



NATIONAL SCIENCE FOUNDATION
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ARLINGTON, VIRGINIA 22230

NSF 17-093

Dear Colleague Letter: CAREER Proposals Submitted to the Directorate for Education and Human Resources (EHR) - Suggestions for Enhancing the Quality of Proposals

June 5, 2017

Dear Colleagues:

The Faculty Early Career Development (CAREER) Program is a Foundation-wide activity that offers the National Science Foundation's most prestigious awards in support of early-career faculty who have the potential to serve as academic role models in research and education, and to lead advances in the mission of their departments or organizations. The intent of the program is to provide stable support at a sufficient level and duration to enable awardees to develop careers not only as outstanding researchers, but also as educators demonstrating commitment to teaching, learning, and dissemination of knowledge. The CAREER program solicitation ([NSF 17-537](#)) can be accessed at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf17537.

The Directorate for Education and Human Resources (EHR) supports excellence in U.S. STEM education at all levels and settings for the development of a diverse and well-prepared workforce of scientists, technicians, engineers, mathematicians, and educators, as well as a well-informed citizenry. A significant portion of the EHR investment is strategically aimed at research to understand science, technology, engineering, and mathematics (STEM) learning and education.

The purpose of this letter is twofold: (a) to highlight, clarify, and draw attention to important information included in Program Solicitation [NSF 17-537](#) as it relates to CAREER proposals submitted to divisions and programs within EHR; and (b) to provide suggestions for enhancing the quality of these proposals.

Important Items of the New Program Solicitation Program Solicitation [NSF 17-537](#) highlights significant items related to the investigators' eligibility criteria, including: (a) be engaged in research and education in a field supported by the NSF; and (b) be employed in a tenure-track (**or tenure-track-equivalent**) position as an assistant professor (or equivalent title) as of October 1 after the proposal submission.

It is important to reiterate that for a position to be considered tenure-track-equivalent, it must meet all of the following requirements: (1) the employee has a continuing appointment that is expected to last the five years of a CAREER grant; (2) the appointment has substantial research and educational responsibilities; and (3) the proposed project relates to the employee's career goals and job responsibilities, as well as to the mission of the department or organization.

The following information aims at assisting investigators in the planning, conceptualization, and submission of CAREER proposals to EHR.

FEATURES OF CAREER PROPOSALS

CAREER investigators are encouraged to ensure their proposals address the following key features:

Research Design and Methodology

CAREER investigators are expected to formulate research questions that are likely to yield significant knowledge relevant to core problems of STEM education. To support this goal, the proposed research methods should be detailed and carefully justified.

- Investigators should pose research problems of compelling importance deeply rooted in one or more STEM fields. Proposed research methods must closely align with clear, specific research questions.
- Investigators must demonstrate how the proposed research plan builds upon existing theory and evidence from relevant fields. Proposals must draw broadly on the current education-relevant literatures and also on the specific literature in any STEM domain of central focus.
- Investigators must explicitly describe the research design, including underlying methodological assumptions, targeted population and sampling, measures and instruments, and data gathering and analysis plan. Data collection procedures should be well specified, particularly with information on the reliability, validity, and appropriateness of proposed measures and instruments or specific plans for establishing them if not initially known.
- Proposals involving quantitative research should include: descriptions of the statistical methods to be used; details on how potential threats to internal and external validity will be addressed; results of power analyses demonstrating the adequacy of proposed sample sizes; and estimates of effect sizes, as appropriate.
- Proposals involving qualitative research should explain the procedures that would be used to collect, code, reduce, and analyze data, and describe the specific conceptual frameworks that will guide analyses.

Reporting pilot results and providing examples of anticipated findings that might result from the proposed studies will strengthen the competitiveness of proposals.

The *Common Guidelines for Education Research and Development (NSF 13-126)*, jointly developed by the National Science Foundation and the Institute of Education Sciences in the U.S. Department of Education, are a useful reference to help in the preparation of CAREER proposals. The Guidelines can be found at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf13126.

Integration of Research and Education

Proposals are expected to clearly describe substantially integrated research and education plans with the goal of making advances in both domains. While EHR recognizes that there is no single approach to conceptualizing and implementing an integrated research and education plan, investigators are encouraged to consider and clarify how key features of their

research (e.g., creativity or innovation in the topics addressed and approaches employed) will impact their education goals and, conversely, how key elements of their education activities will inform their research. Please note that simply conducting research on education issues is not sufficient to integrate research and education efforts.

Evaluation

One of the elements to be considered in the review of both the intellectual merit and broader impacts of proposals is the mechanism to evaluate success. Meaningful assessment and evaluation of NSF-funded projects should be based on appropriate metrics. Thus, individual CAREER projects submitted to EHR should include clearly stated goals, specific descriptions of the activities that the PI intends to do, and a plan in place to document the outputs of those activities.

Advisory Boards

CAREER proposals submitted to EHR may include advisory boards, including experts from the fields represented in the proposals to ensure appropriate advice, oversight, direction of the proposed scopes of work, and evaluation of the impact of the research and education activities. Advisory boards may assess the impact and success of a proposal's scope of work; however it is the investigator's responsibility to ensure the required assessment and evaluation plans are sound and employ appropriate metrics, including the presence of the evaluation expertise.

EHR DIVISIONS AND PROGRAMS

Divisions and Programs within EHR emphasize different categories of research and development activities. When submitting a CAREER proposal to EHR, investigators need to indicate the program to which the scope of work of their proposals most closely aligns. Following is a listing of EHR Divisions and Programs that accept CAREER proposals. Investigators are encouraged to read the program solicitations identified below and determine the best fit to their work. Divisions and Programs within EHR that accept CAREER proposals are:

Division of Graduate Education

- EHR Core Research (ECR)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504924

Division of Research on Learning in Formal and Informal Settings

- Advancing Informal STEM Learning (AISL)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504793
- Discovery Research K-12 (DRK-12)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=500047
- EHR Core Research (ECR)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504924
- Innovative Technology Experiences for Students and Teachers (ITEST)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5467
- STEM + Computing Partnerships (STEM +C)

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505006

Division of Undergraduate Education

- EHR Core Research (ECR)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504924
- Improving Undergraduate STEM Education (IUSE)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504976
Note: The IUSE solicitation is currently being revised
- Robert Noyce Teacher Scholarship Program (Track 4)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5733

Division of Human Resources Development

- EHR Core Research (ECR)
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504924
- Historically Black Colleges and Universities Undergraduate Program
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5481
- Louis Stokes Alliances for Minority Participation
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13646
- Tribal Colleges and Universities Program
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5483

To gather additional information about relevant aspects related to the submission of CAREER proposals, please see the Frequently Asked Questions about the CAREER program ([NSF 17-050](#)) at https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf17050. Likewise, to request further clarifications, please access the CAREER EHR Directorate and Division Contacts at <https://www.nsf.gov/crssprgm/career/contacts.jsp>.

Sincerely,

William J. (Jim) Lewis
Acting Assistant Director