Tips for Successful Fellowship and Career Development Applications

National Student Research Forum
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Course: “Funding and Grantsmanship for Research and Career Development Activities”
http://grantscourse.columbia.edu/
Timeline of Funding for Junior Investigators

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

**Medical School**

**Internship/Residency**

**Fellowship – Research Years**

**Instructor/Assistant Professor**

**Year-long Enhancement Programs**
# Timeline of Funding for Junior Investigators

<table>
<thead>
<tr>
<th>Graduate School</th>
<th>Post-doctoral Years</th>
<th>Instructor/Assistant Professor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual Fellowship Training Grant</strong></td>
<td><strong>Individual Post-doc Fellowship or Institutional T32 Post-doc Training Grant slot</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Mentor’s Research Grant</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Graduate School**
- **Post-doctoral Years**
- **Instructor/Assistant Professor**
Pre-doc and Post-doc: Institutional Training Grant (NIH-T32)

- Pre-docs and Post-docs selected by institution
- Research training in specific area
- Defined number of slots
- Stipend, health fees, tuition, travel
Individual Fellowship

- Supports specific individual
- Stipend, health fees, tuition, travel
- NIH: Pre-doc: F31, Post-doc: F32
- Review criteria:
  - Individual fellow
  - Mentor
  - Research project
  - Research environment
Post-doc Fellowships (F31s)
Applications, awards, and success rates

[Graph showing applications, awards, and success rates over fiscal years 1998 to 2013. The graph displays the number of applications, awards, and the success rate percentage each year.]
Post-doc Fellowships (F32s)
Applications, awards, and success rates
Post-doc: Individual Fellowships

Non-government, non-profit agencies

- Voluntary Health Organizations
- Professional Societies
- Private Foundations
American Heart Association (Founders Affiliate)

Postdoctoral Fellowship Program

- Cardiovascular function and disease and stroke
- Clinical, basic science, bioengineering, biotechnology, epidemiological, behavioral, community, and public health

Funding

- Stipend/Salary: $39,200-$54,100; Fringe Benefits: $1,000
- Award Duration: 2 years

Citizenship

- U.S. citizen/ Permanent resident/ Pending permanent resident/ Visas (e.g. F1, H1-B, J-1, O-1)
American Assoc for the Study of Liver Diseases - Clinical and Translational Research Fellowship

• Support for an investigator from outside North America to perform clinical research in US in a liver-related area

• One one-year award of $75,000 will be funded

• MD or equivalent and/or a PhD

• MD within four years of completing residency or fellowship training, or, if a PhD, within four years of the receipt of the degree

• Student/trainee visa
The Helen Hay Whitney Foundation

Postdoctoral Research Fellowships

• Supports early postdoctoral research training in all basic biomedical sciences

• Candidates who hold, or are in the final stages of obtaining PhD, MD, or equivalent - candidates who have no more than one year of postdoctoral research experience

• 3-year fellowships (<5% success rate)

• Stipend: $49,000-$51,000; Research Allowance: $1,500

• US and foreign citizens
Timeline of Funding for Junior Investigators

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

Medical School

Year-long Enhancement Programs

Internship/Residency

Fellowship – Research Years

Instructor/Assistant Professor

Career Transition Awards
Career Transition Awards

BWF: Career Awards for Medical Scientists

- Supports physician-scientists to bridge advanced postdoctoral/fellowship training and the early years of faculty appointment
- Must hold an M.D., D.D.S., or D.V.M.
- 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 of the Award: Years 3-5
    Annual Total: $170,000
Career Transition Awards

American Heart Association (National)

Career Fellow-to-Faculty Transition Award

- For physician-scientists
- Provides funding for the period of career development which spans the completion of research training through the early years of the first faculty/staff position
- Training stage: Maximum of $65,000 per year
- Faculty stage: Maximum of $132,000 per year
- Award Duration: 5 years
Timeline of Funding for Junior Investigators

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

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

Career Transition Awards
Pathway to Independence Award

- Career Transition Award (K99/R00)
- No citizenship requirement
- Applicants must:
  - Have earned a clinical or research doctorate;
  - Have no more than 4 years of research experience since completing the requirements of the doctoral degree
  - Have not been the principal investigator of an NIH research grant (e.g., R01, R03, R21), career development award (e.g., K01, K07, K08, K23, K25), other peer-reviewed NIH or non-NIH research grant over $100,000 direct costs per year, or have been a project leader on a sub-project of a program project (P01) or a center (P50) grant.
1-2 years as a mentored K award for “post-docs”

- Funding level is Institute-specific
  - NHLBI, NIDDK, NIA, NICHD: $75K for salary plus fringe benefits, $25K for research support (+ 8% I.C.)
  - 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
Career Transition Awards

- **JDRF: Advanced Postdoctoral Fellowships**
  - Provides an opportunity to receive full-time research training and to assist awardees in transitioning from a fellowship to an independent (faculty-level) position
  - First degree (PhD, MD, DMD, DVM, or equivalent) received no more than 5 years before the fellowship
  - $90,000 per year for up to 3 years
  - **Transition Award**: Optional transition year in which awardees may request funding support for their first year as a faculty member (up to $110,000 for one year)
Timeline of Funding for Junior Investigators

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

- Year-long Enhancement Programs
- Career Transition Awards
- Individual Mentored K Career Development Award
Research Career Programs (K)

- Provides predominantly salary support
  - Specified salary levels (e.g. NIDDK: $90K, NCI: $100K)
- Minimum effort: e.g. 75%, (some exceptions to 50%)
- Research and Career Development activities
- Up to 5 years
- US citizen/permanent resident
- May reduce effort to 50% in the last 2 years if the PI of an NIH research grant
Mentored Clinical Scientist Development Award (K08)

- Support to develop outstanding independent clinician research scientists
- Basic and translational science
Mentored Patient-Oriented Research Career Development Award (K23)

- **Patient-oriented research**: Research conducted with human subjects (or on material of human origin) for which an investigator directly interacts with human subjects

- **Research areas**: (1) Mechanisms of human disease, (2) Therapeutic interventions, (3) Clinical trials, and (4) Development of new technologies
Mentored Research Scientist Development Award (K01)

Not all NIH Institutes participate in program.

Participating Institutes may use for different purposes.

- Train in a new field
- Specific research areas
- Hiatus in research career
- Increase research workforce diversity
Mentored Research Scientist Development Awards (K01)

- **NIMH**
  - 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

- **NCI, NHLBI, NINDS:**
  - Underrepresented faculty

- **NIAID:**
  - (a) Epidemiology
  - (b) Modeling Techniques
  - (c) Outcomes Research
Mentored Research Scientist Development Awards (K01)

- **NIDDK:**
  - Advanced postdoctoral and/or newly independent research scientists

- **NHLBI:**
  - (a) Epidemiology
  - (b) Biostatistics
  - (c) Comparative effectiveness

- **NHGRI**
  - (a) Genomics, proteomics, population genomics
  - (b) Ethical, legal and social issues (ELSI)

- **NIA:** Aging and Health Disparities Research
Mentored Research Scientist Development Awards (K01)

- **NINR**
  - (a) Symptom management
  - (b) Pulmonary, critical care, trauma
  - (c) Reproductive health
  - (d) End-of-life and palliative care

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

- **FIC:**
  - International Research Scientist Development Award (IRSDA)
Mentored Quantitative Research Career Development Award (K25)

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

- NCI program
- Support individuals with health professional or science doctoral degrees who are not fully established investigators
Research Career Development Awards

![Graph showing the number of Research Career Development Awards from 1997 to 2013. The graph includes different award types, with K01, K08, K23, K25, and K99 categories. The number of awards varies each fiscal year, with some years showing a decrease compared to others.]
<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>2013</td>
<td>K23</td>
<td>NCI</td>
<td>34</td>
<td>7</td>
<td>20.6%</td>
<td>$1,193,695</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NHLBI</td>
<td>107</td>
<td>32</td>
<td>29.9%</td>
<td>$4,639,354</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIDCR</td>
<td>5</td>
<td>2</td>
<td>40.0%</td>
<td>$269,379</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIDDK</td>
<td>68</td>
<td>28</td>
<td>41.2%</td>
<td>$4,753,537</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NINDS</td>
<td>36</td>
<td>11</td>
<td>30.6%</td>
<td>$2,005,444</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIAID</td>
<td>30</td>
<td>11</td>
<td>36.7%</td>
<td>$1,912,625</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIGMS</td>
<td>11</td>
<td>6</td>
<td>54.5%</td>
<td>$1,050,771</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NICHD</td>
<td>56</td>
<td>14</td>
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<td>$1,786,481</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NEI</td>
<td>6</td>
<td>6</td>
<td>100.0%</td>
<td>$1,174,369</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIEHS</td>
<td>5</td>
<td>3</td>
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<td>$456,831</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIA</td>
<td>52</td>
<td>10</td>
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<td>$1,642,731</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIAMS</td>
<td>19</td>
<td>10</td>
<td>52.6%</td>
<td>$1,261,269</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIDCD</td>
<td>5</td>
<td>1</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NIMH</td>
<td>72</td>
<td>21</td>
<td>29.2%</td>
<td>$3,622,831</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIDA</td>
<td>18</td>
<td>8</td>
<td>44.4%</td>
<td>$1,399,676</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NIAAA</td>
<td>8</td>
<td>3</td>
<td>37.5%</td>
<td>$482,577</td>
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<tr>
<td>2013</td>
<td>K23</td>
<td>NINR</td>
<td>13</td>
<td>4</td>
<td>30.8%</td>
<td>$512,858</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>
<td>$0</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>NCCCAM</td>
<td>8</td>
<td>0</td>
<td>0.0%</td>
<td>$0</td>
</tr>
<tr>
<td>2013</td>
<td>K23</td>
<td>*OD Other</td>
<td>1</td>
<td>1</td>
<td>100.0%</td>
<td>$154,601</td>
</tr>
<tr>
<td><strong>2013</strong></td>
<td><strong>K23</strong></td>
<td><strong>Activity Total</strong></td>
<td><strong>555</strong></td>
<td><strong>178</strong></td>
<td><strong>32.1%</strong></td>
<td><strong>$28,555,388</strong></td>
</tr>
</tbody>
</table>
Agency for Healthcare Research and Quality (AHRQ)

- **K08**: Mentored Clinical Scientist Research Career Development Award - Health services research
  - Safety and Quality
  - Effectiveness
  - Efficiency

- **K08**: Patient-Centered Outcomes Research (PCOR) Mentored Clinical Investigator Award

- **K01**: Patient-Centered Outcomes Research (PCOR) Mentored Research Scientist Development Award
Centers for Disease Control and Prevention (CDC)

- **K01**: Mentored Public Health Research Scientist Development Award
  - Basic, behavioral, and applied sciences
  - Health promotion
  - Disease prevention
  - Injury and disability prevention
  - Health protection from infectious, environmental, and terrorist health threats
Research Career Development/Scholar Programs

- AGA Research Foundation
  - Research Scholar Awards
- American Heart Association
  - Scientist Development Grant
- American Academy of Neurology
  - Clinician-Scientist Development Awards
- Damon Runyon Cancer Research Foundation
  - Clinical Investigator Award
- Doris Duke Charitable Foundation
  - Clinical Scientist Development Grant
NIH Career Development (K) Application

- Model for other career development/scholar grant programs supported by voluntary health organizations, private foundations, and professional societies
- Model for pre-doc and post-doc fellowship applications
NIH Career Development (K) Application

- **NIH K Kiosk**
  - [http://grants.nih.gov/training/careerdevelopmentawards.htm](http://grants.nih.gov/training/careerdevelopmentawards.htm)

- **Career Award Wizard - Select the right career award**
  - [http://grants.nih.gov/training/kwizard/index.htm](http://grants.nih.gov/training/kwizard/index.htm)

- **Research Training and Career Development Programs at Specific Institutes**
  - [http://grants.nih.gov/training/trainingfunds.htm](http://grants.nih.gov/training/trainingfunds.htm)

- **K application guide and instructions**
<table>
<thead>
<tr>
<th>Candidate Information</th>
<th>12 pages total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Candidate's Background</td>
<td>12 pages total</td>
</tr>
<tr>
<td>3. Career Goals and Objectives</td>
<td>12 pages total</td>
</tr>
<tr>
<td>4. Candidate's Plan for Career Development/Training Activities During Award Period</td>
<td>12 pages total</td>
</tr>
<tr>
<td>5. Training in the Responsible Conduct of Research</td>
<td>1 page</td>
</tr>
<tr>
<td>6. Candidate's Plan to Provide Mentoring (as applicable)</td>
<td>1 page</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statements and Letters of Support</th>
<th>6 pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Plans and Statements of Mentor and Co-Mentor(s)</td>
<td>6 pages</td>
</tr>
<tr>
<td>8. Letters of Support from Collaborators, Contributors, and Consultants</td>
<td>6 pages</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environment and Institutional Commitment to Candidate</th>
<th>1 page</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Description of Institutional Environment</td>
<td>1 page</td>
</tr>
<tr>
<td>10. Institutional Commitment to Candidate's Research Career Development</td>
<td>1 page</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Plan</th>
<th>12 pages total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Specific Aim</td>
<td>1 page</td>
</tr>
<tr>
<td>12. Research Strategy</td>
<td>12 pages total</td>
</tr>
<tr>
<td>13. Progress Report Publication List (for RENEWAL applications only)</td>
<td>1 page</td>
</tr>
</tbody>
</table>
1 + 12 Pages Combined

- The Candidate
  - Sections 2., 3., and 4.

- Research Plan
  - 11. Specific Aims (1 page)
  - 12. Research Strategy
The Candidate

2. Candidate’s Background

3. Career Goals and Objectives:
Scientific Biography

4. Career Development/Training Activities
During Award Period
2. Candidate’s Background

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

- Unique expertise/Scientific history
  - Previous work
    - Consistent themes, or
    - Why research interests have changed direction
e.g. Joint appointments, Multidisciplinary
- Skills that are lacking
  - Identification of specific modules to address areas for growth, provides justification of award
  - Role of specific Mentor(s) and Advisory Committee member(s)
Justify award

- Fits into past and future research career

Short-term Career Goals

- Timeline for funded period

Year 1: Preliminary data

Year 2-4: Submit publications (possible journals), Presentations at national meetings (examples), Formulation of R01 application

Year 5: By the end of the funded period, applicant will be an independent investigator with 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
4. Career Development/Training Activities During Award Period

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

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

Module: Career skills

- Grantsmanship
- Becoming a mentor
- Laboratory management

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

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

<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>
Summary of coursework

- List previous relevant coursework

- Proposed coursework
  - Course number and description
  - Include courses on grant writing and responsible conduct of research

- Additional didactic activities
  - e.g. those offered by professional societies, workshops, symposiums
- **Clinical activities**
  - Be specific, mention hrs. per week, restate % of time dedicated to research

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

- **Percentage of time for each activity**

- **Timetable**
<table>
<thead>
<tr>
<th>Career Development Activities</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mentorship</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
<td>X</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>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Advisory Group – frequency (e.g. quarterly) of meetings</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Career Development Activities</td>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
<td>Year 4</td>
<td>Year 5</td>
</tr>
<tr>
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<td>-------</td>
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<tr>
<td><strong>Experimental Training</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mentor (name) – Specific area of research and/or methodology</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Co-Mentor (name) – Specific area of research and/or methodology</td>
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<td>X</td>
<td>X</td>
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<td></td>
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<tr>
<td>Co-Investigator 1 (name) – Specific area of research and/or methodology</td>
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<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Co-Investigator 2 (name) – Specific area of research and/or methodology</td>
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<td>Year 2</td>
<td>Year 3</td>
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<td>Workshops &amp; Additional Training Programs</td>
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<td>Cold Spring Harbor Course on......</td>
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<td>Woods Hole Workshop on.....</td>
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<td>American Association for... Junior Investigators Training on.....</td>
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<td>CTSA “K to R” Program</td>
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<td>Year 2</td>
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<td><strong>Mentoring Skills (responsibility shared with K mentors)</strong></td>
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<td>Students (summer, undergraduate, medical)</td>
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<tr>
<td><strong>Communication Skills (Written)</strong></td>
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<tr>
<td>Preparation of manuscripts for peer reviewed journals</td>
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<td><strong>Grant Writing</strong></td>
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<td>CTSA pilot award for junior investigator (to supplement K award)</td>
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<td>Center for...... award for new investigators</td>
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<td>R01 preparation and submission (on research funded by K award)</td>
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</table>
5. Training in the Responsible Conduct of Research (1)

- Required training

- Subject Matter:
  - Conflict of interest; Human subjects; Vertebrate animal; Safe laboratory practices; Mentor/Mentee responsibilities and relationships; Collaborative research, Peer review, Data acquisition, management, sharing and ownership; Research misconduct, Authorship and publication, Societal impact of scientific research
5. Training in the Responsible Conduct of Research (2)

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

- Additional IRB-related programs?

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

No more than 1 page
7. Plans and Statements of Mentor and Co-Mentor(s)

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

Mentor’s Plans for Providing Guidance and Counseling

- How this will promote candidate’s development

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

Candidate’s Additional Responsibilities

- Courses, seminars, lab meetings
- Teaching, clinical, administrative
Source of Support for Candidate’s Research Project

- Grants
- Core/shared facilities
- Technical support

Previous Experience as a Mentor

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

No more than 6 pages
Advisory Committee

Purpose

- Reviews research progress, publications, R01 submission, career development activities, didactic program
- Provides scientific guidance
- Documents meetings with an annual report

Name, title, and short paragraph on each member

Each should provide a letter and Biosketch

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

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

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

- 9. Description of Institutional Environment
- 10. Institutional Commitment to the Candidate’s Research Career Development
Environment and Institutional Commitment to the Candidate

9. Description of Institutional Environment

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

No more than 1 page
Environment and Institutional Commitment to the Candidate

10. Institutional Commitment to the Candidate’s Research Career Development

- Letter from Dept Chair/Division Chief
  - 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 space, etc. required for project
  - Statement that sponsors will be able to provide time and support for mentoring responsibilities
  - Signed and dated on letterhead stationery

- No more than 1 page
Letters of Reference: 3-5

- From individuals not directly involved in the application or proposed research project, not mentor
- Familiar with candidate’s qualifications, training, and interests
- Should address candidate's competence, professional training and qualifications, and potential to develop into an independent investigator
- Where possible, not from the candidate's current department or organization
- Submitted electronically through NIH eCommons
10. Facilities & Other Resources

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

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

**Career Development Resources**

- Faculty development programs
  - Institutional
  - Departmental
  - Professional societies

- Formal degree programs and other didactics
  - e.g. School of Public Health, Engineering
  - Course on Funding & Grantsmanship

- Workshops, webinars, other training programs
NIH's Scoring/Evaluation System

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

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<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
<th>Strengths/Weaknesses</th>
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<tr>
<td>High</td>
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<td>Exceptional</td>
<td>Exceptionally strong with essentially no weaknesses</td>
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<td>2</td>
<td>Outstanding</td>
<td>Extremely strong with negligible weaknesses</td>
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<td>3</td>
<td>Excellent</td>
<td>Very strong with only some minor weaknesses</td>
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<td>Medium</td>
<td>4</td>
<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>
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<td>Fair</td>
<td>Some strengths but with at least one major weakness</td>
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<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>
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</table>

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

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

**Major Weakness:** A weakness that severely limits impact
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
Write a paragraph summarizing the factors that informed your Overall Impact score.
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>
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<td>Weaknesses</td>
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5. Environment and Institutional Commitment to the Candidate

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<td>Weaknesses</td>
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NIH’s Review of K awards

- Guidelines for Reviewers Review Critique

- Fill-able Templates

- Review Criteria and Considerations
  - [http://grants.nih.gov/grants/peer/critiques/k.htm](http://grants.nih.gov/grants/peer/critiques/k.htm)
When Preparing an Application:

- Read instructions
- Never assume that reviewers “will know what you mean”
- Refer to literature thoroughly and thoughtfully
- Explicitly state the rationale of the proposed investigation
- Include well-designed tables and figures
- Present an organized, lucid write-up
Anticipate Questions and Answer them before they are asked
Bell Curve of Reviewer’s Grant Applications

Definitely do not fund

Fine

Great

Definitely fund
Poor Statistics
Research Resources not Adequately Described
Career Development Plan
not Comprehensive
Figure Caption Font too Small
All Components of the Application are as Strong as Possible
Elements of a Good Proposal

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

- Competent
- Enthusiastic
- Thorough
- Professional
Research Arrangements

- Collaborations
- Subcontracts
- Multiple Principle Investigators
  - Now permitted by NIH
- Co-investigators
- Multidisciplinary/Interdisciplinary
When Preparing an Application:

- Read instructions
- **Never assume that reviewers “will know what you mean”**
- Refer to literature thoroughly and thoughtfully
- Explicitly state the rationale of the proposed investigation
- Include well-designed tables and figures
- Present an organized, lucid write-up
Anticipate Questions and Answer them before they are asked
Common Problems with Grant Applications from New Investigators

- Overly ambitious
- Not independent of previous mentor’s research
- Fishing expedition
- Not hypothesis driven
- Descriptive, not mechanistic project
- Unfocussed
- No or insufficient preliminary data
- Unrealistic budget
- Methodologies beyond the expertise of investigator or research team
NIH Grant Forms

- [http://grants.nih.gov/grants/forms.htm](http://grants.nih.gov/grants/forms.htm)
- **Electronic Applications**
- **Paper Applications**
Resources for Grant Writing

- Writing a Grant Proposal
  (Application Forms and Writing Tips)

http://grantscourse.columbia.edu/writing.htm
Good Luck!