“Best Practices and Effective Grantsmanship for Competitive NIH Institutional Research Training Grant Applications”

December 2016

Jaime S. Rubin, Ph.D.
College of Physicians and Surgeons
Columbia University

JSR9@columbia.edu, (212) 342-3184
NIH Training Grants

- Why Training Grants?
- Timeline of Funding for Junior Investigators
- Institutional National Research Service Awards
  - General description
  - Types of training grants
  - Funding announcements
  - Data: No. of applications, awards, and success rate

NIH Training Grants

- Applications: Overview of Major Components
  - Research
  - Mentors
  - Applicant pool
  - Training program
  - Didactics, career development, other activities
  - Role of Institutions
  - Tables
NIH Training Grants

- Applications: NIH Review
  - Role of NIH Institutes
  - Deadlines
  - Scoring scale, Impact Scores
  - Review criteria

- Applications: Detail of Major Components
  - Program Plan
  - Tables

- General Approaches for Competitive Applications
  - Prepare to Complete the Application
  - Complete the Application

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NIH Training Grants

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Young scientists lead the way on fresh ideas

Analysis of millions of papers finds that junior biomedical researchers tend to work on more innovative topics than their senior colleagues do.

Young researchers are much more likely than older scientists to study exciting innovative topics, according to a text analysis of more than 20 million biomedical papers published over the past 70 years. More-senior researchers are more likely to publish in hot areas when they are supervising a younger scientist.

Young scientists go for fresh ideas.
Callaway E.

Age and the Trying Out of New Ideas

Mikko Packalen, Jay Bhattacharya

NBER Working Paper No. 20920

http://www.nature.com/news/young-scientists-lead-the-way-on-fresh-ideas-1.16934
http://www.nber.org/papers/w20920

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HOT SPOT
Pairings of young first authors and mid-career last authors are the most likely to work on the hottest biomedical topics.
Share of publications trying out new ideas
- >23%
- 20–23%
- 17–20%
- <17%

Rescuing US biomedical research from its systemic flaws

Bruce Alberts\textsuperscript{a}, Marc W. Kirschner\textsuperscript{b}, Shirley Tilghman\textsuperscript{c}, and Harold Varmus\textsuperscript{d}

\textsuperscript{a}Department of Biophysics and Biochemistry, University of California, San Francisco, CA 94158; \textsuperscript{b}Department of Systems Biology, Harvard Medical School, Boston, MA 02115; \textsuperscript{c}Department of Molecular Biology, Princeton University, Princeton, NJ 08540; and \textsuperscript{d}National Cancer Institute, Bethesda, MD 20892

Educating graduate students. For the last several decades, the numbers of graduate students pursuing careers in biomedical science have grown unchecked because trainees are overwhelmingly supported on research grants (2). In contrast, the number of students who rely on training grants and individual fellowships has remained constant for a long time.

To give federal agencies more control over the number of trainees and the quality of their training, we propose moving gradually to a system in which graduate students are supported with training grants and fellowships and not with research grants. Fellowships have the virtue of providing peer review of the student applicants, and training programs set high standards for selection of students and for the education they receive.
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Timeline of Funding for Junior Investigators

- Individual Fellowship
- T32 Training Grant
- Mentor’s Research Grant

<table>
<thead>
<tr>
<th>Graduate School</th>
<th>Post-doctoral Years</th>
<th>Instructor/Assistant Professor</th>
</tr>
</thead>
</table>

Timeline of Funding for Junior Investigators

Graduate School

Post-doctoral Years

Instructor/Assistant Professor

Individual Fellowship
T32 Training Grant
Mentor's Research Grant

Individual Post-doc Fellowship
Institutional T32 Post-doc Training Grant slot
Mentor's Research Grant

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Timeline of NIH Funding for Junior Investigators

Short term Training
Institutional T35

Medical School
Internship/Residency
Fellowship – Research Years
Instructor/Assistant Professor

Year-long Enhancement Programs
MD/PhD Fellowship or Institutional T32

Timeline of NIH Funding for Junior Investigators

Medical School

Short term Training
Institutional T35

Internship/Residency

Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot

Fellowship – Research Years

Instructor/Assistant Professor

Year-long Enhancement Programs
MD/PhD Fellowship or Institutional T32

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Institutional National Research Service Award (T32, T35)

- Institutions select trainees to support for training and career development in defined areas of research
- Defined number of slots
  - Pre-docs, post-docs, or both
- Provides:
  - Stipend
  - Health fees (Training Related Expenses)
  - Tuition
  - Travel

Budget

- Defined line items
- Defined amounts for each line item
- **Stipends:**
  - NIH may increase each FY
  - Pre-doctoral Trainees: One stipend level
  - Post-doctoral trainees: Sliding scale based on years of experience
- **Tuition:** NIH-set levels
- **Training Related Expenses (TRE):** NIH-set levels
- **Travel:** May be set by Institute

Budget

- **Tuition:**
  - **Pre-doctoral Trainee:** “60% of the level requested by the sponsoring institution, up to $16,000 per year”
  - **Dual-degree Pre-doctoral Trainee (e.g., MD/PhD):** “60% of the level requested by the sponsoring institution… up to $21,000 per year.”
  - **Postdoctoral Trainee:** “60% of the level requested by the applicant institution, up to $4,500 per year”
  - **Postdoctoral Trainee in a Formal Degree-Granting Program:** “60% of the level requested by the applicant institution… up to $16,000 per year.”

NIH Grants Policy Statement:

Budget

- **Training Related Expenses (TRE):**
  - Per Trainee, per year
    - Pre-doctoral Trainee: $4,200 (FFY 2016)
    - Postdoctoral Trainee: $8,850 (FFY 2016)
  - “staff salaries, consultant costs, equipment, research supplies, staff travel, trainee health insurance (self-only or family as applicable), and other expenses directly related to the training program”

NIH Grants Policy Statement:
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Ruth L. Kirschstein Institutional National Research Service Award

To enable institutions to recruit individuals selected by the program leadership for predoctoral and/or postdoctoral research training in specified scientific areas.

- **Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Training Grant (Parent T32)**
- T32 Training Program for Institutions That Promote Diversity (T32)
- **Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Training for a Dental, Oral and Craniofacial Research Workforce (T32)**
Ruth L. Kirschstein National Research Service Award (NRSA) Institutional Research Training Grant (Parent T32)

National Cancer Institute (NCI)
National Eye Institute (NEI)
National Heart, Lung, and Blood Institute (NHLBI)
National Human Genome Research Institute (NHGRI)
National Institute on Aging (NIA)
National Institute on Alcohol Abuse and Alcoholism (NIAAA)
National Institute of Allergy and Infectious Diseases (NIAID)
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
National Institute of Biomedical Imaging and Bioengineering (NIBIB)
Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)
National Institute on Deafness and Other Communication Disorders (NIDCD)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
National Institute on Drug Abuse (NIDA)
National Institute of Environmental Health Sciences (NIEHS)
National Institute of General Medical Sciences (NIGMS)
National Institute of Mental Health (NIMH)
National Institute of Neurological Disorders and Stroke (NINDS)
National Institute of Nursing Research (NINR)
National Center for Complementary and Integrative Health (NCCIH)
Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs (ORIP)
Office of Dietary Supplements (ODS)
Contact Institute Program Officer

Confirm Application Deadline (not all Institutes accept applications at all 3 deadlines)

Additional info on programmatic focus, PI requirements, costs (e.g., trainee travel)

Some Institutes have their own Training Grant dedicated webpages
Ruth L. Kirschstein National Research Service Award (NRSA) Short-Term Institutional Research Training Grant (Parent T35) PA-16-151

National Eye Institute (NEI)
National Heart, Lung, and Blood Institute (NHLBI)
National Institute on Aging (NIA)
National Institute on Alcohol Abuse and Alcoholism (NIAAA)
National Institute of Allergy and Infectious Diseases (NIAID)
National Institute of Biomedical Imaging and Bioengineering (NIBIB)

*Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD)
National Institute on Deafness and Other Communication Disorders (NIDCD)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
National Institute of Environmental Health Sciences (NIEHS)
National Center for Complementary and Integrative Health (NCCIH)
Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs (ORIP)

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NRSA Institutional Research Training Grants

Applications, awards, and success rates

[Graph showing applications, awards, and success rates over fiscal years from 1998 to 2015]
Training Grants and Fellowships: Pre- and Post-Doctoral Positions
NRSA Institutional Research Training Grants & Fellowships: Funding in current and constant dollars.
## Funding Facts

<table>
<thead>
<tr>
<th>IC</th>
<th>Fiscal Year</th>
<th>Topic</th>
<th>Activity</th>
<th>Type</th>
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<tr>
<td>All NIH</td>
<td>2014</td>
<td>Applications - Number</td>
<td>T32</td>
<td>New</td>
<td>204</td>
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<tr>
<td>All NIH</td>
<td>2014</td>
<td>Awards - Number</td>
<td>T32</td>
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<tr>
<td>All NIH</td>
<td>2014</td>
<td>Success Rate</td>
<td>T32</td>
<td>New</td>
<td>25.98%</td>
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</table>


<table>
<thead>
<tr>
<th>IC</th>
<th>Fiscal Year</th>
<th>Topic</th>
<th>Type</th>
<th>Statistic</th>
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</thead>
<tbody>
<tr>
<td>All NIH</td>
<td>2014</td>
<td>Applications - Number</td>
<td>Competing Renewals</td>
<td>493</td>
</tr>
<tr>
<td>All NIH</td>
<td>2014</td>
<td>Awards - Number</td>
<td>Competing Renewals</td>
<td>309</td>
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<tr>
<td>All NIH</td>
<td>2014</td>
<td>Success Rate</td>
<td>Competing Renewals</td>
<td>62.68%</td>
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**Project Number:** T32HL007854-21  
**Title:** POSTDOCTORAL TRAINING IN CARDIOVASCULAR DISEASE

**Contact PI / Project Leader Information:**  
**Name:** HARDY, MARK A  
**Email:** Click to view Contact PI / Project Leader email address  
**Title:** PROFESSOR

**Program Official Information:**  
**Name:** CARLSON, DREW E  
**Email:** Click to view PO email address

**Other PI Information:**  
**Name:** MARX, STEVEN Q

**Organization:**  
**Name:** COLUMBIA UNIVERSITY HEALTH SCIENCES  
**City:** NEW YORK  
**Country:** UNITED STATES (US)

**Department/ Organization Type:**  
**Department:** SURGERY  
**Organization Type:** SCHOOLS OF MEDICINE

**Congressional District:**  
**State Code:** NY  
**District:** 13

**FOA:** PA-14-015  
**Study Section:** Special Emphasis Panel [NITM (QA)]

**Fiscal Year:** 2016  
**Award Notice Date:** 18-APR-2016

**DUNS Number:** 621889815  
**Project Start Date:** 1-JUL-1996  
**Budget Start Date:** 1-JUL-2016

**CFDA Code:** 837  
**Project End Date:** 30-JUN-2021  
**Budget End Date:** 30-JUN-2017

**Project Funding Information for 2016:**

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<th>Year</th>
<th>Funding IC</th>
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<th>Indirect Costs: $44,886</th>
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<td>2016</td>
<td>NATIONAL HEART, LUNG, AND BLOOD INSTITUTE</td>
<td>$896,727</td>
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</tr>
</tbody>
</table>

https://projectreporter.nih.gov/reporter.cfm  
**Project Number:** 2T32HL007854-21  
**Title:** POSTDOCTORAL TRAINING IN CARDIOVASCULAR DISEASE  
**Contact PI / Project Leader:** HARDY, MARK A  
**Awardee Organization:** COLUMBIA UNIVERSITY HEALTH SCIENCES

**Abstract Text:**

DESCRIPTION (provided by applicant): This application requests funding for the fourth competitive renewal of a postdoctoral training program in Cardiovascular Diseases. The program is designed to provide opportunities for Cardiology, Surgical and Pediatrics-based physician-scientist trainees to become independent investigators in Cardiovascular research. Trainees will be exposed to a diverse group of faculty, ranging from junior faculty to full-professor, each well-funded, with outstanding training and publication records. Trainees are encouraged to choose co-mentors, to enhance their multi-disciplinary training. Faculty mentors will direct research training in four primary areas: 1) Vascular Biology including atherosclerosis, diabetes and metabolism; 2) Cardiomyocyte biology, including ion channels, pharmacology and tissue- and biomedical-engineering, 3) Immunology and Genomics, and 4) Translational, Outcomes and Clinical Research. The usual duration of the program is two years but may be extended to three years. Candidates are selected from a very large pool of outstanding applicants to our clinical training programs in Surgery, Cardiothoracic Surgery, Adult and Pediatric Cardiology, Neonatology and Pediatric Critical Care, as well as through direct applications to the training program. Special efforts are undertaken to enhance our recruitment of woman and minorities, in part through affiliation with Harlem Hospital’s Surgical Residency program. The training program and the core departments have well-established cardiovascular seminar series and journal clubs, joint laboratory meetings and retreats that are designed to foster collaborations and interdisciplinary research. In addition, the training program itself sponsors an annual retreat, seminars and monthly work-in-progress sessions to assess trainee progress. The training program has an efficient evaluation and feedback system to ensure appropriate training of our fellows. Throughout the program and afterwards, trainees are advised on research and career development, individually and through a mentoring program headed by an Associate Director for Trainee Development. The program is designed to take advantage of the many existing strengths of Columbia University, including the Irving Center for Clinical and Translational Research (CTSA), Mailman School of Public Health, Genome Center, Bioinformatics, Tissue and Biomedical Engineering and numerous basic science departments and strong clinical programs, as well as the established track record of research training of physician-scientists in this program for the past 20 years. (End of Abstract)

**Public Health Relevance Statement:**

Our training program seeks to train physicians and surgeons in the design and execution of high-quality clinically relevant cardiovascular research. The program is designed to enhance and ensure the development of academic leaders by acquiring broad-based scientific knowledge. Highly qualified applicants, with an excellent representation of minorities and women, have filled all slots within the training program.

**Project Terms:**

Cardiovascular Diseases; post-doctoral training
NIH Training Grants

- **Applications: Overview of Major Components**
  - Research
  - Mentors
  - Applicant pool
  - Training program
  - Didactics, career development, other activities
  - Role of Institutions
  - Tables
Research

- Thematic
- Multidisciplinary/Interdisciplinary
- Collaborative
- State-of-the-art
NIH Training Grants

Applications: Overview of Major Components

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Mentors - 1

- **Quality**
  - NIH-funded in TG research area(s)
  - History of successfully mentoring pre-doc and post-doctoral trainees
    - Past mentees have continued in research careers
  - Publications in TG research area(s)
  - History of collaborations

Mentors - 2

- **Quantity**
  - “Critical mass” in TG research area(s)
  - Age distribution
    - Junior faculty w/o NIH funding: Possible co-mentors w/ more senior faculty
  - Gender distribution
  - Coincides with requested number of slots
NIH Training Grants

Applications: Overview of Major Components

- Research
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- Tables
Applicant Pool

- **Quantity**
  - Training Grant Eligible [TGE]
  - Coincides with requested number of slots

- **Quality**
  - Past research experiences
  - Academic record
  - Reviewers will be confident that they will continue in research-oriented careers
NIH Training Grants

Applications: Overview of Major Components

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Training Program - 1

- **Formal organizational structure**
  - **Director(s)**
    - Expertise and experience as leader and administrator (preferably in a training/educator role)
  - **Associate Program Directors**
  - **Programmatic Committees**
  - **Advisory Committees**
    - Internal and External
Training Program - 2

**Formal Processes**

- Recruitment/Admissions
  - Committee
  - Selection Process
  - Advertisement
  - Materials
  - Underrepresented Minorities
- Trainees’ selection of mentors
- Monitoring of trainees’ academic/research progress
- Didactic program
- Measurement/Evaluation of training program; e.g. outcomes, questionnaires for mentors and mentees
NIH Training Grants

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Didactics, Career Development, and Other Activities

- Formal courses
- Retreat
- Seminars/Journal Clubs
- Research presentations
- Individual Development Plans (IDP)
- Training in the “Responsible Conduct of Research”
- Training in “Rigor and Reproducibility”

Program-specific activities are important

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Advanced Notice of Coming Requirements for Formal Instruction in Rigorous Experimental Design and Transparency to Enhance Reproducibility: NIH and AHRQ Institutional Training Grants, Institutional Career Development Awards, and Individual Fellowships

Individual fellowship applications will be required to summarize in the research strategy section plans to ensure rigorous, well-controlled experiments that consider all relevant biological variables, use authenticated biological and chemical resources, and apply appropriate statistical tests for data analyses. In addition more detailed description of instruction in rigorous experimental design to ensure reproducibility will be required in the section on Institutional Environment and Commitment to Training. The impacted programs will include the following individual fellowships: F05, F30, F31, F32, F37, F38, and F12.

Individual Development Plans

- “NIH encourages grantees to develop an institutional policy requiring that an Individual Development Plan (IDP) be implemented for every graduate student and postdoctoral research supported by any NIH grant… regardless of the type of NIH grant that is used for support.”

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Individual Development Plans

- **Science Careers: myIDP:**
  - “Exercises to help you examine your skills, interests, and values
  - A list of 20 scientific career paths with a prediction of which ones best fit your skills and interests
  - A tool for setting strategic goals for the coming year, with optional reminders to keep you on track
  - Articles and resources to guide you through the process”

http://myidp.sciencecareers.org/

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NIH Training Grants

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- Tables
Institution

- Need
  - Support for trainees not otherwise available

- Support, Resources, and Commitment
  - Letters of support from senior leadership
  - Research and career development resources
  - Financial, e.g., to support PI’s effort, stipend/tuition supplementation

- Training Program Integrated into Research and Academic Infrastructure
NIH Training Grants

- Applications: Overview of Major Components
  - Research
  - Mentors
  - Applicant pool
  - Training program
  - Didactics, career development, other activities
  - Role of Institutions
  - Tables
Tables

- Very time- and labor-intensive
- Many different data elements on mentors, applicant pool, and past and current trainees
- Information from many different institutional academic components
  - Schools, Departments, Centers/Institutes, etc.
- NIH provides example completed Tables
- Cannot start too early
NIH Training Grants

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<table>
<thead>
<tr>
<th>Cntr for Scientific Rev</th>
<th>Institutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Research Grants (R01, R03)</td>
<td>• Multi-Project Grants (P01, P50, etc)</td>
</tr>
<tr>
<td>• Fellowships (F’s)</td>
<td>• Training Grants (T’s)</td>
</tr>
<tr>
<td>• Small Business</td>
<td>• Career Development (K’s)</td>
</tr>
<tr>
<td></td>
<td>• Conference Grants (R13)</td>
</tr>
<tr>
<td></td>
<td>• Research Grants in response to RFAs</td>
</tr>
<tr>
<td></td>
<td>• Contracts</td>
</tr>
</tbody>
</table>

Adapted from: NIH (DRG) - Peer Review of NIH Research Grants Applications

<table>
<thead>
<tr>
<th>Activity Codes</th>
<th>Program Description</th>
<th>Cycle I Due Date</th>
<th>Cycle II Due Date</th>
<th>Cycle III Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>T Series</td>
<td><em>Institutional</em> National Research Service Awards Other Training Grants</td>
<td>January 25</td>
<td>May 25</td>
<td>September 25</td>
</tr>
</tbody>
</table>

D Series
*All - new, renewal, resubmission, revision

NOTE: Applicants should check with the relevant Institute or Center (IC), since some do not accept T series applications for all three receipt/review/award cycles. Applicants should refer to the IC Table of Contacts for information for each IC's scientific/research contact for the NRSA T32 program.
## Application Due Dates

<table>
<thead>
<tr>
<th>Activity Codes Cited Above</th>
<th>Program Description</th>
<th>Cycle I Due Date</th>
<th>Cycle II Due Date</th>
<th>Cycle III Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Activity Codes</strong></td>
<td>AIDS and AIDS-Related Applications</td>
<td>May 7</td>
<td>September 7</td>
<td>January 7</td>
</tr>
</tbody>
</table>

*Effective. Sept 5, 2015 - N/A for SBIR/STTR Applications using Standard Due Dates

NOTE: See Key Dates section of funding opportunity announcement to determine if AIDS dates apply.
## Application Due Dates

<table>
<thead>
<tr>
<th></th>
<th>Cycle I</th>
<th>Cycle II</th>
<th>Cycle III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Due Dates</td>
<td>January 25 - May 7</td>
<td>May 25 - September 7</td>
<td>September 25 - January 7</td>
</tr>
<tr>
<td>Scientific Merit Review</td>
<td>June - July</td>
<td>October - November</td>
<td>February - March</td>
</tr>
<tr>
<td>Advisory Council Round</td>
<td>August or October *</td>
<td>January</td>
<td>May</td>
</tr>
<tr>
<td>Earliest Project Start Date</td>
<td>September or December *</td>
<td>April</td>
<td>July</td>
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</table>

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OVERALL IMPACT

Reviewers are asked to provide an overall impact/priority score to reflect their assessment of
the likelihood for the project to promote the training of pre- and postdoctoral fellows in
biomedical, behavioral and clinical research, in consideration of the following five core review
criteria, and the additional review criteria (as applicable for the project proposed).

**Overall Impact** Write a paragraph summarizing the factors that informed your Overall Impact score.
NIH's New Evaluation System (1/09)

9-point rating scale (1=exceptional; 9=poor)

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Impact</td>
<td>1</td>
<td>Exceptional</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Outstanding</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Excellent</td>
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<tr>
<td>Moderate Impact</td>
<td>4</td>
<td>Very Good</td>
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<tr>
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<td>Outstanding</td>
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<td>3</td>
<td>Excellent</td>
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<td>4</td>
<td>Very Good</td>
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<td>6</td>
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<td>8</td>
<td>Marginal</td>
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<td>9</td>
<td>Poor</td>
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</table>

**Minor Weakness:** An easily addressable weakness that does not substantially lessen impact

**Moderate Weakness:** A weakness that lessens impact

**Major Weakness:** A weakness that severely limits impact
## INSTITUTIONAL TRAINING & INSTITUTIONAL CAREER AWARDS

### Overall Impact:
The likelihood that the proposed training (T) or career development (K) program will prepare individuals for successful, productive scientific research careers and thereby exert a sustained influence on the research field(s) involved.

### Evaluating Overall Impact
Consider the 5 criteria (weighting based on reviewer’s judgment):

<table>
<thead>
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<th>Ts</th>
<th>Ks</th>
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<tbody>
<tr>
<td>Training Program and Environment</td>
<td>Career Development Program &amp; Environment</td>
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<td>Training PD(s)/PI(s)</td>
<td>PD(s)/PI(s)</td>
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<td>Preceptors/ Mentors</td>
<td>Mentors</td>
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<tr>
<td>Trainees</td>
<td>Candidates/ Scholars</td>
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<tr>
<td>Training Record</td>
<td>Training Record</td>
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and other score influences, e.g. human subjects, animal welfare, inclusion plans, and biohazards.

### Overall Impact Table

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<tr>
<th>Score</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
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### Examples:
- **e.g. Proposes a high-value training or career development program that is well designed to prepare individuals for highly successful, productive scientific research careers.**
  - Weaknesses in the criteria may have some or no weaknesses in the criteria.
  - 5 is a good, medium-impact application. The entire scale (1-9) should always be considered.

- **e.g. Proposes a training or career development program of moderate value that is adequately designed to prepare individuals for successful, productive scientific research careers.**
  - Weaknesses in the criteria reduce the overall impact to medium.
  - 4 is a medium, low-impact application. The entire scale (1-9) should always be considered.

- **e.g. Proposes a low-value training or career development program that is inadequately designed. May have some or no weaknesses in the criteria.**
  - 3 is a low, very low-impact application. The entire scale (1-9) should always be considered.
Pink Sheet: Reviewers’ Comments
Final Impact Score:

10 x Average (to one decimal point) of the Overall/Priority Score [1 – 9 (whole integers)] provided by all eligible reviewers.

Range: 10 – 90

Example: 20 reviewers

Scores: 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 10 x 44/20 = 10 x 2.2 = 22
Training Grant Payline: NHLBI

<table>
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<tr>
<th>Grant Program</th>
<th>Percentile</th>
<th>Priority Score</th>
<th>Description</th>
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<tr>
<td>T32/T35</td>
<td>25</td>
<td></td>
<td>Institutional NRSA Training</td>
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</table>
NIH Training Grants

- **Applications: NIH Review**
  - Role of NIH Institutes
  - Deadlines
  - Scoring scale, Impact Scores
  - Review criteria

- **Applications: Detail of Major Components**
  - Program Plan
  - Tables

- **General Approaches for Competitive Applications**
  - Prepare to Complete the Application
  - Complete the Application
1. **Training Program and Environment**

- Are the research facilities and research environment conducive to preparing trainees for successful careers as biomedical research scientists?
- Are the objectives, design and direction of the proposed research training program likely to ensure effective training?

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<tr>
<th>Weaknesses</th>
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T32 – 1. Training Program and Environment

“Do the courses, where relevant, and research experiences provide opportunities for trainees to acquire state-of-the-art scientific knowledge, methods, and tools that are relevant to the goals of the training program?

Does the program provide appropriate inter- or multidisciplinary research training opportunities?

Is the proposed training program likely to ensure trainees will be well prepared for research-intensive and research-related careers?
T32 – 1. Training Program and Environment

- “Is the level of institutional commitment to the training program, including administrative and research training support, sufficient to ensure the success of the program?

- Is it clear how the proposed training program is distinguished from other externally funded training programs at the institution?
T32 – 2. Training Program Director(s) (PI)

- “Does the PD/PI have the scientific background, expertise, and administrative and training experience to provide strong leadership, direction, management, and administration of the proposed research training program?

- Does the PD/PI plan to commit sufficient effort to the program to ensure the program's success?”

2. Training Program Director/Principal Investigator (PD/PI)

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T32 - 3. Preceptors/Mentors

“Are sufficient **numbers** of experienced preceptors/mentors with **appropriate expertise and funding** available to support the number and level of trainees (including short-term trainees, if applicable) proposed in the application?”

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<th>3. Preceptors/Mentors</th>
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<td><strong>Strengths</strong></td>
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<tr>
<td><strong>Weaknesses</strong></td>
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</table>
T32 – 3. Preceptors/Mentors

“Do the preceptors/mentors have strong records as researchers, including recent publications and successful competition for research support in areas directly related to the proposed research training program?”

“Do the preceptors/mentors have strong records of training individuals at the level of trainees (including short-term trainees, if applicable) proposed in the program?”

“Are appropriate plans in place to ensure that preceptors lacking sufficient research training experience are likely to provide strong and successful mentoring?”
T32 – 4. Trainees

“Is a recruitment plan proposed with strategies likely to attract well-qualified trainees for the training program?

Is there a competitive applicant pool of sufficient size and quality, at each of the proposed levels (predoctoral, postdoctoral and/or short-term), to ensure a successful training program?”?

4. Trainees

Strengths

•

Weaknesses

•
T32 – 4. Trainees

“Are there well-defined and justified selection and re-appointment criteria as well as retention strategies?”
T32 – 5. Training Record

““How successful are the trainees (or for new applications, other past students/fellows in similar training) in completing the program?”

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<th>5. Training Record</th>
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<td><strong>Strengths</strong></td>
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<tr>
<td><strong>Weaknesses</strong></td>
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T32 – 5. Training Record

“Has the training program ensured that trainees are productive (or, for new applications, other past students/postdoctorates in similar training) in terms of research accomplishments, publication of research conducted during the training period, and subsequent training appointments and fellowship or career development awards?”
T32 – 5. Training Record

“How successful are the trainees (or for new applications other past students/postdoctorates in similar training) in achieving productive scientific careers as evidenced by successful competition for research science positions in industry, academia, government or other research venues; grants, receipt of honors, awards, or patents; high-impact publications; promotion to scientific leadership positions; and/or other such measures of success?”
T32 – 5. Training Record

““To what extent do trainees' subsequent positions in industrial, academic, government, non-profit, or other sectors benefit from their NRSA-supported research training and directly benefit the broader biomedical research enterprise?”

“Does the program propose a rigorous evaluation plan to assess the quality and effectiveness of the training?

Are effective mechanisms in place for obtaining feedback from current and former trainees?”
NIH Training Grants

- Applications: NIH Review
  - Role of NIH Institutes
  - Deadlines
  - Scoring scale, Impact Scores
  - Review criteria

- Applications: Detail of Major Components
  - Program Plan
  - Tables

- General Approaches for Competitive Applications
  - Prepare to Complete the Application
  - Complete the Application

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TRAINING INSTRUCTIONS FOR NIH AND
OTHER PHS AGENCIES
SF424 (R&R) APPLICATION PACKAGES

Guidance developed and maintained by NIH for preparing and submitting applications via Grants.gov to NIH and other PHS agencies using the SF424 (R&R)
### Training Program Section

2. * Program Plan

3. Plan for Instruction in the Responsible Conduct of Research

4. Plan for Instruction in Methods for Enhancing Reproducibility

5. Multiple PD/PI Leadership Plan (if applicable)

6. Progress Report (for RENEWAL applications only)

### Faculty, Trainees and Training Record Section

7. Participating Faculty Biosketches

8. Letters of Support

9. Data Tables

Program Plan

- 25 pages
- Refer to and summarize Data Tables in text
- Include Figures and Tables where informative

A. Background

- Rationale, history, need, current training activities, etc.
- Tables 1, 2, and 3

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B. Program Plan

a. Program Administration
   - Program Director, Administrative structure

b. Program Faculty
   - Mentors’ research, funding and collaborations
   - Criteria for selecting Mentors
   - Tables 2, 4, and 5
Formal Organizational Structure

Multidisciplinary Training in Translational Research

- Program Director/ Principal Investigator: Dr. X
- Associate Program Director: Dr. Y

External Advisory Comm
- Dr. A
- Dr. B
- Dr. C

Internal Advisory Comm
- Dr. D
- Dr. E
- Dr. F

Recruitment and Admissions Committee
- Dr. M
- Dr. N
- Dr. O

Research and Mentorship Committee
- Dr. R
- Dr. S
- Dr. T

Career Development Committee
- Dr. I
- Dr. J
- Dr. K

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<table>
<thead>
<tr>
<th>Committee</th>
<th>Role and Responsibilities</th>
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</table>
| Recruitment and Admissions      | • Advertisement of training program  
• Recruitment of trainees  
• Formal application  
• Review and selection process  
• Diversity and recruitment of underrepresented minorities |
| Research and Mentorship         | • Trainees’ selection of mentors  
• Didactic program, e.g., formal courses, workshops  
• Monitoring of trainees’ academic and research progress  
• Yearly Retreat  
• Meetings with and Progress Reports to Advisory Committees  
• Seminars and Journal Clubs  
• Research presentations by trainees  
• Measurement/Evaluation of training program  
  e.g., Outcomes (“Where are they Now”), Questionnaires for mentors and mentees |
| Career Development              | • Individual Development Plans (IDP)  
• Preparation for the next career stage  
  e.g., Post-doctoral Trainees: “Transition to Independence”  
• Training: “Responsible Conduct of Research”, how to write journal articles, give presentations, grantsmanship and funding, etc. |
B. Program Plan

a. Program Administration
   - Program Director, Administrative structure

b. Program Faculty
   - Mentors’ research, funding and collaborations
   - Criteria for selecting Mentors
   - Tables 2, 4, and 5
Multidisciplinary Research Theme A

Sub-Research Theme #1

Sub-Research Theme #2

Multidisciplinary Research Theme B
Program Plan

B. Program Plan

a. Program Administration
   - Program Director, Administrative structure

b. Program Faculty
   - Mentors’ research, funding and collaborations
   - Criteria for selecting Mentors
   - Tables 2, 4, and 5
“Connecting lines” represent collaborations (e.g., grants, publications, co-mentorship)

Mentors are grouped by Research Area
Program Plan

B. Program Plan

- c. Proposed Training
  - Trainees: No., Level(s), Academic/Research Background
  - Research opportunities
  - How Trainees select Mentors and research areas
  - Oversight of Trainees: Monitoring and Evaluation
  - Degree programs, didactics, courses, seminars, workshops, journal clubs
  - Length of training (e.g., 2 years for post-docs)
Program Plan

B. Program Plan

d. Training Program Evaluation

- Input from current and former Trainees
- Evaluation metrics
- Outcome data on former Trainees’ career progression (e.g., current positions, funding, publications)
Program Plan

B. Program Plan

e. Trainee Candidates

- Size and qualifications of applicant pool
- Recruitment activities
- Process and criteria to select Trainees
- Table 6
Program Plan

B. Program Plan

f. Institutional Environment and Commitment to Training

- Document (Letter of Support) and describe institutional support (e.g., PI’s effort, space, support of additional Trainees, stipend supplementation)

- Relationship of proposed training program to any similar programs at the applicant institution

- Proposed training program should have its own identity, but still integrated into the research and research training/academic activities of the institution
B. Program Plan

g. Qualifications of Trainee Candidates and Admissions and Completion Records

- Recruitment and retention of trainees
- Competitiveness of the selection process
- “Quality and Quantity” of the applicant pool
- Tables 6, 7, and 8
C. Recruitment Plan to Enhance Diversity

- History and Achievements
- Proposed plans
- Critical to include Training Program’s efforts, not just institutional policies and efforts
- “Supplemental Grant Application Instructions”
  

- Tables 6 and 7
Program Plan

C. Recruitment Plan to Enhance Diversity

A: “Individuals from racial and ethnic groups that have been shown... to be underrepresented in health-related sciences... Blacks or African Americans, Hispanics or Latinos, American Indians or Alaska Natives, and Native Hawaiians and other Pacific Islanders.

B: “Individuals with disabilities, who are defined as those with a physical or mental impairment that substantially limits one or more major life activities...”

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Program Plan

C. Recruitment Plan to Enhance Diversity

C: Individuals from disadvantaged backgrounds:

- C1: “Individuals who come from a family with an **annual income** below established low-income thresholds.”

- C2: “Individuals who come from an **educational environment** [that has] inhibited the individual from obtaining the knowledge, skills, and abilities necessary to develop and participate in a research career.”

- C1 and C2: “applicable **only to programs focused on high school and undergraduate candidates**…. generally **NOT** part of the recruitment plan for predoctoral and postdoctoral trainees on institutional training grants….”
### Training Program Section

2. * Program Plan

3. Plan for Instruction in the Responsible Conduct of Research

4. Plan for Instruction in Methods for Enhancing Reproducibility

5. Multiple PD/PI Leadership Plan (if applicable)

6. Progress Report (for RENEWAL applications only)

### Faculty, Trainees and Training Record Section

7. Participating Faculty Biosketches

8. Letters of Support

9. Data Tables
Tables

- Data on Participating Depts./Centers
- Data on Mentors
- Data on Trainee Applicants and Entrants
- Data on TG-Supported Trainees
Tables

- **Data on Participating Depts./Centers**
  - Training environment (Table 1)
  - “Critical Mass” of faculty
  - Distribution of scientific disciplines
  - # of Faculty
  - # of Training Program participating faculty
  - # of Pre- and Postdoctoral Trainees
  - # of TGE Pre- and Postdoctoral Trainees

Tables

- **Data on Mentors**
  - Distribution and Mentoring Record (Table 2)
    - Distribution: Rank (title), Dept./Center, Degrees, Research interests
    - Mentoring Record for Pre- and Postdoctoral Trainees:
      - # Current Trainees, # of Trainees who completed training, # who continued in research-related careers
  - Current other training grants (Table 3)
    - Overlap with other training programs?
  - Extramural research support (Table 4)
    - Adequate for trainee’s research costs?
  - Publication track record of Trainees (Table 5)
    - Measure of trainees’ productivity (‘‘quality and quantity’’)

### Tables

#### Data on Applicants and Entrants (Table 6)

- **“Quality and Quantity”** of applicant pool
- Selectivity and Competitiveness of recruitment
- Determination of the no. of “slots” to be awarded

#### Counts

- # of Total applicants, # of TGE applicants, # of Entrants, # of TGE Entrants, # of TGE Entrants appointed to TG

#### Characteristics

- GPA of applicants and entrants [pre-docs]
- Entrants: Previous research experience (months) [pre-dos]
- # of publications/# of 1st author publications [post-docs]
- Entrants: Previous institutions, % from underrepresented groups, % with disability

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Tables

- **Data on TG-Supported Trainees**
  - TG Appointments (Table 7-renewals)
    - No of “Slots”: Awarded and Appointed
    - Best to avoid “unfilled slots”
  - Program Outcomes (Table 8)
    - Individual Pre- and Post-docs:
      - During training: Mentor, Funding, Degrees received, Research topic
      - Post training: Initial and current positions, Subsequent grant support
    - Statistics: % of Pre-docs receiving Ph.D. and average time to degree

NIH Resources for Training Grant Applications

- Program Announcements for NIH Institutional Training Grants (e.g., T32, T35)
  https://researchtraining.nih.gov/programs/training-grants

- Specific Institute Contacts, Interests and Instructions

- Review Criteria and Considerations, Guidelines for Reviewers, Review Critique Fillable Templates
  https://grants.nih.gov/grants/policy/review_templates.htm

- Additional Scoring Guidance

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NIH Resources for Training Grant Applications

- **Review Criteria at a Glance – Training**

- **Supplemental Grant Application Instructions**

- **NIH Research Training and Career Development**
  - Individual Career Path Information, Funding Programs at each Institute, FAQ’s, Information for Applicants and Awardees
  https://researchtraining.nih.gov/

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NIH Resources for Training Grant Applications

- NIH Biosketch Format Pages, Instructions and Samples
  http://grants.nih.gov/grants/forms/biosketch.htm

- Instruction in the Responsible Conduct of Research

- Application Page Limits
NIH Resources for Training Grant Applications

- Funded Training Grants – NIH Reporter

- Application and Award Information-Funding Facts
NIH Training Grants

- Applications: NIH Review
  - Role of NIH Institutes
  - Deadlines
  - Scoring scale, Impact Scores
  - Review criteria

- Applications: Detail of Major Components
  - Program Plan
  - Tables

- General Approaches for Competitive Applications
  - Prepare to Complete the Application
  - Complete the Application

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It’s not the will to win, but the will to prepare to win that makes the difference.

Bear Bryant, University of Alabama
Prepare to Complete the Grant Application

- Speak with Institute’s TG Program Officer
- Speak with colleagues who are/were awardees
- Review funded applications if possible
- Review NIH TG review criteria
- Identify what will make the application more competitive
  - Research and career development opportunities
  - Who should be Mentors?
  - What is/are the Applicant Pool(s)?
  - Who will serve as Advisors?

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Research and Career Development Arrangements

- Multiple Principle Investigators
- Mentors and Co-Mentorship
- Advisory Groups
- Multidisciplinary/Interdisciplinary Research
- Role of Institutional offices
  - Office of Graduate Affairs/Student Affairs
  - Office of Post-doctoral Affairs
  - Office of Diversity and Multicultural Affairs
Prepare to Complete the Grant Application

- Identify and meet with those with Programmatic Leadership roles (e.g., Committees)
- Identify application preparation roles and responsibilities
  - Programmatic, Administrative
- Identify necessary research facilities and career development resources
- Meet with research administrators
- Human subjects, lab animals and any other regulatory issues?

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Complete the Grant Application

- Review the application instructions
- Identify the different components
- Create a checklist
- Create an outline
  - Content, Length of section (*vis a vis* page limits)
- Identify and delegate responsibilities for the different components
  - Programmatic
  - Administrative – e.g. budget
  - Draft letters of support
- Identify colleague(s) to review and comment

Complete the Grant Application

- Confirm page limits for each component
- Create a schedule for any required meetings
- Determine:
  - Shared computer drive/folders
  - Naming of files (dates?)
  - Track changes?
  - Font, margin, other formatting requirements
- Set a **firm** time-line for each responsibility
  - Writing milestones
  - Absolute deadline date for final compilation
<table>
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<tr>
<th>Mentor</th>
<th>e-mail address</th>
<th>Agreed</th>
<th>Biosketch</th>
<th>Research Paragraph</th>
<th>Research Facilities</th>
<th>Table 2</th>
<th>Table 3 TG Support</th>
<th>Table 4 Funding</th>
<th>Table 5 Pubs</th>
<th>Collab</th>
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SPA: Sponsored Projects Administration (grants office)
Anticipate Questions
and
Answer them before they are asked
Elements of a Good Proposal

- Feasible
- Relevant
- Unique
- Innovative
- Clear
- Brief
- Consistent
NIH: One round of applications
Bell Curve of Reviewer’s Grant Applications

Definitely do not fund

Fine

Definitely fund

Great

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Trainees Have Poor Outcomes With Regard To Continuing in Research

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Mentors Do Not Have Extramural Research Funding
Career Development/Research Training Plan
Not Comprehensive

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Data Tables Are Not Internally Consistent
All Components Of The Application Are As Strong as Possible
Good Luck!