon submission. Errors must be corrected and a changed/corrected application must be submitted to Grants.gov on or before the application due date and time. If a Changed/Corrected application is submitted after the deadline, the application will be considered late. Applications that miss the due date and time are subjected to the NIH Policy on Late Application Submission.

**Applicants are responsible for viewing their application before the due date in the eRA Commons to ensure accurate and successful submission.**

Information on the submission process and a definition of on-time submission are provided in the SF424 (R&R) Application Guide.

### 5. Intergovernmental Review (E.O. 12372)

This initiative is not subject to intergovernmental review (https://grants.nih.gov/grants/policy/nihgps/html5/section_10/10.10.1_executive_orders.htm).

### 6. Funding Restrictions

All NIH awards are subject to the terms and conditions, cost principles, and other considerations described in the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11120).

Pre-award costs are allowable only as described in the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11143).

### 7. Other Submission Requirements and Information

Applications must be submitted electronically following the instructions described in the SF424 (R&R) Application Guide. Paper applications will not be accepted.

Applicants must complete all required registrations before the application due date. Section III. Eligibility Information contains information about registration.

For assistance with your electronic application or for more information on the electronic submission process, visit How to Apply Application Guide (https://grants.nih.gov/grants/how-to-apply-application-guide.html). If you encounter a system issue beyond your control that threatens your ability to complete the submission process on-time, you must follow the Dealing with System Issues (https://grants.nih.gov/grants/how-to-apply-application-guide/due-dates-and-submission-policies/dealing-with-system-issues.htm) guidance. For assistance with application submission, contact the Application Submission Contacts in Section VII.

**Important reminders:**

All PD(s)/PI(s) must include their eRA Commons ID in the Credential field of the Senior/Key Person Profile form**.** Failure to register in the Commons and to include a valid PD/PI Commons ID in the credential field will prevent the successful submission of an electronic application to NIH.

The applicant organization must ensure that the unique entity identifier provided on the application is the same identifier used in the organization's profile in the eRA Commons and for the System for Award Management. Additional information may be found in the SF424 (R&R) Application Guide.

See more tips (//grants.nih.gov/grants/guide/url_redirect.php?id=11146) for avoiding common errors.

Upon receipt, applications will be evaluated for completeness and compliance with application instructions by the Center for Scientific Review, NIH. Applications that are incomplete or non-compliant will not be reviewed.

### Post Submission Materials

Applicants are required to follow the instructions for post-submission materials, as described in the policy (//grants.nih.gov/grants/guide/url_redirect.php?id=82299).

## Section V. Application Review Information

### 1. Criteria

Only the review criteria described below will be considered in the review process. Applications submitted to the NIH in support of the NIH mission (//grants.nih.gov/grants/guide/url_redirect.php?id=11149) are evaluated for scientific and technical merit through the NIH peer review system.

For this particular announcement, note the following:

The goal of the ESTEEMED program is to support educational activities including research experiences and courses for skills development to encourage undergraduate bioengineering and related STEM field students from diverse backgrounds, including those from underrepresented groups in the biomedical and behavioral sciences, to pursue a Ph.D. or M.D./Ph. D degree and a biomedical research career in academia or industry.

### Overall Impact

Reviewers will provide an overall impact score to reflect their assessment of the likelihood for the project to strongly advance research education by fulfilling the goal of this R25 Education Program, in consideration of the following review criteria and additional review criteria, as applicable for the project proposed.

### Scored Review Criteria

Reviewers will consider each of the review criteria below in the determination of scientific merit and give a separate score for each. An application does not need to be strong in all categories to be judged likely to have major scientific impact.

#### Significance

Does the proposed program address a key audience and an important aspect or important need in research education? Is there convincing evidence in the application that the proposed program will significantly advance the stated goal of the program?

#### Investigator(s)

Is the PD/PI capable of providing both administrative and scientific leadership to the development and implementation of the proposed program? Is there evidence that an appropriate level of effort will be devoted by the program leadership to ensure the program's intended goal is accomplished? If applicable, is there evidence that the participating faculty have experience in mentoring students and teaching science? If applicable, are the faculty good role models for the participants by nature of their scientific accomplishments? If the project is collaborative or multi-PD/PI, do the investigators have complementary and integrated expertise; are their leadership approach, governance, and organizational structure appropriate for the project?

Do the PD/PI(s) and program faculty have a history of effectively mentoring students from diverse backgrounds, including those from underrepresented backgrounds, in STEM fields? Does the PD/PI(s) have experience in developing and leading similar programs? Do the PDs/PIs have the appropriate background and expertise in bioengineering or more broadly, applications of engineering and the physical/computational sciences in medicine and biology?

Is there a description of how the PD/PI(s) will work with program faculty and, if applicable, program coordinator(s) to monitor and evaluate the progress of the individual program elements and the overall functioning of the proposed program?

#### Innovation

Taking into consideration the nature of the proposed research education program, does the applicant make a strong case for this program effectively reaching an audience in need of the program's offerings? Where appropriate, is the proposed program developing or utilizing innovative approaches and latest best practices to improve the knowledge and/or skills of the intended audience?

#### Approach

Does the proposed program clearly state its goals and objectives, including the educational level of the audience to be reached, the content to be conveyed, and the intended outcome? Is there evidence that the program is based on a sound rationale, as well as sound educational concepts and principles? Is the plan for evaluation sound and likely to provide information on the effectiveness of the program? If the proposed program will recruit participants, are the planned recruitment, retention, and follow-up (if applicable) activities adequate to ensure a highly qualified participant pool?

Are the proposed contents of the Summer Bridge Program, Academic Year Activities, and the Summer Research Experience likely to achieve program goals?

**Summer Bridge Program**: Are the proposed activities of the summer program likely to prepare the students for a successful transition from high school to college? Do they provide good learning habits and coping skills as well as a review of basic academic skills such as basic sciences, computation, and science communication?

**Academic Year Activities**: Do the academic year activities appropriately address academic success, professional development (including the use of IDPs), and career choices? Are the proposed activities for freshman and sophomore years clearly described and represent a meaningful progression? Is there strong focus on bioengineering or related disciplines?

**Summer Research Experiences**: Does the institution offer enough opportunities for summer research experiences? Otherwise, is there evidence of collaborations with other institutions and appropriate arrangements to place the students in research labs in the summer following the sophomore year? Is the summer research component designed to provide students ownership of projects? Will it provide meaningful experiences in the design and conduct of research and in the written and oral presentation of findings?

**Community Colleges (if applicable)**: Is there a well described partnership arrangement with a community college so that community college students can benefit from ESTEEMED program activities? Is there an equitable integration across the partnering institutions, including the use of ESTEEMED program resources and plans for coordination and communication between the sites?

**Mentoring**: Does the institution have mentors with appropriate expertise in bioengineering and relevant areas? Is their number commensurate with the number of participant slots proposed? Do these mentors have sufficient experience in mentoring undergraduate students, including those from underrepresented groups? Have such mentees moved on to doctoral programs and ultimately embarked on research careers? Are the roles of the mentors in the proposed program and their interaction with the students clearly described? Is there evidence that the participants will receive effective and sufficient mentoring? Are the procedures for assigning mentors to individual students explained in enough detail in terms of matching criteria and timing? Are these procedures reasonable? Will the institution offer any training on mentoring to the faculty and peer mentors?

**Admission of Participants**: Are the eligibility for participation in the program and the criteria used for selecting program participants among applicants clear and reasonable? Are they likely to result in a strong pool of students for the program?

**Retention of Participants:** Are the requirements for participants to remain in the program clearly specified and sound? Are the procedures to help struggling students remain in the program sufficiently detailed and appropriate?

**Honors Program**: Are the admission and retention requirements clear and reasonable? Are the procedures for any ESTEEMED students that do not meet the admission or retention criteria of the honors program described and sound?

**Evaluation Plan:** Does the plan use appropriate markers of success and a reasonable comparator group? Does the plan include data acquisition at meaningful points along the participants' careers? Do the applicants have a feasible strategy to track the participants over time and to gauge the impact of the program? Are there sufficiently frequent efforts to obtain participant feedback and incorporate these to improve the program?

**Dissemination Plan**: Is the dissemination plan strong and clear?

### Environment

Will the scientific and educational environment of the proposed program contribute to its intended goals? Is there a plan to take advantage of this environment to enhance the educational value of the program? Is there tangible evidence of institutional commitment? Is there evidence that the faculty have sufficient institutional support to create a sound educational environment for the participants? Where appropriate, is there evidence of collaboration and buy-in among participating programs, departments, and institutions?

Is there evidence that the program and its environments are effective, inclusive, safe and supportive for the participating students?

Is an Advisory Committee presented and is the proposed expertise adequate?

## Additional Review Criteria

As applicable for the project proposed, reviewers will evaluate the following additional items while determining scientific and technical merit, and in providing an overall impact score, but will not give separate scores for these items.

### Protections for Human Subjects

For research that involves human subjects but does not involve one of the categories of research that are exempt under 45 CFR Part 46, the committee will evaluate the justification for involvement of human subjects and the proposed protections from research risk relating to their participation according to the following five review criteria: (1) risk to subjects, (2) adequacy of protection against risks, (3) potential benefits to the subjects and others, (4) importance of the knowledge to be gained, and (5) data and safety monitoring for clinical trials.

For research that involves human subjects and meets the criteria for one or more of the categories of research that are exempt under 45 CFR Part 46, the committee will evaluate: (1) the justification for the exemption, (2) human subjects involvement and characteristics, and (3) sources of materials. For additional information on review of the Human Subjects section, please refer to the Guidelines for the Review of Human Subjects (//grants.nih.gov/grants/guide/url_redirect.php?id=11175).

### Inclusion of Women, Minorities, and Individuals Across the Lifespan

When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of individuals of all ages (including children and older adults) to determine if it is justified in terms of the scientific goals and research strategy proposed. For additional information on review of the Inclusion section, please refer to the Guidelines for the Review of Inclusion in Clinical Research (//grants.nih.gov/grants/guide/url_redirect.php?id=11174).

### Vertebrate Animals

The committee will evaluate the involvement of live vertebrate animals as part of the scientific assessment according to the following criteria: (1) description of proposed procedures involving animals, including species, strains, ages, sex, and total number to be used; (2) justifications for the use of animals versus alternative models and for the appropriateness of the species proposed; (3) interventions to minimize discomfort, distress, pain and injury; and (4) justification for euthanasia method if NOT consistent with the AVMA Guidelines for the Euthanasia of Animals. Reviewers will assess the use of chimpanzees as they would any other application proposing the use of vertebrate animals. For additional information on review of the Vertebrate Animals section, please refer to the Worksheet for Review of the Vertebrate Animals Section. (//grants.nih.gov/grants/guide/url_redirect.php?id=11150)

### Biohazards

Reviewers will assess whether materials or procedures proposed are potentially hazardous to research personnel and/or the environment, and if needed, determine whether adequate protection is proposed.

### Resubmissions

For Resubmissions, the committee will evaluate the application as now presented, taking into consideration the responses to comments from the previous scientific review group and changes made to the project.

### Renewals

For Renewals, the committee will consider the progress made in the last funding period, and the success of the program in attracting individuals from diverse populations, including populations underrepresented in biomedical, behavioral and clinical research on a national basis.

### Revisions

Not Applicable

## Additional Review Considerations

As applicable for the project proposed, reviewers will consider each of the following items, but will not give scores for these items, and should not consider them in providing an overall impact score.

### Recruitment Plan to Enhance Diversity

Peer reviewers will separately evaluate the recruitment plan to enhance diversity after the overall score has been determined. Reviewers will examine the strategies to be used in the recruitment of prospective participants from underrepresented groups. The review panel's evaluation will be included in the summary statement. Plans will be rated as **acceptable** or **unacceptable**, and the summary statement will provide the consensus of the review committee.

### Training in the Responsible Conduct of Research

Taking into account the specific characteristics of the proposed research education program, the level of participant experience, the reviewers will evaluate the adequacy of the proposed RCR training in relation to the following five required components: 1) ***Format -*** the required format of instruction, i.e., face-to-face lectures, coursework, and/or real-time discussion groups (a plan with only on-line instruction is not acceptable); 2) ***Subject Matter -*** the breadth of subject matter, e.g., conflict of interest, authorship, data management, human subjects and animal use, laboratory safety, research misconduct, research ethics; 3) ***Faculty Participation -*** the role of the program faculty in the instruction; 4) ***Duration of Instruction -*** the number of contact hours of instruction, taking into consideration the duration of the program; and 5) ***Frequency of Instruction*** instruction must occur during each career stage and at least once every four years. See also: NOT-OD-10-019 (http://grants1.nih.gov/grants/guide/notice-files/NOT-OD-10-019.html) and NOT-OD-22-055 (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-22-055.html). The review panel's evaluation will be included in the summary statement. Plans will be rated as **acceptable** or **unacceptable**, and the summary statement will provide the consensus of the review committee.

### Applications from Foreign Organizations

Not Applicable

### Select Agent Research

Generally not applicable. Reviewers should bring any concerns to the attention of the Scientific Review Officer.

### Resource Sharing Plans

Reviewers will comment on whether the Resource Sharing Plan(s) (e.g., Sharing Model Organisms (https://sharing.nih.gov/other-sharing-policies/model-organism-sharing-policy#policy-overview)) or the rationale for not sharing the resources, is reasonable. If support for development, maintenance, or enhancement of software is requested in the application, the reviewers will comment on the proposed software dissemination plan.

### Budget and Period of Support

Reviewers will consider whether the budget and the requested period of support are fully justified and reasonable in relation to the proposed research.

### 2. Review and Selection Process

Applications will be evaluated for scientific and technical merit by (an) appropriate Scientific Review Group(s), convened by National Institute for Biomedical Imaging and Bioengineering (NIBIB) in accordance with NIH peer review policy and procedures (//grants.nih.gov/grants/guide/url_redirect.php?id=11154), using the stated review criteria. Assignment to a Scientific Review Group will be shown in the eRA Commons.

As part of the scientific peer review, all applications will receive a written critique.

- May undergo a selection process in which only those applications deemed to have the highest scientific and technical merit (generally the top half of applications under review) will be discussed and assigned an overall impact score.

Applications will be assigned on the basis of established PHS referral guidelines to the appropriate participating NIH Institute or Center. Applications will compete for available funds with all other recommended applications. Following initial peer review, recommended applications will receive a second level of review by the appropriate national Advisory Council or Board. The following will be considered in making funding decisions:

- Scientific and technical merit of the proposed project as determined by scientific peer review.
- Availability of funds.
- Relevance of the proposed project to program priorities.

### 3. Anticipated Announcement and Award Dates

After the peer review of the application is completed, the PD/PI will be able to access his or her Summary Statement (written critique) via the eRA Commons (https://grants.nih.gov/grants/guide/url_redirect.php?id=11123). Refer to Part 1 for dates for peer review, advisory council review, and earliest start date.

Information regarding the disposition of applications is available in the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11120).

## Section VI. Award Administration Information

### 1. Award Notices

If the application is under consideration for funding, NIH will request "just-in-time" information from the applicant as described in the NIH Grants Policy Statement (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_2/2.5.1_just-in-time_procedures.htm).

A formal notification in the form of a Notice of Award (NoA) will be provided to the applicant organization for successful applications. The NoA signed by the grants management officer is the authorizing document and will be sent via email to the recipient's business official.

Recipients must comply with any funding restrictions described in Section IV.6. Funding Restrictions. Selection of an application for award is not an authorization to begin performance. Any costs incurred before receipt of the NoA are at the recipient's risk. These costs may be reimbursed only to the extent considered allowable pre-award costs.

Any application awarded in response to this FOA will be subject to terms and conditions found on the Award Conditions and Information for NIH Grants (https://grants.nih.gov/grants/policy/nihgps/HTML5/part_ii_subpart_b.htm) website. This includes any recent legislation and policy applicable to awards that is highlighted on this website.

Institutional Review Board or Independent Ethics Committee Approval: Recipient institutions must ensure that protocols are reviewed by their IRB or IEC. To help ensure the safety of participants enrolled in NIH-funded studies, the recipient must provide NIH copies of documents related to all major changes in the status of ongoing protocols.

### 2. Administrative and National Policy Requirements

All NIH grant and cooperative agreement awards include the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11120) as part of the NoA. For these terms of award, see the NIH Grants Policy Statement Part II: Terms and Conditions of NIH Grant Awards, Subpart A: General (//grants.nih.gov/grants/guide/url_redirect.php?id=11157) and Part II: Terms and Conditions of NIH Grant Awards, Subpart B: Terms and Conditions for Specific Types of Grants, Recipients, and Activities (//grants.nih.gov/grants/guide/url_redirect.php?id=11159), including of note, but not limited to:

- Federal wide Research Terms and Conditions (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_3/3.1_federalwide_standard_terms_and_conditions_for_research_grants.htm)

- Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment (https://grants.nih.gov/grants/guide/notice-files/NOT-OD-21-041.html)
- Acknowledgment of Federal Funding (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_4/4.2.1_acknowledgement_of_federal_funding.htm)

If a recipient is successful and receives a Notice of Award, in accepting the award, the recipient agrees that any activities under the award are subject to all provisions currently in effect or implemented during the period of the award, other Department regulations and policies in effect at the time of the award, and applicable statutory provisions.

Should the applicant organization successfully compete for an award, recipients of federal financial assistance (FFA) from HHS will be required to complete an HHS Assurance of Compliance form (HHS 690) (https://ocrportal.hhs.gov/ocr/aoc/instruction.jsf) in which the recipient agrees, as a term and condition of receiving the grant, to administer their programs in compliance with federal civil rights laws that prohibit discrimination on the basis of race, color, national origin, age, sex and disability, and agreeing to comply with federal conscience laws, where applicable. This includes ensuring that entities take meaningful steps to provide meaningful access to persons with limited English proficiency; and ensuring effective communication with persons with disabilities. Where applicable, Title XI and Section 1557 prohibit discrimination on the basis of sexual orientation, and gender identity. The HHS Office for Civil Rights provides guidance on complying with civil rights laws enforced by HHS. Please see https://www.hhs.gov/civil-rights/for-providers/provider-obligations/index.html (https://www.hhs.gov/civil-rights/for-providers/provider-obligations/index.html) and https://www.hhs.gov/civil-rights/for-individuals/nondiscrimination/index.html (https://www.hhs.gov/civil-rights/for-individuals/nondiscrimination/index.html)

HHS recognizes that research projects are often limited in scope for many reasons that are nondiscriminatory, such as the principal investigator's scientific interest, funding limitations, recruitment requirements, and other considerations. Thus, criteria in research protocols that target or exclude certain populations are warranted where nondiscriminatory justifications establish that such criteria are appropriate with respect to the health or safety of the subjects, the scientific study design, or the purpose of the research. For additional guidance regarding how the provisions apply to NIH grant programs, please contact the Scientific/Research Contact that is identified in Section VII under Agency Contacts of this FOA.

- Recipients of FFA must ensure that their programs are accessible to persons with limited English proficiency. For guidance on meeting the legal obligation to take reasonable steps to ensure meaningful access to programs or activities by limited English proficient individuals see https://www.hhs.gov/civil-rights/for-individuals/special-topics/limited-english-proficiency/fact-sheet-guidance/index.html (https://www.hhs.gov/civil-rights/for-individuals/special-topics/limited-english-proficiency/fact-sheet-guidance/index.html) and https://www.lep.gov (https://www.lep.gov/).
- For information on an institution's specific legal obligations for serving qualified individuals with disabilities, including providing program access, reasonable modifications, and to provide effective communication, see https://www.hhs.gov/civil-rights/for-individuals/disability/index.html (https://www.hhs.gov/civil-rights/for-individuals/disability/index.html).
- HHS funded health and education programs must be administered in an environment free of sexual harassment, see https://www.hhs.gov/civil-rights/for-individuals/sex-discrimination/index.html (https://www.hhs.gov/civil-rights/for-individuals/sex-discrimination/index.html). For information about NIH's commitment to supporting a safe and respectful work environment, who to contact with questions or concerns, and what NIH's expectations are for institutions and the individuals supported on NIH-funded awards, please see https://grants.nih.gov/grants/policy/harassment.htm (https://grants.nih.gov/grants/policy/harassment.htm).
- For guidance on administering programs in compliance with applicable federal religious nondiscrimination laws and applicable federal conscience protection and associated anti-discrimination laws see https://www.hhs.gov/conscience/conscience-protections/index.html (https://www.hhs.gov/conscience/conscience-protections/index.html) and https://www.hhs.gov/conscience/religious-freedom/index.html (https://www.hhs.gov/conscience/religious-freedom/index.html).

Please contact the HHS Office for Civil Rights for more information about obligations and prohibitions under federal civil rights laws at https://www.hhs.gov/ocr/about-us/contact-us/index.html (https://www.hhs.gov/ocr/about-us/contact-us/index.html) or call 1-800-368-1019 or TDD 1-800-537-7697.

In accordance with the statutory provisions contained in Section 872 of the Duncan Hunter National Defense Authorization Act of Fiscal Year 2009 (Public Law 110-417), NIH awards will be subject to the Federal Awardee Performance and Integrity Information System (FAPIIS) requirements. FAPIIS requires Federal award making officials to review and consider information about an applicant in the designated integrity and performance system (currently FAPIIS) prior to making an award. An applicant, at its option, may review information in the designated integrity and performance systems accessible through FAPIIS and comment on any information about itself that a federal agency previously entered and is currently in FAPIIS. The Federal awarding agency will consider any comments by the applicant, in addition to other information in FAPIIS, in making a judgement about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in 45 CFR Part 75.205 and 2 CFR Part 200.206 Federal awarding agency review of risk posed by applicants. This provision will apply to all NIH grants and cooperative agreements except fellowships.

### 3. Data Management and Sharing

Note: The NIH Policy for Data Management and Sharing is effective for due dates on or after January 25, 2023.

Consistent with the NIH Policy for Data Management and Sharing, when data management and sharing is applicable to the award, recipients will be required to adhere to the Data Management and Sharing requirements as outlined in the NIH Grants Policy Statement (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_8/8.2.3_sharing_research_resources.htm). Upon the approval of a Data Management and Sharing Plan, it is required for recipients to implement the plan as described.

### 4. Reporting

When multiple years are involved, recipients will be required to submit the Research Performance Progress Report (RPPR) (//grants.nih.gov/grants/rppr/index.htm) annually. Continuation support will not be provided until the required forms are submitted and accepted.

Programs should report on education in the responsible conduct of research and complete a Trainee Diversity Report (https://grants.nih.gov/grants/funding/2590/traineediversity.pdf), in accordance with the RPPR Instruction Guide (//grants.nih.gov/grants/rppr/rppr_instruction_guide.pdf). In addition, information on trainee outcomes should be listed in Undergraduate Training Table 8D (https://grants.nih.gov/grants/funding/datatables-f/Table_8D_Undergraduate_Blank.docx).

NIH FOAs outline intended research goals and objectives. Post award, NIH will review and measure performance based on the details and outcomes that are shared within the RPPR, as described at 45 CFR Part 75.301 and 2 CFR 200.301.

The Federal Funding Accountability and Transparency Act of 2006 (Transparency Act), includes a requirement for awardees of Federal grants to report information about first-tier subawards and executive compensation under Federal assistance awards issued in FY2011 or later. All recipients of applicable NIH grants and cooperative agreements are required to report to the Federal Subaward Reporting System (FSRS) available at www.fsrs.gov (//grants.nih.gov/grants/guide/url_redirect.php?id=11170) on all subawards over the threshold. See the *NIH Grants Policy Statement* (https://grants.nih.gov/grants/policy/nihgps/HTML5/section_4/4.1.8_federal_funding_accountability_and_transparency_act__ffata_.htm) for additional information on this reporting requirement.

Failure by the recipient institution to submit required forms in a timely, complete, and accurate manner may result in an expenditure disallowance or a delay in any continuation funding for the award.

In accordance with the regulatory requirements 45 CFR Part 75 and 2 CFR Part 200 and Appendix XII to 45 CFR Part 75.113 and 2 CFR Part 200.113, recipients that have currently active Federal grants, cooperative agreements, and procurement contracts from all Federal awarding agencies with a cumulative total value greater than $10,000,000 for any period of time during the period of performance of a Federal award, must report and maintain the currency of information reported in the System for Award Management (SAM) about civil, criminal, and administrative proceedings in connection with the award or performance of a Federal award that reached final disposition within the most recent five-year period. The recipient must also make semiannual disclosures regarding such proceedings. Proceedings information will be made publicly available in the designated integrity and

performance system (currently FAPIIS). This is a statutory requirement under section 872 of Public Law 110-417, as amended (41 U.S.C. 2313). As required by section 3010 of Public Law 111-212, all information posted in the designated integrity and performance system on or after April 15, 2011, except past performance reviews required for Federal procurement contracts, will be publicly available. Full reporting requirements and procedures are found in Appendix XII to 45 CFR Part 75 and 2 CFR Part 200 Award Term and Condition for Recipient Integrity and Performance Matters.

### Other Reporting Requirements

- The institution must submit a completed Statement of Appointment (PHS Form 2271 (//grants.nih.gov/grants/guide/url_redirect.php?id=61189)) for each participant appointed full time for eight weeks or more or the equivalent. Grantees must submit the PHS 2271 data electronically using the xTrain system. More information on xTrain is available at xTrain (eRA Commons) (//grants.nih.gov/grants/guide/url_redirect.php?id=41183). An appointment or reappointment may begin any time during the budget period, but not before the budget period start date of the grant year.

A final RPPR and the expenditure data portion of the Federal Financial Report are required for closeout of an award as described in the *NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11161)*.

### 5. Evaluation

In carrying out its stewardship of human resource-related programs, the NIH or its Institutes and Centers will periodically evaluate their R25 research education programs, employing the measures identified below. In assessing the effectiveness of its research education investments, NIH may request information from databases, PD/PIs, and from participants themselves. Where necessary, PD/PIs and participants may be contacted after the completion of a research education experience for periodic updates on participants subsequent educational or employment history and professional activities.

Upon the completion of a program evaluation, NIH and its ICs will determine whether to (a) continue a program as currently configured, (b) continue a program with modifications, or (c) discontinue a program.

In evaluating this research education program National Institute of Biomedical Imaging and Bioengineering (NIBIB) expects to use the following evaluation measures:

Number and demographic characteristics of participants:

- Entering the program
- Entering an honors program
- Completing an undergraduate degree in bioengineering or related STEM field
- Enrolling in an advanced degree program in bioengineering or related STEM field
- Completing a doctorate degree in bioengineering or related STEM field
- Obtaining a postdoctoral position
- Entering a biomedical research or research-related career
- Participants' feedback at the end of each component of the program: the summer bridge, academic year, and summer research experience.

NIBIB may conduct surveys to further assess the impact of the program using the hallmarks of success listed at https://www.nigms.nih.gov/training/dpc/Pages/success.aspx (https://www.nigms.nih.gov/training/dpc/Pages/success.aspx)

## Section VII. Agency Contacts

We encourage inquiries concerning this funding opportunity and welcome the opportunity to answer questions from potential applicants.

### Application Submission Contacts

eRA Service Desk (Questions regarding ASSIST, eRA Commons, application errors and warnings, documenting system problems that threaten submission by the due date, and post-submission issues)

Finding Help Online: https://www.era.nih.gov/need-help (https://www.era.nih.gov/need-help) (preferred method of contact)
Telephone: 301-402-7469 or 866-504-9552 (Toll Free)

General Grants Information (Questions regarding application instructions, application processes, and NIH grant resources)
Email: GrantsInfo@nih.gov (mailto:GrantsInfo@nih.gov) (preferred method of contact)
Telephone: 301-480-7075

Grants.gov Customer Support (Questions regarding Grants.gov registration and Workspace)
Contact Center Telephone: 800-518-4726
Email: support@grants.gov (mailto:support@grants.gov)

SBA Company Registry (Questions regarding required registration at the SBA Company Registry and for technical questions or issues)
Website to Email: http://sbir.gov/feedback?type=reg (http://sbir.gov/feedback?type=reg)

### Scientific/Research Contact(s)

Tina Gatlin, Ph.D.
National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Phone: 301-480-1608
Email:gatlincl@nih.gov (mailto:christine.gatlin@nih.gov)

Ralph Nitkin, Ph.D.
*Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)
Telephone: 301-402-4206
Email: rn21e@nih.gov (BLOCKED::mailto:rn21e@nih.gov)

### Peer Review Contact(s)

Manana Sukhareva, Ph.D.
National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Telephone: (301) 451-3397
Email: sukharem@mail.nih.gov (mailto:sukharem@mail.nih.gov)

### Financial/Grants Management Contact(s)

Monique Binger, Ph.D.
National Institute of Biomedical Engineering and Bioengineering (NIBIB)

Telephone: 301-451-4787
Email: Monique.binger@nih.gov (mailto:Monique.binger@nih.gov)
Margaret Young
*Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)
Telephone: 301-642-4552
Email: margaret.young@nih.gov (mailto:margaret.young@nih.gov)

## Section VIII. Other Information

Recently issued trans-NIH policy notices (//grants.nih.gov/grants/guide/url_redirect.php?id=11163) may affect your application submission. A full list of policy notices published by NIH is provided in the NIH Guide for Grants and Contracts (//grants.nih.gov/grants/guide/url_redirect.php?id=11164). All awards are subject to the terms and conditions, cost principles, and other considerations described in the NIH Grants Policy Statement (//grants.nih.gov/grants/guide/url_redirect.php?id=11120).

### Authority and Regulations

Awards are made under the authorization of Sections 301 and 405 of the Public Health Service Act as amended (42 USC 241 and 284) and under Federal Regulations 42 CFR Part 52 and 45 CFR Part 75.

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