Grantsmanship for Students and Postdocs: NIH’s Individual Fellowships

- New York Academy of Sciences -

November 2, 2016

Jaime S. Rubin, Ph.D.
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
  - Institute Funding Paylines
  - 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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Rescuing US biomedical research from its systemic flaws

Bruce Alberts\textsuperscript{a}, Marc W. Kirschner\textsuperscript{b}, Shirley Tilghman\textsuperscript{c,1}, 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.
Timeline of Funding for Junior Investigators

Graduate School | Post-doctoral Years | Instructor/Assistant Professor

Individual Fellowship
Training Grant
Mentor’s Research Grant

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Timeline of Funding for Junior Investigators

Graduate School

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

Post-doctoral Years

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

Instructor/Assistant Professor

Timeline of Funding for Junior Investigators

Graduate School

Post-doctoral Years

Instructor/Assistant Professor

 Individual Fellowship Training Grant
       Mentor’s Research Grant

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

 Pre-doc to Post-doc Transition Awards

F31

F32

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Timeline of Funding for Junior Investigators

Graduate School

- Individual Fellowship Training Grant
- Mentor’s Research Grant

Post-doctoral Years

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

Instructor/Assistant Professor

Career Transition Awards

Timeline of NIH Funding for Junior Investigators

Medical School

Internship/Residency

Fellowship – Research Years

Instructor/Assistant Professor

Short term Training

Year-long Enhancement Programs

MD/PhD Fellowship or Institutional T32

F30

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Timeline of NIH Funding for Junior Investigators

Short term Training

Medical School

Research Support

Internship/Residency

Fellowship – Research Years

Instructor/Assistant Professor

Year-long Enhancement Programs

MD/PhD Fellowship or Institutional T32

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

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R01 Research Award

Independent Investigator

Funds research project
- Salaries of PI and other research personnel
- Supplies, reagents, etc
- Animal costs
- Patient care costs
- Core facilities
- Page charges for publications

Multi-Year (4yrs – 5yrs)
Renewable (e.g. original grant + 2 renewals = 15yrs)

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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
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%

Ruth L. Kirschstein Individual Predoctoral NRSA for MD/PhD and other Dual Degree Fellowships

Individual fellowships for predoctoral training which leads to the combined MD/PhD and other dual Clinical/Research degrees.

F30 Details View Current Funding Opportunities

Ruth L. Kirschstein Predoctoral Individual National Research Service Award

To provide predoctoral individuals with supervised research training in specified health and health-related areas leading toward the research doctoral degree (e.g., PhD).

F31 Details View Current Funding Opportunities

Ruth L. Kirschstein Postdoctoral Individual National Research Service Award

To provide postdoctoral research training to individuals to broaden their scientific background and extend their potential for research in specified health-related areas.

F32 Details View Current Funding Opportunities
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

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Predoctoral MD/PhD or Other Dual-Doctoral Degree Fellowship (F30)

- Supports specific individual - dual degree candidate: health professional doctoral degree (e.g., MD, DDS) and a research doctoral degree (e.g., PhD, DrPH)
- Stipend, health fees, tuition, travel
- Review criteria:
  - Individual fellow
  - Mentor
  - Research project
  - Research/Career Development environment

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Postdoctoral Individual National Research Service Award (F32)

- Supports specific individual (e.g., PhD, MD, or MD/PhD trained)
- May be in degree program
- Stipend, health fees, tuition, travel
- Review criteria:
  - Individual fellow
  - Mentor
  - Research project
  - Research/Career Development environment

Post-doc Fellowships (F32s)
Applications, awards, and success rates
### NIAID F32: Applications, awards, and success rates

<table>
<thead>
<tr>
<th>IC</th>
<th>Fiscal Year</th>
<th>Topic</th>
<th>Activity</th>
<th>Type</th>
<th>Stat</th>
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<tbody>
<tr>
<td>NIAID</td>
<td>2013</td>
<td>Success Rate</td>
<td>F32</td>
<td>New</td>
<td>20%</td>
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<td>NIAID</td>
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<td>New</td>
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<td>F32</td>
<td>New</td>
<td>50</td>
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<tr>
<td>NIAID</td>
<td>2014</td>
<td>Success Rate</td>
<td>F32</td>
<td>New</td>
<td>21.43%</td>
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<td>Applications - Number</td>
<td>F32</td>
<td>New</td>
<td>224</td>
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<tr>
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<td>2014</td>
<td>Awards - Number</td>
<td>F32</td>
<td>New</td>
<td>48</td>
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<tr>
<td>NIAID</td>
<td>2015</td>
<td>Awards - Number</td>
<td>F32</td>
<td>New</td>
<td>37</td>
</tr>
</tbody>
</table>

Training Grants and Fellowships: Pre- and Post-Doctoral Positions

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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
Individual Development Plans

- “NIH encourages institutions to assist graduate students and postdoctoral researchers to achieve their career goals within the biomedical research workforce through the use of Individual Development Plans (IDPs)”

- “is required for all T, F, K… and other awards or award components designed to provide training and professional development opportunities for graduate students and postdoctoral researchers.”

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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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http://acd.od.nih.gov/bwf.htm
Biomedical Workforce Task Force

Improving graduate student and postdoctoral training

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

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Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31)

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 Alternative Medicine (NCCAM)
Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs (ORIP)
National Institutes of Health

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

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Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31)

National Cancer Institute (NCI)
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National Institute on Alcohol Abuse and Alcoholism (NIAAA)
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
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Ruth L. Kirschstein Individual Predoctoral NRSA for MD/PhD and other Dual Degree Fellowships

Individual fellowships for predoctoral training which leads to the combined MD/PhD and other dual Clinical/Research degrees.

- Ruth L. Kirschstein National Research Service Award (NRSA) Fellowship for Students at Institutions Without NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30)

- Ruth L. Kirschstein National Research Service Award (NRSA) Fellowship for Students at Institutions With NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30)

https://researchtraining.nih.gov/programs/fellowships
Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32)

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)
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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 Center for Complementary and Integrative Health (NCCIH)

PA-16-307

Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32) (PA-16-307)

Contacts, Submission Dates and Special Interests/Instructions

Release Date: June 3, 2016
Expiration Date: May 8, 2019

| NIH Institute or Center | Institute or Center Specific Information |

https://grants.nih.gov/grants/guide/contacts/parent_F32.html
“This NINDS F32 will support postdocs who are within the first 3 years of research training in the sponsor's laboratory, and includes several other key differences from the parent F32. Most notably, applicants are only eligible for the NINDS F32 prior to starting, or within the first 12 months of starting, their postdoctoral training in the sponsor's laboratory or research environment. Because of the very early application, no preliminary data are expected. It is anticipated that another Funding Opportunity Announcement for postdocs, which utilizes the K01 activity code, will be published in time for the February 12, 2017 initial receipt date. This will be available to applicants in their second through fourth year of cumulative postdoctoral research experience (see NOT-NS-16-013).”
NINDS Ruth L. Kirschstein National Research Service Award (NRSA) for Training of Postdoctoral Fellows (F32) PAR-16-458

Notice of Intent to Publish a Funding Opportunity Announcement for an NINDS Postdoctoral Research Career Development Award (K01)

Notice Number: NOT-NS-16-013
Individual Fellowships

Non-government, non-profit agencies

- Voluntary Health Organizations
- Professional Societies
- Private Foundations
Voluntary Health Organizations, Foundations, Professional Societies

- American Cancer Society
- American Heart Association
- American Kidney Fund
- American Liver Foundation
- Daland Fellowships in Clinical Investigation
- Helen Hay Whitney Foundation
American Heart Association: Pre- and Post-doctoral Fellowship Programs

- Cardiovascular function and disease and stroke
- Clinical, basic science, bioengineering, biotechnology, epidemiological, behavioral, community, and public health
- Funding (annual)
  - Pre-Doc: Stipend/Salary: $22,950, Health Insurance: $1,000, Project Support: $2,000
  - Post-Doc: Stipend/Salary: $42,850 - $56,400, Health Insurance: $1,000, Project Support: $3,000
- Award Duration: 2 years
- Citizenship
  - U.S. citizen/ Permanent resident/ Pending permanent resident/ Visas (e.g., E-3, F1, H1-B, J-1, O-1)

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## 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>
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<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>
</tr>
<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>F Series Fellowships new, renewal, resubmission</td>
<td>Individual 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>F31 Diversity Fellowships new, renewal, resubmission</td>
<td>Individual 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.

<table>
<thead>
<tr>
<th>Based on Activity Code</th>
<th>May 7</th>
<th>September 7</th>
<th>January 7</th>
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http://grants.nih.gov/grants/funding/submissionschedule.htm

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<th>Cycle I</th>
<th>Cycle II</th>
<th>Cycle III</th>
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<tr>
<td>Scientific Merit Review</td>
<td>June - July</td>
<td>October - November</td>
<td>February - March</td>
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<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>
</tr>
</tbody>
</table>

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

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Dual Review System for Grant Applications

First Level of Review
Scientific Review Group
• Provides initial scientific review of grant applications
• Makes recommendations for appropriate level of support and duration of award

Second Level of Review
Institute’s Council
• Assesses quality of SRG review of grant applications
• Makes recommendations to institute staff on funding
• Evaluates program priorities and relevance
• Advises on policy

Adapted from: NIH (DRG) - Peer Review of NIH Research Grants Applications
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Review Process for a Research Grant Application

National Institutes of Health

Research Grant Application

School or Other Research Center

- Initiates Research Idea
- Assigns to Study Section & Institute

Study Section

- Evaluates for Scientific Merit
- Institute
- Evaluates for Program Relevance

Advisory Councils and Boards

- Recommends Action
- Institute Director
- Takes final action for NIH Director

- Submits Application
- Conducts Research
- Allocates Funds
<table>
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<tr>
<th>Ctr Scientific Rev</th>
<th>Institutes</th>
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<tr>
<td>• Research Grants (R01, R03)</td>
<td>• Multi-Project Grants (P01, P50, etc)</td>
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<tr>
<td>• Fellowships (F’s)</td>
<td>• Training Grants (T’s)</td>
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<td>• Small Business</td>
<td>• Career Development (K’s)</td>
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<td><strong>• Conference Grants (R13)</strong></td>
<td>• Conference Grants (R13)</td>
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<tr>
<td><strong>• Research Grants in response to RFAs</strong></td>
<td>• Contracts</td>
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Adapted from: NIH (DRG) - Peer Review of NIH Research Grants Applications

NIH REFERRAL AND REVIEW SYSTEM
REGULAR RESEARCH GRANT APPLICATIONS

PROGRAM & POLICY CONSIDERATIONS

NINDS  NIGMS  NIA

NIAID

NCI

NEI

NIAMS

NHLBI

NCHGR

NIH

NCRR  FIC  NIDDK

SCIENTIFIC MANAGEMENT

FUNDING DECISIONS

CSR
Center for Scientific Review
- Integrated Review Groups (IRG's) -

- AIDS and Related Research
- Biobehavioral and Behavioral Processes
- Biological Chemistry and Macromolecular Biophysics
- Biology of Development and Aging
- Bioengineering Sciences and Technologies
- Brain Disorders and Clinical Neuroscience
- Cell Biology
- Cardiovascular and Respiratory Sciences
- Digestive, Kidney, and Urological Sciences
- Emerging Technologies and Training Neurosciences
- Endocrinology, Metabolism, Nutrition and Reproductive Sciences
- Genes, Genomes and Genetics
- Healthcare Delivery and Methodologies

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
- Immunology
- **Infectious Diseases and Microbiology**
- Integrative, Functional, and Cognitive Neuroscience
- Interdisciplinary Molecular Sciences and Training
- Molecular, Cellular, and Developmental Neuroscience
- Musculoskeletal, Oral and Skin Sciences
- Oncology 1 – Basic Translational
- Oncology 2 – Translational Clinical
- Population Sciences and Epidemiology
- Risk, Prevention and Health Behavior
- Surgical Sciences, Biomedical Imaging, and Bioengineering
- Vascular and Hematology
Infectious Diseases and Microbiology IRG [IDM]

- Bacterial Pathogenesis Study Section [BACP]
- Clinical Research and Field Studies of Infectious Diseases Study Section [CRFS]
- Drug Discovery and Mechanisms of Antimicrobial Resistance Study Section [DDR]
- Host Interactions with Bacterial Pathogens Study Section [HIBP]
- Pathogenic Eukaryotes Study Section [PTHE]
- Vector Biology Study Section [VB]
- Virology A & B Study Sections [VIRA & VIRB]
- Topics in Bacterial Pathogenesis Special Emphasis Panel [IDM-B 80]
- 2 Small Business Study Sections [IDM -10] and (IDM-12)
- Infectious Diseases and Microbiology Fellowship Study Section [F13]

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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
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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]
<table>
<thead>
<tr>
<th>Study Section</th>
<th>Study Section Description</th>
<th>SRO</th>
</tr>
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<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>
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<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>
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<tr>
<td>F03B</td>
<td>Fellowships: Biophysical, Physiological, Pharmacological and Bioengineering Neuroscience</td>
<td>Schauwecker, Paula</td>
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<tr>
<td>F04A</td>
<td>Fellowships: Chemistry, Biochemistry, Biophysics, and Bioengineering A</td>
<td>Radtko, Mike</td>
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<tr>
<td>F04B</td>
<td>Fellowships: Chemistry, Biochemistry, Biophysics, and Bioengineering B</td>
<td>Jollie, David</td>
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<tr>
<td>F05-D</td>
<td>Fellowships: Cell Biology, Developmental Biology, and Bioengineering</td>
<td>Gubin, Alexander</td>
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<td>Fellowships: Cell Biology, Developmental Biology, and Bioengineering</td>
<td>Krishnaraju, Raj</td>
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<tr>
<td>F06</td>
<td>Fellowships: Endocrinology, Metabolism, Nutrition and Reproductive Sciences</td>
<td>Sierra-Rivera, Elaine</td>
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<td>F07</td>
<td>Fellowships: Immunology and Area</td>
<td>Mulky, Alok</td>
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<td>F08</td>
<td>Fellowships: Genes, Genomes and Genetics</td>
<td>Cohen, Tatiana</td>
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<tr>
<td>F09A</td>
<td>Fellowships: Oncological Sciences</td>
<td>Bies, Juraj</td>
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<tr>
<td>F09B</td>
<td>Fellowships: Oncological Sciences</td>
<td>Howard, Ola Mae</td>
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<tr>
<td>F10A</td>
<td>Fellowships: Physiology and Pathobiology of Cardiovascular and Respiratory Systems</td>
<td>Aitouche, Abdelouahab</td>
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<td>F10B</td>
<td>Fellowships: Physiology and Pathobiology of Musculoskeletal, Oral and Skin Systems</td>
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<td>Fellowships: Infectious Diseases and Microbiology</td>
<td>Politis, Alexander</td>
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<td>F15</td>
<td>Fellowships: Surgical Sciences, Biomedical Imaging and Bioengineering</td>
<td>Li, Jan</td>
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<tr>
<td>F16</td>
<td>Fellowships: Risk, Prevention and Health Behavior</td>
<td>Faraday, Martha</td>
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<tr>
<td>F17</td>
<td>Fellowships: AIDS and AIDS Related Applications</td>
<td>Tuo, Jingsheng</td>
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<tr>
<td>#</td>
<td>Act</td>
<td>Project</td>
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<td>---------</td>
</tr>
<tr>
<td>1</td>
<td>F32</td>
<td>AI124507</td>
</tr>
<tr>
<td>2</td>
<td>F31</td>
<td>AI120613</td>
</tr>
<tr>
<td>3</td>
<td>F31</td>
<td>AI106288</td>
</tr>
<tr>
<td>4</td>
<td>F31</td>
<td>ES023293</td>
</tr>
<tr>
<td>5</td>
<td>F31</td>
<td>AI110071</td>
</tr>
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</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 Integrated Review Group
- Review research areas of Study Section
- Review roster of Study Section members
  - Do not contact reviewers
- Review Study Section’s funded grants in RePorter
- Discuss with colleagues in similar research area
- Request via Form in Application
Awarding Component Assignment Request (optional)

If you have a preference for an Awarding Component (e.g., NIMH Intramural/Extramural assignment), please use the link below to identify the most appropriate assignment and then enter the short abbreviation (e.g., NCI for National Cancer Institute) in “Assign to/Do Not Assign To Awarding Component” sections below. Your first choice should be in column 1. All requests will be considered; however, locus of review is predetermined for some applications and assignment requests cannot always be honored.

Information about Awarding Components can be found here: [https://grants.nih.gov/grants/phs_assignment_information.html](https://grants.nih.gov/grants/phs_assignment_information.html)

<table>
<thead>
<tr>
<th>Assign to Awarding Component:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Do Not Assign to Awarding Component:</th>
</tr>
</thead>
</table>

Study Section Assignment Request (optional)

If you have a preference for a study section assignment, please use the link below to identify the most appropriate study section and then enter the short abbreviation for that study section in “Assign to/Do Not Assign to Study Section” sections below. Your first choice should be in column 1. All requests will be considered; however, locus of review is predetermined for some applications and assignment requests cannot always be honored.

For example, you would enter “CAMP” if you wish to request assignment to the Cancer Molecular Pathobiology study section or enter “ZRG1 HDM-R” if you wish to request assignment to the Healthcare Delivery and Methodologies SBIR/STTR panel for informatics. Be careful to accurately capture all formatting (e.g., spaces, hyphens) when you type in the request.

Information about Study Sections can be found here: [https://grants.nih.gov/grants/phs_assignment_information.html](https://grants.nih.gov/grants/phs_assignment_information.html)

<table>
<thead>
<tr>
<th>Assign to Study Section: Only 20 characters allowed</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Do Not Assign to Study Section: Only 20 characters allowed</th>
</tr>
</thead>
</table>

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

1

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

Note: Please do not provide names of individuals

Expertise:

Only 40 characters allowed
Topics to be Discussed

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

Pink Sheet: Reviewers’ Comments
Initial Review Group or Study Section

Actions

- **Discussed applications:**
  - Receives Impact/Priority Scores
  - Receives Scores for individual core review criteria

- **Not Discussed**
  - Receives Scores for individual core review criteria

- **Not Recommended for Further Consideration (NRFC)**

- **Other:** e.g. Deferred
### NIH's Evaluation System

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

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
<th>Strengths/Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Impact</strong></td>
<td>1</td>
<td>Exceptional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Outstanding</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Excellent</td>
<td></td>
</tr>
<tr>
<td><strong>Moderate Impact</strong></td>
<td>4</td>
<td>Very Good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Satisfactory</td>
<td></td>
</tr>
<tr>
<td><strong>Low Impact</strong></td>
<td>7</td>
<td>Fair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Marginal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Poor</td>
<td></td>
</tr>
</tbody>
</table>

Strengths

Weaknesses

[Link to NIH's Evaluation System](http://enhancing-peer-review.nih.gov/docs/scoring_and_critique_overview_June2009.pdf)

[Jaime S. Rubin, Ph.D.](http://grantscourse.columbia.edu)
<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
**FELLOWSHIPS & CAREER AWARDS**

### Overall Impact:
The likelihood that the proposed training (F) or career development (K) will enhance the candidate's potential for a productive, independent scientific research career in a health-related field.

<table>
<thead>
<tr>
<th>Overall Impact</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>123</td>
<td>456</td>
<td>789</td>
</tr>
</tbody>
</table>

### Evaluating Overall Impact

Consider the 5 criteria (weighting based on reviewer's judgment):

#### Fs
- Applicant
- Sponsor(s)
- Research Training Plan
- Training Potential
- Institutional Environment & Commitment

#### Ks
- Candidate
- Career Development Plan/Goals*
- Research Plan
- Mentor(s)**
- Environment & Institutional Commitment

And other score influences, e.g. human subjects, animal welfare, inclusion plans, and biohazards.

*K05 and K24: Plan to Provide Mentoring
**K02: Consultants/Collaborators

---

- e.g. Proposes training or career development of high value/benefit for the candidate who has high potential for developing into a productive, independent scientist. May have some or no weaknesses in the criteria.

- e.g. Proposes training or career development of moderate value/benefit for the candidate who has high or moderate potential for further development, but weaknesses in the criteria reduce the overall impact to medium.

- e.g. Proposes training or career development of low value/benefit for the candidate who has moderate or low potential for further development. Weaknesses in the criteria reduce the overall impact to low.

5 is a good, medium-impact application. The entire scale (1-9) should always be considered.
Impact Score

- Preliminary Impact Scores determine which applications discussed at study section
- Impact Score given by each member of the study section
- Overall Impact Score (for discussed applications): Mean of reviewers’ Impact Scores x10
- 81 possible overall Impact Scores (10 – 90, whole numbers)
Post Initial Review Group Actions

- Calculations of priority scores and percentile rankings
- Removal of applications from Council/Board consideration

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

<table>
<thead>
<tr>
<th>Rank</th>
<th>Impact Score</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>2</td>
<td>15</td>
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<td>3</td>
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<tr>
<td>4</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>80</td>
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</table>
Percentile Value Calculation

- Relative rank for each priority score on a scale from 10 to 90.

- Follows NIH convention: Inverse relationship of priority score to scientific merit - lowest percentile value represents the highest scientific merit.

- Specifies the percent of applications with scores equal to or better than (lower impact score) the application

\[ P = \frac{100}{N} \times (k^{-\frac{1}{2}}) \]

- \( P \) = Percentile Value
- \( k \) = Numerical Rank of Impact Score
- \( N \) = Total number of applications

Calculating Percentile

80 applications*, 14 of which were not recommended for further consideration

<table>
<thead>
<tr>
<th>Rank</th>
<th>Impact Score</th>
<th>Percentile</th>
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</thead>
<tbody>
<tr>
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<td>2</td>
<td>15</td>
<td>1.9</td>
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<td>3</td>
<td>20</td>
<td>3.1</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>4.4</td>
</tr>
</tbody>
</table>

//
//
//

80

Rank = 3

P = \frac{100}{80} \times (3-\frac{1}{2}) = 3.1

* Study section’s last three review cycles

Council Actions

- Concurrence with Study Section action
- Modification of Study Section action based on program or policy considerations
- Deferral for further review

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

What Determines which Awards are Made?

- Scientific Merit
- Program Considerations
- Availability of Funds
Topics to be Discussed

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
<table>
<thead>
<tr>
<th>Payline</th>
<th>Grant Program</th>
<th>Grant Program Description</th>
<th>Percentile</th>
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<tr>
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<td>Research Project Grant</td>
<td>14</td>
<td>N/A</td>
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<tr>
<td>ESI</td>
<td>Early Stage Investigators</td>
<td>24^</td>
<td>N/A</td>
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<tr>
<td>K awards</td>
<td>Career Development Awards</td>
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<td>30</td>
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<tr>
<td>F30</td>
<td>Pre-doctoral NRSA</td>
<td>N/A</td>
<td>20</td>
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<tr>
<td>F31,F32,F33</td>
<td>Pre and Post-doctoral NRSA</td>
<td>36</td>
<td>N/A</td>
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</tr>
</tbody>
</table>

FY16

http://www.nhlbi.nih.gov/research/funding/general/current-operating-guidelines

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
## Fellowship Payline: NIAID

<table>
<thead>
<tr>
<th>Grant Type</th>
<th>Payline</th>
<th>Status</th>
<th>Description</th>
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<tbody>
<tr>
<td>R01 (non-new Pls)</td>
<td>13 percentile</td>
<td>Fiscal Year</td>
<td>Research Projects for established investigators</td>
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<tr>
<td>R01 (new Pls)</td>
<td>17 percentile</td>
<td>Fiscal Year</td>
<td>Research Projects for new and early-stage investigators</td>
</tr>
<tr>
<td>F30</td>
<td>14 overall impact/priority score</td>
<td>Fiscal Year</td>
<td>NRSA Individual Predoctoral M.D./Ph.D. or Other Dual-Doctoral Degree Fellowships</td>
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<tr>
<td>F31</td>
<td>21 overall impact/priority score</td>
<td>Fiscal Year</td>
<td>NRSA Individual Predoctoral Fellowships</td>
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<tr>
<td>F32</td>
<td>20 overall impact/priority score</td>
<td>Fiscal Year</td>
<td>NRSA Individual Postdoctoral Fellowships</td>
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</table>

**FY16**


## Fellowship Payline: NIAID

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<thead>
<tr>
<th>FY</th>
<th>R01</th>
<th>R01 (new PI)</th>
<th>Percentile</th>
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<tr>
<td>2015</td>
<td>12</td>
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<td>2014</td>
<td>9</td>
<td>13</td>
<td>13</td>
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<tr>
<td>2013</td>
<td>8</td>
<td>12</td>
<td>N/A</td>
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<tr>
<td>2012</td>
<td>10</td>
<td>14</td>
<td>N/A</td>
</tr>
<tr>
<td>2011</td>
<td>10</td>
<td>14</td>
<td>N/A</td>
</tr>
<tr>
<td>2010*</td>
<td>11</td>
<td>16</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* FY2010 data is preliminary.


Topics to be Discussed

- NIH Fellowship Overview
- NIH Fellowship Grant Review Process
  - Institutes and Study Sections
  - Scoring System: Impact Scores
  - Institute Funding Paylines
  - Fellowship Review Criteria
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**Overall Impact/Merit** Write a paragraph summarizing the factors that informed your Overall Impact score.
Overall Impact/Merit Score

Reviewer’s assessment “that the fellowship will enhance the applicant’s potential for, and commitment to, an independent scientific research career…”
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?”

https://grants.nih.gov/grants/peer/critiques/f_D.htm
1. Fellowship Applicant – F30

■ “Are the applicant’s interests consistent with a career as a physician-scientist or other clinician-scientist?”

■ “Does the applicant have the potential to develop into an independent and productive contributor to biomedical, behavioral or clinical science as a physician-scientist or clinician-scientist?”

■ “Does the applicant demonstrate commitment to a career as a physician-scientist or other clinician-scientist?”
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 (if applicable) 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?”

https://grants.nih.gov/grants/peer/critiques/f_D.htm
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?"
- "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?"

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
3. Research Training Plan – F30

“Is the training plan well-reasoned, and likely to provide an effective, integrated research and clinical training experience and ease the transitions between the phases of the dual-degree program?”

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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?
4. Training Potential – F30

- “Are the proposed research project and research and clinical training plan likely to provide the applicant with an integrated perspective and appropriate skills for a physician-scientist or other clinical-scientist?”

- “Are appropriate opportunities for electives, early and longitudinal clinical experiences, or other enhanced clinical training available to the applicant?”

- Are appropriate opportunities available to ease the transition to clinical clerkships and for research electives during clinical training?

- Does the proposed integrated research and clinical training have the potential to serve as a sound foundation that will clearly enhance the applicant’s ability to develop into a productive, independent physician-scientist or other clinician-scientist?
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?
5. Institutional Environment & Commitment to Training – F30

■ “Does the environment include individuals with similar training who will serve as role models for the applicant?”

■ “Given the integrated nature of the training program, will appropriate advising be available to the applicant as he/she transitions between the research and clinical components of the integrated training program and to the next career stage?”

https://grants.nih.gov/grants/peer/critiques/f_D.htm
Topics to be Discussed

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- Components of a Fellowship Application
- Approaches for Competitive Applications
  - Prepare to Write the Grant Application
  - Complete the Grant Application

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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>
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<td>Note: This page limit includes the Additional Educational Information required for F30 and F31 applications.</td>
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<td>Applications for Concurrent Support</td>
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<td>Biographical Sketch</td>
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</tbody>
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# 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
6. Selection of Sponsor and Institution
7. Progress Report Publication List (for RENEWAL applications only)
8. Training in the Responsible Conduct of Research

## Sponsor(s), Collaborator(s), and Consultant(s) Section

9. Sponsor and Co-Sponsor Statements
10. Letters of Support from Collaborators, Contributors, and Consultants

## Institutional Environment and Commitment to Training Section

11. Description of Institutional Environment and Commitment to Training
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)

  **Graduate students:**
  - Preliminary description of doctoral thesis research

  **Post-doctoral Fellows:**
  - Describe previous scientific areas studied and findings
  - Specify which previous experiences were part of a doctoral thesis and which were part of a previous postdoctoral period

2. Applicant’s Background and Goals for Fellowship Training (6 pages)

B. Training Goals and Objectives:

- Overall training (short-term)/career (long-term) 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”

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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

# PHS Fellowship Supplemental Form

## Introduction
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## Institutional Environment and Commitment to Training Section
11. Description of Institutional Environment and Commitment to Training
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


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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
<table>
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<th>Description</th>
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<td>8. Training in the Responsible Conduct of</td>
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<tr>
<td>Sponsor(s), Collaborator(s), and Consultant(s)</td>
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<tr>
<td>and Commitment to Training</td>
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</table>
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.”
# 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

6. Selection of Sponsor and Institution

7. Progress Report Publication List (for RENEWAL applications only)
8. Training in the Responsible Conduct of Research

## Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsor and Co-Sponsor Statements
10. Letters of Support from Collaborators, Contributors, and Consultants

## Institutional Environment and Commitment to Training Section
11. Description of Institutional Environment and Commitment to Training

---

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.”
- Postdoctoral applicants “requesting training at either their doctorate institution or at the institution where they have been training for more than a year must explain why further training at that institution would be valuable.”
### 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
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7. Progress Report Publication List (for RENEWAL applications only)
8. Training in the Responsible Conduct of Research

#### Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsor and Co-Sponsor Statements
10. Letters of Support from Collaborators, Contributors, and Consultants

#### Institutional Environment and Commitment to Training Section
11. Description of Institutional Environment and Commitment to Training


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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## PHS Fellowship Supplemental Form

### Introduction
1. Introduction
   (for Resubmission)

### Fellowship Applicant Section
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### Research Training Plan Section
3. Specific Aims
4. Research Strategy
5. Respective Contributions
6. Selection of Sponsor and Institution
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8. Training in the Responsible Conduct of Research

### Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsor and Co-Sponsor Statements
10. Letters of Support from Collaborators,
    Contributors, and Consultants

### Institutional Environment and Commitment to Training Section
11. Description of Institutional
    Environment and Commitment to Training


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.

9. 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

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9. 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”

## 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
6. Selection of Sponsor and Institution
7. Progress Report Publication List (for RENEWAL applications only)
8. Training in the Responsible Conduct of Research

### Sponsor(s), Collaborator(s), and Consultant(s) Section

9. Sponsor and Co-Sponsor Statements
10. Letters of Support from Collaborators, Contributors, and Consultants

### Institutional Environment and Commitment to Training Section

11. Description of Institutional Environment and Commitment to Training
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

**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
6. Selection of Sponsor and Institution
7. Progress Report Publication List (for RENEWAL applications only)
8. Training in the Responsible Conduct of Research

### Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsor and Co-Sponsor Statements
10. Letters of Support from Collaborators, Contributors, and Consultants

### Institutional Environment and Commitment to Training Section
11. Description of Institutional Environment and Commitment to Training

---

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, didactics, journal clubs, seminars, workshops, etc.
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
  - Post-doctoral Investigators: Office of Postdoctoral Affairs

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)

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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

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Not yet Required for Fellowship Applications
### 1. Are Human Subjects Involved?
- Yes
- No

1.a. If YES to Human Subjects
- Is the Project Exempt from Federal regulations?
  - Yes
  - No
- If yes, check appropriate exemption number: 1 2 3 4 5 6
- If no, is the IRB review Pending?
  - Yes
  - No
- IRB Approval Date: 
- Human Subject Assurance Number: 

2. Are Vertebrate Animals Used?
- Yes
- No

2.a. If YES to Vertebrate Animals
- Is the IACUC review Pending?
  - Yes
  - No
- IACUC Approval Date: 
- Animal Welfare Assurance Number: 

3. Is proprietary/privileged information included in the application?
- Yes
- No

4.a. Does this Project Have an Actual or Potential Impact - positive or negative - on the environment?
- Yes
- No

4.b. If yes, please explain:

4.c. If this project has an actual or potential impact on the environment, has an exemption been authorized or an environmental assessment (EA) or environmental impact statement (EIS) been performed?
- Yes
- No

4.d. If yes, please explain:

5. Is the research performance site designated, or eligible to be designated, as a historic place?
- Yes
- No

5.a. If yes, please explain:

6. Does this project involve activities outside of the United States or partnerships with international collaborators?
- Yes
- No

6.a. If yes, identify countries: 

6.b. Optional Explanation: 

7. Project Summary/Abstract
- Add Attachment
- Delete Attachment
- View Attachment

8. Project Narrative
- Add Attachment
- Delete Attachment
- View Attachment

9. Bibliography & References Cited
- Add Attachment
- Delete Attachment
- View Attachment

10. Facilities & Other Resources
- Add Attachment
- Delete Attachment
- View Attachment

11. Equipment
- Add Attachments
- Delete Attachments
- View Attachments

12. Other Attachments
- Add Attachments
- Delete Attachments
- View Attachments
10. 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

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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

- Additional Scoring Guidance:
NIH “F” Sites of Interest

- 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/

- 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
  - Institute Funding Paylines
  - Fellowship Review Criteria
- Components of a Fellowship Application
- Approaches for Competitive Applications
  - Prepare to Write the Grant Application
  - Complete the Grant Application
Approaches for Competitive Applications

- Identify Funding
- 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?

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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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Topics to be Discussed

- NIH Fellowship Overview
- NIH Fellowship Grant Review Process
  - Institutes and Study Sections
  - Scoring System: Impact Scores
  - Institute Funding Paylines
  - 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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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

- 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
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

Tips:
- Bold label in text (e.g., **Fig. 4**) so it’s easier for reviewers to locate relevant text for individual Figure
- Try to have Figure and relevant text on the same page
## Timeline for Specific Aims and Benchmarks/Milestones of Research Progress

<table>
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<th>Benchmarks/ Milestones</th>
<th>Year 1</th>
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<th>Year 3</th>
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<td>Summary of Specific Aim 1a</td>
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<td>Summary of Specific Aim 1b</td>
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<td>Summary of Specific Aim 2a</td>
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<td>Summary of Specific Aim 2b</td>
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<td>Summary of Specific Aim 3</td>
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Anticipate Questions
and
Answer them before
they are asked
Not everything that can be counted counts.
Not everything that counts can be counted.

Research Training Plan Section
3. Specific Aims
4. Research Strategy

Fellowship Applicant Section
2. Applicant's Background and Goals for Fellowship Training

Quote Investigator suggests crediting sociologist William Bruce Cameron
http://quoteinvestigator.com/2010/05/26/everything-counts-einstein/
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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

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Poor Statistics

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Research Resources not Adequately Described

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