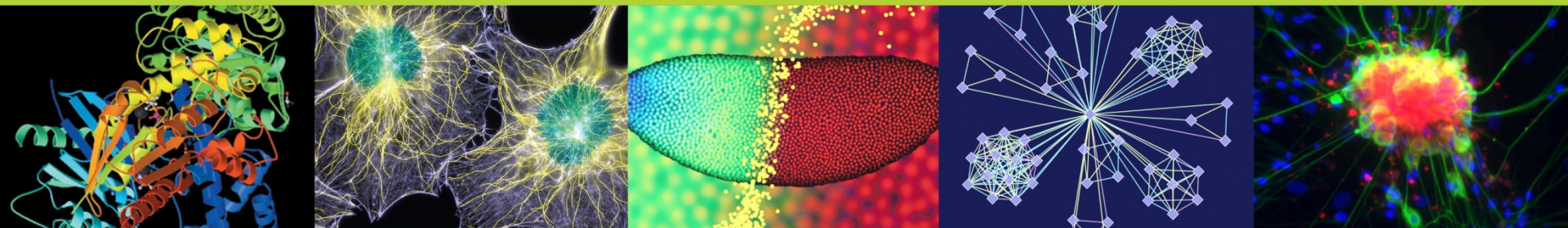


NIGMS Predoctoral T32 Funding Opportunity Announcement Concept Clearance

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Biomedical Graduate Training

- For many years, NIGMS has supported the training of excellent scientists
- While preserving the best elements, NIGMS would like to catalyze changes in biomedical graduate education to keep pace with the rapid evolution of biomedical research

Catalyzing the Modernization of Graduate Education

Propose: Predoctoral T32 training grant Funding Opportunity Announcement (FOA) tailored for NIGMS-supported programs

Gathered input from:

- ✓ Published literature
- ✓ The community (Feedback Loop, RFI, Symposium)
- ✓ NIGMS Leadership, Program Directors, Review Officers
- ✓ NAGMS Council

Summary of Community Input

- **Modern programs should focus on:**
 - Developing a broad range of scientific and professional skills, rigor & reproducibility, diversity & inclusion, career preparation
 - Innovation, assessment, dissemination
- **Research incentive structures can create conflicts with training – programs should focus on:**
 - The development of skilled, creative, rigorous and responsible scientists
 - Current emphasis is primarily on “productive” students
 - Faculty commitment to training and supportive research environment
 - Current emphasis is primarily on research resources and productivity

Rationale

- Parent FOA is written to support most of NIH's T32 programs: Ph.D., M.D./Ph.D., postdoctoral; from basic science to clinical research training.
- The NIGMS FOA will improve the Institute's ability to promote and monitor the modernization of biomedical graduate training and to enhance the diversity of the biomedical research enterprise.

NEW NIGMS-specific funding announcement

- Emphasize the development of a diverse pool of well-trained scientists.
- Focus on skills development, rigor and reproducibility, diversity and inclusion, and responsible conduct.
- Address conflicts in the incentive structure of the research enterprise.
- Encourage the use of evidence-based, innovative educational practices.
- Require the collection and dissemination of data on the success/failure of educational interventions.
- Emphasize improvements in career preparation (broadly defined) and dissemination of career outcomes on publicly available sites.
- Align the review criteria with the training objectives and program plan.

Program Objective Change

The Objective of the Institutional Research Training Grant Program is to:

- **OLD:** develop and/or enhance research training opportunities for individuals interested in careers in biomedical, behavioral and clinical research that are relevant to the NIH mission. The training program should provide.... (a set of experiences)
- **NEW:** develop a diverse pool of responsible, well-trained, scientists who have (a set of skills, described in the next slides)

Proposed *Trainee* Focused Objectives: Technical/Operational Skills

- Broad understanding across biomedical disciplines, and the skills to independently acquire the knowledge needed to advance their chosen field
- The ability to think critically, independently and to identify important biomedical research questions and approaches that push forward the boundaries of their area of study



Proposed *Trainee* Focused Objectives: Technical/Operational Skills

- A strong foundation in rigorous research design, experimental methods, quantitative literacy and reasoning skills, data analysis and rigorous interpretation
- Experience initiating, conducting, interpreting, and presenting rigorous and reproducible biomedical research with increasing independence



Proposed *Trainee* Focused Objectives: Professional Skills

- The ability to work effectively in teams with colleagues from diverse backgrounds and to promote a supportive scientific environment
- The skills and opportunities to communicate scientific research methodologies and findings to a wide variety of audiences in multiple formats
- The knowledge, professional skills and experiences required to identify and transition into productive biomedical research careers



Program Plan

- **OLD** - does not have a program plan description to speak of – it is trying to fit all training grants
- **NEW – highlights**
 - Emphasize that a high quality research environment is essential, but the objectives and program plan must be trainee focused – emphasis on skills development as well as productivity
 - Support the re-working of curricula to de-emphasize learning facts in Year 1 and instead focus on acquiring skills at key stages throughout training
 - Focus on research and professional skills development should increase scientific productivity and efficiency, and decrease the time to degree

Review Criteria: Overall Impact

Overall Impact: Reviewers will provide an overall impact score to reflect their assessment of the likelihood that the proposed training program...

OLD

...will prepare individuals for successful, productive scientific research careers and thereby exert a sustained influence on the research field(s) involved.

NEW

...through courses, structured training activities, and mentored research experiences will produce well-trained, responsible, rigorous and diverse scientists with the technical, operational, and professional skills necessary to transition into productive biomedical research careers.

Review Criteria -Training Program and Environment

Questions focused on:

NEW

OLD

- Research Environment
 - Training Program Plan
 - Institutional Commitment Sufficient
 - Distinct from other funded programs
- Mission, Objectives, and Overall Training Plan
 - Institutional Commitment
 - Research Environment, Faculty, Training Program, Diversity and Inclusion
 - Program Enhancements to the Training Environment
 - Evidence-based approaches to teaching, mentoring and inclusion
 - Mentor Selection Process and Mentor Training
 - Career Development
 - Program Evaluation

Review Criteria: Principal Investigator

- **OLD**
 - Expertise, leadership and time commitment
 - Somewhat discouraging of multiple PI's
- **NEW**
 - Expertise, leadership, *record of rigorous research*, time commitment, *trained in mentoring, diversity and inclusion*
 - Encourage multiple PI's with complementary expertise in training

Review Criteria: Preceptors/Mentors

OLD

- Focused on numbers, funding, and scientific expertise

NEW

- Numbers, funding and expertise
- Bandwidth and commitment *to training*
- Must provide research opportunities and teach: experimental design, rigor & reproducibility
- Trained mentors
- Commitment to diversity and a supportive research environment
- Actively promote career development

Review Criteria: Trainees

OLD

- Mostly whether there are sufficient numbers of “well-qualified” students
- Must have an appointment plan

NEW

- Focus on recruiting and appointing trainees from diverse backgrounds with potential to become outstanding scientists
- Encourages a holistic review process when accepting and appointing students
- Emphasizes a retention plan

Review Criteria: Training Record

OLD

- Completion
- Research accomplishments: (e.g., “high-impact” publications, awards, careers in research, leadership positions)
- Evaluations

NEW

- Completion
- Demonstrate rigorous research activity that advanced scientific knowledge and/or technologies (e.g., peer-reviewed papers, presentations at scientific meetings, etc.)
- Diversity & inclusion
- Career development and tracking
- Evaluation, outcomes, and dissemination and iterative improvements

Timeline

- **NIH Guide publication:** September 2017
- **Application receipt:** May 2018
- **Initial review:** Oct/Nov 2018
- **NAGMS Council review:** January 2019
- **Earliest award date:** July 2019

Questions or comments?