Extramurally-Funded Sponsored Projects to Support Fellowship and Career Development Activities: Best Practices for Competitive Applications

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Dept. of Medicine
College of Physicians and Surgeons
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Course: “Funding and Grantsmanship for Research and Career Development Activities”

http://grantscourse.columbia.edu/
Course Policies:

Please, No:

- Recording of Presentation
- Screen Shots of Presentation
- Posting to Social Media
- Sharing of Course Material with those Outside of Course

Thanks, Jaime Rubin
Topics to be Discussed

- **Individual Fellowship Programs**
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

- **Career Transition Funding Programs**

- **Junior Faculty Career Development Programs**
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
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- **Junior Faculty Career Development Programs**
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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

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

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Timeline of Funding for Junior Investigators

Graduate School

Individual Fellowship
Training Grant
Mentor’s Research Grant

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

Post-doctoral Years

F31
F32

Instructor/Assistant Professor

Pre-doc to Post-doc Transition Awards

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Timeline of NIH Funding for Junior Investigators

Medical School

Internship/Residency

Fellowship – Research Years

Instructor/Assistant Professor

Short term Training

Year-long Enhancement Programs

MD/PhD Fellowship or Institutional T32

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Timeline of NIH Funding for Junior Investigators

- **Medical School**
  - Short term Training

- **Internship/Residency**
  - Research Support

- **Fellowship – Research Years**
  - Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot

- **Instructor/Assistant Professor**
  - Year-long Enhancement Programs
    - MD/PhD Fellowship or Institutional T32

F30

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.

Details  View Current Funding Opportunities

F31

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).

Details  View Current Funding Opportunities

F32

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.

Details  View Current Funding Opportunities
Ruth L. Kirschstein Predoctoral Individual National Research Service Award

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

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

Predoctoral Individual National Research Service Award (F31)

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

Pre-doc Fellowships (F31’s)  
Applications, awards, and success rates

Pre-doc Fellowships (F31’s)  
Applications, awards, and success rates

<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>
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<tbody>
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<td>F31</td>
<td>NCCIH****</td>
<td>15</td>
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<td>F31</td>
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<td>70</td>
<td>17</td>
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<td>5</td>
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<td>$182,994</td>
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<td>F31</td>
<td>NHLBI</td>
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<td>$4,052,099</td>
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<td>F31</td>
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<td>F31</td>
<td>NIAID</td>
<td>349</td>
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<td>88</td>
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<td>F31</td>
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<td>30</td>
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<td>F31</td>
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<td>2019</td>
<td>F31</td>
<td>NIEHS</td>
<td>50</td>
<td>15</td>
<td>30.0%</td>
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<td>F31</td>
<td>NIGMS</td>
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<td>NIMH</td>
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<td>NIMHD***</td>
<td>32</td>
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<td>15.6%</td>
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<td>NINDS</td>
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<td>102</td>
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<tr>
<td>2019</td>
<td>F31</td>
<td>NINR</td>
<td>39</td>
<td>20</td>
<td>51.3%</td>
<td>$796,689</td>
</tr>
<tr>
<td>2019</td>
<td>F31</td>
<td>NLM</td>
<td>10</td>
<td>5</td>
<td>50.0%</td>
<td>$202,397</td>
</tr>
</tbody>
</table>

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
# Pre-doc Fellowships (F31’s)

Applications, awards, and success rates

<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>
<tr>
<td>2010</td>
<td>F31</td>
<td>NIDDK</td>
<td>24</td>
<td>12</td>
<td>50.0%</td>
<td>$401,646</td>
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<td>2011</td>
<td>F31</td>
<td>NIDDK</td>
<td>21</td>
<td>10</td>
<td>47.6%</td>
<td>$343,573</td>
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<tr>
<td>2012</td>
<td>F31</td>
<td>NIDDK</td>
<td>31</td>
<td>9</td>
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<tr>
<td>2013</td>
<td>F31</td>
<td>NIDDK</td>
<td>29</td>
<td>9</td>
<td>31.0%</td>
<td>$312,742</td>
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<tr>
<td>2014</td>
<td>F31</td>
<td>NIDDK</td>
<td>51</td>
<td>15</td>
<td>29.4%</td>
<td>$490,924</td>
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<tr>
<td>2015</td>
<td>F31</td>
<td>NIDDK</td>
<td>137</td>
<td>45</td>
<td>32.8%</td>
<td>$1,660,371</td>
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<tr>
<td>2016</td>
<td>F31</td>
<td>NIDDK</td>
<td>152</td>
<td>36</td>
<td>23.7%</td>
<td>$1,285,280</td>
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<td>2017</td>
<td>F31</td>
<td>NIDDK</td>
<td>162</td>
<td>43</td>
<td>26.5%</td>
<td>$1,653,871</td>
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<td>2018</td>
<td>F31</td>
<td>NIDDK</td>
<td>172</td>
<td>53</td>
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<td>$1,993,026</td>
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<tr>
<td><strong>2019</strong></td>
<td><strong>F31</strong></td>
<td><strong>NIDDK</strong></td>
<td><strong>189</strong></td>
<td><strong>55</strong></td>
<td><strong>29.1%</strong></td>
<td><strong>$2,190,246</strong></td>
</tr>
</tbody>
</table>


American Heart Association
Predoctoral Fellowship Program

- “Cardiovascular, cerebrovascular, and brain health research”
- Students “enrolled in a post-baccalaureate PhD, MD, DO, DVM, PharmD, DDS, DrPH, or PhD in nursing or equivalent clinical health science doctoral degree program”
- Funding: Stipend (NIH rate), Health insurance, Project support
- Award Duration: 1-2 years
- Application components similar to NIH – e.g., Letters of Reference, encourages Individual Development Plans (IDPs)
- Review criteria similar to NIH – Training Plan, Significance of proposed research
- US citizenship/Permanent Residency not required

https://professional.heart.org/en/research-programs/application-information
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Predoctoral MD/PhD or Other Dual-Doctoral Degree Fellowship (F30)

- Supports specific individual - dual degree candidate: health professional doctoral degree (e.g., MD, DDS) and a research doctoral degree (e.g., PhD, DrPH)

- Stipend, tuition, institutional allowance (e.g., health fees, travel)

- Review criteria:
  - Individual fellow
  - Mentor
  - Research project
  - Research training/Career Development environment

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Predoctoral to Postdoctoral Fellow Transition Award (F99/K00)

- Facilitates “the transition of talented graduate students into successful research postdoctoral appointments”
- F99: 1-2 years of support to complete graduate (Ph.D.) research
- K00: 3-4 years of support for mentored postdoctoral research training and career development activities
# Pre-doc to Post-doc Transition Awards (F99’s) Applications, awards, and success rates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Activity Code</th>
<th>NIH Institute/Cent</th>
<th>Number of Applications Reviewed</th>
<th>Number of Applications Awarded</th>
<th>Success Rate</th>
<th>Total Funding</th>
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</thead>
<tbody>
<tr>
<td>2016</td>
<td>F99</td>
<td>NCI</td>
<td>76</td>
<td>36</td>
<td>47.4%</td>
<td>$1,391,380</td>
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<tr>
<td>2016</td>
<td>F99</td>
<td>ACTIVITY TOTAL</td>
<td>76</td>
<td>36</td>
<td>47.4%</td>
<td>$1,391,380</td>
</tr>
<tr>
<td>2017</td>
<td>F99</td>
<td>NCI</td>
<td>90</td>
<td>27</td>
<td>30.0%</td>
<td>$1,025,370</td>
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<td>2017</td>
<td>F99</td>
<td>NINDS</td>
<td>29</td>
<td>12</td>
<td>41.4%</td>
<td>$394,321</td>
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<tr>
<td>2017</td>
<td>F99</td>
<td>ACTIVITY TOTAL</td>
<td>119</td>
<td>39</td>
<td>32.8%</td>
<td>$1,419,691</td>
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<tr>
<td>2018</td>
<td>F99</td>
<td>NCI</td>
<td>73</td>
<td>23</td>
<td>31.5%</td>
<td>$907,420</td>
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<tr>
<td>2018</td>
<td>F99</td>
<td>NINDS</td>
<td>40</td>
<td>18</td>
<td>45.0%</td>
<td>$689,588</td>
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<tr>
<td>2018</td>
<td>F99</td>
<td>ACTIVITY TOTAL</td>
<td>113</td>
<td>41</td>
<td>36.3%</td>
<td>$1,597,008</td>
</tr>
<tr>
<td>2019</td>
<td>F99</td>
<td>NCI</td>
<td>70</td>
<td>26</td>
<td>37.1%</td>
<td>$1,069,791</td>
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<tr>
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<td>F99</td>
<td>NIA</td>
<td>0</td>
<td>0</td>
<td>0.0%</td>
<td>$28,600</td>
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<tr>
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<td>F99</td>
<td>NIDDK</td>
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<td>ACTIVITY TOTAL</td>
<td>111</td>
<td>48</td>
<td>43.2%</td>
<td>$1,934,397</td>
</tr>
</tbody>
</table>

Postdoctoral Individual National Research Service Award (F32)

- Supports specific individual (e.g., PhD, MD, or MD/PhD trained)
- May be in degree program
- Stipend, tuition, institutional allowance (e.g., health fees, travel)

Review criteria:
- Individual fellow
- Mentor
- Research project
- Research training/Career Development environment

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Post-doc Fellowships (F32’s)
Applications, awards, and success rates

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NRSA Training Grants and Fellowships: Funding in Current and Constant Dollars
Training Grants and Fellowships: Pre- and Post-Doctoral Positions

Number of Positions

Fiscal Year


Pre-Doctoral Training Post-Doctoral Training Pre-Doctoral Fellowship Post-Doctoral Fellowship

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Training Grants and Fellowships: Pre- and Post-Doctoral Positions

![Graph showing trends in pre- and post-doctoral training and fellowships from 1998 to 2019. The graph indicates fluctuations in the number of positions available over the years.](image)
Training Grants and Fellowships: Pre- and Post-Doctoral Positions

[Bar chart showing number of positions from 1998 to 2019 for Pre-Doctoral Training, Post-Doctoral Training, and Pre-Doctoral Fellowship.]
Ruth L. Kirschstein National Research Service Award (NRSA) Stipends, Tuition/Fees and Other Budgetary Levels Effective for Fiscal Year 2021

**Notice Number:**
NOT-OD-21-049

**Predoctoral Trainees and Fellows:** For institutional training grants (T32, T35, T90, TL1) and individual fellowships (F30, F31), one stipend level is used for all predoctoral candidates, regardless of the level of experience.

<table>
<thead>
<tr>
<th>Career Level</th>
<th>Years of Experience</th>
<th>Stipend for FY 2021</th>
<th>Monthly Stipend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predoctoral</td>
<td>All</td>
<td>$25,836</td>
<td>$2,153</td>
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</table>
Ruth L. Kirschstein National Research Service Award (NRSA) Stipends, Tuition/Fees and Other Budgetary Levels Effective for Fiscal Year 2021

Notice Number:
NOT-OD-21-049

### Postdoctoral Trainees and Fellows:

<table>
<thead>
<tr>
<th>Career Level</th>
<th>Years of Experience</th>
<th>Stipend for FY 2021</th>
<th>Monthly Stipend</th>
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<td>$54,540</td>
<td>$4,545</td>
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<td>5</td>
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<td></td>
<td>6</td>
<td>$63,036</td>
<td>$5,253</td>
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<td></td>
<td>7 or More</td>
<td>$65,292</td>
<td>$5,441</td>
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<td>Years of Experience</td>
<td>Stipend for FY 2016</td>
<td>Stipend for FY 2017</td>
<td>Stipend for FY 2018</td>
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<td>$43,692</td>
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<td>6</td>
<td>$55,296</td>
<td>$56,400</td>
<td>$57,528</td>
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<tr>
<td>7 or more</td>
<td>$57,504</td>
<td>$58,560</td>
<td>$59,736</td>
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</table>
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
Ruth L. Kirschstein National Research Service Award (NRSA) Individual Predoctoral Fellowship (Parent F31)

National Center for Complementary and Integrative Health (NCCIH)
National Cancer Institute (NCI)
National Eye Institute (NEI)
National Human Genome Research Institute (NHGRI)
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)
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 of Environmental Health Sciences (NIEHS)
National Institute of Mental Health (NIMH)
National Institute on Minority Health and Health Disparities (NIMHD)
National Institute of Nursing Research (NINR)
National Institute of Neurological Disorders and Stroke (NINDS)
National Library of Medicine (NLM)
Office of Research Infrastructure Programs (ORIP)
National Institute on Drug Abuse (NIDA)

Funding Opportunity Announcement (FOA) Number
PA-21-051

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

National Center for Complementary and Integrative Health (NCCIH)
National Cancer Institute (NCI)
National Eye Institute (NEI)
National Human Genome Research Institute (NHGRI)
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)
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 of Environmental Health Sciences (NIEHS)
National Institute of Mental Health (NIMH)
National Institute on Minority Health and Health Disparities (NIMHD)
National Institute of Nursing Research (NINR)
National Institute of Neurological Disorders and Stroke (NINDS)
National Library of Medicine (NLM)
Office of Research Infrastructure Programs (ORIP)
National Institute on Drug Abuse (NIDA)
National Institute of Biomedical Imaging and Bioengineering (NIBIB)
National Institute of General Medical Sciences (NIGMS)

Funding Opportunity Announcement (FOA) Number PA-21-052

A. Individuals from racial and ethnic groups that have been shown by the National Science Foundation to be underrepresented in health-related sciences on a national basis (see data at http://www.nsf.gov/statistics/showpub.cfm?TopID=2&SubID=27) and the report Women, Minorities, and Persons with Disabilities in Science and Engineering. The following racial and ethnic groups have been shown to be underrepresented in biomedical research: Blacks or African Americans, Hispanics or Latinos, American Indians or Alaska Natives, Native Hawaiians and other Pacific Islanders. In addition, it is recognized that underrepresentation can vary from setting to setting; individuals from racial or ethnic groups that can be demonstrated convincingly to be underrepresented by the grantee institution should be encouraged to participate in NIH programs to enhance diversity. For more information on racial and ethnic categories and definitions, see the OMB Revisions to the Standards for Classification of Federal Data on Race and Ethnicity (https://www.govinfo.gov/content/pkg/FR-1997-10-30/html/97-28653.htm).

B. Individuals with disabilities, who are defined as those with a physical or mental impairment that substantially limits one or more major life activities, as described in the Americans with Disabilities Act of 1990, as amended. See NSF data at, https://www.nsf.gov/statistics/2017/nsf17310/static/data/tab7-5.pdf.
C. Individuals from disadvantaged backgrounds, defined as those who meet **two or more** of the following criteria:

1. Were or currently are homeless, as defined by the McKinney-Vento Homeless Assistance Act (Definition: [https://nche.ed.gov/mckinney-vento/](https://nche.ed.gov/mckinney-vento/));

2. Were or currently are in the foster care system, as defined by the Administration for Children and Families (Definition: [https://www.acf.hhs.gov/cb/focus-areas/foster-care/](https://www.acf.hhs.gov/cb/focus-areas/foster-care/));

3. Were eligible for the Federal Free and Reduced Lunch Program for two or more years (Definition: [https://www.fns.usda.gov/school-meals/income-eligibility-guidelines](https://www.fns.usda.gov/school-meals/income-eligibility-guidelines));

4. Have/had no parents or legal guardians who completed a bachelor’s degree (see [https://nces.ed.gov/pubs2018/2018009.pdf](https://nces.ed.gov/pubs2018/2018009.pdf));

5. Were or currently are eligible for Federal Pell grants (Definition: [https://www2.ed.gov/programs/fpg/eligibility.html](https://www2.ed.gov/programs/fpg/eligibility.html));

6. Received support from the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) as a parent or child (Definition: [https://www.fns.usda.gov/wic/wic-eligibility-requirements](https://www.fns.usda.gov/wic/wic-eligibility-requirements)).

7. Grew up in one of the following areas: a) a U.S. rural area, as designated by the Health Resources and Services Administration (HRSA) Rural Health Grants Eligibility Analyzer ([https://data.hrsa.gov/tools/rural-health](https://data.hrsa.gov/tools/rural-health)), or b) a Centers for Medicare and Medicaid Services-designated Low-Income and Health Professional Shortage Areas (qualifying zipcodes are included in the file). Only one of the two possibilities in #7 can be used as a criterion for the disadvantaged background definition.
Ruth L. Kirschstein National Research Service Award (NRSA) Individual Fellowship for Students at Institutions with NIH-Funded Institutional Predoctoral Dual-Degree Training Programs (Parent F30)

National Center for Complementary and Integrative Health (NCCIH)
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)
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National Institute of Mental Health (NIMH)
National Institute on Minority Health and Health Disparities (NIMHD)
Office of Research Infrastructure Programs (ORIP)

Funding Opportunity Announcement (FOA) Number
PA-21-049

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

National Center for Complementary and Integrative Health (NCCIH)
National Cancer Institute (NCI)
National Eye Institute (NEI)
National Human Genome Research Institute (NHGRI)
National Heart, Lung and Blood Institute (NHLBI)
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National Institute of Dental and Craniofacial Research (NIDCR)
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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 Library of Medicine (NLM)
Office of Research Infrastructure Programs (ORIP)

Funding Opportunity Announcement (FOA) Number
PA-21-050

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

National Center for Complementary and Integrative Health (NCCIH)
National Cancer Institute (NCI)
National Eye Institute (NEI)
National Human Genome Research Institute (NHGRI)
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 of Environmental Health Sciences (NIEHS)
National Institute of General Medical Sciences (NIGMS)
National Institute of Mental Health (NIMH)
National Institute of Nursing Research (NINR)
National Institute on Drug Abuse (NIDA)
National Institute on Minority Health and Health Disparities (NIMHD)

Funding Opportunity Announcement (FOA) Number
PA-21-048

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 $\sim12$ months prior to the start of the proposed postdoctoral position to within 12 months after starting in the proposed postdoctoral position. 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. Inclusion of preliminary data is strongly discouraged; rather, this F32 seeks innovative research ideas and thoughtful plans for training and mentorship that will facilitate the development of the postdoctoral fellow into an outstanding scientist. 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 4 years of a candidate's activity in a specific laboratory or research environment, so as to further encourage early, thoughtful planning and timely completion of “mentored training” within a particular lab or environment.
National Science Foundation: Graduate Research Fellowship Program

**Eligibility:**

- **Citizenship:**
  - US citizens, Nationals, Permanent Residents

- **Degree Requirements:**
  - Rules with regard to degree status (undergraduate vs. graduate student), joint degree programs, # of applications

- **Research Areas not Eligible:**
  - “goals are directly health-related, such as etiology, diagnosis, or treatment of physical or mental disease, abnormality, or malfunction in humans and other animals…”

https://www.nsfgrfp.org/
Jaime S. Rubin, Ph.D: http://grantscourse.columbia.edu
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/
Jaime S. Rubin, Ph.D.: http://grantscourse.columbia.edu
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/
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
- American Liver Foundation
- Daland Fellowships in Clinical Investigation
- Damon Runyon Cancer Research Foundation
- Helen Hay Whitney Foundation
- Jane Coffin Childs Memorial Fund
American Heart Association
Postdoctoral Fellowship Program

- “Cardiovascular, cerebrovascular, and brain health research”
- Funding: Stipend, Health insurance, Project support
- Award Duration: 1-2 years, May apply for a second 2-year award
- Application components/Review criteria similar to NIH
- US citizenship/Permanent Residency not required

https://professional.heart.org/en/research-programs/application-information
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Topics to be Discussed

- **Individual Fellowship Programs**
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

- **Career Transition Funding Programs**

- **Junior Faculty Career Development Programs**
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application
### Application Due Dates

<table>
<thead>
<tr>
<th>Activity Codes</th>
<th>Program Description</th>
<th>Cycle I Due Date</th>
<th>Cycle II Due Date</th>
<th>Cycle III Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>F Series Fellowships (including F31 Diversity – NOT-OD-17-029)</td>
<td><em>Individual National Research Service Awards (Standard)</em> (see NRSA Training Page)</td>
<td>April 8</td>
<td>August 8</td>
<td>December 8</td>
</tr>
</tbody>
</table>

`new, renewal, resubmission`
<table>
<thead>
<tr>
<th>All Activity Codes Cited Above</th>
<th>AIDS and AIDS-Related Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Effective. Sept 5, 2015 - N/A for SBIR/STTR Applications using Standard Due Dates</em></td>
<td></td>
</tr>
<tr>
<td>NOTE: See Key Dates section of funding opportunity announcement to determine if AIDS dates apply.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>May 7</th>
<th>September 7</th>
<th>January 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
## Application Due Dates

### Review and Award Cycles

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

National Institutes of Health

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NIH REFERRAL AND REVIEW SYSTEM
REGULAR RESEARCH GRANT APPLICATIONS

CSR

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

<table>
<thead>
<tr>
<th>Study Section</th>
<th>Study Section Description</th>
<th>Scientific Review Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td>F01A</td>
<td>Fellowships: Brain Disorders and Related Neurosciences</td>
<td>Dr. Vilen Movsesyan</td>
</tr>
<tr>
<td>F01B</td>
<td>Fellowships: Learning and Memory, Language, Communication and Related Neurosciences</td>
<td>Dr. Jyothi Arlikoth</td>
</tr>
<tr>
<td>F02A</td>
<td>Fellowships: Behavioral Neuroscience</td>
<td>Dr. Mei Qin</td>
</tr>
<tr>
<td>F02B</td>
<td>Fellowships: Sensory and Motor Neurosciences, Cognition and Perception</td>
<td>Dr. Cibu Thomas</td>
</tr>
<tr>
<td>F03A</td>
<td>Fellowships: Neurodevelopment, Synaptic Plasticity and Neurodegeneration</td>
<td>Dr. Tze-Tsang (Tina) Tang</td>
</tr>
<tr>
<td>F03B</td>
<td>Fellowships: Biophysical, Physiological, Pharmacological and Bioengineering Neuroscience</td>
<td>Dr. Sussan Paydar</td>
</tr>
<tr>
<td>F04A</td>
<td>Fellowships: Chemistry, Biochemistry and Biophysics A</td>
<td>Dr. Shan Wang</td>
</tr>
<tr>
<td>F04B</td>
<td>Fellowships: Chemistry, Biochemistry and Biophysics B</td>
<td>Dr. Ian Thorpe</td>
</tr>
<tr>
<td>F05-D</td>
<td>Fellowships: Cell Biology, Development Biology, and Bioengineering</td>
<td>Dr. Alexander Gubin</td>
</tr>
<tr>
<td>F05-U</td>
<td>Fellowships: Cell Biology, Development Biology, and Bioengineering</td>
<td>Dr. Raj Krishnaraju</td>
</tr>
<tr>
<td>F06</td>
<td>Fellowships: Endocrinology, Metabolism, Nutrition and Reproductive Sciences</td>
<td>Dr. Gregory Shellenes</td>
</tr>
<tr>
<td>F07A</td>
<td>Fellowships: Infectious Diseases and Immunology</td>
<td>Dr. Shahrooz Vahedi</td>
</tr>
<tr>
<td>F07B</td>
<td>Fellowships: Infectious Diseases and Immunology</td>
<td>Dr. Uma Basavanna</td>
</tr>
<tr>
<td>F08</td>
<td>Fellowships: Genes, Genomes and Genetics</td>
<td>Dr. Lystranne Maynard Smith</td>
</tr>
<tr>
<td>F09A</td>
<td>Fellowships: Oncological Sciences</td>
<td>Dr. Reigh-Yi Lin</td>
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<tr>
<td>F09B</td>
<td>Fellowships: Oncological Sciences</td>
<td>Dr. Jian Gao</td>
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<tr>
<td>F09C</td>
<td>Fellowships: Oncological Sciences</td>
<td>Dr. Zack Howard</td>
</tr>
<tr>
<td>F10A</td>
<td>Fellowships: Physiology and Pathobiology of Cardiovascular and Respiratory Systems</td>
<td>Dr. Kimm Hamann</td>
</tr>
<tr>
<td>F10B</td>
<td>Fellowships: Musculoskeletal, Rehabilitation and Skin Sciences</td>
<td>Dr. Chi-Wing Chow</td>
</tr>
<tr>
<td>F10C</td>
<td>Fellowships: Physiology and Pathobiology of the Vascular and Hematological Systems</td>
<td>Dr. Larry Pinkus</td>
</tr>
<tr>
<td>F15</td>
<td>Fellowship: Surgical Sciences, Biomedical Imaging, and Bioengineering</td>
<td>Dr. Weihua Luo</td>
</tr>
<tr>
<td>F16</td>
<td>Fellowships: Risk, Prevention and Health Behavior</td>
<td>Dr. Martha Faraday</td>
</tr>
<tr>
<td>F17A</td>
<td>Fellowships: HIV/AIDS Biological</td>
<td>Dr. Alexander Politis</td>
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<tr>
<td>F17B</td>
<td>Fellowships: HIV/AIDS Behavioral</td>
<td>Dr. Mark Rubert</td>
</tr>
<tr>
<td>F18</td>
<td>Fellowships: Epidemiology and Population Sciences</td>
<td>Dr. Steven Frank</td>
</tr>
</tbody>
</table>

https://public.csr.nih.gov/StudySections/Fellowship
Fellowships: Infectious Diseases and Immunology – F07A

The Infectious Diseases and Immunology (F07A) study section reviews fellowship applications broadly focused on infectious diseases (excluding HIV), microbiology and immunology.

Review Dates

- 11/19/2020
- 11/12/2020
- 07/13/2020

https://public.csr.nih.gov/StudySections/DPPS/IDIA/F07A
**Notice of NIH Policy to All Applicants:** Meeting rosters are provided for information purposes only. Applicant investigators and institutional officials must not communicate directly with study section members about an application before or after the review. Failure to observe this policy will create a **serious breach of integrity** in the peer review process, and may lead to actions outlined in NOT-OD-14-073 and NOT-OD-15-106 including removal of the application from immediate review.
Shared Interests and Overlaps:

- “The two fellowship study sections covering infectious diseases, microbiology and immunology (F07A and F07B) are broad in scope and cover substantially equivalent areas of science, with the final assignment made by the staff at the Center for Scientific Review to ensure that each application has the appropriate expertise to review it.

- There are shared interests with Oncological Sciences C (F09C). Fellowship applications with an emphasis on translational aspects, such as prevention, diagnosis, development and evaluation of therapeutic strategies may be reviewed by F09C, whereas applications focusing on mechanistic immunological aspects, such as the innate and adaptive immune responses to tumor cells may be reviewed here.

- There are shared interests with Cell Biology, Developmental Biology and Bioengineering (F05). Fellowship applications with focus on biomaterials development as delivery vectors, computational bioengineering, stem cell biology, or basic principles of cell biology may be reviewed by F05, whereas applications focusing on immunological aspects, such as innate and adaptive immune mechanisms underlying vaccine development or lymphocyte development may be reviewed here.

- Fellowship applications with a biological focus on HIV are reviewed in HIV/AIDS Biological (F17A) on an expedited review cycle.”
There were 73 results matching your search criteria.

<table>
<thead>
<tr>
<th>T</th>
<th>Act</th>
<th>Project</th>
<th>Year</th>
<th>Sub #</th>
<th>Project Title</th>
<th>Contact PI/Project Leader</th>
<th>Organization</th>
<th>FY</th>
<th>Admin IC</th>
<th>Funding IC</th>
<th>FY Total Cost</th>
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<tbody>
<tr>
<td></td>
<td>F32</td>
<td>Al147456</td>
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<td></td>
<td>USING DIET TO ALTER IMMUNE MANIPULATION BY EGGERTHELLE LENTA METABOLITES. EATING AWAY AT AUTOIMMUNITY</td>
<td>ALEXANDER, MARGARET ROSE</td>
<td>UNIVERSITY OF CALIFORNIA, SAN FRANCISCO</td>
<td>2020</td>
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<td></td>
<td>F31</td>
<td>CA228240</td>
<td>03</td>
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<td>THE REGULATION OF DENDRITIC CELL FUNCTION BY LMYC AT STEADY STATE AND DURING IMMUNE RESPONSES TO CANCER</td>
<td>ANDERSON, DAVID ALEXANDER</td>
<td>WASHINGTON UNIVERSITY</td>
<td>2020</td>
<td>NCI</td>
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<td>F31</td>
<td>HL147397</td>
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<td>PNEUMONIA AND ALVEOLAR MACROPHAGE RESILIENCE</td>
<td>ARAFA, EMAD</td>
<td>BOSTON UNIVERSITY MEDICAL CAMPUS</td>
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<td></td>
<td>F31</td>
<td>HD095569</td>
<td>03</td>
<td></td>
<td>CELLULAR MECHANISMS IN IMMUNE-DRIVEN PLACENTAL INJURY</td>
<td>ARTHUR, AMBER</td>
<td>STANFORD UNIVERSITY</td>
<td>2020</td>
<td>NICHD</td>
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<td></td>
<td>F30</td>
<td>Al157448</td>
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<td>INVESTIGATING THE EFFECT OF ANTIBODY MEDIATED FEEDBACK ON B CELL CLONAL SELECTION</td>
<td>BARBULESCU, ALEXANDRU</td>
<td>WEILL MEDICAL COLL OF CORNELL UNIV</td>
<td>2021</td>
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<td>F31</td>
<td>AR077989</td>
<td>01</td>
<td></td>
<td>THE ROLES AND REGULATION OF TLR7 IN SYSTEMIC LUPUS ERYTHEMATOSUS</td>
<td>BAXENDELL, HAYLEE</td>
<td>UNIVERSITY OF PITTSBURGH AT PITTSBURG</td>
<td>2020</td>
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<td>NIAMS</td>
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<td>F32</td>
<td>HL149155</td>
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<td>CONTRIBUTION OF ASC DYNAMICS TO SURVIVAL WITHIN THE BONE MARROW</td>
<td>BENET, ZACHARY LEO</td>
<td>ALBERT EINSTEIN COLLEGE OF MEDICINE</td>
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<td></td>
<td>F32</td>
<td>CA250155</td>
<td>01A1</td>
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<td>INVESTIGATING MECHANISMS UNDERSCORING DICHOTOMOUS T CELL RESPONSES BETWEEN MEDULLOBLASTOMA SUBGROUPS</td>
<td>BOI, SHANNON</td>
<td>ST. JUDE CHILDREN'S RESEARCH HOSPITAL</td>
<td>2021</td>
<td>NCI</td>
<td>NCI</td>
<td>$66,390</td>
</tr>
</tbody>
</table>
How to Direct a Grant Application to the Appropriate Study Section

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

Pre-populated from announcement information.

Awarding Component Assignment Suggestions (optional)

If you have a suggestion for an awarding component (e.g., NIH Institute/Center) assignment, use the link below to identify the appropriate short abbreviation (e.g., "NCI" for National Cancer Institute) and enter it below in the boxes for "Suggested Awarding Components". All suggestions will be considered; however, not all assignment suggestions can be honored.

Information about Awarding Component can be found here: https://grants.nih.gov/grants/phs_assignment_information.htm#AwardingComponents

Suggested Awarding Components:

Study Section Assignment Suggestions (optional)

If you have a suggestion for a study section assignment, use the link below to identify a study section(s). Enter the short abbreviation for that study section in the boxes for "Suggested Study Sections." Remove all hyphens, parentheses, and spaces. All suggestions will be considered; however, not all assignment suggestions can be honored.

For example, enter "CAMP" if you wish to suggest assignment to the NIH Cancer Molecular Pathobiology study section, or "ZRG1HDMR" if you wish to suggest assignment to the NIH Healthcare Delivery and Methodologies SBIR/STTR panel for informatics.

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

Suggested Study Sections:

Only 20 characters allowed

Rationale for assignment suggestions (optional)

Entry is limited to 1000 characters.

Suggestions are considered with other assignment factors. Not all suggestions can be honored.

Suggestions are considered with other assignment factors. Not all suggestions can be honored.
PHS Assignment Request Form

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

Provide sufficient information (e.g., name organization affiliation) to correctly identify each individual. Provide specific reason why an individual should not review your application. Information will be considered, but listing an individual does not guarantee they will not be on review panel.

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

Note: Do not provide names of individuals

Expertise:
Each entry is limited to 40 characters

Limit your answers to expertise. DO NOT enter the names of individuals you’d like to review your application.
Initial Review Group or Study Section

Actions

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

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

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

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

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

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
<th>Strengths/Weaknesses</th>
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<tr>
<td>High Impact</td>
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<td>Very strong with only some minor weaknesses</td>
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<td>Very Good</td>
<td>Strong but with numerous minor weaknesses</td>
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<td>5</td>
<td>Good</td>
<td>Strong but with at least one moderate weakness</td>
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<td>6</td>
<td>Satisfactory</td>
<td>Some strengths but also some moderate weaknesses</td>
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<tr>
<td>Low</td>
<td>7</td>
<td>Fair</td>
<td>Some strengths but with at least one major weakness</td>
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<td>8</td>
<td>Marginal</td>
<td>A few strengths and a few major weaknesses</td>
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<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>
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<th>Medium</th>
<th>Low</th>
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<tbody>
<tr>
<td>Score</td>
<td>1 2 3</td>
<td>4 5 6</td>
<td>7 8 9</td>
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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

---
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.

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

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

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.
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 $\times 10$
- 81 possible overall Impact Scores
  (10 – 90, whole numbers)
# Fellowship Payline: NIAID

<table>
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<th>FY</th>
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<td>2014</td>
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## Fellowship Payline: NHLBI

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**FY20**

https://www.nhlbi.nih.gov/current-operating-guidelines

Application Review Information from the Fellowship Funding Opportunity Announcements

“A fellowship application has a research project that is integrated with the training plan. The review will emphasize the applicant's potential for a productive career, the applicant's need for the proposed training, and the degree to which the research project and training plan, the sponsor(s), and the environment will satisfy those needs.”

https://researchtraining.nih.gov/programs/fellowships

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Overall Impact/Merit Score

Reviewer’s assessment “that the fellowship will enhance the applicant’s potential for, and commitment to, a productive independent scientific research career…”
Reviewers will consider each of the five review criteria below in the determination of scientific and technical merit, and give a separate score for each.

1. **Fellowship Applicant**
   - Strengths
   - Weaknesses

2. **Sponsors, Collaborators, and Consultants**
   - Strengths
   - Weaknesses

3. **Research Training Plan**
   - Strengths
   - Weaknesses
### 4. Training Potential

**Strengths**
- 

**Weaknesses**
- 

### 5. Institutional Environment & Commitment to Training

**Strengths**
- 

**Weaknesses**
- 

1. Fellowship Applicant

■ “Are the candidate’s **academic record** and **research experience** of high quality?

■ Does the candidate have the **potential** to develop into an **independent** and **productive researcher**?

■ Does the candidate demonstrate **commitment** to a **research career** in the future?

■ Does the research project reflect a **significant contribution of the candidate** to the originality of the project idea, approach and/or hypotheses reflective to the **career stage of the applicant***?”

https://researchtraining.nih.gov/programs/fellowships

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 candidate?

- Is there evidence of a match between the research and clinical interests (if applicable) 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://researchtraining.nih.gov/programs/fellowships
2. Sponsors, Collaborators, and Consultants

- “Is there evidence of adequate research funds to support the candidate’s proposed research project and training for the duration of the research component of the fellowship?
- If a team of sponsors is proposed, is the team structure well justified for the mentored training plan, and are the roles of the individual members appropriate and clearly defined?”

2. Sponsors, Collaborators, and Consultants

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

■ If the candidate is proposing to gain experience in a clinical trial as part of his or her research training, is there evidence of the appropriate expertise, experience, resources, and ability on the part of the sponsor(s) to guide the candidate during the clinical trial research experience?”

https://researchtraining.nih.gov/programs/fellowships
2. Sponsors, Collaborators, and Consultants

“Does the sponsor's research and training record, as well as mentoring statement, indicate that the applicant will receive outstanding training in the proposed research area and have the opportunity to publish high quality papers and present research data at national meetings as the project progresses?”

https://researchtraining.nih.gov/programs/fellowships

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

■ “Is the proposed research project of high scientific quality, and is it well integrated with the proposed research training plan?

■ Is the prior research that serves as the key support for the proposed project rigorous?

■ Has the applicant included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project?

■ Has the applicant presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed?”

https://researchtraining.nih.gov/programs/fellowships

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

- “Has the applicant presented adequate plans to address relevant biological variables, such as sex, for studies in vertebrate animals or human subjects?

- Based on the sponsor’s description of his/her active research program, is the candidate’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://researchtraining.nih.gov/programs/fellowships
3. Research Training Plan

- “Does the training plan provide adequate opportunities to present and publish research findings and meet with scientists in the community at national meetings as the work progresses?”

- Will the training plan provide the professional skills needed for the candidate to transition to the next stage of his/her research career?

- If proposed, will the clinical trial experience contribute to the proposed project and/or the candidate’s research training?”

https://researchtraining.nih.gov/programs/fellowships
3. Research Training Plan

Dual-Degree (MD/PhD):

“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?”


4. Training Potential

- “Are the proposed research project and training plan likely to provide the candidate 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 candidate’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 candidate’s ability to develop into a productive researcher?”

https://researchtraining.nih.gov/programs/fellowships
4. Training Potential
Dual-Degree (MD/PhD):

- “Does the proposed integrated research and clinical training have the potential to serve as a sound foundation that will clearly enhance the candidate’s ability to develop into a productive, independent physician-scientist or other clinician-scientist?

- If applicable to the dual-degree program, 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?”

5. Institutional Environment & Commitment to Training

- “Are the research facilities, resources (e.g., equipment, laboratory space, computer time, subject populations, clinical training settings), 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://researchtraining.nih.gov/programs/fellowships
5. Institutional Environment & Commitment to Training

Post-docs:

“Does the institutional and/or lab environment provide appropriate and sufficient opportunities for the applicant to gain the professional skills needed for a successful research career?”
5. Institutional Environment & Commitment to Training

Dual-Degree (MD/PhD):

- "Is the institutional environment for the applicant’s scientific and clinical development of high quality?"
- Are the facilities and resources appropriate to provide exposure to a research-oriented, clinical environment?
- Does the environment include individuals with similar training who will serve as role models for the candidate?"

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

https://researchtraining.nih.gov/programs/fellowships
5. Institutional Environment & Commitment to Training

Dual-Degree (MD/PhD):

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

https://researchtraining.nih.gov/programs/fellowships

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
5. Institutional Environment & Commitment to Training

Dual-Degree (MD/PhD):

- “Is there appropriate institutional commitment to fostering the candidate's integrated training as a physician-scientist or other clinician-scientist?
- Does this commitment extend to support the candidate's research and training, if needed, for the duration of the proposed award?”


Additional Review Criteria

Evaluated for the overall impact score, but not given an individual score

- Protections for Human Subjects
- Inclusion of Women, Minorities, and Individuals Across the Lifespan (as of Jan 25, 2019)
- Vertebrate Animals
- Biohazards
- Resubmissions
  - Response to previous reviewers’ comments and subsequent changes made to the proposal

https://researchtraining.nih.gov/programs/fellowships
Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Additional Review Considerations

Not given an individual score and not considered for the overall impact score

- **Training in the Responsible Conduct of Research**
  - Address required components (mentor/faculty involvement)

- **Select Agent Research**

- **Resource Sharing Plans**
  - 1) Data Sharing Plan; 2) Sharing Model Organisms; and
  - 3) Genomic Data Sharing Plan

- **Budget and Period of Support**

https://researchtraining.nih.gov/programs/fellowships
Guidance for NIH Reviewers

- Rigor and Transparency
- Sex as a Biological Variable
- Vertebrate Animals
- Human Subjects Section
- Clinical Trials
- Single IRB for multi-site studies
- Inclusion on the Basis of Sex/Gender, Race, Ethnicity, and Age in Clinical Research

- Human Embryonic Stem Cells
- Authentication of Key Biological and/or Chemical Resources
- Select Agents
- Resource Sharing Plans
- Budget Information
- Revision Applications
### Guidelines for NIH Reviewers

[Guidelines link](https://grants.nih.gov/grants/policy/review-guidelines.htm)

#### Table of Awards

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<tr>
<td>T</td>
<td>T Awards (Training)</td>
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</table>

Jaime S. Rubin, Ph.D.; [GrantsCourse Website](http://grantscourse.columbia.edu)
Guidelines for NIH Reviewers

https://grants.nih.gov/grants/policy/review-guidelines.htm

F Awards (Fellowships)

- F30 GUIDE FOR REVIEWERS (07/30/2020)
- F31 Diversity GUIDE FOR REVIEWERS (07/30/2020)
- F31 GUIDE FOR REVIEWERS (09/03/2020)
- F32 GUIDE FOR REVIEWERS (07/30/2020)
- F33 GUIDE FOR REVIEWERS (07/30/2020)
### NIH Review Criteria at a Glance


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<td>- Sponsors, Collaborators, and Consultants</td>
<td>- Career Development Plan/Career Goals &amp; Objectives/Plan to Provide Mentoring</td>
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<td>- Research Training Plan</td>
<td>- Research Plan</td>
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<tr>
<td>- Training Potential</td>
<td>- Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)</td>
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<td>- Institutional Environment &amp; Commitment to Training</td>
<td>- Environment &amp; Institutional Commitment to the Candidate</td>
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<td>- <strong>All:</strong></td>
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<td>- Inclusion of Women, Minorities, &amp; Children</td>
<td>- <strong>Protections for Human Subjects</strong></td>
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<td>- Vertebrate Animals</td>
<td>- <strong>Inclusion of Women, Minorities, &amp; Children</strong></td>
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<td>- Biohazards</td>
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<td>- <strong>Authentication of Key Biological and/or Chemical Resources</strong></td>
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Responses for items with emphasis (italics) are required. *Last updated March 9, 2018*
NIH Fellowship Review Criteria – Changes

For applications with deadlines on or after January 25, 2019

| Additional Review Criteria | Inclusion of Women, Minorities, and Individuals Across the Lifespan | When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of children to determine if it is justified in terms of the scientific goals and research strategy proposed. | When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of children and older adults to determine if it is justified in terms of the scientific goals and research strategy proposed. |


Notice Number: NOT-OD-18-227
Clinical Trial-Specific Review Criteria

FOAs that accept clinical trials will include additional review criteria questions in Section V. Application Review Information.

The NIH Announces New Review Criteria for Ruth L. Kirschstein National Research Service Award (NRSA) Individual Fellowship Applications Involving Research Experiences in Clinical Trials

Sponsors, Collaborators, and Consultants

- If the applicant is proposing to gain experience in a clinical trial as part of his or her research training, is there evidence of the appropriate expertise, experience, resources, and ability on the part of the sponsor(s) to guide the applicant during the clinical trial research experience?

Research Training Plan

- If proposed, will the clinical trial experience contribute to the proposed project and/or the applicant’s research training?
Topics to be Discussed

- **Individual Fellowship Programs**
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

- **Career Transition Funding Programs**

- **Junior Faculty Career Development Programs**
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

FELLOWSHIP INSTRUCTIONS FOR NIH AND OTHER PHS AGENCIES

SF424 (R&R) APPLICATION PACKAGES

FORMS VERSION F SERIES
Released: October 16, 2020

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
PHS Fellowship Supplemental Form

The PHS Fellowship Supplemental Form is used only for fellowship applications. This form includes fields to upload several attachments including the Specific Aims, Research Strategy, and Applicant Background and Goals. The attachments in this form, together with the rest of your application, should include sufficient information needed for evaluation of the project and fellow, independent of any other documents (e.g., previous application). Be specific and informative, and avoid redundancies.

Quick Links

Introduction

1. Introduction to Application (for Resubmission applications)

Fellowship Applicant Section
• In describing their training goals and objectives in the Program Plan attachment, fellowship candidates will be expected to address, as applicable, any new research skills they plan to acquire in the areas of rigorous research design, experimental methods, quantitative approaches, and data analysis and interpretation.
• In the Research Strategy section of the Program Plan attachment, fellowship candidates will be expected to describe (a) the strengths and weaknesses in the rigor of the prior research that serves as the key support for the proposed project, (b) plans to address any weaknesses in the rigor of the prior research, (c) how the experimental objectives proposed will achieve robust and unbiased results, and (d) how relevant biological variables are factored into research designs and analyses.
• If applicable, fellowship candidates will be required to include the Authentication of Key Biological and/or Chemical Resources attachment.
• Applicants for diversity-related fellowship programs will be expected to attach a Description of Candidate’s Contribution to Program Goals, explaining how the candidate’s participation would further the goals of the program to promote diversity in health-related research.
For all **Fellowship (F) Applications**

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<td>Applicant’s Background and Goals for Fellowship Training</td>
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<td>Research Strategy</td>
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<tr>
<td>Selection of Sponsor and Institution</td>
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</tr>
<tr>
<td>Description of Institutional Environment and Commitment to Training</td>
<td>2 pages</td>
</tr>
<tr>
<td>Note: This page limit includes the Additional Educational Information required for F30 and F31 applications.</td>
<td></td>
</tr>
<tr>
<td>Applications for Concurrent Support (when applicable)</td>
<td>1 page</td>
</tr>
<tr>
<td>Biographical Sketch</td>
<td>5 pages</td>
</tr>
</tbody>
</table>

https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/page-limits.htm#fell
**PHS Fellowship Supplemental Form**

<table>
<thead>
<tr>
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<td>Details</td>
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<td>1. Introduction to Application (for Resubmission applications)</td>
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<td>4. * Research Strategy</td>
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<td></td>
<td>5. * Respective Contributions</td>
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<td></td>
<td>6. * Selection of Sponsor and Institution</td>
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<tr>
<td></td>
<td>7. Progress Report Publication List (for Renewal applications)</td>
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# PHS Fellowship Supplemental Form

## Fellowship Applicant Section
1. Applicant’s Background and Goals for Fellowship Training
   - Required. Limited to 6 pages.

## Research Training Plan Section
2. Specific Aims
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3. Research Strategy
   - Required. Limited to 6 pages.
4. Respective Contributions
   - Required. Limited to 6 pages.
5. Selection of Sponsor and Institution
   - Required. Limited to 1 page.
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   - Required. Limited to 1 page.

## Sponsor(s), Collaborator(s), and Consultant(s) Section
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9. Letters of Support from Collaborators, Contributors, and Consultants
   - Limited to 6 pages.

## Institutional Environment and Commitment to Training Section
10. Description of Institutional Environment and Commitment to Training
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11. Description of Candidate’s Contribution to Program Goals
    - Must be completed by candidates for diversity-related fellowships, not required for others.
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)
  - Include results and conclusions, publications, presentations
  - Relationship to proposed fellowship

- Graduate students:
  - Undergraduate research
  - Graduate lab rotations
  - Preliminary description of doctoral thesis research

- Post-doctoral fellows:
  - Predoctoral research
  - Previous post-doctoral research


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

B. Training Goals and Objectives:

- Overall training goals and 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), Research and Technical Skills (e.g., rigorous study design), Career Development Skills (e.g., presentations, writing)
- How the fellowship will “facilitate your transition to the next career stage”
# Mentors/Advisory Committee

- Scientific area per Mentor/Committee member
- Schedule of meetings

**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>
</tr>
<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>

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, Clinical, Teaching
  - Research skills and techniques to be learned
  - Relate non-research activities (e.g., professional development) to the proposed research training
- Timeline of research training and other activities
- Estimate % of time devoted to each activity
<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) 1-on-1 meetings (schedule? e.g. weekly) Guided readings Research meetings (schedule? e.g. weekly) Applied training Clinical experience</td>
</tr>
<tr>
<td>Career skills</td>
<td>All mentors and advisors</td>
<td>Improving communication skills Grant writing course Professional workshops/seminars Collaborations Abstracts and manuscripts Travel/Small grant application submission</td>
</tr>
<tr>
<td>Dissemination of Research Results</td>
<td></td>
<td>Supervising technical support personnel, organizing lab meetings, journal clubs e.g. training new lab members, undergraduate, summer students</td>
</tr>
<tr>
<td>Research management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentorship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Development Activities</td>
<td>Year 1</td>
<td>Year 2</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Mentorship</strong></td>
<td></td>
<td></td>
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<tr>
<td>Mentor (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>
</tr>
<tr>
<td>Co-Mentor (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>
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</tr>
<tr>
<td>Advisory Group – frequency (e.g. quarterly) of meetings</td>
<td>X</td>
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</table>
# Career Development Activities

<table>
<thead>
<tr>
<th><strong>Experimental Training</strong></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mentor</strong> (name) – Specific area of research and/or methodology</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Co-Mentor</strong> (name) – Specific area of research and/or methodology</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td><strong>Co-Investigator 1</strong> (name) – Specific area of research and/or methodology</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Co-Investigator 2</strong> (name) – Specific area of research and/or methodology</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td><strong>Collaborator 1</strong> (name) – Specific area of research and/or methodology</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Collaborator 2</strong> (name) – Specific area of research and/or methodology</td>
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</table>

# Formal Coursework

<table>
<thead>
<tr>
<th><strong>Course #1</strong>: Specific Course # / Formal Title</th>
<th>Year 1</th>
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<tbody>
<tr>
<td><strong>Course #2</strong>: Specific Course # / Formal Title</td>
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<tr>
<td>Rigor &amp; Reproducibility</td>
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<tr>
<td>Responsible Conduct of Research</td>
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<tr>
<td>Funding for Research Activities</td>
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<table>
<thead>
<tr>
<th>Career Development Activities</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Workshops &amp; Additional Training Programs</strong></td>
<td></td>
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<tr>
<td>Cold Spring Harbor Course on.....</td>
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<tr>
<td>Woods Hole Workshop on.....</td>
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</tr>
<tr>
<td>American Association for....  Junior Investigators Training on.....</td>
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<tr>
<td>CU Graduate School Workshop on…</td>
<td>X</td>
<td>X</td>
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<tr>
<td>CU Post-doc Affairs Workshop on…</td>
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<tr>
<td>Individual Development Plan Workshop</td>
<td>X</td>
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<tr>
<td><strong>Scientific Conferences-Communication Skills (Oral / Poster Presentations)</strong></td>
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<tr>
<td>Symposium of ....(annual)</td>
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<tr>
<td>Congress of........ (annual)</td>
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</tr>
<tr>
<td>American Association for........ (annual)</td>
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<tr>
<td>Society of...... (biannual)</td>
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</tr>
<tr>
<td>Career Development Activities</td>
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<tr>
<td>------------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>Mentoring Skills (responsibility shared with mentors)</strong></td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Students (summer, undergraduate, medical)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Communication Skills (Written)</strong></td>
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<td>X</td>
<td>X</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>CU pilot award for junior investigator</td>
<td>X</td>
<td></td>
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<tr>
<td>Travel Award for…</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Grant preparation and submission for next career stage</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Improving graduate student and postdoctoral training

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

http://acd.od.nih.gov/bwf.htm
Individual Development Plans

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

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

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/

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

Individually 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.


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
| **Introduction** |
|------------------|--------------------------------------------------|
| 1. Introduction to Application (for Resubmission applications) | Required for Resubmission applications. Limited to 1 page. |

| **Fellowship Applicant Section** |
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| 2. * Applicant’s Background and Goals for Fellowship Training | Required. Limited to 6 pages. |

| **Research Training Plan Section** |
|-----------------------------------|--------------------------------------------------|
| 3. * Specific Aims | Required. Limited to 1 page. |
| 7. Progress Report Publication List (for Renewal applications) | Add Attachment Delete Attachment View Attachment |

| **Sponsor(s), Collaborator(s), and Consultant(s) Section** |
|-----------------------------------------------------------|--------------------------------------------------|
| 10. Letters of Support from Collaborators, Contributors, and Consultants | Limited to 6 pages. |

| **Institutional Environment and Commitment to Training Section** |
|---------------------------------------------------------------|--------------------------------------------------|
| 12. Description of Candidate's Contribution to Program Goals | Must be completed by candidates for diversity-related fellowships, not required for others. |
3. Specific Aims (1 page)
4. Research Strategy (6 pages total)

- Not overly ambitious
- Appropriate for the career level and of the applicant
- Appropriate for the length of the fellowship
- Achievable research goals
- Appropriate for the Mentor’s expertise/background
- Appropriate for the Mentor’s available funding
- Appropriate of the Institution’s resources


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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 to progress in the field
  ■ Develop new technology
4. Research Strategy (6 pages total)

(1) Significance

- “Importance of the problem or critical barrier to progress that the proposed project addresses”
- “Strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed project.”
- “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”


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

■ (2) Approach

■ “Overall strategy, methodology, and analyses to be used”
■ “Plans to address weaknesses in the rigor of the prior research”
■ “Experimental design and methods proposed and how they will achieve robust and unbiased results.”
■ “How the data will be collected, analyzed, and interpreted”
■ “Potential problems [challenges], alternative strategies, and benchmarks [milestones] for success”
■ Strategies “to establish feasibility, and address the management of any high risk aspects”
4. Research Strategy (6 pages total)

(2) Approach

“Explain how relevant biological variables, such as sex, are factored into research designs and analyses for studies in vertebrate animals and humans.”

Preliminary studies and results (including those collected by others in the research group)

Relevant previous experiences

Additional: e.g., human embryonic stem cells (hESC), human fetal tissue (HFT), clinical trials, hazardous situations
**PHS Fellowship Supplemental Form**

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<tr>
<td>Description of Institutional Environment and Commitment to Training</td>
<td>2</td>
</tr>
<tr>
<td>Description of Candidate’s Contribution to Program Goals</td>
<td></td>
</tr>
</tbody>
</table>

5. Respective Contributions (1 page)

■ “Describe the collaborative process between you and your sponsor/co-sponsor(s) in the development, review, and editing of this Research Training Plan.”

■ “Discuss the respective roles in accomplishing the proposed research.”
# PHS Fellowship Supplemental Form

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<tr>
<th>Section</th>
<th>Requirements</th>
<th>Attachments</th>
</tr>
</thead>
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<td>Delete Attachment</td>
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</tbody>
</table>

Links:
- [Jaime S. Rubin, Ph.D.](http://grantscourse.columbia.edu)
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.”

- Post-doctoral Fellows: “Training is expected to broaden a fellow's perspective. Therefore, if you are requesting training at either your doctorate institution or any institution where you have been training for more than a year, you must explain why further training at that institution would be valuable.”


### PHS Fellowship Supplemental Form

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1. Introduction to Application (for Resubmission applications)
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12. Description of Candidate's Contribution to Program Goals
    - Must be completed by candidates for diversity-related fellowships, not required for others.
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 training faculty
  - Duration of Instruction (e.g., contact hours)
  - Frequency of Instruction
    - At every career stage, at least once every four years
  - Document any prior instruction

### PHS Fellowship Supplemental Form

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4. * Research Strategy  
   - Required. Limited to 6 pages.
5. * Respective Contributions  
   - Required. Limited to 6 pages.
6. * Selection of Sponsor and Institution  
   - Required. Limited to 1 page.
7. Progress Report Publication List (for Renewal applications)  
8. * Training in the Responsible Conduct of Research  
   - Required. Limited to 1 page.

#### Sponsor(s), Collaborator(s), and Consultant(s) Section
9. Sponsor and Co-Sponsor Statements  
   - Required. Limited to 6 pages.
10. Letters of Support from Collaborators, Contributors, and Consultants  
    - Limited to 6 pages.

#### Institutional Environment and Commitment to Training Section
11. Description of Institutional Environment and Commitment to Training  
    - Required for F05, F30, F31, F32, F33, F37, F38, F12, F99/K00. Limited to 2 pages. 
      Includes Additional Education Information for F30 and F31 applications.
12. Description of Candidate’s Contribution to Program Goals  
    - Must be completed by candidates for diversity-related fellowships, not required for others.

---

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 on time in sponsor’s research group and on current positions.


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

C. Training Plan, Environment, Research Facilities

- Fellow-specific individualized research training plan
- Addresses applicant’s strengths, as well as gaps in current knowledge base and skill sets
- Didactics, courses, seminars, workshops
- 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
- Specific new skills and techniques to be acquired

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

■ C. Training Plan, Environment, Research Facilities
  ■ Professional development (e.g., grant writing, presentation skills)
  ■ How training plan will facilitate the applicant's transition to the next career stage
  ■ F30: “Opportunities to integrate clinical experiences during the research training component; a plan for a smooth transition to the clinical training component;
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 during the award period

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

- Additional instructions if a clinical trial research experience is proposed

---

The NIH Announces New Review Criteria for Ruth L. Kirschstein National Research Service Award (NRSA) Individual Fellowship Applications Involving Research Experiences in Clinical Trials

**Notice Number: NOT-OD-17-122**

**Sponsors, Collaborators, and Consultants**

- *If the applicant is proposing to gain experience in a clinical trial as part of his or her research training,* is there evidence of the appropriate expertise, experience, resources, and ability on the part of the sponsor(s) to guide the applicant during the clinical trial research experience?

**Research Training Plan**

- *If proposed, will the clinical trial experience contribute to the proposed project and/or the applicant’s research training?*

---

# PHS Fellowship Supplemental Form

## Introduction

1. **Introduction to Application (for Resubmission applications)**
   - Required for Resubmission applications. Limited to 1 page.

## Fellowship Applicant Section

2. **Applicant's Background and Goals for Fellowship Training**
   - Required. Limited to 6 pages.

## Research Training Plan Section

3. **Specific Aims**
   - Required. Limited to 1 page.

4. **Research Strategy**
   - Required. Limited to 6 pages.

5. **Respective Contributions**
   - Required. Limited to 6 pages.

6. **Selection of Sponsor and Institution**
   - Required. Limited to 1 page.

7. **Progress Report Publication List (for Renewal applications)**

8. **Training in the Responsible Conduct of Research**
   - Required. Limited to 1 page.

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

9. **Sponsor and Co-Sponsor Statements**
   - Required. Limited to 6 pages.

10. **Letters of Support from Collaborators, Contributors, and Consultants**
    - Limited to 6 pages.

## Institutional Environment and Commitment to Training Section

11. **Description of Institutional Environment and Commitment to Training**
    - Required for F05, F30, F31, F32, F33, F37, F38, FI2, F99/K00. Limited to 2 pages. Includes Additional Education Information for F30 and F31 applications.

12. **Description of Candidate's Contribution to Program Goals**
    - Must be completed by candidates for diversity-related fellowships, not required for others.
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 and contribution to the applicant’s proposed project, research training, career development, and future career goals

- Signed on letterhead stationery

- Sometimes, NIH Biosketch is included (other section)
<table>
<thead>
<tr>
<th>Section</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Required for Resubmission</td>
</tr>
<tr>
<td>Fellowship Applicant Section</td>
<td>Limited to 1 page.</td>
</tr>
<tr>
<td>Research Training Plan Section</td>
<td>Required. Limited to 1 page.</td>
</tr>
<tr>
<td>Sponsor(s), Collaborator(s), and Consultant(s)</td>
<td>Required. Limited to 6 pages.</td>
</tr>
<tr>
<td>Institutional Environment and Commitment to</td>
<td>Required for F05, F30, F31, F32, F33, F37, F38, F12, F99/K00. Limited to 2 pages. Includes Additional Education Information for F30 and F31 applications.</td>
</tr>
</tbody>
</table>

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
- Opportunities for collaborations, courses, journal clubs, seminars, workshops, presentations, etc.
- Appropriate facilities and resources available for academic, research, and career development activities
- Refer to “Facilities/Resources” and “Sponsor’s Statement” sections

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

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 Fellows: Office of Post-doctoral Affairs


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

■ **Additional Educational Info – F31/F30 applications**
  ■ Description of graduate/degree-granting program
    ■ Structure of the program
    ■ Description of and timeline of required milestones
      ■ Courses, Teaching, Clinical requirements, (e.g., F30), Qualifying exams
  ■ Average time to degree over the past 10 years
  ■ Applicant’s progress in relation to the program's timeline
  ■ Frequency and method to formally monitor and evaluate student's progress
  ■ Usually provided by the graduate program’s director/ department chair (include name and title)


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

---

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

- **Additional Educational Information – F30 applications**
  - Clinical didactic programs during the graduate research years
  - Programs to facilitate the transition from graduate/research training (PhD) to the clinical training (MD) of the dual-degree program
  - Research-related programs during the clinical years of the dual-degree program
# PHS Fellowship Supplemental Form

## Introduction
1. **Introduction to Application**
   - For Resubmission applications
   - Required for Resubmission applications. Limited to 1 page.

## Fellowship Applicant Section
2. **Applicant’s Background and Goals for Fellowship Training**
   - Required. Limited to 6 pages.

## Research Training Plan Section
3. **Specific Aims**
   - Required. Limited to 1 page.
4. **Research Strategy**
   - Required. Limited to 6 pages.
5. **Respective Contributions**
   - Required. Limited to 6 pages.
6. **Selection of Sponsor and Institution**
   - Required. Limited to 1 page.
7. **Progress Report Publication List**
   - For Renewal applications
   - Add Attachment
8. **Training in the Responsible Conduct of Research**
   - Required. Limited to 1 page.

## Sponsor(s), Collaborator(s), and Consultant(s) Section
9. **Sponsor and Co-Sponsor Statements**
   - Required. Limited to 6 pages.
10. **Letters of Support from Collaborators, Contributors, and Consultants**
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11. **Description of Institutional Environment and Commitment to Training**
    - Required for F05, F30, F31, F32, F33, F37, F38, F12, F99/K00. Limited to 2 pages.
    - Includes Additional Education Information for F30 and F31 applications.
12. **Description of Candidate’s Contribution to Program Goals**
    - Must be completed by candidates for diversity-related fellowships, not required for others.
12. Description of Candidates Contribution to Program Goals

- Required for those applying to “Diversity-Related” programs
  - e.g., F31 “Individual Predoctoral Fellowship to Promote Diversity in Health-Related Research”
- **Institutional document** (on letterhead) addressing “how the candidate's participation will further the goals of the fellowship program to promote diversity in health-related research”.


10. Facilities & Other Resources
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), biohazards]

- Discuss how the proposed studies will benefit from unique features of the scientific environment, subject populations, or collaborative arrangements
10. Facilities & Other Resources

Career Development Resources

- More complete descriptions of programs referenced in:
  - 2. Applicant’s Background and Goals for Fellowship Training - C. Activities Planned Under this Award
  - 6. Selection of Sponsor and Institution
  - 9. Sponsor(s) and Co-Sponsor(s) - C. Training Plan, Environment, Research Facilities
  - 11. Description of Institutional Environment and Commitment to Training

- Cannot be used to avoid page limitations of other application sections
R&R Other Project Information:

10. Facilities & Other Resources

Career Development Resources

- 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 courses: e.g., Funding & Grantsmanship

- Workshops, webinars, other training programs

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

- Include a list of Referees in the Cover Letter
- 3-5 Letters of References are required
- Individuals who know you well from a research perspective (qualifications, training, and interests)
- Individuals not directly involved in the research project
- 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/institution

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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”
21. Cover Letter Attachment

- Must include
- Title of application
- Title of funding opportunity announcement
- List of Referees (name and affiliation)
- Administrative document – not seen by reviewers
### Biosketch Format Pages, Instructions and Samples

<table>
<thead>
<tr>
<th>Form Name</th>
<th>Biographical Sketch Format Page (fellowship) - Due Dates on/after May 25, 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Prepare biographical sketches for applications and progress reports for fellowship applications and awards.</td>
</tr>
<tr>
<td><strong>How to Access</strong></td>
<td>Fellowship Biosketch (blank format page, Word)</td>
</tr>
<tr>
<td><strong>Instructions</strong></td>
<td>Instructions for Biographical Sketch</td>
</tr>
<tr>
<td></td>
<td>These instructions will be incorporated into the NIH Application Form Instructions with the next update by FY 2022.</td>
</tr>
<tr>
<td><strong>Additional Information</strong></td>
<td>- Predoctoral Fellowship biosketch sample (Word)</td>
</tr>
<tr>
<td></td>
<td>- Postdoctoral Fellowship biosketch sample (Word)</td>
</tr>
<tr>
<td></td>
<td>- FAQs</td>
</tr>
<tr>
<td><strong>Updated Date</strong></td>
<td>March 2021</td>
</tr>
</tbody>
</table>

Try SciENcv to help you develop your biosketch and automatically format it according to NIH requirements. The updated biosketch format will be available in SciENcv March 2021.

[https://grants.nih.gov/grants/forms/biosketch.htm](https://grants.nih.gov/grants/forms/biosketch.htm)
Biographical Sketch

- Students/Post-docs are considered the PI of their NIH Fellowship application (F’s)
- Student/Post-doc PI of NIH Fellowship application uses a different NIH Biosketch format, as compared to all other “roles”
- Everyone else in the application uses the “usual” NIH Biosketch format
  - Mentor(s), Collaborators, Co-investigators, Advisors
- https://grants.nih.gov/grants/forms/biosketch.htm
- https://grants.nih.gov/grants/how-to-apply-application-guide/forms-e/general/g.240-r&r-seniorkey-person-profile-(expanded)-form.htm#Instructions
ADMINISTRATIVE NOTE:
During the review of this application, reviewers and/or NIH staff noted that one or more biosketches did not comply with the required format (NOT-OD-15-032). An electronic notification has been sent to the contact Program Director/Principal Investigator and Signing Official for this application, to ensure that future applications use the correct biosketch format. NIH has the authority to withdraw such applications from review or consideration for funding.
- **Keep Yours Current!**
- Include all information that is relevant – even if mentioned/discussed elsewhere in the application
- “Stand alone” document that conveys to the reviewers everything you want them to know about you
- 5 pages in length total
Used by reviewers to assess the qualifications of the Mentor, collaborator, co-investigator, Advisor, etc. in terms of their proposed role in the applicant’s training, in addition to the overall competence of the entire “team”

Make sure that the NIH Biosketches others give you for your application are current (information and format) and programmatically appropriate
Biosketch for Fellowship Applications

- “Special” NIH Biosketch for Fellowship (F) applicants
- B. Positions, Scientific Appointments and Honors
  - Scholarships, Fellowships, Traineeships
- C. Contributions to Science
  - High School Research:
  - Undergraduate Research:
  - Graduate Research:
  - Post-doctoral Research:
- D. Scholastic Performance (courses and grades)

https://grants.nih.gov/grants/forms/biosketch.htm

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
NAME: Simmons-Gonzales, Leilani

eRA COMMONS USER NAME (credential, e.g., agency login): Simmons!

POSITION TITLE: Graduate Student Research Assistant

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

<table>
<thead>
<tr>
<th>INSTITUTION AND LOCATION</th>
<th>DEGREE (if applicable)</th>
<th>Start Date MM/YYYY</th>
<th>Completion Date MM/YYYY</th>
<th>FIELD OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purdue University</td>
<td>BA</td>
<td>08/2014</td>
<td>05/2018</td>
<td>Biological Chemistry</td>
</tr>
<tr>
<td>UC San Diego</td>
<td>PHD</td>
<td>08/2018</td>
<td>05/2023 (Expected)</td>
<td>Molecular Biology</td>
</tr>
</tbody>
</table>
A. Personal Statement

I first became interested in human health and disease in high school when I was awarded an NIH Diversity Supplement to work as a research technician for two summers in Dr. Indira Creative's lab at the University of Hawaii. I continued to pursue this interest as an undergraduate at Purdue University, where I conducted research with Dr. Daniel Richardson on the mechanisms of action of a new class of small molecules for cancer treatment. This resulted in a co-authorship publication, as well as an invitation to present a poster at the annual Oncological meeting in Denver, Colorado. By the end of my undergraduate career, I knew that I wanted to pursue a long-term career in research. For my graduate training at UC San Diego, I have moved into the fields of genetics and biochemistry by studying the signaling and motility mechanisms of cancer cells, under the mentorship of Dr. Nani Green. Dr. Green is an internationally recognized leader in the field of cancer genetics and has an extensive record for training predoctoral and postdoctoral fellows. Along with giving me new conceptual and technical training, the proposed training plan outlines a comprehensive set of career development activities and workshops. I will have opportunities to engage in public speaking, conduct literature analysis, consider biomedical ethics, and learn about varied career options. For my initial project, I am currently developing a novel protocol for the identification of transcription complexes involved in cancer signaling pathways, which I hope to submit as a first author publication in the next few months. As a native Hawaiian, I am the first in my family to graduate from college, and I am excited to continue making great strides with my education. Overall, I believe that my current research setting in conjunction with my proposed training plan will provide a solid foundation for my long-term goal to become an academic researcher.

### Positions, Scientific Appointments, and Honors

#### Positions and Scientific Appointments

<table>
<thead>
<tr>
<th>Year</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019 – 2020</td>
<td>Robertson Fellowship for Outstanding Graduate Students, Genetics Department, UC San Diego</td>
</tr>
<tr>
<td>2018 – Present</td>
<td>Graduate Research Assistant, UC San Diego</td>
</tr>
<tr>
<td>2016 – 2018</td>
<td>Lab Technician, University of Hawaii</td>
</tr>
<tr>
<td>2014 – Present</td>
<td>Member, Association for Women in Science</td>
</tr>
<tr>
<td>2014 – Present</td>
<td>Member, Sigma Xi</td>
</tr>
<tr>
<td>2014 – 2016</td>
<td>Diversity Supplement, National Institutes of Health</td>
</tr>
</tbody>
</table>

#### Honors

<table>
<thead>
<tr>
<th>Year</th>
<th>Honor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>Virtual Poster Presenter, Genetics and Molecular Biology Meeting</td>
</tr>
<tr>
<td>2019</td>
<td>Poster Presenter, Advances in Cancer Research and Therapy Meeting</td>
</tr>
<tr>
<td>2018</td>
<td>Paula F. Laufenberg award for best senior project in the Biology Department, Purdue University</td>
</tr>
<tr>
<td>2014 – 2018</td>
<td>Scholarship, National Merit Scholarship Program</td>
</tr>
<tr>
<td>2014</td>
<td>Scholarship, Daughters of Hawaii Society</td>
</tr>
</tbody>
</table>
C. Contributions to Science

2. **High School Research**: I spent two summers doing research in the laboratory of Dr. Indira Creative at University of Hawaii, funded by a NIH Diversity Supplement award. Dr. Creative has developed several new anti-fungal drugs that might protect against skin infections. Over the course of two summers I set up in vitro cultures of skin cell lines and conducted a wide range of toxicity assays. We were excited to find that one of the new agents showed almost no toxicity, even at fairly high doses. Dr. Creative is now testing the drug in animals exposed to different types of fungal infections, including *Candida albicans*.


3. **Undergraduate Research**: I was part of a project in the laboratory of Dr. Daniel Richardson at Purdue University. Dr. Richardson’s laboratory studies the mechanisms of action of small molecules for cancer treatment. During my time in his lab I was looking at how a new small molecule, Gen Y, is able to target cancerous cells. My contributions to this work were included in a publication recently accepted in Cellular and Molecular Biology. The work was particularly exciting because it looks like the mechanism of action of Gen Y might be completely novel, making it a potential candidate for treating patients afflicted with colon cancer. Dr. Richardson was recently awarded a patent for this new drug.


   2. Simmons-Gonzales, L, Richardson, D. Testing the ability of a small molecule, Gen Y, to target colon cancer cells. Advances in Cancer Research and Therapy; 2019 September; Denver, CO.

4. **Graduate Research**: My ongoing predoctoral research is focused on transcriptional gene regulation and signaling impacting motility of cancer cells. I believe the results from my research will likely be highly relevant to human health as they will provide new details into the workings of complex biological systems, which will allow for further extrapolations into the development of several types of cancer and their progression. I am currently developing a novel protocol for the identification of transcription complexes involved in cancer signaling pathways, which I hope to submit as a first author publication in the next few months.

   1. Simmons-Gonzales, L, Green, N. A tandem identification approach for transcriptional complexes involved in the signaling and motility of cancerous cells. Genetics and Molecular Biology Virtual Meeting; 2020 September
<table>
<thead>
<tr>
<th>YEAR</th>
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<tbody>
<tr>
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<td>Introductory Biology</td>
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<tr>
<td>2014</td>
<td>Introductory Biology Lab</td>
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<tr>
<td>2014</td>
<td>Foundations of Chemical Principles</td>
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<tr>
<td>2014</td>
<td>French and Francophone World</td>
<td>A</td>
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<td>2014</td>
<td>Ethics, Religion, and Culture Today</td>
<td>A</td>
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<tr>
<td>2015</td>
<td>Organismal and Population Biology</td>
<td>B</td>
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<tr>
<td>2015</td>
<td>Omics</td>
<td>B</td>
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<tr>
<td>2015</td>
<td>First Year Seminar: Nation and Migration</td>
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<tr>
<td>2015</td>
<td>Statistics, Probability, and Reliability</td>
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<td>2015</td>
<td>Calculus I</td>
<td>B</td>
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<td>General Physics I</td>
<td>B</td>
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<tr>
<td>2015</td>
<td>Introductory Chemistry</td>
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<tr>
<td>2015</td>
<td>Population &amp; Ecol Genetics</td>
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<tr>
<td>2015</td>
<td>Organic Chemistry</td>
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### UC SAN DIEGO

<table>
<thead>
<tr>
<th>Year</th>
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<th>Grade</th>
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<tbody>
<tr>
<td>2018</td>
<td>Seminar in Genetics</td>
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</tr>
<tr>
<td>2018</td>
<td>Statistics for the Life Sciences</td>
<td>P</td>
</tr>
<tr>
<td>2018</td>
<td>Ethics in Biological Research</td>
<td>CRE</td>
</tr>
<tr>
<td>2019</td>
<td>Seminar in Physiology and Behavior</td>
<td>P</td>
</tr>
<tr>
<td>2019</td>
<td>Cancer Immunology</td>
<td>P</td>
</tr>
<tr>
<td>2020</td>
<td>Mechanisms of Cell Motility</td>
<td>P</td>
</tr>
<tr>
<td>2020</td>
<td>Biochemical Mechanisms of Cancer Cells</td>
<td>P</td>
</tr>
<tr>
<td>2020</td>
<td>Toxicology</td>
<td>P</td>
</tr>
<tr>
<td>2020</td>
<td>Physiology for the Molecular Biologist</td>
<td>P</td>
</tr>
</tbody>
</table>

Except for the scientific ethics course, UC San Diego graduate courses are graded P (pass) or F (fail). Passing is C plus or better. The scientific ethics course is graded CRE (credit) or NC (no credit). Students must attend at least seven of the eight presentation/discussion sessions for credit.
For applications with deadlines on or after January 25, 2019

“NIH Policy and Guidelines on the Inclusion of Children. Changes to the policy include (1) the applicability of the policy to individuals of all ages, including children and older adults; (2) clarification of potentially acceptable reasons for excluding participants based on age; and (3) a requirement to provide data on participant age at enrollment in progress reports.

“NIH Policy and Guidelines on the Inclusion of Individuals Across the Lifespan as Participants in Research Involving Human Subjects”


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Human Subjects/Clinical Trials Info - changes

| Human Subjects and Clinical Trials Information | Section 2 – Study Population Characteristics | 2.4 Inclusion of Women, Minorities, and Children | 2. Inclusion of Children [References to the Inclusion of Children in Clinical Research policy] | 2. Inclusion Across the Lifespan [References to Inclusion of Children replaced with Inclusion Across the Lifespan] |


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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
  https://grants.nih.gov/grants/how-to-apply-application-guide/forms-e/general/g.100-how-to-use-the-application-instructions.htm

- Reference Letters

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

- Application Page Limits

- NIH Biosketch Format Pages, Instructions and Samples
  [https://grants.nih.gov/grants/forms/biosketch.htm](https://grants.nih.gov/grants/forms/biosketch.htm)

- Instruction in the Responsible Conduct of Research
NIH “F” Sites of Interest

- NIH 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
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application
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
- K99/R00
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

Pathway to Independence Award

- 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
Eligibility Window

no more than 4 years of postdoctoral research experience as of the relevant application due date regardless of whether it is a new or resubmission application… must be in mentored, postdoctoral training positions to be eligible

Parental, medical, or other well-justified leave for personal or family situations of generally less than 12 months… is not included in the 4-year eligibility limit… Part-time postdoctoral research training, related to personal or family situations… will be pro-rated accordingly… time spent conducting postgraduate clinical training that does not involve research is not considered as part of the 4-year research training eligibility limit. Only time dedicated to research activities would count toward the 4-year limit.”
NIH remains strongly committed to enhancing biomedical research workforce diversity.

Applicants for the K99 awards listed in this NOT must have no more than 4 years of postdoctoral research experience at the time of the initial (new) or subsequent resubmission application. NIH considers requests for extension of the K99 eligibility window for various reasons, including medical concerns, disability, family care, extended periods of clinical training, natural disasters, and active duty military service. Each of these requests is reviewed on a case by case basis.

Consistent with the NIH Extension Policy for Early Stage Investigator Status (ESI), effective immediately, NIH will approve an extension of one year for childbirth within the 4 year K99 eligibility window.”
<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>
<tr>
<td>2010</td>
<td>K99</td>
<td>NHLBI</td>
<td>91</td>
<td>35</td>
<td>38%</td>
<td>$3,759,077</td>
</tr>
<tr>
<td>2011</td>
<td>K99</td>
<td>NHLBI</td>
<td>106</td>
<td>22</td>
<td>21%</td>
<td>$2,353,970</td>
</tr>
<tr>
<td>2012</td>
<td>K99</td>
<td>NHLBI</td>
<td>130</td>
<td>39</td>
<td>30%</td>
<td>$4,121,559</td>
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<tr>
<td>2013</td>
<td>K99</td>
<td>NHLBI</td>
<td>112</td>
<td>25</td>
<td>22%</td>
<td>$2,680,777</td>
</tr>
<tr>
<td>2014</td>
<td>K99</td>
<td>NHLBI</td>
<td>167</td>
<td>40</td>
<td>24%</td>
<td>$4,590,006</td>
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<tr>
<td>2015</td>
<td>K99</td>
<td>NHLBI</td>
<td>111</td>
<td>27</td>
<td>24.3%</td>
<td>$3,094,830</td>
</tr>
<tr>
<td>2016</td>
<td>K99</td>
<td>NHLBI</td>
<td>124</td>
<td>32</td>
<td>25.8%</td>
<td>$4,066,065</td>
</tr>
<tr>
<td>2017</td>
<td>K99</td>
<td>NHLBI</td>
<td>99</td>
<td>24</td>
<td>24.2%</td>
<td>$3,072,290</td>
</tr>
<tr>
<td>2018</td>
<td>K99</td>
<td>NHLBI</td>
<td>113</td>
<td>28</td>
<td>24.8%</td>
<td>$3,341,524</td>
</tr>
<tr>
<td>2019</td>
<td>K99</td>
<td>NHLBI</td>
<td>112</td>
<td>33</td>
<td>29.5%</td>
<td>$4,096,354</td>
</tr>
</tbody>
</table>

[1] Success Rate
[2] Total Funding

Post-doc Fellowship/ Career Transition Support to Research Grant (R01)

Post-Doc Fellowship → R01
K99 R00 R01
K99 R00 R01

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

- NIH Pathway to Independence Award (Parent K99/R00 Independent Basic Experimental Studies with Humans Required)
- NIH Pathway to Independence Award (Parent K99/R00 - Clinical Trial Required)
- NIH Pathway to Independence Award (Parent K99/R00 - Independent Clinical Trial Not Allowed)
  - NIDCR Dual Degree Dentist Scientist Pathway to Independence Award (K99/R00 - Clinical Trial Not Allowed)
  - NIAID Physician-Scientist Pathway to Independence Award (K99/R00)
  - NIDCR Dual Degree Dentist Scientist Pathway to Independence Award (K99/R00 Clinical Trial Required)
  - NIAID Physician-Scientist Pathway to Independence Award (K99/R00 Clinical Trial Required)
  - Pathway to Independence Award in Tobacco Regulatory Research (K99/R00 - Independent Clinical Trial Not Allowed)
  - Pathway to Independence Award in Tobacco Regulatory Research (K99/R00 - Independent Clinical Trial Required)
  - BRAIN Initiative Advanced Postdoctoral Career Transition Award to Promote Diversity (K99/R00 Independent Clinical Trial Not Allowed)
  - BRAIN Initiative Advanced Postdoctoral Career Transition Award to Promote Diversity (K99/R00 Clinical Trial Required)
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.

Eligible Individuals
K99/R00 applicants must have no more than 4 years of postdoctoral research experience as of the relevant application due date regardless of whether it is a new or resubmission application. Individuals must be in mentored, postdoctoral training positions to be eligible to apply to the K99/R00 program. If an applicant achieves independence (i.e., any faculty or non-mentored research position) before a K99 award is made, neither the K99 award, nor the R00 award, will be issued.

Parental, medical, or other well-justified leave for personal or family situations of generally less than 12 months duration is not included in the 4-year eligibility limit, nor is clinical training with no research involvement (e.g., full-time residency training). NIH will approve an extension of one year for childbirth within the 4 year K99 eligibility window…. Part-time postdoctoral research training, related to personal or family situations or occurring during a research residency or fellowship, will be pro-rated accordingly. In addition, time spent conducting postgraduate clinical training that does not involve research is not considered as part of the 4-year research training eligibility limit. Only time dedicated to research activities would count toward the 4-year limit.
“Candidates for the K99/R00 are strongly encouraged to obtain confirmation of their eligibility from the relevant IC before they begin to prepare their applications. It is incumbent upon the candidate to provide evidence that they meet all of the eligibility criteria outlined below.”

Individuals are NOT eligible if they:

Ph.D. (or equivalent research doctorate degree) candidates in positions other than postdoctoral fellow positions:

Clinicians (including those with M.D., D.D.S, D.V.M. and other licensed professionals) in positions not designated as postdoctoral positions:

The following is provided as an aid to distinguish independent from non-independent positions. However, it is not sufficient merely to cite one or more of the following items to document eligibility:

**Additional Information for Clinician-Scientists**

Frequently Asked Questions (FAQs):
[https://grants.nih.gov/faqs#/New-Investigators-Program](https://grants.nih.gov/faqs#/New-Investigators-Program)
Timeline of Funding for Junior Investigators

- **Medical School**
  - Short term Training

- **Internship/Residency**
  - Research Support

- **Fellowship – Research Years**
  - Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot

- **Instructor/Assistant Professor**
  - Year-long Enhancement Programs
    - MD/PhD Fellowship or Institutional T32
  - Career Transition Awards
    - K99/R00

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.
The purpose of the NIAID Physician-Scientist Pathway to Independence Award (K99/R00) program is to increase and maintain a strong cohort of new and talented independent physician-scientists. This program is designed to facilitate a timely transition of outstanding postdoctoral researchers with a clinical doctorate degree from mentored, postdoctoral research positions to independent, tenure-track or equivalent faculty positions. The program will provide independent NIAID research support during this transition to help awardees launch competitive, independent research careers in biomedical fields and thereby help to address the national physician-scientist workforce shortage.
Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) Postdoctoral Career Transition Award to Promote Diversity (K99/R00 - Independent Clinical Trial Not Allowed)

| National Institute of General Medical Sciences (NIGMS) |
| National Institute of Biomedical Imaging and Bioengineering (NIBIB) |
| National Institute of Nursing Research (NINR) |
| National Institute on Minority Health and Health Disparities (NIMHD) |
| National Human Genome Research Institute (NHGRI) |
| National Institute on Aging (NIA) |
| National Library of Medicine (NLM) |
| National Institute of Mental Health (NIMH) |
| National Institute on Drug Abuse (NIDA) |
| National Institute on Alcohol Abuse and Alcoholism (NIAAA) |
| National Heart, Lung and Blood Institute (NHLBI) |
| National Institute of Environmental Health Sciences (NIEHS) |
| 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 Center for Complementary and Integrative Health (NCCIH) |
| National Institute of Allergy and Infectious Diseases (NIAID) |
| National Institute of Neurological Disorders and Stroke (NINDS) |
| National Eye Institute (NEI) |

Career Transition Award (K22)

- **NCI, NIAID**: Transition from mentored, non-independent research position to independent faculty (or equivalent) position

- **NCI, NINDS**: Diversity candidates
Timeline of Funding for Junior Investigators

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

<table>
<thead>
<tr>
<th>Medical School</th>
<th>Internship/Residency</th>
<th>Fellowship – Research Years</th>
<th>Instructor/Assistant Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year-long Enhancement Programs</strong>&lt;br&gt;MD/PhD Fellowship or Institutional T32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Career Transition Awards</strong></td>
<td></td>
</tr>
</tbody>
</table>

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

Topics to be Discussed

- Individual Fellowship Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application
Timeline of Funding for Junior Investigators

- **Medical School**
  - Short term Training
  - Year-long Enhancement Programs
    - MD/PhD Fellowship or Institutional T32

- **Internship/Residency**
  - Research Support

- **Fellowship – Research Years**
  - Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot

- **Instructor/Assistant Professor**
  - Career Transition Awards
  - Individual Mentored K Career Development Award

Timeline of Funding for Junior Investigators

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

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

- Instructor/Assistant Professor
  - Career Transition Awards
  - Individual Mentored K Career Development Award

Career Development (K) Support to Research Grant (R01)

K01/K08/K23 → R01
K12/KL2 → K23 → R01
K12/KL2 → K23 → R01
K01/K08/K23 → R01
K12/KL2 → R01

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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
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

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

NCI will **no longer** be participating in PA-16-198, "Mentored Patient-Oriented Research Career Development Award (Parent K23)"

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

**NCI K08 Career Development Awards** will support training in Basic, Translational, and Patient-Oriented Cancer Research, as well as combinations of Basic, Translational, and Patient-Oriented Research.

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

Mentored Research Scientist Development Award (K01)

Not all NIH Institutes participate in program. Participating Institutes may use for different purposes.

- Specific research areas
- Increase research workforce diversity
- Train in a new field
- Hiatus in research career
- Some Institutes support the parent funding announcement, some issue their own

Mentored Research Scientist Development Awards (K01)

- **NIMH:**
  - “Supports a 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… a strong, well-planned, thorough career development plan, in addition to development of an impactful research project, is a critical aspect of this K01”
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:**
  - Epidemiology and Data Science
  - Includes “computational modeling, bioinformatics, big data and advanced statistical analyses”

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

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

Mentored Research Scientist Development Awards (K01)

- **NINR:**
  - Supports “mentored patient-oriented 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
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

- **NCI, NHLBI, NIDCR, NINDS:** Promote Faculty Diversity
Mentored Quantitative Research Career Development Award (K25)

- To attract investigators with expertise in quantitative science and engineering research (e.g., mathematics, statistics, economics, computer science, imaging science, informatics, physics, chemistry), but whose research has not been focused on NIH-relevant questions of health and disease.

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# Parent Announcements (For Unsolicited or Investigator-Initiated Applications)

## Career Development (K) Announcements

<table>
<thead>
<tr>
<th>K08</th>
<th>Mentored Clinical Scientist Research Career Development Award (Parent K08 Independent Clinical Trial Not Allowed)</th>
<th>PA-20-203</th>
</tr>
</thead>
<tbody>
<tr>
<td>K08</td>
<td>Mentored Clinical Scientist Research Career Development Award (Parent K08 Independent Clinical Trial Required)</td>
<td>PA-20-202</td>
</tr>
<tr>
<td>K08</td>
<td>Mentored Clinical Scientist Research Career Development Award (Parent K08 Independent Basic Experimental Studies with Humans Required)</td>
<td>PA-20-201</td>
</tr>
<tr>
<td>K23</td>
<td>Mentored Patient-Oriented Research Career Development Award (Parent K23 Independent Clinical Trial Required)</td>
<td>PA-20-206</td>
</tr>
<tr>
<td>K23</td>
<td>Mentored Patient-Oriented Research Career Development Award (Parent K23 Independent Clinical Trial Not Allowed)</td>
<td>PA-20-205</td>
</tr>
<tr>
<td>K23</td>
<td>Mentored Patient-Oriented Research Career Development Award (Parent K23 Independent Basic Experimental Studies with Humans Required)</td>
<td>PA-20-204</td>
</tr>
</tbody>
</table>

https://grants.nih.gov/grants/guide/parent_announcements.htm
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.

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.

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.

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.

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.

- Mentored Patient-Oriented Research Career Development Award (Parent K23 Independent Basic Experimental Studies with Humans Required)
- Mentored Patient-Oriented Research Career Development Award (Parent K23 - Clinical Trial Required)
- Mentored Patient-Oriented Research Career Development Award (Parent K23 - Independent Clinical Trials Not Allowed)
“NIH will require that all applications involving one or more clinical trials be submitted through a Funding Opportunity Announcement (FOA) specifically designed for clinical trials. This means that the NIH will no longer accept clinical trial applications through "parent" FOA announcements or through other FOAs that are not specifically designed to accept clinical trials.”

“New Effective Date
Effective January 25, 2018, all grant applications with plans to conduct clinical trials must be submitted in response to an FOA which specifically states that clinical trials are allowed. After that date, applications planning a clinical trial that are submitted to a non-clinical trial FOA will be returned without review.”

Funding Announcements – New Clinical Trials Policy: Basic Experimental Studies with Humans

“new parent Funding Opportunity Announcement (FOAs) for basic science experimental studies involving humans [BESH], referred to in NOT-OD-18-212 as “prospective basic science studies involving human participants.” These studies fall within the NIH definition of a clinical trial and also meet the definition of basic research. Types of studies that should submit under this FOA include studies that prospectively assign human participants to conditions (i.e., experimentally manipulate independent variables) and that assess biomedical or behavioral outcomes in humans for the purpose of understanding the fundamental aspects of phenomena without specific application towards processes or products in mind.”


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## Comparison of Funding Opportunity Announcement Types by Clinical Trial Allowability

<table>
<thead>
<tr>
<th>Clinical Trial Not Allowed FOA</th>
<th>Clinical Trial Required FOA</th>
<th>Basic Experimental Studies with Humans Required FOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Studies not involving humans as research participants</td>
<td>• Studies of the safety, efficacy, or effectiveness of an intervention on biomedical or behavioral outcomes or processes</td>
<td>• Studies that prospectively assign interventions or experimentally manipulate independent variables with human participants and assess biomedical or behavioral outcomes for the purpose of understanding the fundamental aspects of phenomena without specific application towards processes or products in mind</td>
</tr>
<tr>
<td>• Studies of biospecimens obtained from humans in which any experimental manipulation is performed on the biospecimens, not on the humans</td>
<td>• Studies that prospectively assign interventions intended or anticipated to change the health status of human participants even if not for the purpose of assessing the safety, efficacy or effectiveness of the intervention (e.g., to study the mechanisms or pathways by which the treatment produces its effect)</td>
<td>• Studies that use an experimental manipulation or intervention probe in order to understand normal functioning or the pathophysiology of a disorder</td>
</tr>
<tr>
<td>• Human observational studies in which no experimental manipulations of independent variables and no prospective assignment of interventions are performed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Studies in which experimental intervention(s) are performed by someone other than the investigator (e.g., health service delivery studies in which the assignment is performed by the healthcare system, natural experiments in which a natural or policy event occurs outside the investigator's control)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Studies of tests (e.g., laboratory, biomarkers, patient-report, performance, observational) in which the purpose of the study is to assess the various properties of the test (reliability, validity, sensitivity/specificity, etc.), not to assess biomedical or behavioral outcomes or processes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interventions or experimentally manipulate independent variables to understand the fundamental aspects of phenomena with a specific application in mind (e.g., FDA Phase 0 or 1 trials, translational/applied studies in which fundamental processes are applied to a particular problem or health condition)

**Note:** Many ICs will continue to accept basic experimental studies with humans through existing FOAs that accept clinical trials (Clinical Trial Required or Clinical Trial Optional)

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**Note:** Participation in Funding Opportunities will vary by NIH Institutes and Centers (ICs)
Research Career Development Awards

![Chart showing the number of awards from 1997 to 2018 for different award types: K01, K08, K23, K25, K99. The chart indicates a notable increase in the number of K23 awards by 2018.](http://grantscourse.columbia.edu)
Individual Research Career Development Awards – by NIH Institute

Awards for 2019

Institute / Center

FIC  NCCIH  NCI  NCRR  NEI  NHGRI  NHLBI  NIA  NIAMS  NIAID  NIBIB  NICHD  NIDA  NIDCD  NIDCR  NIDDK  NIEHS  NIGMS  NIMH  NIMHD  NINDS  NINR  NLM  OD

Awards

0  100  200  300  400  500  600  700  800

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Research Career Development Awards

![Graph showing trends in Total Funding and Average Funding over fiscal years 1998 to 2018.](image-url)
<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Activity Code</th>
<th>NIH Institute / Center</th>
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<th>Success Rate</th>
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<td>2013</td>
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<td>127</td>
<td>43</td>
<td>33.9%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIDCR</td>
<td>3</td>
<td>3</td>
<td>100.0%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIDDK</td>
<td>33</td>
<td>38</td>
<td>40.9%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NINDS</td>
<td>66</td>
<td>18</td>
<td>27.3%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIAID</td>
<td>50</td>
<td>22</td>
<td>44.0%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIGMS</td>
<td>6</td>
<td>5</td>
<td>83.3%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NICHD</td>
<td>51</td>
<td>24</td>
<td>47.1%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NEI</td>
<td>12</td>
<td>4</td>
<td>33.3%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIEHS</td>
<td>7</td>
<td>5</td>
<td>71.4%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIA</td>
<td>44</td>
<td>16</td>
<td>36.4%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIAMS</td>
<td>25</td>
<td>9</td>
<td>36.0%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIDCD</td>
<td>10</td>
<td>4</td>
<td>40.0%</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIMH</td>
<td>37</td>
<td>25</td>
<td>25.8%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIDA</td>
<td>33</td>
<td>12</td>
<td>30.8%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIAAA</td>
<td>13</td>
<td>5</td>
<td>38.5%</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NINR</td>
<td>18</td>
<td>8</td>
<td>44.4%</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIBIB</td>
<td>1</td>
<td>0</td>
<td>0.0%</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NCCIH***</td>
<td>6</td>
<td>4</td>
<td>66.7%</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIMHD***</td>
<td>9</td>
<td>6</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

**2019 Activity Total**

- Number of Applications Reviewed: 677
- Number of Applications Awarded: 251
- Success Rate: 37.1%
- Total Funding: $44,849,753
# NHLBI K23 Application Success Rate

<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>
<tr>
<td>2010</td>
<td>K23</td>
<td>NHLBI</td>
<td>90</td>
<td>38</td>
<td>42%</td>
<td>$5,466,560</td>
</tr>
<tr>
<td>2011</td>
<td>K23</td>
<td>NHLBI</td>
<td>89</td>
<td>39</td>
<td>44%</td>
<td>$5,486,852</td>
</tr>
<tr>
<td>2012</td>
<td>K23</td>
<td>NHLBI</td>
<td>86</td>
<td>18</td>
<td>21%</td>
<td>$2,635,891</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NHLBI</td>
<td>107</td>
<td>32</td>
<td>30%</td>
<td>$4,639,354</td>
</tr>
<tr>
<td>2014</td>
<td>K23</td>
<td>NHLBI</td>
<td>77</td>
<td>29</td>
<td>38%</td>
<td>$4,147,948</td>
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<tr>
<td>2015</td>
<td>K23</td>
<td>NHLBI</td>
<td>94</td>
<td>36</td>
<td>38.3%</td>
<td>$5,393,783</td>
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<tr>
<td>2016</td>
<td>K23</td>
<td>NHLBI</td>
<td>101</td>
<td>45</td>
<td>44.6%</td>
<td>$8,086,510</td>
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<tr>
<td>2017</td>
<td>K23</td>
<td>NHLBI</td>
<td>138</td>
<td>52</td>
<td>37.7%</td>
<td>$9,311,596</td>
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<tr>
<td>2018</td>
<td>K23</td>
<td>NHLBI</td>
<td>137</td>
<td>50</td>
<td>36.5%</td>
<td>$8,957,091</td>
</tr>
<tr>
<td>2019</td>
<td>K23</td>
<td>NHLBI</td>
<td>127</td>
<td>43</td>
<td>33.9%</td>
<td>$7,613,342</td>
</tr>
</tbody>
</table>


Agency for Healthcare Research and Quality

- **Portfolios of Research:** “Make health care safer, Increase accessibility, Improve health care affordability, efficiency and cost transparency”

- **Selected Areas of Research Interest:** Health Information Technology (Health IT), Healthcare-Associated Infections, Simulation in Healthcare

- **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

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

https://www.ahrq.gov/funding/fund-opps/index.html
https://www.ahrq.gov/funding/priorities-contacts/contacts/index.html

Centers for Disease Control and Prevention (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”

Timeline of Funding for Junior Investigators

- Short term Training
- Research Support
- Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot
- Institutional K12 Career Development Slot
- Medical School
- Internship/Residency
- Fellowship – Research Years
- Instructor/Assistant Professor
- Year-long Enhancement Programs MD/PhD Fellowship or Institutional T32
- Career Transition Awards
- Individual Mentored K Career Development Award

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Mentored Clinical Scientist Development Program Award (K12)

- **Multi-Institute:** Women’s Health

- **Institute specific**
  - NCI: Clinical oncology
  - NIDDK: Urology research
  - NIDDK: Diabetes research for endocrinologists
  - NICHD:
    - Child health
    - Pediatric scientists
    - Reproductive scientists

Mentored Clinical Scientist
Development Program Award (K12)

- Institute specific
  - NIDA: Mentored clinical scientist development
  - NEI: Physician scientist award
  - NHLBI: Late stage (T4) translation research
  - NIDCR: Dental specialty and PhD program
  - NINDS: Neurosurgeons

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

Source: Zerhouni (NIH) [9/06]

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Research Career Development/Scholar Programs

Non-government, non-profit agencies

- Voluntary Health Organizations
- Professional Societies
- Private Foundations
Research Career Development/Scholar Programs

- **American Heart Association**
  - Career Development Award

- **Harold Amos Medical Faculty Development Program**
  - “to increase the number of faculty from historically disadvantaged backgrounds who can achieve senior rank in academic medicine, dentistry, or nursing” [“challenges facing individuals because of their race, ethnicity, socioeconomic status, or other similar factors”]
  - **Partners:** American Heart Association, American Society of Hematology, American Society of Nephrology

- **Damon Runyon Cancer Research Foundation**
  - Clinical Investigator Award

- **Doris Duke Charitable Foundation**
  - Clinical Scientist Development Award

Topics to be Discussed

- Individual Fellowship Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application
- Career Transition Funding Programs
- Junior Faculty Career Development Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

### NEW APPLICATIONS

<table>
<thead>
<tr>
<th>Activity Codes</th>
<th>Program Description</th>
<th>Cycle I Due Date</th>
<th>Cycle II Due Date</th>
<th>Cycle III Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>K series</td>
<td><em>new</em> Research Career Development</td>
<td>February 12</td>
<td>June 12</td>
<td>October 12</td>
</tr>
</tbody>
</table>
### RESUBMISSION AND COMPETITIVE RENEWAL APPLICATIONS

<table>
<thead>
<tr>
<th>Activity Codes</th>
<th>Program Description</th>
<th>Cycle I Due Date</th>
<th>Cycle II Due Date</th>
<th>Cycle III Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>K series</td>
<td>Research Career Development</td>
<td>March 12</td>
<td>July 12</td>
<td>November 12</td>
</tr>
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</table>

*renewal, resubmission, revision*

---


<table>
<thead>
<tr>
<th>All Activity Codes Cited Above</th>
<th>AIDS and AIDS-Related Applications</th>
<th>May 7</th>
<th>September 7</th>
<th>January 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>new, renewal, resubmission, revision</td>
<td>*Effective. Sept 5, 2015 - N/A for SBIR/STTR Applications using Standard Due Dates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTE: See Key Dates section of funding opportunity announcement to determine if AIDS dates apply.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Application Due Dates

### Review and Award Cycles

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

---


### NIH's Evaluation System

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

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

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

---

*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 or low value/benefit for the candidate who has moderate or low potential for further development. Weaknesses in the criteria reduce the overall impact to low.

*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.
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
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)

http://enhancing-peer-review.nih.gov/timelines.html

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
# K awards 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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</thead>
<tbody>
<tr>
<td>R01</td>
<td>Research Project Grant</td>
<td>16</td>
<td>N/A</td>
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<tr>
<td>R01 ESI</td>
<td>Early Stage Investigators</td>
<td>26</td>
<td>N/A</td>
</tr>
<tr>
<td>K awards</td>
<td>Career Development Awards</td>
<td>N/A</td>
<td>32</td>
</tr>
</tbody>
</table>

FY20

https://www.nhlbi.nih.gov/current-operating-guidelines

NIH's Review Criteria

**Overall Impact Score**

- “assessment of the likelihood that the proposed career development and research plan will enhance the candidate’s potential for a productive, independent scientific research career in a health-related field…”

**Core Review Criteria**

A separate score is given for each

For Mentored Patient-Oriented Research Career Development Award (Parent K23 – Independent Clinical Trial Not Allowed) (PA-20-205)

Check individual funding announcement if applying to another
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
1. **Candidate**

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

2. **Career Development Plan/Career Goals & Objectives/Plan to Provide Mentoring**

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

3. **Research Plan**

   **Strengths**
   - 
   **Weaknesses**
   -
4. **Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)**

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

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

1. Candidate

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

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

2. Career Development Plan/Career Goals & Objectives

- “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?”

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?”

■ If proposed, will the clinical trial experience contribute to the applicant’s research career development?
3. Research Plan

- “Are the proposed research questions, design, and methodology of significant scientific and technical merit?

- Is the prior research that serves as the key support for the proposed project rigorous?

- Has the candidate included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project?

- Has the candidate presented strategies to ensure a robust and unbiased approach, as appropriate for the work proposed?
3. Research Plan

- Has the candidate presented adequate plans to address **relevant biological variables**, such as sex, for studies in vertebrate animals or human subjects?”

- “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?”

- If proposed, will the **clinical trial** experience contribute to the proposed research project?

NIH Review criteria – changes

- For applications with deadlines on or after January 25, 2019

<table>
<thead>
<tr>
<th>Section</th>
<th>Criteria</th>
<th>Current language</th>
<th>Revised language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scored Review Criteria</td>
<td>Research Plan</td>
<td>Is there a strong scientific premise for the project?</td>
<td>Is the prior research that serves as the key support for the proposed project?</td>
</tr>
<tr>
<td>Scored Review Criteria</td>
<td>Research Plan</td>
<td>Not Applicable</td>
<td>Has the candidate included plans to address weaknesses in the rigor of prior research that serves as the key support for the proposed project?</td>
</tr>
</tbody>
</table>
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?”

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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?”
4. Mentor(s), Co-mentor(s), Consultant(s), Collaborator(s)

- “If the applicant is proposing to gain experience in a clinical trial as part of his or her research career development, is there evidence of the appropriate expertise, experience, and ability on the part of the mentor(s) to guide the applicant during participation in the clinical trial?”

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?”


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
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?”
Additional Review Criteria

Evaluated for the overall impact score, but not given an individual score

- Protections for Human Subjects
- Inclusion of Women, Minorities, and Individuals Across the Lifespan (as of Jan 25, 2019)
- Vertebrate Animals
- Biohazards
- Resubmissions
  - Response to previous reviewers’ comments and subsequent changes made to the proposal

Additional Review Considerations

Not given an individual score and not considered for the overall impact score

- Training in the Responsible Conduct of Research
  - Address required components (training faculty involvement)

- Select Agent Research

- Resource Sharing Plans
  - 1) Data Sharing Plan; 2) Sharing Model Organisms; and 3) Genomic Data Sharing Plan

- Authentication of Key Biological and/or Chemical Resources
  - Plans for identifying and ensuring the validity of resources

- Budget and Period of Support


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Guidance for NIH Reviewers

- Rigor and Transparency
- Sex as a Biological Variable
- Vertebrate Animals
- Human Subjects Section
- Clinical Trials
- Single IRB for multi-site studies
- Inclusion on the Basis of Sex/Gender, Race, Ethnicity, and Age in Clinical Research
- Human Embryonic Stem Cells
- Authentication of Key Biological and/or Chemical Resources
- Select Agents
- Resource Sharing Plans
- Budget Information
- Revision Applications


Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Guidelines for NIH Reviewers

https://grants.nih.gov/grants/policy/review-guidelines.htm

<table>
<thead>
<tr>
<th>R</th>
<th>R and U Awards (Research Project Grants; R01, R03, R21, SBIR/STTR, etc. and Cooperative Agreements: U01, etc.).</th>
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<tbody>
<tr>
<td>K</td>
<td>K Awards (Career Development)</td>
</tr>
<tr>
<td>F</td>
<td>F Awards (Fellowships)</td>
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<tr>
<td>S</td>
<td>S10 Awards (Shared Instrumentation)</td>
</tr>
<tr>
<td>T</td>
<td>T Awards (Training)</td>
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</tbody>
</table>

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
# Guidelines for NIH Reviewers

https://grants.nih.gov/grants/policy/review-guidelines.htm

<table>
<thead>
<tr>
<th>K</th>
<th>K Awards (Career Development)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K01</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K02</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K07</td>
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</tr>
<tr>
<td>K08</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K12</td>
<td>Institutional Clinician Scientist Award (see below under T awards) (07/28/2020)</td>
</tr>
<tr>
<td>K22</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K23</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K24</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K25</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
<tr>
<td>K99/R00</td>
<td>GUIDE FOR REVIEWERS (07/28/2020)</td>
</tr>
</tbody>
</table>

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
# NIH Review Criteria at a Glance


<table>
<thead>
<tr>
<th>Fellowship (F30, F31, F32, F33)</th>
<th>Career Development (K01, K02, K07, K08, K23, K24, K25, K99)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Impact</strong></td>
<td><strong>Overall Impact</strong></td>
</tr>
<tr>
<td><strong>Scored Review Criteria</strong></td>
<td><strong>Scored Review Criteria</strong></td>
</tr>
<tr>
<td>(Scored individually and considered in overall impact score)</td>
<td>(Scored individually and considered in overall impact score)</td>
</tr>
<tr>
<td>✓ Fellowship Applicant</td>
<td>✓ Candidate</td>
</tr>
<tr>
<td>✓ Sponsors, Collaborators, and Consultants</td>
<td>✓ Career Development Plan/Career Goals &amp; Objectives/Plan to Provide Mentoring</td>
</tr>
<tr>
<td>✓ Research Training Plan</td>
<td>✓ Research Plan</td>
</tr>
<tr>
<td>✓ Training Potential</td>
<td>✓ Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)</td>
</tr>
<tr>
<td>✓ Institutional Environment &amp; Commitment to Training</td>
<td>✓ Environment &amp; Institutional Commitment to the Candidate</td>
</tr>
<tr>
<td><strong>Additional Review Criteria</strong></td>
<td>For Clinical Trials:</td>
</tr>
<tr>
<td>(Not scored individually, but considered in overall impact score)</td>
<td>✓ Study Timeline for Clinical Trials</td>
</tr>
<tr>
<td>✓ Protections for Human Subjects</td>
<td>All:</td>
</tr>
<tr>
<td>✓ Inclusion of Women, Minorities, &amp; Children</td>
<td>✓ Protections for Human Subjects</td>
</tr>
<tr>
<td>✓ Vertebrate Animals</td>
<td>✓ Inclusion of Women, Minorities, &amp; Children</td>
</tr>
<tr>
<td>✓ Biohazards</td>
<td>✓ Vertebrate Animals</td>
</tr>
<tr>
<td>✓ Resubmission</td>
<td>✓ Biohazards</td>
</tr>
<tr>
<td>✓ Renewal</td>
<td>✓ Resubmission</td>
</tr>
<tr>
<td><strong>Additional Review Considerations</strong></td>
<td>✓ Renewal</td>
</tr>
<tr>
<td>(Not scored individually and not considered in overall score)</td>
<td>✓ Revision</td>
</tr>
<tr>
<td>✓ Training in the Responsible Conduct of Research</td>
<td></td>
</tr>
<tr>
<td>✓ Applications from Foreign Organizations</td>
<td></td>
</tr>
<tr>
<td>✓ Select Agents</td>
<td></td>
</tr>
<tr>
<td>✓ Resource Sharing Plans</td>
<td></td>
</tr>
<tr>
<td>✓ Budget &amp; Period of Support</td>
<td></td>
</tr>
</tbody>
</table>

Responses for items with emphasis (italics) are required. Last updated March 9, 2018
# NIH Review criteria – changes

- **For applications with deadlines on or after January 25, 2019**

| Additional Review Criteria | Inclusion of Women, Minorities, and Individuals Across the Lifespan | When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of children to determine if it is justified in terms of the scientific goals and research strategy proposed. | When the proposed project involves human subjects and/or NIH-defined clinical research, the committee will evaluate the proposed plans for the inclusion (or exclusion) of individuals on the basis of sex/gender, race, and ethnicity, as well as the inclusion (or exclusion) of individuals of all ages (including children and older adults) to determine if it is justified in terms of the scientific goals and research strategy proposed. |

FOAs that accept clinical trials will include additional review criteria questions in *Section V. Application Review Information.*

**Revision: The NIH Announces Additional Review Criteria for Career Development Award Applications Involving Clinical Trials**

In *addition* to the standard individual K award review questions:

### Scored Review Criteria *(Independent Clinical Trial Required)*

- Candidate
- Research Plan
- Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)
- Environment & Institutional Commitment to the Candidate

### Scored Review Criteria *(Independent Clinical Trial Not Allowed)*

- Career Development Plan/Career Goals and Objectives
- Research Plan
- Mentor(s), Co-Mentor(s), Consultant(s), Collaborator(s)

### Additional Review Criteria

- Study Timeline for Clinical Trials

---

https://grants.nih.gov/policy/clinical-trials/review-criteria.htm
https://grants.nih.gov/grants/peer/critiques/k_D.htm

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.
Guidance: Rigor and Reproducibility in Grant Applications

NIH research grant and career development award application instructions and review language focus on four key areas:

1. The rigor of the prior research
2. Rigorous experimental design for robust and unbiased results
3. Consideration of relevant biological variables
4. Authentication of key biological and/or chemical resources
Review of Literature

<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>Rigor of the Prior Research</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>


<table>
<thead>
<tr>
<th>4 AREAS OF FOCUS</th>
<th>WHAT DOES IT MEAN?</th>
<th>WHERE SHOULD IT BE INCLUDED IN THE APPLICATION?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigor of the Prior Research</td>
<td>A careful assessment of the <strong>rigor of the prior research</strong> that serves as the key support for a proposed project will help applicants identify any weaknesses or gaps in the line of research. Describe the strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed project. Describe plans to address weaknesses in the rigor of the prior research that serves as the key support for the proposed project.</td>
<td><em>See related FAQs, blog post</em></td>
</tr>
<tr>
<td>Scientific Rigor (Design)</td>
<td><strong>Scientific rigor</strong> is the strict application of the scientific method to ensure robust and unbiased experimental design, methodology, analysis, interpretation and reporting of results. Emphasize how the experimental design and methods proposed will achieve robust and unbiased results.</td>
<td><em>See related FAQs, blog post, examples from pilots</em></td>
</tr>
</tbody>
</table>


### Rigor and Reproducibility in NIH Applications: Resource Chart

<table>
<thead>
<tr>
<th>4 AREAS OF FOCUS</th>
<th>WHAT DOES IT MEAN?</th>
<th>WHERE SHOULD IT BE INCLUDED IN THE APPLICATION?</th>
</tr>
</thead>
</table>
| **Biological Variables** | Biological variables, such as sex, age, weight, and underlying health conditions, are often critical factors affecting health or disease. In particular, sex is a biological variable that is frequently ignored in animal study designs and analyses, leading to an incomplete understanding of potential sex-based differences in basic biological function, disease processes and treatment response. Explain how relevant biological variables, such as the ones noted above, are factored into research designs, analyses, and reporting in vertebrate animal and human studies. Strong justification from the scientific literature, preliminary data or other relevant considerations must be provided for applications proposing to study only one sex. | Research Strategy  
➢ Approach |

*See related FAQs, blog posts, article*

| **Authentication** | Key biological and/or chemical resources include, but are not limited to, cell lines, specialty chemicals, antibodies and other biologics. Briefly describe methods to ensure the identity and validity of key biological and/or chemical resources used in the proposed studies. These resources may or may not have been generated with NIH funds and:  
• may differ from laboratory to laboratory or over time;  
• may have qualities and/or qualifications that could influence the research data;  
• are integral to the proposed research.  
The authentication plan should state in one page or less how you will authenticate key resources, including the frequency, as needed for your research. Note: Do not include authentication data in your plan. |  
Other Research Plan Section  
➢ Include as an attachment  
➢ Do not include in the Research Strategy |

*See related FAQs, blog post, examples*
Topics to be Discussed

- Individual Fellowship Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application

- Career Transition Funding Programs

- Junior Faculty Career Development Programs
  - Overview of Programs and Funding Agencies
  - NIH Review Process, Criteria, and Scoring System
  - Components of an NIH Application
FORMS VERSION F SERIES
Released: October 16, 2020

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

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
The PHS 398 Career Development Award Supplemental Form is used only for career development applications and multi-project applications with an "Indiv. Career Dev" Component.

This form includes fields to upload several attachments including the Specific Aims, Research Strategy, and Candidate Background and Goals.

See NIH's Reference Letters page for information including instructions for referees and how to submit letters.

The attachments in this form, together with the rest of your application, should include sufficient information needed for evaluation of the project and the candidate, independent of any other documents (e.g., previous application). Be specific and informative, and avoid redundancies.

Quick Links

Introduction

1. Introduction to Application (for Resubmission and Revision applications)

Candidate Section

2. Candidate Information and Goals for Career Development

Research Plan Section

View larger image
• In describing their career development plans in the Program Plan attachment, candidates for career development awards will be expected to address, as applicable, any new research skills they plan to acquire in the areas of rigorous research design, experimental methods, quantitative approaches, and data analysis and interpretation.
• Applicants for diversity-related career development programs will be expected to attach a Description of Candidate’s Contribution to Program Goals, explaining how the candidate’s participation would further the goals of the program to promote diversity in health-related research.
<table>
<thead>
<tr>
<th>Section of Application</th>
<th>Page Limits * (if different from FOA, FOA supersedes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Summary/Abstract</td>
<td>30 lines of text</td>
</tr>
<tr>
<td>Project Narrative</td>
<td>Three sentences</td>
</tr>
<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>
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<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>
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<tr>
<td>Institutional Commitment to Candidate's Research Career Development</td>
<td>1</td>
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<tr>
<td>Biographical Sketch</td>
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</tbody>
</table>
### PHS 398 Career Development Award Supplemental Form

**View Burden Statement**

**OMB Number: 0925-0001**  
**Expiration Date: 2/28/2023**

#### Introduction
1. Introduction to Application  
(for Resubmission and Revision applications)

#### 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)  
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  
12. Description of Candidate’s Contribution to Program Goals

**12 pages total**

---


1 + 12 Pages Combined

- **Candidate Information**
  - Section 2

- **Research Plan**
  - 3. Specific Aims (1 page)
  - 4. Research Strategy
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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<tr>
<td>Introduction</td>
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<td>1. Introduction to Application</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
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<td>2. Candidate Information and Goals for</td>
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<td>Career Development</td>
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<td>Candidate Section</td>
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<tr>
<td>2. Candidate Information and Goals for Career Development</td>
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<td>Research Plan Section</td>
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<td>3. Specific Aims</td>
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<td>4. *Research Strategy</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
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<tr>
<td>5. Progress Report Publication List</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
</tr>
<tr>
<td>(for Renewal applications)</td>
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<tr>
<td>6. Training in the Responsible Conduct</td>
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<tr>
<td>of Research</td>
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<tr>
<td>Other Candidate Information Section</td>
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</tr>
<tr>
<td>7. Candidate's Plan to Provide Mentoring</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
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<tr>
<td>Mentor, Co-Mentor, Consultant, Collaborators Section</td>
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<tr>
<td>8. Plans and Statements of Mentor and Co-</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
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<td>Mentor(s)</td>
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</tr>
<tr>
<td>9. Letters of Support from Collaborators,</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
</tr>
<tr>
<td>Contributors, and Consultants</td>
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<tr>
<td>Environment and Institutional Commitment to</td>
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</tr>
<tr>
<td>Candidate Section</td>
<td></td>
</tr>
<tr>
<td>10. Description of Institutional Environment</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
</tr>
<tr>
<td>11. Institutional Commitment to Candidate's</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
</tr>
<tr>
<td>Research Career Development</td>
<td></td>
</tr>
<tr>
<td>12. Description of Candidate's Contribution</td>
<td>Add Attachment, Delete Attachment, View Attachment</td>
</tr>
<tr>
<td>to Program Goals</td>
<td></td>
</tr>
</tbody>
</table>
2. Candidate Information

- Candidate’s Background
- Career Goals and Objectives
- Candidate’s Plan for Career Development / Training Activities During Award Period
2. Candidate’s Background

- Scientific history/Unique expertise
  - Previous work
    - Consistent themes, or
    - Why research interests have changed direction
  - Relationship to career path described in application
- Other didactic/training experiences
  - e.g., Masters degree
- Other research experiences
  - e.g., MD/PhD, Medical school, Fellowship
- Reasons for basic, clinical, translational, epidemiology, behavioral, multidisciplinary research, relevant publications

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Career Goals and Objectives

- Justify award
  - Fits into past and future research career

- 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)

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
## 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>
</tr>
<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>

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

**Years 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 required to fill gaps in knowledge in order to reach long term goals
  - Rational for each of the training activities
New Section on each Module

- Reason for module

- Specific description of each “Mode of Learning”
  - Role of Mentor(s) and Advisor(s)
  - Specific courses, workshops, and other didactics
  - Details on research meetings

- Module: Career skills
  - Grantsmanship
  - Becoming a mentor
  - Research Group/Laboratory management

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
<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) 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 Results</td>
<td></td>
<td>Grant writing course</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Professional workshops/seminars</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Collaborations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abstracts and manuscripts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R01/Small grant application submission</td>
</tr>
<tr>
<td>Research management</td>
<td></td>
<td>Supervising technical support personnel, organizing lab meetings, journal clubs</td>
</tr>
<tr>
<td>Mentorship</td>
<td></td>
<td>e.g. training new lab members, undergraduate, summer students</td>
</tr>
</tbody>
</table>

Summary of coursework

- List previous relevant coursework
- Proposed coursework
  - Course number and description
  - Include career development courses (e.g., grant writing) and responsible conduct of research
- Additional didactic activities
  - e.g. Those offered by professional societies, workshops, symposiums

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
Clinical and/or Teaching activities

- Relationship to proposed research and career development activities
- Be specific, mention hrs. per week (cal months)
- Percentage of time for each activity

Restate % of time dedicated to research

Timetable

Table: Career Development/ Training Activities During Award Period
<table>
<thead>
<tr>
<th>Career Development Activities</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
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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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<td>X</td>
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## Experimental Training

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## Formal Coursework

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# PHS 398 Career Development Award Supplemental Form

**Introduction**

1. Introduction to Application (for Resubmission and Revision applications)

**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)
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
12. Description of Candidate's Contribution to Program Goals
1 + 12 Pages Combined

- Candidate Information
  - Section 2

- Research Plan
  - 3. Specific Aims (1 page)
  - 4. Research Strategy
# 4. Research Strategy – changes

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<th>Section</th>
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<th>Current language</th>
<th>Revised language</th>
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<td>Research Plan - Research Strategy</td>
<td>Significance</td>
<td>Describe the scientific premise for the proposed project, including consideration of the strengths and weaknesses of published research or preliminary data crucial to the support of your application.</td>
<td>Describe the strengths and weaknesses in the rigor of the prior research (both published and unpublished) that serves as the key support for the proposed project.</td>
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<td>Research Plan - Research Strategy</td>
<td>Approach</td>
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<td>Describe plans to address weaknesses in the rigor of the prior research that serves as the key support for the proposed project.</td>
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</table>
6. Training in the Responsible Conduct of Research

- 1) Format, 2) Subject Matter, 3) Faculty Participation, 4) Duration, and 5) Frequency of Instruction
- Role of Mentor
- Prior instruction in RCR
- Once every four years requirement
- Don’t do the minimum
- Additional IRB or IACUC-related programs?
- [http://grants.nih.gov/training/responsibleconduct.htm](http://grants.nih.gov/training/responsibleconduct.htm)
- No more than 1 page
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12. Description of Candidate's Contribution to Program Goals
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
  - Career development activities
    - Seminars, scientific meetings, presentations, becoming a mentor, RCR
- Expectations for publications

Jaime S. Rubin, Ph.D.; http://grantscourse.columbia.edu
- What aspect of the research will the candidate be allowed to take to start their own independent research career

- Mentor’s plans for providing mentoring and supervision
  - 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

- Previous mentees - Type (e.g., graduate student, post-doctoral fellow, junior faculty), Number, Career Outcomes

Mentor and Co-Mentors

- How mentorship responsibilities will be shared
- How different areas of expertise enhance mentorship
- Past collaborative research/co-mentorship activities

Addition instructions if clinical trials proposed

No more than 6 pages
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<th>Question</th>
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<td>12. Description of Candidate's Contribution to Program Goals</td>
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</tbody>
</table>
9. Letters of Support from Collaborators, Contributors, and Consultants

- Advisory Committee (described in Section 2)
  - 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 in Section 2
  - Each should provide a letter and NIH Biosketch
Collaborators and Consultants (described in Section 2)
- Name, title, and short paragraph on each individual in Section 2
- Each should provide a letter and NIH Biosketch

Director of Core Facility

Source of “special” research resource (e.g., data set, patient samples, unique animal model/cell line/reagent)

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

## Introduction

1. Introduction to Application (for Resubmission and Revision applications)

## 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)

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

12. Description of Candidate's Contribution to Program Goals

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Environment and Institutional Commitment to the Candidate

- 10. Description of Institutional Environment
- 11. Institutional Commitment to the Candidate’s Research Career Development
- 12. Description of Candidate's Contribution to Program Goals
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 schools, centers, shared resources, core facilities, CTSA, etc.
  - Degree programs, courses, seminars, journal clubs
  - Institution’s/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)
  - Statement that appointment and salary are not contingent on award
  - Statement on availability of research resources, personnel, office and research space, equipment, etc. required for project
  - Statement that mentors and collaborators will be able to provide time and support for mentoring/research responsibilities
  - Signed and dated on letterhead stationery

- No more than 1 page
12. Description of Candidate's Contribution to Program Goals

- Required for applicants to “diversity-related” career development funding programs
  - e.g., Diversity-related K01’s and K22’s
- Institutional letter
  - Addresses how the applicant’s participation in this funding program “to promote diversity in health-related research”
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), biohazards]

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

10. Facilities & Other Resources

Career Development Resources

- More complete descriptions of programs referenced in:
  - 2. Career Development/Training Activities During Award Period
  - 8. Plans and Statements of Mentor and Co-Mentor(s)
  - 10. Description of Institutional Environment
  - 11. Institutional Commitment to the Candidate’s Research Career Development

- Cannot be used to avoid page limitations of other application sections
10. Facilities & Other Resources

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

- Career development programs
  - Institutional (e.g. Office of Postdoctoral Affairs)
  - Department/Institute
  - Professional societies

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

- Workshops, webinars, other training programs

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

- Include a list of Referees in the Cover Letter
- 3-5 Letters of References are required
- Individuals who know you well from a research perspective (qualifications, training, and interests)
- Individuals not directly involved in the research project
- 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/institution
Letters of Reference

- "Potential to become an independent research scientist;
- Evidence of originality;
- Adequacy of scientific background;
- Quality of research endeavors or publications to date, if any;
- Commitment to health-oriented research; and
- Need for further research experience and training
- Any additional related comments that the referee may wish to provide”
21. Cover Letter Attachment

- Must include
- Title of application
- Title of funding opportunity announcement
- List of Referees (name and affiliation)
- Administrative document – not seen by reviewers
PHS Assignment Request Form

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

Entry is limited to 1000 characters.

Provide sufficient information (e.g., name organization affiliation) to correctly identify each individual. Provide specific reason why an individual should not review your application. Information will be considered, but listing an individual does not guarantee they will not be on review panel.

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

Note: Do not provide names of individuals

Expertise:
Each entry is limited to 40 characters

Limit your answers to expertise. DO NOT enter the names of individuals you’d like to review your application.
NIH Career Development (K) Application

- Model for other career development/scholar grant programs supported by voluntary health organizations, private foundations, and professional societies
NIH “K” Sites of Interest

- **K Kiosk** – includes Program Announcements for K01, K07, K08, K22, K23, K25, and K99 grant mechanisms
  
  [Link](https://researchtraining.nih.gov/programs/career-development)

- **Career Development (K) Applications Instructions**
  
  [Link](https://grants.nih.gov/grants/how-to-apply-application-guide.html)
  [Link](https://grants.nih.gov/grants/how-to-apply-application-guide/forms-f/general/g.100-how-to-use-the-application-instructions.htm)

**Reference Letters**


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

- Application Page Limits

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

- Instruction in the Responsible Conduct of Research
NIH “K” Sites of Interest

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

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