Writing a Successful Career Development Grant (K Award)

Moderator: Jonathan Katz, MD

Panel:

K23 Erum Hartung, MD, MTR
Susan Furth, MD, PhD

K08 Jeffrey Thompson, MD, MTR
Steven Albelda, MD

K99 Kiran Musunuru, MD, PhD, MPH
NIH K Awards
(K01, K08, K23, K99/R00, and others – also R03; vary by institute)
http://grants.nih.gov/training/careerdevelopmentawards.htm

• **K01 Mentored Research Scientist Development Award**
  – Career development in a new area of research; 3-5 years; salary determined by sponsoring institution

• **K08 Mentored Clinical Scientist Development Award**
  – Career development of the clinical research scientist; 3-5 years; 75% effort

• **K23 Mentored Patient Oriented Research Career Development Award**
  – Career development of the clinical research scientist in patient oriented research; 3-5 years; 75% effort

• **K99/R00 Pathway to Independence (PI) Award**
  – Support for individuals with a terminal clinical or research doctorate degree to foster the transition of postdoctoral scientists from mentored training environments to research independence (R01 support) earlier in their career; up to 5 years
    • Mentored Phase (K99); up to 2 years
    • Independent Investigator Phase (R00); up to 3 years
  – K99-R00 Transition
    • Evaluation by NIH extramural program staff
      – Success in K99 phase
      – Commitment of candidate’s institution to his/her career development
    • Extramural institutional appointment – full-time tenure-track position at the assistant professor level (or equivalent) not contingent on transfer of the K99/R00 award
Start with a timeline

Make the work of the reviewer easy

- Use models, figures, and white space throughout the grant
  - Don’t make your figures too small (this applies also to text in figures)

- Some repetition is necessary (reviewers will rarely read an entire grant in one sitting) but don’t copy and paste exact text

- Don’t try to “trick” the reviewer – don’t hide the holes
  - Confront issues head-on (e.g. conflicts in the literature may be a strength – i.e. need to study this as there is no clear consensus)
  - Make sure to include potential pitfalls and alternative approaches in your research strategy
  - If you can identify potential flaws or limitations in your proposal (issues with your research, gaps in your training, etc.), chances are a reviewer will too
Candidate’s background

Use the candidate’s background to tie things together:

• How did your interest in the themes of your grant developed (i.e. medical school to residency to fellowship, etc.)?

• How do your various achievements support your ability to become an independent investigator?

• Address any potential concerns in your application (e.g. a few years where you focused on something else, were exclusively clinical, etc.).
Career development plan

Propose a career development/training plan that is distinct from what you are doing now:

- Address gaps in your knowledge
  - Additional coursework, workshops, etc.
  - New techniques from mentors, collaborators
  - Including a table with a time-course is very helpful

- Don’t simply propose to continue going to lab and other group meetings - if you don’t convince reviewers that you need additional training and mentorship, reviewers may question why you are applying for a career development grant and not an independent award!

A training matrix of the proposed career development activities is below.

<table>
<thead>
<tr>
<th>Research (85% effort)</th>
<th>T32/Current Achievements</th>
<th>K99 Goals—Year 1</th>
<th>K99 Goals—Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C. elegans techniques and genetics Lineage analysis w/ confocal microscopy Recombinatoria Transgenesis by germline injection</td>
<td>Specific Aim 1: CRISPR/Cas gene targeting ChIP-seq HTS data analysis</td>
<td>Specific Aim 2: Computational enhancer identification Enhancer assays</td>
</tr>
<tr>
<td>Coursework</td>
<td>CSHL Genomics course Penn Programming Bootcamp</td>
<td>Penn Bioinformatics course Attend BPP seminars</td>
<td>Attend BPP seminars</td>
</tr>
<tr>
<td>Teaching &amp; Mentorship (5% effort)</td>
<td>Founded Penn Education Journal Club PGF1 Undergraduate Outreach lecture Mentored undergraduates</td>
<td>Education Journal Club Mentor undergraduates Teach GCB534 grad lecture</td>
<td>Education Journal Club Mentor undergraduates Supervise technicians</td>
</tr>
<tr>
<td>Grant Writing (10% effort)</td>
<td>F32 Fellowship application R01 application participation Grant writing workshops</td>
<td>Assist with NIH/NSF applications NIH R21</td>
<td></td>
</tr>
<tr>
<td>Presentation Skills</td>
<td>International C. elegans Meeting talk Genetics Trainee seminars Developmental Biology Club Penn Worm Group Penn Postdoctoral Research Symposium</td>
<td>Society for Developmental Biology Philadelphia/NJ Worm Group Genetics Trainee seminars Developmental Biology Club Penn Worm Group</td>
<td>GSA Model Organism Meeting Genetics Trainee seminars Developmental Biology Club Penn Worm Group</td>
</tr>
<tr>
<td>Job Search</td>
<td>Prepared teaching philosophy statement</td>
<td>Applications Career Services workshops Interviews</td>
<td></td>
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</tbody>
</table>

Courtesy of Amanda Zacharias, PhD
Letters of Reference

• Minimum of 3, no more than 5 letters submitted directly through eRA Commons and due by the application receipt deadline date.

• Choose well-established scientists with a personal connection who can address your strengths and potential to become an independent investigator - letters should be strong, personal, and specific.

• Keep in mind those individuals who might be expected to write letters (e.g. thesis advisor, prior postdoctoral mentor) and think carefully before excluding them.

• Take the initiative to track the letters and send reminders (your letter writers are busy and your letter may not be their top priority; it is your responsibility to ensure that your letters are submitted on time).
Statements by the mentor(s)

• Mentor’s (and Co-Mentor’s) track record of successful mentoring of trainees

• Nature of the supervision and mentoring including metrics for monitoring the candidate’s research, publications, and progression towards independence

• Description of the advisory committee

• Plan for career progression of the candidate from the mentored stage to an independent research investigator - how your career path will be distinct from that of your mentor?

• **Clear statement** of what aspects of the proposed research the candidate will be able to take into an independent position
Institutional Commitment

• Institutional commitment should **NOT** be contingent upon receipt of the career development award.

• Letter must contain assurances that the candidate will be able to devote a minimum of 75% effort (i.e. 9 person-months) to research.

• Description of office and laboratory space, equipment, and other resources and facilities (including access to clinical and/or other research populations, cores, and other facilities) to carry out the proposed research.
A few other key points

• Write for an experienced scientist but not necessarily an expert in your field

• Refer to the NIH guidelines
  • For example, the NIH gives clear guidelines for points to include in RCR and vertebrate animals sections – use these

• Don’t propose more than you can do in the allotted time

• Stay focused throughout your application – training and research plan should fit together like a hand in a glove

• Review the NIH review criteria for your grant mechanism (think like a reviewer!)
  • Specific review criteria are typically listed within each program announcement
Scoring for K grants

**FELLOWSHIPS & CAREER AWARDS**

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

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

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

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

- e.g. Proposes training or career development of high value/benefit for the candidate who has high potential for developing into a productive, independent scientist. May have some or no weaknesses in the criteria.
- e.g. Proposes training or career development of high or moderate value/benefit for the candidate who has high or moderate potential for further development, but weaknesses in the criteria reduce the overall impact to medium.
- e.g. Proposes training or career development of moderate value/benefit for the candidate who shows moderate potential. May have some weaknesses in the criteria.
- e.g. Proposes training or career development of low value/benefit for the candidate who 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 low value/benefit for the candidate who shows low potential. May have some weaknesses in the criteria.

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

Whom do I contact with questions?

Prior to submission – Program Officer*

Example of question:

“Is my grant more appropriate for a K08 or K23 mechanism?”
“Is my grant more appropriate for a K08 or K23 mechanism?”
“I was thinking about writing for a K99. Do you think I am a strong
enough candidate?”

After submission but before review – Scientific Review Officer

Example of question:

“What is the deadline to submit supplementary information?”

After review – Program Officer*

Example of question:

“What is the likelihood of funding?”
“What should I do for my resubmission?”

*Get to know your Program Officer.
Panel discussion:
Other topics, questions?