Sponsored Projects: Planning & Organizing Fellowship and Career Development Proposals

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

- **Individual Fellowship Programs**
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- **Career Transition Funding Programs**

- **Junior Faculty Career Development Programs**
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- **Approaches for Competitive Applications**
Topics to be Discussed

- **Individual Fellowship Programs**
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  - Components of a Career Development Application

- **Approaches for Competitive Applications**

Not All Funding Opportunities Are the Same

- **Different mission statements**
  - **Fellowships**
    - Career development (K’s)/ Scholar awards
    - Research project (R’s)

- **Different funding**
  - Stipend/Salary
  - Pilot awards vs. Comprehensive research costs

- **Different time frames**
  - Not renewable: e.g. 5 years (K’s), 3 years (F’s), 2 years (T’s)
  - Renewable: 4 years-5 years (R01) each competitive period

Timeline of Funding for Junior Investigators

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

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

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Timeline of Funding for Junior Investigators

Graduate School

Individual Fellowship
Training Grant
Mentor’s Research Grant

F31

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

F32

Post-doctoral Years

Instructor/Assistant Professor

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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

Pre-doc to Post-doc Transition Awards

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Timeline of NIH Funding for Junior Investigators

- **Medical School**
  - Year-long Enhancement Programs
    - MD/PhD Fellowship or Institutional T32
  - Short term Training
- **Internship/Residency**
- **Fellowship – Research Years**
- **Instructor/Assistant Professor**

Timeline of NIH Funding for Junior Investigators

Short term Training

Medical School

Year-long Enhancement Programs

MD/PhD Fellowship or Institutional T32

F30

Research Support

Internship/Residency

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

F32

Fellowship – Research Years

Instructor/Assistant Professor

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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 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).

[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.
Fellowship Programs

Predoctoral Individual National Research Service Award (F31)

- Supports specific individual in research degree program (e.g. PhD candidate)
- Stipend, health fees, tuition, travel
- Review criteria:
  - Individual fellow
  - Mentor
  - Research project

Post-doc Fellowships (F31s) Applications, awards, and success rates

Graph showing applications, awards, and success rates from 1998 to 2016.
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

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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

Post-doc Fellowships (F32s)
Applications, awards, and success rates

[Graph showing applications, awards, and success rates from 1998 to 2016]
Training Grants and Fellowships: Funding in Current and Constant Dollars

[Graph showing trends in funding over fiscal years.]

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

[Bar chart showing the number of positions for Pre-Doctoral Training, Post-Doctoral Training, Pre-Doctoral Fellowship, and Post-Doctoral Fellowship from 1998 to 2016.]
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.
Biomedical Workforce Task Force

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
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  - Components of a Fellowship Application

- **Career Transition Funding Programs**

- **Junior Faculty Career Development Programs**
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- **Approaches for Competitive Applications**
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)
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 on Dental and Craniofacial Research (NIDCR)
National Institute on Drug Abuse (NIDA)
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Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs (ORIP)

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
National Institutes of Health – F31

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

Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral MD/PhD and Other Dual Doctoral Degree Fellows (Parent F30)

National Cancer Institute (NCI)
National Eye Institute (NEI)
National Heart, Lung, and Blood Institute (NHLBI)
National Human Genome Research Institute (NHGRI)
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Division of Program Coordination, Planning and Strategic Initiatives, Office of Research Infrastructure Programs (ORIP)
National Institutes of Health – F30

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

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Eligibility:

- **Citizenship:**
  - US citizens, nationals, permanent residents

- **Degree Requirements:**
  - have not completed > than 12 months of full-time graduate study (or equivalent) as of August 1\textsuperscript{st} for Fall deadlines

- **Fields of Study not Eligible:**
  - Disease-related, patient-oriented research, epidemiological, medical behavioral studies, outcomes research, health services, pharmacologic, etc.

https://www.nsfgrfp.org/
National Science Foundation: Graduate Research Fellowship Program

**Fields of Study:** Chemistry, Computer and Information Science and Engineering, Engineering, Geosciences; **Life Sciences;** Materials Research; Mathematical Sciences; Physics and Astronomy; Psychology; Social Sciences; STEM Education and Learning Research

- **Life Sciences:** Biochemistry, Bioinformatics and Computational Biology, Biophysics, Cell Biology, Developmental Biology, Ecology, Environmental Biology, Evolutionary Biology, Genetics, Genomics, Microbial Biology, Neurosciences, Organismal Biology, Physiology, Proteomics, Structural Biology, Systematics and Biodiversity, Systems and Molecular Biology, Other (specify)

https://www.nsfgrfp.org/
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National Science Foundation: Graduate Research Fellowship Program

Application includes:
- Personal, Relevant Background and Future Goals
- Graduate Research Plan
- Reference Letters
- Transcripts

Funding:
- Stipend
- Cost-of-education allowance

https://www.nsfgrfp.org/
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Training postdoctoral fellows. There are currently more than 40,000 postdoctoral fellows in the US biomedical research system, and the number has been increasing rapidly in recent years (2, 17). The position has become one in which young scientists spend a significant fraction of their most productive years while being paid salaries that are quite low considering their extensive education. On the one hand, these fellows are pursuing science full time without the distractions that often come with more permanent jobs. On the other hand, for most of them, the holding pattern postpones the time when they are able to explore their own ideas in independent careers.
Improving graduate student and postdoctoral training

- A. Put individual development plans in place for all trainees
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http://acd.od.nih.gov/bwf.htm

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“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.”
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/

The purpose of this award is to support outstanding scientific training of highly promising postdoctoral candidates with outstanding mentors. Candidates are eligible to apply for support from this program from ~12 months prior to the start of the proposed postdoctoral position to within 12 months after starting in postdoctoral position. Based on the early timeframe of eligibility, and the discouragement of inclusion of preliminary data, this NINDS F32 seeks to foster early, goal-directed planning and to encourage applications for bold and/or innovative projects by the candidate that have the potential for significant impact. Applications are expected to incorporate strong training in quantitative reasoning and the quantitative principles of experimental design and analysis. Support by this program is limited to the first 3 years of a candidate's activity in a specific laboratory or research environment, so as to further encourage early fellowship application and timely completion of “mentored training” of the postdoctoral candidate in a single environment.
Individual Fellowships

Non-government, non-profit agencies

- Voluntary Health Organizations
- Professional Societies
- Private Foundations
Post-doc: Individual Fellowship
- Voluntary Health Organizations, Foundations, Professional Societies -

- American Cancer Society
- American Heart Association (Founders)
- American Kidney Fund
- American Liver Foundation
- Daland Fellowships in Clinical Investigation
- Helen Hay Whitney Foundation
American Heart Association
Postdoctoral Fellowship Program

- Cardiovascular and stroke research
- Basic, clinical, behavioral, epidemiological, community and clinical research

- Funding
  - Stipend
  - Health insurance
  - Project support

- Award Duration: 2 years, Can then apply for a second 2-year award

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Jane Coffin Childs Memorial Fund for Medical Research

Postdoctoral Research Fellowships

- Supports early postdoctoral research training
- Basic research into the causes and treatment of cancer; “broad approach to the study of cell growth and development”
- 3-year fellowships
- Stipend, Research Allowance, and Travel
- Stipends for child care
- US and foreign citizens

Jaime S. Rubin, Ph.D.; http://grantcourse.columbia.edu
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  - Components of a Career Development Application

- Approaches for Competitive Applications

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

**Strengths/Weaknesses**

- **Strengths**
- **Weaknesses**

---

<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>
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<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
### Fellowsships & 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>
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</thead>
<tbody>
<tr>
<td><strong>Score</strong></td>
<td>1 2 3</td>
<td>4 5 6</td>
<td>7 8 9</td>
</tr>
</tbody>
</table>

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#### 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

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- **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 *high or 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 *moderate value/benefit* for the candidate who shows moderate potential. May have some weaknesses in the criteria.

- **e.g.** Proposes training or career development of *low value/benefit* for the candidate who shows low potential. May have some weaknesses in the criteria.

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

“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.”
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

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# Fellowship Payline: NHLBI

<table>
<thead>
<tr>
<th>Grant Program</th>
<th>Grant Program Description</th>
<th>Percentile</th>
<th>Priority Score</th>
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<tbody>
<tr>
<td>R01</td>
<td>Research Project Grant</td>
<td>15</td>
<td>N/A</td>
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<tr>
<td>R01 ESI</td>
<td>Early Stage Investigators</td>
<td>25</td>
<td>N/A</td>
</tr>
<tr>
<td>K awards</td>
<td>Career Development Awards</td>
<td>N/A</td>
<td>32</td>
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<tr>
<td>F30</td>
<td>Pre-doctoral NRSA</td>
<td>N/A</td>
<td>20</td>
</tr>
<tr>
<td><strong>F31, F32, F33</strong></td>
<td>Pre and Post-doctoral NRSA</td>
<td>36</td>
<td>N/A</td>
</tr>
<tr>
<td>R15</td>
<td>Academic Research Enhancement Awards (AREA)</td>
<td>N/A</td>
<td>24</td>
</tr>
<tr>
<td>R43</td>
<td>Small Business Innovation Research (SBIR) Grants (Phase I)</td>
<td>N/A</td>
<td>29</td>
</tr>
</tbody>
</table>

FY17

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

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<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 PIs)</td>
<td>10 percentile</td>
<td>Interim</td>
<td>Research Projects for established investigators</td>
</tr>
<tr>
<td>R01 (new PIs)</td>
<td>14 percentile</td>
<td>Interim</td>
<td>Research Projects for new and early-stage investigators</td>
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<tr>
<td>F30</td>
<td>15 overall impact/priority score</td>
<td>Interim</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>17 overall impact/priority score</td>
<td>Interim</td>
<td>NRSA Individual Predoctoral Fellowships</td>
</tr>
<tr>
<td>F32</td>
<td>19 overall impact/priority score</td>
<td>Interim</td>
<td>NRSA Individual Postdoctoral Fellowships</td>
</tr>
</tbody>
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## Fellowship Payline: NIAID

<table>
<thead>
<tr>
<th>FY</th>
<th>R01 Percentile</th>
<th>R01 (new PI)</th>
<th>Overall Impact Score</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>F30</td>
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<tr>
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https://www.niaid.nih.gov/grants-contracts/archive-paylines-fiscal-year

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
4. **Training Potential**

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

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</table>
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?”
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

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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

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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 transition to the next career stage and enhance the applicant’s ability to develop into a productive researcher?”

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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**?

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

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Topics to be Discussed

- **Individual Fellowship Programs**
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- **Career Transition Funding Programs**

- **Junior Faculty Career Development Programs**
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- **Approaches for Competitive Applications**

NIH & AHRQ Announce Upcoming Changes to Policies, Instructions and Forms for 2016 Grant Applications

The planned changes focus on the following areas:

- Rigor and transparency in research
- Vertebrate animals
- Inclusion reporting
- Data safety monitoring
- Research training
- Appendices
- Font requirements
- Biosketch clarifications

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<thead>
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<th>Section</th>
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<tr>
<td>Introduction to Resubmission or Revision Application (when applicable)</td>
<td>1</td>
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<tr>
<td>Applicant's Background and Goals for Fellowship Training</td>
<td>6</td>
</tr>
<tr>
<td>Specific Aims</td>
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<tr>
<td>Research Strategy</td>
<td>6</td>
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<tr>
<td>Respective Contributions</td>
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<tr>
<td>Selection of Sponsor and Institution</td>
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<td>Sponsor and Co-Sponsor Statements</td>
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<tr>
<td>Letters of Support from Collaborators, Contributors, and Consultants</td>
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<tr>
<td>Description of Institutional Environment and Commitment to Training</td>
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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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<tr>
<td>Applications for Concurrent Support (when applicable)</td>
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<tr>
<td>Biographical Sketch</td>
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</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
6. Selection of Sponsor and Institution
7. Progress Report Publication List (for RENEWAL applications only)
8. Training in the Responsible Conduct of Research

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11. Description of Institutional Environment and Commitment to Training

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- 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 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”
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

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Research Training Plan Section

3. Specific Aims
4. Research Strategy

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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
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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<tr>
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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.”


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# PHS Fellowship Supplemental Form

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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**

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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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### PHS Fellowship Supplemental Form

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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


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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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”
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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, didactics, 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
  - 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
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<th>Instructions</th>
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<td>1. Are Human Subjects Involved?</td>
<td>☐ Yes ☐ No</td>
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<td>1.a. If YES to Human Subjects</td>
<td>☐ Yes ☐ No</td>
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<tr>
<td>Is the Project Exempt from Federal regulations?</td>
<td>☐ Yes ☐ No</td>
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<tr>
<td>If yes, check appropriate exemption number.</td>
<td>☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6</td>
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<td>If no, is the IRB review Pending?</td>
<td>☐ Yes ☐ No</td>
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<td>IRB Approval Date:</td>
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<tr>
<td>Human Subject Assurance Number:</td>
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<tr>
<td>2. Are Vertebrate Animals Used?</td>
<td>☐ Yes ☐ No</td>
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<tr>
<td>2.a. If YES to Vertebrate Animals</td>
<td>☐ Yes ☐ No</td>
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<tr>
<td>Is the IACUC review Pending?</td>
<td>☐ Yes ☐ No</td>
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<td>IACUC Approval Date:</td>
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<td>Animal Welfare Assurance Number:</td>
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<tr>
<td>3. Is proprietary/privileged information included in the application?</td>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>4.a. Does this Project Have an Actual or Potential Impact - positive or negative - on the environment?</td>
<td>☐ Yes ☐ No</td>
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<tr>
<td>4.b. If yes, please explain:</td>
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</tr>
<tr>
<td>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?</td>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>4.d. If yes, please explain:</td>
<td></td>
</tr>
<tr>
<td>5. Is the research performance site designated, or eligible to be designated, as a historic place?</td>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>5.a. If yes, please explain:</td>
<td></td>
</tr>
<tr>
<td>6. Does this project involve activities outside of the United States or partnerships with international collaborators?</td>
<td>☐ Yes ☐ No</td>
</tr>
<tr>
<td>6.a. If yes, identify countries:</td>
<td></td>
</tr>
<tr>
<td>6.b. Optional Explanation:</td>
<td></td>
</tr>
<tr>
<td>7. Project Summary/Abstract</td>
<td></td>
</tr>
<tr>
<td>8. Project Narrative</td>
<td></td>
</tr>
<tr>
<td>9. Bibliography &amp; References Cited</td>
<td></td>
</tr>
<tr>
<td>10. Facilities &amp; Other Resources</td>
<td></td>
</tr>
<tr>
<td>11. Equipment</td>
<td></td>
</tr>
<tr>
<td>12. Other Attachments</td>
<td></td>
</tr>
</tbody>
</table>
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
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
21. Cover Letter Attachment

- Must include List of Referees (name/affiliation)
- Administrative document – not seen by reviewers
- Request of specific Institute and Study Section now made via Assignment Request Form
Awarding Component Assignment Request (optional)

If you have a preference for an Awarding Component (e.g., NIAID for Clinical Research Center), please use the link below to identify the most appropriate assignment, 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#Awarding Components

Assign to Awarding Component:  
Do Not Assign to Awarding Component:

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, 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#Study Section

Assign to Study Section:  
Do Not Assign to Study Section:  Only 20 characters allowed
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”

http://grants.nih.gov/sites/default/files/instructions-for-fellowship-referees.docx
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NIH “F” Sites of Interest

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

- Instruction in the Responsible Conduct of Research

- Application Page Limits

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NIH “F” Sites of Interest

- **Review Criteria and Considerations, Guidelines for Reviewers, Review Critique Fillable Templates**

- **Additional Scoring Guidance**

- **Review Criteria at a Glance – Training**
NIH “F” Sites of Interest

- Research Training and Career Development Programs
  https://researchtraining.nih.gov/

- Research Training and Career Development Programs at Specific Institutes
  https://researchtraining.nih.gov/institute
Topics to be Discussed

- Individual Fellowship Programs
  - Funding Agencies
  - Components of a Fellowship Application
  - Scoring and Review Criteria

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Funding Agencies
  - Components of a Career Development Application
  - Scoring and Review Criteria

Approaches for Competitive Applications

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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
Pathway to Independence Award

- Career Transition Award (K99/R00)
- No citizenship requirement
- Applicants must:
  - Have earned a clinical or research doctorate
  - Have no more than 4 years of research experience since completing the requirements of the doctoral degree
  - Have not been the principal investigator of an NIH research grant (e.g., R01, R03, R21), career development award (e.g., K01, K07, K08, K23, K25), other peer-reviewed NIH or non-NIH research grant over $100,000 direct costs per year, or have been a project leader on a sub-project of a program project (P01) or a center (P50) grant.

1-2 years as a mentored **K award** for “post-docs”
- Funding level is Institute-specific
  - Salary and Research Support
- 75% effort

3 years as a **Research award** for independent investigators
- Total/year:=$249,000 (salary and research expenses)
  - D.C. + institution’s I.C. rate
- Must have an independent research position
Research Career Development Awards

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Timeline of Funding for Junior Investigators

Short term Training

Medical School

Internship/Residency

Fellowship – Research Years

Instructor/Assistant Professor

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

Research Support

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

Career Transition Awards

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
5. NIH should establish a new physician-scientist-specific granting mechanism to facilitate the transition from training to independence. This program should be similar to the K99/R00 program whose funding currently goes almost exclusively to individuals holding a PhD degree. This new grant program could serve either as a replacement or transition from existing K Awards for physician scientists, and should provide a longer period of support, potentially lengthening the R00 phase to 5 years (with an interim staff review at year 3). This new grant series, as well as K and all other training awards, should rigorously enforce protected time of at least 75 percent effort and provide sufficient salary support to make that possible.
Notice of Reissuance of the NIH Pathway to Independence Award (Parent K99/R00)

Notice Number: NOT-OD-16-049

Key Dates
Release Date: January 8, 2016

Implementation
In response to the Physician Scientist Workforce Working Group recommendations, NIH is reissuing the K99/R00 FOA to provide additional information for physician-scientists who may wish to apply for this program. Specifically:

- **Section I. Funding Opportunity Description:** A separate section has been added under "Additional Information for Physician-Scientists" to further clarify features of K99/R00 program suited to physician scientists, and to provide guidance to applicants with respect to career stage and timing of the application.
- **Section III. Eligibility Information:** A separate section has been added under "Physician-Scientists in positions not designated as postdoctoral positions" to provide additional guidance on the differences between independence in clinical responsibilities and independence is research. In addition, more specific guidance is provided under "Level of Effort" and "Mentor(s)" sections.
- **Section VI. Award Administration Information:** Under the section "Transition to the Independent Phase" additional guidance is provided regarding institutional commitment to the awardee during the R00 phase of the award and beyond.

The purpose of the NIH Pathway to Independence Award (K99/R00) program is to increase and maintain a strong cohort of new and talented, NIH-supported, independent investigators. This program is designed to facilitate a timely transition of outstanding postdoctoral researchers with a research and/or clinical doctorate degree from mentored, postdoctoral research positions to independent, tenure-track or equivalent faculty positions. The program will provide independent NIH research support during this transition in order to help awardees to launch competitive, independent research careers.

Prospective candidates are encouraged to contact the relevant NIH staff for IC-specific programmatic and budgetary information: Table of IC-Specific Information, Requirements and Staff Contacts.
Additional Information for Physician-Scientists

For the purposes of this program, physician-scientists include individuals with an MD, DO, DDS/DMD, DVM/VMD, or nurses with research doctoral degrees who devote the majority of their time to biomedical research. The K99/R00 is intended for those physician-scientists who already have substantial research training and are dedicated to initiating a strong, research-intensive career as physician-scientists. The K99/R00 program is designed to facilitate a timely transition of outstanding physician-scientists from mentored, research positions to independent, tenure-track or equivalent faculty positions, and to provide independent NIH research support during the transition. Individuals who need a longer period of mentored career development before they are prepared to begin the transition to research independence should consider the K08 or K23 program (see: K Kiosk).
Career Transition Awards

- **BWF: Career Awards for Medical Scientists**

  - To support physician-scientists during the last years of a mentored postdoctoral/fellowship position and the beginning years of an independent faculty position.
  
  - Candidates must hold an M.D., D.O., D.D.S., or D.V.M. degree
  
  - 75% effort to research-related activities
  
  - Funding: $700,000 over five years

  - **Postdoctoral/Fellowship Portion**: Years 1 and 2
    Annual Total: $95,000

  - **Faculty Portion**: Years 3-5
    Annual Total: $170,000
Career Transition Awards

- **American Heart Association**

  **Fellow-to-Faculty Transition Award**

  - Provides funding for the “period of career development that spans the completion of research training through the early years of the first faculty/staff position”
  
  - **Training stage:** Maximum of $65,000 per year
  
  - **Faculty stage:** Maximum of $132,000 per year
  
  - **Award Duration:** 5 years

Career Transition Awards

- **JDRF: Advanced Postdoctoral Fellowships**
  - Supports full-time research training and assist awardees “in transitioning from a fellowship to an independent (faculty-level) position”
  - First degree (PhD, MD, DMD, DVM, or equivalent) received no more than 6 years before application
  - No citizenship requirements
  - $95,000 per year for up to 3 years
  - **Transition Award**: “Optional transition year in which the awardee may request funding support in their first year as a faculty member” (up to $110,000 for one year)

http://grantcenter.jdrf.org/grant-center/information-for-applicants/grant-mechanism-descriptions/advanced-postdoctoral-fellowships/

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Topics to be Discussed

- Individual Fellowship Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- Approaches for Competitive Applications
Timeline of Funding for Junior Investigators

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

- Short term Training
- Research Support
- Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot

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

Career Transition Awards

Individual Mentored K Career Development Award

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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

Individual Mentored K Career Development Award
Career Development (K) Support to Independent Research Grant (R01)

K01/K08/K23 → R01
K12 | K23 → R01
K12 | K23 → R01
K01/K08/K23 → R01
K12 → R01

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Not All Funding Opportunities Are the Same

- **Different mission statements**
  - Fellowships
  - Career development (K’s)/ Scholar awards
  - Research project (R’s)

- **Different funding**
  - Stipend/Salary
  - Pilot awards vs. Comprehensive research costs

- **Different time frames**
  - Not renewable: 5 years (K’s), 3 years (F’s), 2 years (T’s)
  - Renewable: 4 years-5 years (R01) each competitive period
Topics to be Discussed

- Individual Fellowship Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- Approaches for Competitive Applications
Research Career Programs (K)

- Provides predominantly salary support
- Minimum requirements for the amount of effort that must be devoted to research and career development (e.g. 75%, some exceptions to 50%)
- Up to 5 years
- Specified salary levels
- US citizen/permanent resident.
- Can reduce effort to 50% in last 2 years if PI of NIH research grant

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Mentored Clinical Scientist Development Award (K08)

- Support to develop outstanding independent clinician research scientists
- Basic and translational science

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Mentored Patient-Oriented Research Career Development Award (K23)

- For investigators just after specialty training; not renewable

Mid-Career Investigator In Patient-Oriented Research Career Development Award (K24)

- Support for clinicians to allow for time to devote to patient-oriented research and to mentor beginning clinical investigators
Patient-oriented research:

- Research conducted with human subjects
  (or on material of human origin, i.e. tissues, specimens, and cognitive phenomena)
- Investigator directly interacts with human subjects

Research areas:

- Mechanisms of human disease
- Therapeutic interventions
- Clinical trials
- Development of new technologies
Mentored Research Scientist Development Award (K01)

Not all NIH Institutes participate in program.

Participating Institutes may use for different purposes.

- Train in a new field
- Specific research areas
- Hiatus in research career
- Increase research workforce diversity

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Mentored Research Scientist Development Awards (K01)

- **NIMH:**
  - Supports “broad spectrum of basic and translational research, including basic neuroscience, human genetics, adult and developmental translational research, services and intervention research, and AIDS-related research”

- **NINDS:**
  - Supports “postdoctoral researchers… Candidates are encouraged to apply for support… between the second through fourth year of cumulative mentored postdoctoral research experience…”

- **NCI, NHLBI, NINDS:** Promote Faculty Diversity

Mentored Research Scientist Development Awards (K01)

- **NIDDK:**
  - For “experienced postdoctoral (two years minimum) and/or recently appointed junior faculty (usually with a Ph.D. degree) in biomedical, behavioral, or clinical sciences”

- **NIAID:**
  - (a) Epidemiology
  - (b) Modeling Techniques
  - (c) Outcomes Research

- **NLM:** Biomedical Informatics and Data Science

Mentored Research Scientist Development Awards (K01)

- **NINR:**
  - Supports “research in the areas of symptom management, pulmonary, critical care, trauma, reproductive health, genetics, epigenetics, behavioral research, incorporation of advanced technology and end-of-life and palliative care”

- **NICHD:**
  - (a) Medical Rehabilitation Research
  - (b) Child Abuse and Neglect
  - (c) Population Research

- **FIC:**
  - International Research Scientist Development Award (IRSDA)

Mentored Research Scientist Development Awards (K01)

- **NHGRI:**
  - (a) Genomic Sciences
  - (b) Ethical, legal and social issues (ELSI)

- **NHLBI:**
  - (a) Epidemiology
  - (b) Biostatistics
  - (c) Outcomes Research
  - (d) Implementation Research
Mentored Career Development Award in Biomedical Big Data Science for Clinicians and Doctorally Prepared Scientists (K01)

National Human Genome Research Institute (NHGRI)
National Cancer Institute (NCI)
National Eye Institute (NEI)
National Heart, Lung, and Blood Institute (NHLBI)
National Institute on Aging (NIA)
National Institute on Alcohol Abuse and Alcoholism (NIAAA)
National Institute of Allergy and Infectious Diseases (NIAID)
National Institute of 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 (NIEMS)
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)
Office of Behavioral and Social Sciences Research (OBSSR)
Office of Strategic Coordination (Common Fund)

RFA-HG-14-007

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Mentored Quantitative Research Career Development Award (K25)

- Investigators with quantitative scientific and engineering backgrounds outside of biology or medicine
- Focus their research on behavioral and/or biomedical research (basic or clinical)
Cancer Prevention, Control, Behavioral, and Population Sciences Career Development Award (K07)

- NCI program

- Support individuals with health professional or science doctoral degrees who are not fully established investigators

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Notice of NCI’s Withdrawal from Participation in PA-16-198
"Mentored Patient-Oriented Research Career Development Award
(Parent K23)"

Eligible clinician scientists who wish to apply for a research career development award in cancer-focused patient-oriented research should instead submit applications to:

- PA-16-191, Mentored Clinical Scientist Research Career Development Award (Parent K08);
- PA-16-193, NIH Pathway to Independence Award (Parent K99/R00); or
- PAR-16-293, The NCI Transition Career Development Award (K22)

NCI will support training in Patient-Oriented Research through K08 Awards and increase K08 Salary and Research Support

https://grants.nih.gov/grants/guide/notice-files/NOT-CA-17-043.html

Jaime S. Rubin, Ph.D.: http://grantcourse.columbia.edu
Mentored Research Scientist Career Development Award

For support of a postdoctoral or early career research scientists committed to research, in need of both advanced research training and additional experience.

Details  View Current Funding Opportunities

Mentored Clinical Scientist Research Career Development Award

To provide the opportunity for promising clinician scientists with demonstrated aptitude to develop into independent investigators, or for faculty members to pursue research, and aid in filling the academic faculty gap in health profession’s institutions.

Details  View Current Funding Opportunities

Mentored Patient-Oriented Research Career Development Award

To provide support for the career development of clinically trained professionals who have made a commitment to patient-oriented research, and who have the potential to develop into productive, clinical investigators.

Details  View Current Funding Opportunities

Pathway to Independence Award

To support both an initial mentored research experience (K99) followed by independent research (R00) for highly qualified, postdoctoral researchers, to secure an independent research position. Award recipients are expected to compete successfully for independent R01 support during the R00 phase.

Details  View Current Funding Opportunities
Research Career Development Awards

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<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Activity Code</th>
<th>NIH Institute / Center</th>
<th>Number of Applications Reviewed</th>
<th>Number of Applications Awarded</th>
<th>Success Rate</th>
<th>Total Funding</th>
</tr>
</thead>
<tbody>
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<td>2016</td>
<td>K23</td>
<td>NCI</td>
<td>31</td>
<td>5</td>
<td>16.1%</td>
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<td>2016</td>
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<tr>
<td>2016</td>
<td>K23</td>
<td>NIDCR</td>
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<td>2</td>
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<td>NIDDK</td>
<td>62</td>
<td>28</td>
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<tr>
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<td>42</td>
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<td>NIGMS</td>
<td>6</td>
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<td>3</td>
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<td>K23</td>
<td>NIA</td>
<td>36</td>
<td>13</td>
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<td>K23</td>
<td>NIAMS</td>
<td>16</td>
<td>7</td>
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<td>NIDCD</td>
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<td><strong>Activity Total</strong></td>
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<td><strong>207</strong></td>
<td><strong>36.0%</strong></td>
<td><strong>$35,665,755</strong></td>
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</tbody>
</table>
- **AHRQ K08**: Mentored *Clinical Scientist* Research Career Development Award for individuals with a clinical doctoral degree or Ph.D./other doctoral degree in a clinical discipline

- **AHRQ K01**: Mentored *Research Scientist* Research Career Development Award - for individuals with a research doctoral degree

- Health Services Research -

- Quality,

- Safety,

- Efficiency, and

- Effectiveness of health care

■ **CDC K01:**

■ National Institute for Occupational Safety and Health

■ Mentored Research Scientist Development Award

■ “career development experience in occupational health and safety research leading to research independence”
Mentored Clinical Scientist Development Program Award (K12)

- Support to an institution for career development experiences for junior investigators leading to research independence

- Institutions recruit and select candidates into their programs

- Candidates must meet the same criteria as for the individual mentored clinical scientist development award

Mentored Clinical Scientist Development Program Award (K12)

- **Multi-Institute:** Women’s Health

- **Institute specific**
  - NCI: Clinical oncology
  - NEI: Clinical vision scientists
  - NIDDK: Pediatric diabetes research
  - NICHD:
    - Child health
    - Pediatric scientists
    - Women’s reproductive health

Mentored Clinical Scientist

Development Program Award (K12)

- **Institute specific**
  - NHLBI: Late stage (T4) translation research
  - NIDCR: Temporomandibular joint disorders and orofacial pain
  - NIDA: Drug abuse and addiction
  - NINDS: Child Neurologists

- **CTSA - Clinical and Translational Scientist Award: KL2**
NIH CTSA Awards: A Home for Clinical and Translational Science

Source: Zerhouni (NIH) [9/06]
Research Career Development/Scholar Programs

- AGA Research Foundation
  - Research Scholar Awards

- American Heart Association
  - Scientist Development Grant

- Robert Wood Johnson Foundation
  - Harold Amos Medical Faculty Development Program

- Damon Runyon Cancer Research Foundation
  - Clinical Investigator Award

- Doris Duke Charitable Foundation
  - Clinical Scientist Development Grant

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Topics to be Discussed

- Individual Fellowship Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- Approaches for Competitive Applications
### 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>High Impact</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>Moderate Impact</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>Low Impact</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>


<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><strong>Score</strong></td>
<td>1 2 3</td>
<td>4 5 6</td>
<td>7 8 9</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

### Examples:
- **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 shows moderate potential. May have some weaknesses in the criteria.
- **e.g.** Proposes training or career development of low value/benefit for the candidate who shows low potential. May have some weaknesses in the criteria.

**5 is a good, medium-impact application. The entire scale (1-9) should always be considered.**
Implementing Rigor and Transparency in NIH & AHRQ Career Development Award Applications

Notice Number: NOT-OD-16-012

These updates focus on four areas deemed important for enhancing rigor and transparency:

1) the scientific premise forming the basis of the proposed research,
2) rigorous experimental design for robust and unbiased results,
3) consideration of relevant biological variables, and
4) authentication of key biological and/or chemical resources.

Updates include:

- Revisions to application guide instructions for preparing your research strategy attachment
- Use of a new "Authentication of Key Biological and/or Chemical Resources" attachment
- Additional rigor and transparency questions reviewers will be asked to consider when reviewing applications

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
## Reviewer Guidance on Rigor and Transparency:
Research Project Grant and Mentored Career Development Applications

### OVERVIEW: MENTORED CAREER DEVELOPMENT AWARD (K) APPLICATIONS

<table>
<thead>
<tr>
<th>Element of Rigor and Transparency</th>
<th>Section of Application</th>
<th>Criterion Score</th>
<th>Additional Review Consideration</th>
<th>Contribute to Overall Impact Score?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Premise</td>
<td>Research Strategy</td>
<td>Research Plan</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>Scientific Rigor</td>
<td>Research Strategy</td>
<td>Research Plan</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>Consideration of Relevant Biological Variables, such as Sex</td>
<td>Research Strategy</td>
<td>Research Plan</td>
<td>NA</td>
<td>Yes</td>
</tr>
<tr>
<td>Authentication of Key Biological and/or Chemical Resources</td>
<td>New Attachment</td>
<td>NA</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

NIH & AHRQ Announce Upcoming Changes to Policies, Instructions and Forms for 2016 Grant Applications

The planned changes focus on the following areas:

- Rigor and transparency in research
- Vertebrate animals
- Inclusion reporting
- Data safety monitoring
- Research training
- Appendices
- Font requirements
- Biosketch clarifications
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**
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)
**Overall Impact** Write a paragraph summarizing the factors that informed your Overall Impact score.
Separate Scores for the Individual Criteria

- All applications receive scores (even those not discussed at study section)
- Individually reported in summary statement
- Major strengths and weaknesses that influenced the overall impact/priority score - ¼ page per criterion
<table>
<thead>
<tr>
<th>1. Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
</tr>
<tr>
<td>•</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td>•</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Career Development Plan/Career Goals &amp; Objectives/Plan to Provide Mentoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
</tr>
<tr>
<td>•</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td>•</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Research Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strengths</strong></td>
</tr>
<tr>
<td>•</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
</tr>
<tr>
<td>•</td>
</tr>
</tbody>
</table>
4. **Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)**

<table>
<thead>
<tr>
<th>Strengths</th>
<th></th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. **Environment and Institutional Commitment to the Candidate**

<table>
<thead>
<tr>
<th>Strengths</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Weaknesses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Candidate

- “Does the candidate have the potential to develop as an independent and productive researcher?
- Are the candidate's prior training and research experience appropriate for this award?
- Is the candidate’s academic, clinical (if relevant), and research record of high quality?
- Is there evidence of the candidate’s commitment to meeting the program objectives to become an independent investigator in research/patient oriented research?”

https://grants.nih.gov/grants/peer/critiques/k_D.htm
1. Candidate

- “Do the **letters of reference** address the above review criteria, and do they provide evidence that the candidate has a high potential for becoming an independent investigator?”

https://grants.nih.gov/grants/peer/critiques/k_D.htm
2. Career Development Plan/Career Goals & Objectives/Plan to Provide Mentoring

- “What is the likelihood that the plan will contribute substantially to the scientific development of the candidate and lead to scientific independence?
- Are the candidate's prior training and research experience appropriate for this award?
- Are the content, scope, phasing, and duration of the career development plan appropriate when considered in the context of prior training/research experience and the stated training and research objectives for achieving research independence?”

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
2. Career Development Plan/Career Goals & Objectives/Plan to Provide Mentoring

■ “Are there adequate plans for monitoring and evaluating the candidate’s research and career development progress?”

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

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

- “Are the proposed research question, design, and methodology of significant scientific and technical merit?
- Is there a strong scientific premise for the project?
- Has the candidate presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed?
- Has the candidate presented adequate plans to address relevant biological variables, such as sex, for studies in vertebrate animals or human subjects?”

https://grants.nih.gov/grants/peer/critiques/k_D.htm
3. Research Plan

- “Is the research plan relevant to the candidate’s research career objectives?
- Is the research plan appropriate to the candidate's stage of research development and as a vehicle for developing the research skills described in the career development plan?”

https://grants.nih.gov/grants/peer/critiques/k_D.htm
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
4. Mentor(s), Co-mentor(s), Consultant(s), Collaborator(s).

- “Are the qualifications of the mentor(s) in the area of the proposed research appropriate?
- Do(es) the mentor(s) adequately address the candidate’s potential and his/her strengths and areas needing improvement?
- Is there adequate description of the quality and extent of the mentor’s proposed role in providing guidance and advice to the candidate?
- Is the mentor’s description of the elements of the research career development activities, including formal course work adequate?”

4. Mentor(s), Co-mentor(s), Consultant(s), Collaborator(s).

- “Is there evidence of the mentor’s, consultant’s and/or collaborator’s previous experience in fostering the development of independent investigators?
- Is there evidence of the mentor’s current research productivity and peer-reviewed support?
- Is active/pending support for the proposed research project appropriate and adequate?
- Are there adequate plans for monitoring and evaluating the career development awardee’s progress toward independence?”

https://grants.nih.gov/grants/peer/critiques/k_D.htm
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
5. Environment and Institutional Commitment to the Candidate

“Is there clear commitment of the sponsoring institution to ensure that the required minimum of the candidate’s effort [usually 75%] will be devoted directly to the research described in the application, with the remaining percent effort being devoted to an appropriate balance of research, teaching, administrative, and clinical responsibilities?

Is the institutional commitment to the career development of the candidate appropriately strong?”

https://grants.nih.gov/grants/peer/critiques/k_D.htm
5. Environment and Institutional Commitment to the Candidate

- “Are the research facilities, resources and training opportunities, including faculty capable of productive collaboration with the candidate, adequate and appropriate?

- Is the environment for scientific and professional development of the candidate of high quality?

- Is there assurance that the institution intends the candidate to be an integral part of its research program as an independent investigator?”

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Topics to be Discussed

- Individual Fellowship Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- Approaches for Competitive Applications

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NIH Career Development (K) Application

- Model for other career development/scholar grant programs supported by voluntary health organizations, private foundations, and professional societies
CAREER DEVELOPMENT INSTRUCTIONS
FOR NIH AND OTHER PHS AGENCIES
SF424 (R&R) APPLICATION PACKAGES


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
<table>
<thead>
<tr>
<th>Section of Application</th>
<th>Page Limits * (if different from FOA, FOA supersedes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Resubmission or Revision Application (when applicable)</td>
<td>1</td>
</tr>
<tr>
<td>Candidate Information and Goals for Career Development and Research Strategy</td>
<td>12 (for both attachments combined)</td>
</tr>
<tr>
<td>Specific Aims</td>
<td>1</td>
</tr>
<tr>
<td>Training in the Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>Candidate's Plan to Provide Mentoring (Include only when required by the specific FOA, e.g., K24 and K05)</td>
<td>6</td>
</tr>
<tr>
<td>Plans and Statements of Mentor and Co-mentor(s)</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</td>
<td>1</td>
</tr>
<tr>
<td>Institutional Commitment to Candidate's Research Career Development</td>
<td>1</td>
</tr>
</tbody>
</table>
PHS 398 Career Development Award Supplemental Form

Introduction
1. Introduction to Application
   (RESUBMISSION)

Candidate Section
2. Candidate Information and Goals for Career Development

Research Plan Section
3. Specific Aims
4. * Research Strategy
5. Progress Report Evaluation List
   (for RENEWAL applications only)
6. Training in the Responsible Conduct of Research

Other Candidate Information Section
7. Candidate's Plan to Provide Mentoring

Mentor, Co-Mentor, Consultant, Collaborators Section
8. Plans and Statements of Mentor and Co-
    Mentor(s)
9. Letters of Support from Collaborators,
    Contributors, and Consultants

Environment and Institutional Commitment to Candidate Section
10. Description of Institutional Environment
11. Institutional Commitment to Candidate's
    Research Career Development

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1 + 12 Pages Combined

- Candidate Information
  - Section 2
- Research Plan
  - 3. Specific Aims (1 page)
  - 4. Research Strategy
# PHS 398 Career Development Award Supplemental Form

- **Introduction**
  1. Introduction to Application (RESUBMISSION)

- **Candidate Section**
  2. Candidate Information and Goals for Career Development

- **Research Plan Section**
  3. Specific Aims
  4. *Research Strategy*
  5. Progress Report Publication List (for RENEWAL applications only)
  6. Training in the Responsible Conduct of Research

- **Other Candidate Information Section**
  7. Candidate's Plan to Provide Mentoring

- **Mentor, Co-Mentor, Consultant, Collaborators Section**
  8. Plans and Statements of Mentor and Co-Mentor(s)
  9. Letters of Support from Collaborators, Contributors, and Consultants

- **Environment and Institutional Commitment to Candidate Section**
  10. Description of Institutional Environment
  11. Institutional Commitment to Candidate's Research Career Development

2. Candidate Information

- Candidate’s Background
- Career Goals and Objectives:
  Scientific Biography
- Career Development/ Training Activities During Award Period
2. Candidate’s Background

- Personal background for this career path
- Other training experiences
  - Masters degree
- Other research experiences
  - MD/PhD, Medical school, Fellowship
- Reasons for basic, clinical, translational, behavioral, multidisciplinary research, relevant publications
Career Goals and Objectives

- Unique expertise/Scientific history
  - Previous work
    - Consistent themes, or
    - Why research interests have changed direction
  - e.g. Joint appointments, Multidisciplinary

- Skills that are lacking
  - Identification of specific modules to address areas for growth, provides justification of award
  - Role of specific Mentor(s) and Advisory Committee member(s)
- **Justify award**
  - Fits into past and future research career

- **Short-term Career Goals**
  - Timeline for funded period

  **Year 1:** Preliminary data

  **Year 2:** Submit publications (possible journals),
  Presentations at national meetings (examples),
  Formulation of R01 application

  **Year 3-5:** By the end of the funded period, applicant will
  be an independent investigator near to R01 funding

Long-term Career Goals

Scientific goals
- Basic science, translational, clinical, epidemiologic, behavioral

Mentoring goals
- How mentoring has been important to you
- Previous/current mentoring responsibilities

Networking goals
- Multidisciplinary activities, grants, etc
Career Development/Training Activities During Award Period

- Review of didactic courses, clinical training, and research experiences to date
- New research skills/ knowledge required
- Identification of training modules required to fill gaps in knowledge in order to reach long term goals
  - Rational for each of the modules

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New Section on each Module

- Reason for module
- Specific Description of each “Mode of Learning”
  - Role of Mentors and Advisors
  - Specific courses, workshops, and other didactics
  - Details on research meetings

Module: Career skills

- Grantsmanship
- Becoming a mentor
- Laboratory management

Table: Career Development/ Training Activities During Award Period
<table>
<thead>
<tr>
<th>Module</th>
<th>Mentor(s)</th>
<th>Mode of learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Area (1-3)</td>
<td>Specific names</td>
<td>Coursework (completed and new)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-on-1 meetings (schedule? e.g. weekly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guided readings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Research meetings (schedule? e.g. weekly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Applied training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clinical experience</td>
</tr>
<tr>
<td>Career skills</td>
<td>All mentors</td>
<td>Improving communication skills</td>
</tr>
<tr>
<td>Dissemination of Research</td>
<td></td>
<td>Grant writing course</td>
</tr>
<tr>
<td>Results</td>
<td></td>
<td>Professional workshops/seminars</td>
</tr>
<tr>
<td>Research management</td>
<td></td>
<td>Collaborations</td>
</tr>
<tr>
<td>Mentorship</td>
<td></td>
<td>Abstracts and manuscripts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R01/Small grant application submission</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supervising technical support personnel, organizing lab meetings, journal clubs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e.g. training new lab members, undergraduate, summer students</td>
</tr>
</tbody>
</table>

## Mentors/Advisory Committee

- Scientific area per mentor/committee member
- Schedule of meetings

### Career Development and Research Training

**Mentors and Advisors**

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Role</th>
<th>Area of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name (Title)</td>
<td>Mentor</td>
<td></td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Co-Mentor</td>
<td></td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Advisory Board Member</td>
<td></td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Advisory Board Member</td>
<td></td>
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<tr>
<td>Name (Title)</td>
<td>Advisory Board Member</td>
<td></td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Collaborator</td>
<td></td>
</tr>
<tr>
<td>Name (Title)</td>
<td>Consultant</td>
<td></td>
</tr>
</tbody>
</table>

Summary of coursework

- List previous relevant coursework
- Proposed coursework
  - Course number and description
  - Include courses on grant writing and responsible conduct of research
- Additional didactic activities
  - e.g. Those offered by professional societies, workshops, symposiums
Clinical and/or Teaching activities

- Be specific, mention hrs. per week, restate % of time dedicated to research

Percentage of time for each activity

Timetable
<table>
<thead>
<tr>
<th>Career Development Activities</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mentorship</strong></td>
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</tr>
<tr>
<td><strong>Mentor</strong> (name) – frequency (e.g. weekly) of individual meetings, frequency of lab meetings, frequency and listing of specific journal clubs, seminars, and other recurring relevant programs</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Co-Mentor</strong> (name) – frequency (e.g. weekly) of individual meetings, frequency of lab meetings, frequency and listing of journal clubs, seminars, and other recurring relevant programs</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Advisory Group</strong> – frequency (e.g. quarterly) of meetings</td>
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<table>
<thead>
<tr>
<th>Career Development Activities</th>
<th>K99</th>
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<tr>
<td><strong>Mentorship</strong></td>
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<tr>
<td><strong>Mentor</strong> (name) – frequency (e.g. weekly) of individual meetings, frequency of lab meetings, frequency and listing of specific journal clubs, seminars, and other recurring relevant programs</td>
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<tr>
<td><strong>Co-Mentor</strong> (name) – frequency (e.g. weekly) of individual meetings, frequency of lab meetings, frequency and listing of journal clubs, seminars, and other recurring relevant programs</td>
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<td><strong>Advisory Group</strong> – frequency (e.g. quarterly) of meetings</td>
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<tr>
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<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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<tbody>
<tr>
<td><strong>Experimental Training</strong></td>
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<tr>
<td>Mentor (name) – Specific area of research and/or methodology</td>
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<tr>
<td><strong>CU Formal Coursework – P&amp;S, M-SPH, GSAS, etc.</strong></td>
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<tr>
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<tr>
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<td>M9780: Funding for Research Activities</td>
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<td>Career Development Activities</td>
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<td>Co-Mentor (name) – Specific area of research and/or methodology</td>
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<td>Co-Investigator 1 (name) – Specific area of research and/or methodology</td>
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<tr>
<td><strong>Formal Coursework – e.g. Graduate School, School of Public Health</strong></td>
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<td>Course #3: Specific Course # / Formal Title</td>
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## Career Development Activities

<table>
<thead>
<tr>
<th>Workshops &amp; Additional Training Programs</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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<tbody>
<tr>
<td>Cold Spring Harbor Course on............</td>
<td>X</td>
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<tr>
<td>Woods Hole Workshop on.......</td>
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<td>American Association for... Junior</td>
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<td>Investigators Training on.....</td>
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<td>CTSA “K to R” Program</td>
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<tr>
<td>IRB 101 Course</td>
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<td>NYAS Science Alliance Sessions on......</td>
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## Scientific Conferences-Communication Skills (Oral / Poster Presentations)

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<tr>
<th>Conference</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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<td>Symposium of the NY Academy of....(annual)</td>
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<td>Congress of....... (annual)</td>
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<td>American Association for....... (annual)</td>
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<td>Society of...... (biannual)</td>
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<tr>
<td>Career Development Activities</td>
<td>Year 1</td>
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<td>Year 3</td>
<td>Year 4</td>
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<tr>
<td><strong>Mentoring Skills (responsibility shared with K mentors)</strong></td>
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<tr>
<td>Students (summer, undergraduate, medical)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Communication Skills (Written)</strong></td>
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<tr>
<td>Preparation of manuscripts for peer reviewed journals</td>
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<tr>
<td><strong>Grant Writing</strong></td>
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<tr>
<td>CTSA pilot award for junior investigator (to supplement K award)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Center for...... award for new investigators</td>
<td></td>
<td>X</td>
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<td></td>
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<tr>
<td>R01 preparation and submission (on research funded by K award)</td>
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</table>

| Career Development Activities | K99 | Year 1 | Year 2 |  | R00 | Year 3 | Year 4 | Year 5 |
|------------------------------|-----|--------|--------|  |     |        |        |       |
| **Workshops & Additional Training Programs** |     |        |        |  |     |        |        |       |
| Cold Spring Harbor Course on..... | X   |        |        |  |     |        |        |       |
| Woods Hole Workshop on..... | X   | X      |        |  |     |        |        |       |
| American Association for.... Junior Investigators Training on..... | X   |        |        |  |     |        |        |       |
| CTSA “K to R” Program |     |        |        |  |     | X      |        |       |
| IRB 101 Course |     |        | X      |  |     |        |        |       |
| NYAS Science Alliance Sessions on...... | X   | X      |        |  |     |        |        |       |
| **Scientific Conferences-Communication Skills (Oral / Poster Presentations)** |     |        |        |  |     |        |        |       |
| Symposium of the NY Academy of....(annual) | X   | X      |        |  |     | X      | X      | X     |
| Congress of........ (annual) |     |        | X      |  |     | X      | X      | X     |
| American Association for........ (annual) |     |        | X      |  |     | X      | X      | X     |
| Society of...... (biannual) |     |        | X      |  |     | X      |        | X     |

<table>
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<tr>
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</table>

## Research Plan Section

### 3. Specific Aims

#### 4. Research Strategy

### Other Candidate Information Section

#### 7. Candidate's Plan to Provide Mentoring

### Mentor, Co-Mentor, Consultant, Collaborators Section

#### 8. Plans and Statements of Mentor and Co-Mentor(s)

#### 9. Letters of Support from Collaborators, Contributors, and Consultants

### Environment and Institutional Commitment to Candidate Section

#### 10. Description of Institutional Environment

#### 11. Institutional Commitment to Candidate's Research Career Development
1 + 12 Pages Combined

- Candidate Information
  - Section 2
- Research Plan
  - 3. Specific Aims (1 page)
  - 4. Research Strategy
### Introduction

1. Introduction to Application (RESUBMISSION)

### Candidate Section

2. Candidate Information and Goals for Career Development

### Research Plan Section

3. Specific Aims

4. *Research Strategy*

5. Progress Report Publication List (for RENEWAL applications only)

6. **Training in the Responsible Conduct of Research**

### Other Candidate Information Section

7. Candidate’s Plan to Provide Mentoring

### Mentor, Co-Mentor, Consultant, Collaborators Section

8. Plans and Statements of Mentor and Co-Mentor(s)

9. Letters of Support from Collaborators, Contributors, and Consultants

### Environment and Institutional Commitment to Candidate Section

10. Description of Institutional Environment

11. Institutional Commitment to Candidate’s Research Career Development
6. Training in the Responsible Conduct of Research

- Format, Subject Matter, Faculty Participation, Duration, and Frequency of Instruction
- Role of Mentor
- Prior instruction in RCR
- Once every four years requirement
- Don’t do the minimum
- Additional IRB-related programs?

http://grants.nih.gov/training/responsibleconduct.htm

No more than 1 page
# PHS 398 Career Development Award Supplemental Form

**View Burden Statement**

**OMB Number: 0925-0001**
**Expiration Date: 10/31/2016**

## Introduction

1. Introduction to Application (RESUBMISSION)

## Candidate Section

2. Candidate Information and Goals for Career Development

## Research Plan Section

3. Specific Aims

4. Research Strategy

5. Progress Report Publication List (for RENEWAL applications only)

6. Training in the Responsible Conduct of Research

## Other Candidate Information Section

7. Candidate’s Plan to Provide Mentoring

## Mentor, Co-Mentor, Consultant, Collaborators Section

8. Plans and Statements of Mentor and Co-Mentor(s)

9. Letters of Support from Collaborators, Investigators, and Consultants

## Environment and Institutional Commitment to Candidate Section

10. Description of Institutional Environment

11. Institutional Commitment to Candidate’s Research Career Development

8. Plans and Statements of Mentor and Co-Mentor(s)

- Mentor’s Assessment of the Candidate
- Mentor’s Research and Career Development Plans for the Candidate
  - Research
  - Developmental activities
    - Seminars, scientific meetings, presentations, becoming a mentor, RCR
- Expectations for Publications
What Aspect of the Research will the Candidate be Allowed to Take to Start their Own Independent Research Career

Mentor’s Plans for Providing Guidance and Counseling
- How this will promote candidate’s development

Plan for Candidate’s Transition from Mentored Stage to Independent Investigator

Candidate’s Additional Responsibilities
- Courses, seminars, lab meetings
- Teaching, clinical, administrative

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Source of Support for Candidate’s Research Project

- Grants
- Core/shared facilities
- Technical support

Previous Experience as a Mentor

- Mentor’s Past and Current Trainees [table]
  - Name, position (e.g. graduate student, post-doctoral fellow, junior faculty) and date when mentored by sponsor, mentee’s current position (title and institution), mentee’s awards/ grants

No more than 6 pages
## PHS 398 Career Development Award Supplemental Form

### Introduction

1. Introduction to Application (RESUBMISSION)

### Candidate Section

2. Candidate Information and Goals for Career Development

### Research Plan Section

3. Specific Aims

4. *Research Strategy*

5. Progress Report Publication List (for RENEWAL applications only)

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9. Letters of Support from Collaborators, Contributors, and Consultants

### Environment and Institutional Commitment to Candidate Section

10. Description of Institutional Environment

11. Institutional Commitment to Candidate's Research Career Development

9. Letters of Support from Collaborators, Contributors, and Consultants

- **Advisory Committee**
  - **Purpose**
    - Reviews research progress, publications, R01 submission, career development activities, didactic program
    - Provides scientific guidance
    - Documents meetings with an annual report
  - Name, title, and short paragraph on each member
  - Each should provide a letter and Biosketch
Collaborators and Consultants

- Name, title, and short paragraph on each individual
- Each should provide a letter and Biosketch

Director of Core Facility

No more than 6 pages
Environment and Institutional Commitment to the Candidate

10. Description of Institutional Environment

11. Institutional Commitment to the Candidate’s Research Career Development
Environment and Institutional Commitment to the Candidate

10. Description of Institutional Environment

- Information relevant to Candidate’s research and career development activities
  - Institution, Dept./Division, Institute
  - Other institutions, schools, centers, shared resources, core facilities, CTSA, etc.
  - Degree programs, courses, seminars
  - Institution/Dept’s formal mentoring program

- **No more than 1 page**
11. Institutional Commitment to the Candidate’s Research Career Development

- Letter from Dept. Chair/Institute Director
  - Specifics on protected time (most K awards: 75%)
  - Specifics on faculty appointment (full-time)
    - K99: Post-doctoral research scientist/Associate research scientist
  - Statement that appointment and salary are not contingent on award
  - Statement on availability of research resources, personnel, office space, etc. required for project
  - Statement that sponsors/mentors will be able to provide time and support for mentoring responsibilities
  - Signed and dated on letterhead stationery

- No more than 1 page

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Letters of Reference: 3-5

- From individuals not directly involved in the application or proposed research project, not mentor
- Familiar with candidate’s qualifications, training, and interests
- Should address candidate's competence, professional training and qualifications, and potential to develop into an independent investigator
- Where possible, not from the candidate's current department or organization
- Submitted electronically through NIH Commons
Facilities to be used for the conduct of the proposed research

- Laboratory
- Animal
- Computer
- Office
- Clinical
- 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 unique collaborative arrangements.
R&R Other Project Information:

10. Facilities & Other Resources

Career Development Resources - also mentioned in “main body” of grant (table) and Mentor’s section

- Faculty/Career development programs
  - Institutional
  - Departmental/Institute
  - Professional societies

- Formal degree programs and other didactics
  - Degree program: e.g., Mailman School of Public Health
  - Scientific course: e.g., Statistics
  - Career Development course: e.g., Funding & Grantsmanship

- Workshops, webinars, other training programs
21. Cover Letter Attachment

- Must include List of Referees (name/affiliation)
- Administrative document – not seen by reviewers
- Request of specific Institute and Study Section now made via Assignment Request Form
## PHS Assignment Request Form

**Awarding Component Assignment Request (optional)**

If you have a preference for an Awarding Component (e.g., NIMH for Mental Health), please use the link below to identify the most appropriate assignment. Enter the short abbreviation (e.g., NCI for National Cancer Institute) in the “Assign To/Do Not Assign To Awarding Component” sections below. Your first choice should be in column 1. All requests will be considered; however, the order 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#Awarding Components

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<thead>
<tr>
<th>Assign to Awarding Component</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td>Do Not Assign to Awarding Component</td>
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</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. Enter the short abbreviation for that study section in the “Assign To/Do Not Assign To Study Section” sections below. Your first choice should be in column 1. All requests will be considered; however, the order 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 “ZRG1 HDMI-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, hyphen) when you type in the request.

Information about Study Sections can be found here: https://grants.nih.gov/grants/phs_assignment_information.html#Study Section

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<tr>
<td>Do Not Assign to Study Section: Only 20 characters allowed</td>
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List Individuals who should not review your application and why (optional)

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

Note: Please do not provide names of individuals

Expertise:

1. [Blank]

Only 1000 characters allowed

Only 40 characters allowed


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NIH “K” Sites of Interest

- **K Kiosk** – includes Program Announcements for K01, K07, K08, K23, K25, and K99 grant mechanisms
  
  https://researchtraining.nih.gov/programs/career-development

- **Guidance for K applications (Forms-D)**
  

- **Reference Letters**
  
  http://grants.nih.gov/sites/default/files/instructions-for-fellowship-referees.docx
NIH “K” Sites of Interest

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

- Instruction in the Responsible Conduct of Research

- Application Page Limits

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NIH “K” Sites of Interest

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

- Additional Scoring Guidance

- Review Criteria at a Glance – Training

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NIH “K” Sites of Interest

- Research Training and Career Development Programs
  [https://researchtraining.nih.gov/](https://researchtraining.nih.gov/)

- Research Training and Career Development Programs at Specific Institutes
  [https://researchtraining.nih.gov/institute](https://researchtraining.nih.gov/institute)
Topics to be Discussed

- Individual Fellowship Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Fellowship Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Funding Agencies
  - Scoring and Review Criteria
  - Components of a Career Development Application

- Approaches for Competitive Applications

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Approaches for Competitive Applications

- Identify Funding
- Prepare to Write the Grant Application
- Complete the Grant Application
Identify Funding

- Identify appropriate funding agencies
  - Government
  - Non-government
- Identify appropriate funding mechanisms
  - Research
  - Training
- Create a calendar of application deadlines for identified funding programs

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?

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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?
Approaches for Competitive Applications

- Identify Funding
- Prepare to Write the Grant Application
- Complete the Grant Application

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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 **limitations** and potential “challenges” and how these will be addressed (e.g., “alternate approaches”)
- Include well-designed **tables and figures**
- Present an **organized**, lucid write-up (use an **outline**)
- 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 limitations and potential “challenges” and how these will be addressed (e.g., “alternate approaches”)
- Include well-designed tables and figures
- Present an organized, lucid write-up (use an outline)
- 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>
<thead>
<tr>
<th>Benchmarks / Milestones</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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</thead>
<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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<td>Summary of Specific Aim 2b</td>
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<tr>
<td>Summary of Specific Aim 3</td>
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</tbody>
</table>

Anticipate Questions
and
Answer them before they are asked
Not everything that can be counted counts.
Not everything that counts can be counted.

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

Candidate Section
2. Candidate Information and Goals for Career Development

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

Jaime S. Rubin, Ph.D.: http://grantscourse.columbia.edu
Investigator

- Competent
- Enthusiastic
- Thorough
- Professional
Personal Statement/ Candidate’s Background

When describing a previous research experience:

- What was the hypothesis/scientific question?
- Why was the study important?
- What were the findings and conclusions?
- What were your role and responsibilities?
- What did you learn and accomplish?
  - “Intellectual aspects”
  - Do not focus on technical aspects
- Cite any resulting publications
- Describe any honors/awards and conference/workshop presentations
Possible Problems Specific for Mentored Fellowship Awards

Mentor

- Too many other responsibilities (e.g. administrative, clinical)
- Too many other mentees (e.g. students, post-docs)
- Not appropriate scientifically
- Too junior
- Limited experience as a mentor
- Limited funds to support proposed research
Possible Problems Specific for Mentored Fellowship Awards

**Institution**

- Limited scientific/technical resources
- Limited career development opportunities
- Limited opportunities for career advancement

Elements of a Good Proposal

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

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
Pink Sheet: Reviewers’ Comments
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
All Components of the Application are as Strong as Possible