NIH F31 Fellowship Applications

- National Research Mentoring Network -

September 27, 2016

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

Course: “Funding and Grantsmanship for Research and Career Development Activities”

http://grantscourse.columbia.edu/
Topics to be Discussed

- NIH Fellowship Overview
- NIH Fellowship Grant Review Process
  - Institutes and Study Sections
  - Scoring System: Impact Scores
  - Fellowship Review Criteria
- Components of a Fellowship Application
- Approaches for Competitive Applications
  - Prepare to Write the Grant Application
  - Complete the Grant Application

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- **NIH Fellowship Grant Review Process**
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- **Components of a Fellowship Application**

- **Approaches for Competitive Applications**
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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.
Improving graduate student and postdoctoral training

- A. Put individual development plans in place for all trainees
- B. Reduce the length of graduate training
- C. Provide F30 and F31 awards from all Institutes/Centers
- D. Increase postdoctoral stipends and consider policies on benefits
- E. Increase support for K99/R00 and shorten eligibility period
- F. Increase support for Early Independence Awards

http://acd.od.nih.gov/bwf.htm
Predoctoral Individual National Research Service Award (F31)

- Supports specific individual in a research degree program
- Stipend, health fees, tuition, travel
- Review criteria:
  - Individual fellow
  - Mentor
  - Research project
  - Research/Career Development environment

Pre-doc Fellowships (F31s)
Applications, awards, and success rates
## Application Due Dates

<table>
<thead>
<tr>
<th>Activity Codes</th>
<th>Program Description</th>
<th>Application Instructions</th>
<th>Cycle I Due Date</th>
<th>Cycle II Due Date</th>
<th>Cycle III Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01 new</td>
<td>Research Grants</td>
<td>SF424 (R&amp;R)</td>
<td>February 5</td>
<td>June 5</td>
<td>October 5</td>
</tr>
<tr>
<td>U01 new</td>
<td>Research Grants - Cooperative Agreements</td>
<td>SF424 (R&amp;R)</td>
<td>February 5</td>
<td>June 5</td>
<td>October 5</td>
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<tr>
<td>K series new</td>
<td>Research Career Development</td>
<td>SF424 (R&amp;R)</td>
<td>February 12</td>
<td>June 12</td>
<td>October 12</td>
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<tr>
<td>R03, R21, R33, R21/R33, R34, R36 new</td>
<td>Other Research Grants</td>
<td>SF424 (R&amp;R)</td>
<td>February 16</td>
<td>June 16</td>
<td>October 16</td>
</tr>
<tr>
<td><strong>F Series Fellowships new, renewal, resubmission</strong></td>
<td><em>Individual</em> National Research Service Awards (Standard) (see NRSA Training Page)</td>
<td>SF424 (R&amp;R)</td>
<td>April 8</td>
<td>August 8</td>
<td>December 8</td>
</tr>
<tr>
<td><strong>F31 Diversity Fellowships new, renewal, resubmission</strong></td>
<td><em>Individual</em> Predoctoral Fellowships (F31) to Promote Diversity in Health-Related Research (see NRSA Training Page)</td>
<td>SF424 (R&amp;R)</td>
<td>April 13</td>
<td>August 13</td>
<td>December 13</td>
</tr>
</tbody>
</table>

### All Activity Codes Cited Above
- new, renewal, resubmission, revision

**AIDS and AIDS-Related Applications**

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

**Based on Activity Code**

<table>
<thead>
<tr>
<th></th>
<th>May 7</th>
<th>September 7</th>
<th>January 7</th>
</tr>
</thead>
</table>

http://grants.nih.gov/grants/funding/submissionschedule.htm

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## Review and Award Cycles

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

http://grants.nih.gov/grants/funding/submissionschedule.htm

Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research (Parent F31 - Diversity)

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 Dental and Craniofacial Research (NIDCR)
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 Institute on Minority Health and Health Disparities (NIMHD)
National Library of Medicine (NLM)
National Center for Complementary and Integrative Health (NCCIH)
Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs (ORIP)
For the purpose of this announcement, institutions must identify applicants who will enhance diversity on a national basis (see NOT-OD-15-053), as defined below:

A. Individuals from racial and ethnic groups that have been shown by the National Science Foundation to be underrepresented in health-related sciences on a national basis (see data at http://www.nsf.gov/statistics/showpub.cfm?TopID=2&SubID=27 and the most recent report on Women, Minorities, and Persons with Disabilities in Science and Engineering). The following racial and ethnic groups have been shown to be underrepresented in biomedical research: African Americans, Hispanic Americans, American Indians, Alaska Natives, 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, as described in the Americans with Disabilities Act of 1990, as amended. See NSF data at http://www.nsf.gov/statistics/wmpd/2013/pdf/tab7-5_updated_2014_16.pdf.
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  - Institutes and Study Sections
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NIH REFERRAL AND REVIEW SYSTEM
REGULAR RESEARCH GRANT APPLICATIONS

CSR
Center for Scientific Review
National Institutes of Health

[Diagram of the scientific review process]

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<table>
<thead>
<tr>
<th>Study Section</th>
<th>Study Section Description</th>
<th>SRO</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01A</td>
<td>Fellowships: Brain Disorders and Related Neurosciences</td>
<td>Movsesyan, Vilen</td>
</tr>
<tr>
<td>F01B</td>
<td>Fellowships: Learning and Memory, Language, Communication and Related Neurosciences</td>
<td>Schueler, Mary</td>
</tr>
<tr>
<td>F02A</td>
<td>Fellowships: Behavioral Neuroscience</td>
<td>Qin, Mei</td>
</tr>
<tr>
<td>F02B</td>
<td>Fellowships: Sensory and Motor Neurosciences, Cognition and Perception</td>
<td>Low, Sharon</td>
</tr>
<tr>
<td>F03A</td>
<td>Fellowships: Neurodevelopment, Synaptic Plasticity and Neurodegeneration</td>
<td>Schueler, Mary</td>
</tr>
<tr>
<td>F03B</td>
<td>Fellowships: Biophysical, Physiological, Pharmacological and Bioengineering Neuroscience</td>
<td>Schauwecker, Paula</td>
</tr>
<tr>
<td>F04A</td>
<td>Fellowships: Chemistry, Biochemistry, Biophysics, and Bioengineering A</td>
<td>Radtke, Mike</td>
</tr>
<tr>
<td>F04B</td>
<td>Fellowships: Chemistry, Biochemistry, Biophysics, and Bioengineering B</td>
<td>Jollie, David</td>
</tr>
<tr>
<td>F05-D</td>
<td>Fellowships: Cell Biology, Developmental Biology, and Bioengineering</td>
<td>Gubin, Alexander</td>
</tr>
<tr>
<td>F05-U</td>
<td>Fellowships: Cell Biology, Developmental Biology, and Bioengineering</td>
<td>Krishnaraju, Raj</td>
</tr>
<tr>
<td>F06</td>
<td>Fellowships: Endocrinology, Metabolism, Nutrition and Reproductive Sciences</td>
<td>Sierra-Rivera, Elaine</td>
</tr>
<tr>
<td>F07</td>
<td>Fellowships: Immunology and Area</td>
<td>Mulky, Alok</td>
</tr>
<tr>
<td>F08</td>
<td>Fellowships: Genes, Genomes and Genetics</td>
<td>Cohen, Tatiana</td>
</tr>
<tr>
<td>F09A</td>
<td>Fellowships: Oncological Sciences</td>
<td>Bies, Juraj</td>
</tr>
<tr>
<td>F09B</td>
<td>Fellowships: Oncological Sciences</td>
<td>Howard, Ola Mae</td>
</tr>
<tr>
<td>F10A</td>
<td>Fellowships: Physiology and Pathobiology of Cardiovascular and Respiratory Systems</td>
<td>Aitouche, Abdelouahab</td>
</tr>
<tr>
<td>F10B</td>
<td>Fellowships: Physiology and Pathobiology of Musculoskeletal, Oral and Skin Systems</td>
<td>Chaudhari, Anshumali</td>
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<tr>
<td>F13</td>
<td>Fellowships: Infectious Diseases and Microbiology</td>
<td>Politis, Alexander</td>
</tr>
<tr>
<td>F15</td>
<td>Fellowships: Surgical Sciences, Biomedical Imaging and Bioengineering</td>
<td>Li, Jan</td>
</tr>
<tr>
<td>F16</td>
<td>Fellowships: Risk, Prevention and Health Behavior</td>
<td>Faraday, Martha</td>
</tr>
<tr>
<td>F17</td>
<td>Fellowships: AIDS and AIDS Related Applications</td>
<td>Tuo, Jingsheng</td>
</tr>
</tbody>
</table>
Infectious Diseases and Microbiology Fellowship Study Section [F13]

The F13 Special Emphasis Panel reviews fellowship applications involving virology and viral pathogenesis, bacteriology and bacterial pathogenesis, fungal pathogenesis, parasitology and parasitic diseases, the innate and adaptive host responses to these microbes and viruses, and the development of anti-infective agents to treat and prevent infectious disease.
Center For Scientific Review
Special Emphasis Panel
MEETING ROSTER

CHAIRPERSON
FRANK, DARA W., PHD
PROFESSOR
DEPARTMENT OF MICROBIOLOGY AND
MOLECULAR GENETICS
MEDICAL COLLEGE OF WISCONSIN
MILWAUKEE, WI 53226

MEMBERS
DAVIES, STEPHEN J, PHD
ASSOCIATE PROFESSOR
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY
UNIFORMED SERVICES UNIVERSITY OF HEALTH SCIENCES
BETHESDA, MD 208144799

DUNNY, GARY M, PHD
PROFESSOR
DEPARTMENT OF MICROBIOLOGY

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Closely Related

- Immunology Fellowship Study Section [F07]
- Genes, Genomes and Genetics [F08]
- Fellowship: Cell Biology, Development Biology and Bioengineering [F05]
- Chemistry, Biochemistry, Biophysics, and Bioengineering [F04]
- Health and Health Related Behavior of Individuals and Populations Fellowship Study Section [F16]
There were 145 results matching your search criteria.

<table>
<thead>
<tr>
<th>T</th>
<th>Act</th>
<th>Project Year</th>
<th>Sub #</th>
<th>Project Title</th>
<th>Contact PI/Project Leader</th>
<th>Organization</th>
<th>FY</th>
<th>Admin IC</th>
<th>Funding IC</th>
<th>FY Total Cost</th>
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<tr>
<td></td>
<td>F32</td>
<td>AI124507</td>
<td>01</td>
<td>CHARACTERIZING THE GAMETOCYTE METABOLOME OF THE HUMAN MALARIA PARASITE PLASMODIUM FALCIPARUM</td>
<td>ALLMAN, ERIK L</td>
<td>PENNSYLVANIA STATE UNIVERSITY-UNIV PARK</td>
<td>2016</td>
<td>NIAID</td>
<td>NIAID</td>
<td>$56,118</td>
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<td></td>
<td>F31</td>
<td>AI120613</td>
<td>01</td>
<td>PHASE VARIATION OF CLOSTRIDIUM DIFFICILE FLAGELLA AND TOXIN PRODUCTION</td>
<td>ANJUWON-FOSTER, BRANDON</td>
<td>UNIV OF NORTH CAROLINA CHAPEL HILL</td>
<td>2015</td>
<td>NIAID</td>
<td>NIAID</td>
<td>$30,872</td>
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<tr>
<td></td>
<td>F31</td>
<td>AI106288</td>
<td>03</td>
<td>REGULATION OF VIBrio BIOFILM FORMATION BY H-NS REPRESSION AND ANTI-REPRESSION.</td>
<td>AYALA-FIguERedo, JULIO C</td>
<td>UNIVERSITY OF ALABAMA AT BIRMINGHAM</td>
<td>2016</td>
<td>NIAID</td>
<td>NIAID</td>
<td>$33,473</td>
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<td></td>
<td>F31</td>
<td>ES023293</td>
<td>03</td>
<td>MICROBIOME-BASED RISK ASSESSMENT: RECIPROCAL EFFECTS OF ARSENIC ON ENVIRONMENTAL</td>
<td>BACHAS-DAUNERT, STEPHANIE</td>
<td>STANFORD UNIVERSITY</td>
<td>2015</td>
<td>NIEHS</td>
<td>NIEHS</td>
<td>$43,120</td>
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<td></td>
<td>F31</td>
<td>AI110071</td>
<td>03</td>
<td>CHEMOKINE REGULATION OF INFLAMMATORY MONOCYTES DURING WEST NILE VIRUS INFECTIOn</td>
<td>BARDINA, SUSANA</td>
<td>ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI</td>
<td>2016</td>
<td>NIAID</td>
<td>NIAID</td>
<td>$36,792</td>
</tr>
</tbody>
</table>

https://projectreporter.nih.gov/reporter.cfm/

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
How to Direct a Grant Application to the Appropriate Study Section

- Review research areas of Study Section
- Review roster of Study Section members
  - Do not contact reviewers
- Review Study Section’s funded grants in NIH Reporter
- Discuss with colleagues in similar research area
- Request via Assignment Request Form in Application
# PHS Assignment Request Form

**List Individuals who should not review your application and why (optional)**

Only 1000 characters allowed

---

**Identify Scientific areas of expertise needed to review your application (optional)**

*Note: Please do not provide names of individuals*

<table>
<thead>
<tr>
<th>Expertise</th>
<th>Only 40 characters allowed</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
<th>Additional Guidance on Strengths/Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>1</td>
<td>Exceptional</td>
<td>Exceptionally strong with essentially no weaknesses</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Outstanding</td>
<td>Extremely strong with negligible weaknesses</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Excellent</td>
<td>Very strong with only some minor weaknesses</td>
</tr>
<tr>
<td>Medium</td>
<td>4</td>
<td>Very Good</td>
<td>Strong but with numerous minor weaknesses</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Good</td>
<td>Strong but with at least one moderate weakness</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Satisfactory</td>
<td>Some strengths but also some moderate weaknesses</td>
</tr>
<tr>
<td>Low</td>
<td>7</td>
<td>Fair</td>
<td>Some strengths but with at least one major weakness</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Marginal</td>
<td>A few strengths and a few major weaknesses</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Poor</td>
<td>Very few strengths and numerous major weaknesses</td>
</tr>
</tbody>
</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
Impact Score

- Impact Score given by each member of the study section

- Overall Impact Score:
  Mean of reviewers’ Impact Scores x10

- 81 possible overall Impact Scores
  (10 – 90, whole numbers)

http://enhancing-peer-review.nih.gov/timelines.html
What Determines which Awards are Made?

- Scientific Merit
- Program Considerations
- Availability of Funds

Adapted from: NIH (DRG) - Peer Review of NIH Research Grants Applications
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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Overall Impact/Merit: Write a paragraph summarizing the factors that informed your Overall Impact score.
Reviewer’s assessment “that the fellowship will enhance the applicant’s potential for, and commitment to, an independent scientific research career…”

“Research project that is integrated with the training plan.”

“Applicant’s need for the proposed training, and the degree to which the research project and training plan, the sponsor(s), and the environment will satisfy those needs.”

https://grants.nih.gov/grants/peer/critiques/f_D.htm

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Reviewers will consider each of the five review criteria below in the determination of scientific and technical merit, and give a separate score for each.

1. **Fellowship Applicant**

   **Strengths**
   -  

   **Weaknesses**
   -  

2. **Sponsors, Collaborators, and Consultants**

   **Strengths**
   -  

   **Weaknesses**
   -  

3. **Research Training Plan**

   **Strengths**
   -  

   **Weaknesses**
   -  

https://grants.nih.gov/grants/peer/critiques/f_critique_template.docx
4. **Training Potential**

**Strengths**
- 

**Weaknesses**
- 

5. **Institutional Environment & Commitment to Training**

**Strengths**
- 

**Weaknesses**
- 

https://grants.nih.gov/grants/peer/critiques/f_critique_template.docx
1. Fellowship Applicant

- “Are the applicant's academic record and research experience of high quality?
- Does the applicant have the potential to develop into an independent and productive researcher?
- Does the applicant demonstrate commitment to a research career in the future?”
2. Sponsors, Collaborators, and Consultants

- “Are the sponsor(s’) research qualifications (including recent publications) and track record of mentoring individuals at a similar stage appropriate for the needs of the applicant?
- Is there evidence of a match between the research and clinical interests of the applicant and the sponsor(s)?
- Do(es) the sponsor(s) demonstrate an understanding of the applicant’s training needs as well as the ability and commitment to assist in meeting these needs?”
2. Sponsors, Collaborators, and Consultants

- “Is there evidence of **adequate research funds** to support the applicant’s proposed research project and training for the duration of the research component of the fellowship?

- If a **team of sponsors** is proposed, is the team structure **well justified** for the mentored training plan, and are the **roles of the individual members** appropriate and clearly defined?”
2. Sponsors, Collaborators, and Consultants

“Are the qualifications of any collaborator(s) and/or consultant(s), including their complementary expertise and previous experience in fostering the training of fellows, appropriate for the proposed project?”

https://grants.nih.gov/grants/peer/critiques/f_D.htm

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3. Research Training Plan

- “Is the proposed research project of high scientific quality, and is it well integrated with the proposed research training plan?
- Based on the sponsor’s description of his/her active research program, is the applicant’s proposed research project sufficiently distinct from the sponsor’s funded research for the applicant’s career stage?
- Is the research project consistent with the applicant's stage of research development?
- Is the proposed time frame feasible to accomplish the proposed training?”

https://grants.nih.gov/grants/peer/critiques/f_D.htm

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4. Training Potential

- “Are the proposed research project and training plan likely to provide the applicant with the requisite individualized and mentored experiences in order to obtain appropriate skills for a research career?
- Does the training plan take advantage of the applicant’s strengths, and address gaps in needed skills?
- Does the training plan document a clear need for, and value of, the proposed training?
- Does the proposed training have the potential to serve as a sound foundation that will clearly enhance the applicant’s ability to develop into a productive researcher?
5. Institutional Environment & Commitment to Training

- “Are the research facilities, resources (e.g. equipment, laboratory space, computer time, subject populations), and training opportunities (e.g. seminars, workshops, professional development opportunities) adequate and appropriate?
- Is the institutional environment for the applicant’s scientific development of high quality?
- Is there appropriate institutional commitment to fostering the applicant's mentored training?”

https://grants.nih.gov/grants/peer/critiques/f_D.htm
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FELLOWSHIP 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)
<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Resubmission or Revision Application (when applicable)</td>
<td>1</td>
</tr>
<tr>
<td>Applicant's Background and Goals for Fellowship Training</td>
<td>6</td>
</tr>
<tr>
<td>Specific Aims</td>
<td>1</td>
</tr>
<tr>
<td>Research Strategy</td>
<td>6</td>
</tr>
<tr>
<td>Respective Contributions</td>
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</tr>
<tr>
<td>Selection of Sponsor and Institution</td>
<td>1</td>
</tr>
<tr>
<td>Training in the Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>Sponsor and Co-Sponsor Statements</td>
<td>6</td>
</tr>
<tr>
<td>Letters of Support from Collaborators, Contributors, and Consultants</td>
<td>6</td>
</tr>
<tr>
<td>Description of Institutional Environment and Commitment to Training</td>
<td>2</td>
</tr>
<tr>
<td>Note: This page limit includes the Additional Educational Information required for F30 and F31 applications.</td>
<td></td>
</tr>
<tr>
<td>Applications for Concurrent Support (when applicable)</td>
<td>1</td>
</tr>
<tr>
<td>Biographical Sketch</td>
<td>5</td>
</tr>
</tbody>
</table>
# PHS Fellowship Supplemental Form

## Introduction
1. Introduction (for Resubmission)

## Fellowship Applicant Section
2. Applicant’s Background and Goals for Fellowship Training

## Research Training Plan Section
3. Specific Aims
4. Research Strategy
5. Respective Contributions
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2. Applicant’s Background and Goals for Fellowship Training (6 pages)

A. Doctoral Dissertation and Research Experience:

- In chronological order, summarize previous research and scientific experiences (not courses)
  - Undergraduate experiences
  - Graduate lab rotations

- Graduate students:
  - Preliminary description of doctoral thesis research

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
2. Applicant’s Background and Goals for Fellowship Training (6 pages)

B. Training Goals and Objectives:

- Overall career goals
- How the fellowship will help you reach these goals
- Identify specific “skills, theories, conceptual approaches, etc.” that will be acquired or expanded upon during the fellowship period
  - Didactics (e.g. statistics), Technical Skills, Career Development Skills (e.g. presentations, writing)
- How the fellowship will “facilitate your transition to the next career stage”


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
2. Applicant’s Background and Goals for Fellowship Training (6 pages)

C. Activities Planned Under this Award:

- Fellowship activities (by year)
  - Specific for applicant and integrated with proposed research project
  - e.g., Research, Didactics, Teaching
  - Skills and techniques to be learned
  - Relate non-research activities (e.g., professional development) to the proposed research training

- Timeline of research training and related activities

- Estimate % of time devoted to each activity

## Research Training Plan Section

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>3. Specific Aims</td>
<td>Add Attachment</td>
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<td>4. Research Strategy</td>
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</table>
3. Specific Aims (1 page)

- Goals of the proposed research
- Expected outcome(s)
- Impact of proposed research on your field(s)
- Specific objectives
  - Test of a stated hypothesis
  - Create a novel design
  - Solve a specific problem
  - Challenge an existing paradigm or clinical practice
  - Address a critical barrier
  - Develop new technology


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
4. Research Strategy (6 pages total)

■ (A) Significance

■ “Importance of the problem or critical barrier to progress in the field that the proposed project addresses”
■ “How the proposed project will improve scientific knowledge, technical capability, and/or clinical practice”
■ “How the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved”
4. Research Strategy (6 pages total)

- **(B) Innovation - do not include**
- **(C) Approach**
  - “Overall strategy, methodology, and analyses to be used”
  - “How the data will be collected, analyzed, and interpreted”
  - “Potential problems [challenges], alternative strategies, and benchmarks for success”
  - Strategies “to establish feasibility, and address the management of any high risk aspects”
  - Preliminary studies and results
  - Relevant previous experiences


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5. Respective Contributions (1 page)

- “Describe the collaborative process between you and your sponsor/co-sponsor in the development, review, and editing of this research training plan.”
- “Discuss the respective roles in accomplishing the proposed research.”

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Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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[1] JaimesRubin.com

6. Selection of Sponsor and Institution (1 page)

- “Explain why the sponsor, co-sponsor (if any), and institution were selected to accomplish the research training goals.”


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<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
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8. Training in the Responsible Conduct of Research (1 page)

- Five required instructional components:
  - Format: on-line only is not acceptable
  - Subject Matter: e.g., required topics
  - Faculty Participation
    - e.g., Role of the Mentor and other faculty
  - Duration of Instruction
  - Frequency of Instruction
    - Every career stage and at least once every four years.
  - Document any prior instruction

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9. Sponsor(s) and Co-Sponsor(s) (6 pages)

A. Research Support Available

- Table containing detailed information on all current and pending research and research training support available to the applicant (contingency plan if there is a gap in funding)
- Role of Sponsor(s) in the proposed integrated research and training plan.
- If more than one Sponsor, then include a plan describing their individual and coordinated roles and efforts

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9. Sponsor(s) and Co-Sponsor(s) (6 pages)

B. Sponsor's/Co-Sponsor’s Previous Fellows/Trainees

- Total number of predoctoral and postdoctoral fellows previously mentored.
- For representative five, provide information time in sponsor’s research group and on current positions.


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D. Sponsor(s) and Co-Sponsor(s) (6 pages)

C. Training Plan, Environment, Research Facilities

- Fellow-specific research training plan (e.g. didactics)
- Research environment (e.g. core facilities, equipment, laboratory, computers, research patient population)
- Relationship of the Fellow’s research/career goals to the proposed research training plan and specific new skills and techniques to be acquired
- Professional development (e.g. grant writing, presentation skills)
- How training plan will facilitate the applicant's transition to the next career stage

D. Sponsor(s) and Co-Sponsor(s) (6 pages)

■ **D. Number of Fellows/Trainees to be Supervised During the Fellowship**
  - Number of pre- and postdoctoral fellows to be mentored

■ **E. Applicant's Qualifications and Potential for a Research Career**
  - Relate applicant’s academic record and previous research experiences to the proposed research training opportunity
  - Describe how the proposed research training plan, and sponsor’s expertise as a mentor, will “assist in producing an independent researcher”
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10. Letters of Support from Collaborators, Contributors, and Consultants (6 pages)

- Collaborators, consultants, advisors, director of core facility, statistician, provider of unique research resource, instructor of unique technique/technology, referring physician, etc.

- Letter describing their role in the applicant’s research training, career development, and future career goals


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11. Description of Institutional Environment and Commitment to Training (2 pages)

- Description of a robust research program relevant to the applicant’s areas of interest
- Appropriate facilities and resources available for research and career development activities
- Opportunities for collaborations, journal clubs, seminars, workshops, etc.

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11. Description of Institutional Environment and Commitment to Training (2 pages)

- Instruction in “rigorous experimental design to ensure reproducibility”
- Institution-wide resources
  - Students: Office of Graduate Affairs


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
11. Description of Institutional Environment and Commitment to Training (2 pages)

- Additional Educational Information
  - Description of graduate/degree-granting program
    - Structure of the program
    - Description of and time line of required milestones
      - Courses, Teaching, commitments, Qualifying exams
  - Average time to degree over the past 10 years
  - Applicant’s progress in relation to the program's timeline
  - Frequency and method by which the program formally monitors and evaluates a student's progress
  - Usually provided by the graduate program’s director/department chair (include name and title)

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Improving graduate student and postdoctoral training

- A. Put individual development plans in place for all trainees
- **B. Reduce the length of graduate training**
- C. Provide F30 and F31 awards from all Institutes/Centers
- D. Increase postdoctoral stipends and consider policies on benefits
- E. Increase support for K99/R00 and shorten eligibility period
- F. Increase support for Early Independence Awards

http://acd.od.nih.gov/bwf.htm

Not yet Required for Fellowship Applications
Facilities & Other Resources

Scientific/Technical Resources

- Facilities to be used for the conduct of the proposed research
  - Laboratory
  - Animal
  - Computer
  - Office
  - Clinical [patient/research subject populations]
  - Other: Core facilities [e.g. research pharmacy, biostatistics, technical cores (microscopy, biomarkers)]

- Discuss ways in which the proposed studies will benefit from unique features of the scientific environment, subject populations, or collaborative arrangements
R&R Other Project Information:

10. Facilities & Other Resources

Career Development Resources - also referenced in “main body” of the grant and Mentor’s section

■ Career development programs
  ■ Institutional (e.g. Office of Postdoctoral or Graduate Affairs)
  ■ Departmental
  ■ Professional societies

■ Formal degree programs and other didactics
  ■ Degree program:
  ■ Scientific courses: e.g., Statistics
  ■ Career Development course: e.g., Funding & Grantsmanship

■ Workshops, webinars, other training programs

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Certification Letter for Predoctoral Fellowships to Promote Diversity

- Institutional letter certifying eligibility of the applicant for the diversity fellowship program
  - Signed by institutional official
    - e.g., Graduate Affairs Office, Grants Office
  - On institutional letterhead

- Do not include “sensitive personal information” (e.g., specific racial/ethnic background, disability)
21. Cover Letter Attachment

- Must include
- List of Referees (name and affiliation)
- Administrative document – not seen by reviewers
Letters of Reference

- Include a list of Referees in the Cover Letter
- 3-5 Letters of References are required
- Individuals who know you well and know you well from a research perspective
- Individuals who can provide “meaningful comments about your qualifications for a research career”
- Mentor(s) cannot be one of the confidential Letters of Reference (“letter” in main body of application)
- Helpful to include at least one referee who is not in your current department.
Letters of Reference

- ‘Research ability and potential to become an independent researcher
- Adequacy of scientific and technical background
- Written and verbal communication abilities including ability to organize scientific data
- Quality of research endeavors or publications to date, if applicable
- Perseverance in pursuing goals
- Evidence of originality
- Need for further research experience and training
- Familiarity with research literature’
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.
NIH “F” Sites of Interest

- Program Announcements for Dual Degree: F30, Pre-Doc: F31 and F31-Diversity, and Post-doc: F32 grant mechanisms
  https://researchtraining.nih.gov/programs/fellowships

- Fellowship Application Instructions

- Reference Letters
  http://grants.nih.gov/sites/default/files/instructions-for-fellowship-referees.docx

- Application Page Limits

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NIH “F” Sites of Interest

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

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

- 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/
NIH “F” Sites of Interest

- Instruction in the Responsible Conduct of Research
Topics to be Discussed

- NIH Fellowship Overview
- NIH Fellowship Grant Review Process
  - Institutes and Study Sections
  - Scoring System: Impact Scores
  - Fellowship Review Criteria
- Components of a Fellowship Application
- Approaches for Competitive Applications
  - Prepare to Write the Grant Application
  - Complete the Grant Application

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 Agency Program Officer
- Speak with colleagues who are/were awardees
- Review funded applications if possible
- Review agency’s review criteria
- Identify what will make the application more competitive
  - Research and/or career development arrangements
  - Access to core facilities/research resources
- Strengthen “Preliminary Work/ Pilot Data”
- Who will write confidential letters of reference?
Research and Career Development Arrangements

- Multiple Principle Investigators (research awards)
- Multiple Mentors (mentored awards)
- Advisors (mentored awards)
- Co-investigators/Collaborations
- Subcontracts to other institutions
- Multidisciplinary/Interdisciplinary
Prepare to Complete the Grant Application

- Identify and meet with Co-investigators, Collaborators, Consultants, Advisors
  - Identify roles and responsibilities
  - Administrative requirements (e.g. if other countries/institutions are involved)
- Identify necessary core facilities and other research 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
  - Technical/Scientific
  - Administrative – e.g. budget
  - Regulatory
  - Draft letters of collaboration/support

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, format of literature citation
- Set a firm time-line for each responsibility
  - Writing milestones
  - Absolute deadline date for final compilation
Complete the Grant Application

- Read instructions
- Never assume that reviewers “will know what you mean”
- Refer to literature thoroughly and thoughtfully
- Explicitly state the rationale of the proposed investigation (“the hypothesis of my study is…”)
- Discuss “challenges” and how these will be addressed (e.g., alternate approaches)
- Include well-designed tables and figures
- Present an organized, lucid write-up
- Ask colleagues to review and comment
Complete the Grant Application

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- **Include well-designed tables and figures**
- Present an organized, lucid write-up
- Ask colleagues to review and comment
Include Well-Designed Tables and Figures

- Include explanatory caption with the figure (not buried in text)
- Not overly complicated
- Informative, even if printed in black and white
- Easy for the reviewers to read
## Timeline for Specific Aims and Benchmarks/Milestones of Research Progress

<table>
<thead>
<tr>
<th>Benchmarks/ Milestones</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
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<tbody>
<tr>
<td>Summary of Specific Aim 1a</td>
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<tr>
<td>Summary of Specific Aim 1b</td>
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<tr>
<td>Summary of Specific Aim 2a</td>
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<tr>
<td>Summary of Specific Aim 3</td>
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Anticipate Questions
and
Answer them before
they are asked
Elements of a Good Proposal

- Feasible
- Relevant
- Unique
- Innovative
- Clear
- Brief
- Consistent

Investigator

- Competent
- Enthusiastic
- Thorough
- Professional
Common Problems with Grant Applications from New Investigators

- Does not address/follow funding agency’s mission, specific instructions, budget limits, etc.
- Overly ambitious
- Not independent of previous mentor’s research
- Fishing expedition
- Not hypothesis driven
- Descriptive, not mechanistic project
- Unfocussed
- No or insufficient preliminary data
- Unrealistic budget
- Methodologies beyond the expertise of investigator or research team
NIH: one round of applications
Bell Curve of Reviewer’s Grant Applications

Definitely do not fund

Fine

Definitely fund

Great

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Poor Statistics
Research Resources not Adequately Described
Career Development/Research Training Plan not Comprehensive
Figure Caption Font too Small
All Components of the Application are as Strong as Possible
Good Luck!