The K Award:

A Quick Primer for the Eager & the Doomed

Steve White, MD
The University of Chicago
Why does NIH Give Grants?

- Money
- Protected Time
- Resources
- Understand how life works
- Find disease mechanisms
- Make things better

To improve health care for Americans
Grants from Start to Established

NIH Grants

- F awards (graduate / post-doc training)
- K awards (transition to independence)
- R awards (standard research support)
- Programs (large scale grants)

Foundation Grants

- Trainee / fellowship grants
- Young faculty awards
- Established investigator awards
- Programmatic grants
K Award Career Timeline

Health Professional Doctorate

<table>
<thead>
<tr>
<th>Med School</th>
<th>Residency</th>
<th>Specialty Training</th>
<th>Junior</th>
<th>Independent</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>F32</td>
<td>R01, R21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>T32</td>
<td>Program ...</td>
</tr>
<tr>
<td>K12</td>
<td>(another K...)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K08 (clinical scientist)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K23 (patient oriented)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K99 / R00</td>
<td></td>
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</table>

4 year limit from terminal degree (PhD) or research fellowship (MD)!
What is a K Award?

- Career development
- Transition to independence
- Mentored
- Up to 5 years of support
- Salary support + protected time
- Requires institutional commitment
Types of K Awards

Institutional K Awards (only some institutes)
- K12 – mentored basic or patient oriented research
- KL2 – clinical, patient oriented research

Individual Career Development – health degree only
- K08 – clinical scientist health research
- K23 – patient oriented research
- K01 – a “K08” for qualified minorities

Pathway to Independence – PhD or health degree
- K99 – basic or patient oriented research
Writing a K Award
A K Award Has Five Big Parts

- Candidate (you)
- Career Development Plan
- Mentor
- Training & Research Environment
- Research Plan

and lots of little parts that you also have to complete
The Candidate

- Principal investigator (you)
- Faculty appointment at the time of award
- Original publications a must
- Publish in best journals possible
- Reviews & book chapters don’t replace original publications
- Explain gaps in your record
Career Development Plan

• Candidate background
  Prior training & effort to this point
  Commitment to 75% protected time
  Potential to be an independent investigator
  Commitment to a health related research career

• Career goals & objectives
  Pivot point
  Systematic plan
  Justifies need for further career development
  Logical progression in training experiences

• Career development plan
  Describe mentoring & advisors
  Didactics and research together train the candidate
  Other professional responsibilities contribute to plan
  Transition to independence (your R01!)
  Timeline table

“The candidate and the mentor are jointly responsible for the career development plan.”
What Reviewers Want

- Promising start
- Sustainable track record
- Potential problems explained

“Past behavior is the best predictor of future performance.”
Your Mentor(s)

• Primary sponsor

• Recognized in proposed research area

• Track record of success in training

• Sufficient independent support to cover costs

• Committed to you & your career development
Advisory Committee

• Assist with developing program of study

• Monitor progress

• Advise mentor & applicant
Mentoring Team

- Lead Mentor
- Co-Mentors
- Career Advisor
- Research Mentor
- Research Advisor

You
Resources & Environment

- Facilities & key resources
- **Scientific** environment: why are you here?
- Institutional commitment

**Chair’s letter**
- Investing in your career
- ≥ 75% protected time
- Faculty appointment at time of award
- Not contingent on award

**Remaining effort**
- Synergistic with K activities
- Beware creeping responsibilities

Your fit in long term plans
Components of a Research Plan

- Introduction to revised application
- Specific aims
- Significance
- Innovation
- Approach

Research Strategy
12 pages *
Specific Aims Page

• State concise goals of proposed research

• Summarize expected outcomes

• Summarize impact the results will have on the field

• List specific objectives of the proposed research

  Test a stated hypothesis
  Create a novel design
  Solve a specific problem

  Challenge existing paradigm
  Address a critical barrier to progress
  Develop new technology
Structure of the Specific Aims Page

• The ‘funnel’ – from a disease to a critical gap in knowledge

• The ‘mousetrap’ – your key preliminary data that can address this gap

• The ‘pivot’ – the new training required to make you a cool scientist

• The goal and the hypothesis

• The aims (statement, nugget, hypothesis, approach)

• The ‘payoff’ –
  cool new science that (long-term) improves health care
  completes training of a cool scientist
## The Research Strategy

### Significance
- Importance of the problem
- Critical barrier to progress
- Scientific premise

### Innovation
- Challenge / shift paradigms
- Novel concepts / approaches

### Approach
- Strategy, methods, analyses
- Feasibility (preliminary data)
- Experimental design
- Data analysis/resource sharing
- Relevant biological variables

### Crucial literature that supports
How proposed work broadly improves the field

### Advantages over current field

### Benchmarks for success
Potential problems
Alternative strategies
Hazards & select agents
Putting It Together

• Follow the rules

• Know your audience

• Start early – time is not your friend

• Early critique – and often!

• Edit – crafting, proof-reading, copy-editing

The race for funding has no finish line...

...so, technically, it’s more like a death march
What Could Possibly Go Wrong...

- You didn’t follow directions
- You were descriptive & not mechanistic
- Your gap in knowledge isn’t all that important
- Your approach lacks significance / innovation
- You lacked focus
- Your preliminary data didn’t demonstrate feasibility
- Your project had a ‘fatal flaw’
How a K Award is Reviewed
Study Section

- **Reviewers**
  Discuss and score your grant

- **Scientific review officer (SRO)**
  Runs the study section
  Assigns applications to reviewers
  Helps the Chair run the meeting
  Prepares summary statements

- **Study section chair**
  Directs the scientific discussion
  Helps SRO with review issues
Who are the Reviewers?

- Selected by SRO
- Those with a conflict of interest excluded
- Reviewers not necessarily in your area of interest
What Reviewers Want

• Promising start
• Sustainable track record
• Potential problems explained

“Past performance is the best predictor of future performance.”
## Scoring Descriptions

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
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<tbody>
<tr>
<td>High Impact</td>
<td>1</td>
<td>Exceptional</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Outstanding</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Excellent</td>
</tr>
<tr>
<td>Moderate Impact</td>
<td>4</td>
<td>Very Good</td>
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<tr>
<td></td>
<td>5</td>
<td>Good</td>
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<tr>
<td></td>
<td>6</td>
<td>Satisfactory</td>
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<tr>
<td>Low Impact</td>
<td>7</td>
<td>Fair</td>
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<tr>
<td></td>
<td>8</td>
<td>Marginal</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Poor</td>
</tr>
</tbody>
</table>
### Review of K Award Application

Review Criteria and an Example of Scoring

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
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</thead>
<tbody>
<tr>
<td>Candidate</td>
<td>2</td>
</tr>
<tr>
<td>Development Plan</td>
<td>2</td>
</tr>
<tr>
<td>Mentor</td>
<td>1</td>
</tr>
<tr>
<td>Environment</td>
<td>1</td>
</tr>
<tr>
<td>Research Plan</td>
<td>4</td>
</tr>
</tbody>
</table>

**Overall Impact** 3
Study Section Discussion

• Applications ordered by preliminary scores

• Panel *streamlines* bottom third to half

• Discuss remaining applications in turn
  
  Reviewers state preliminary scores
  ~ 15 minutes for discussion
  Reviewers state final scores

• **All** members vote a *final* score
  
  Generally stay within range
  Must state why (openly) if go outside the range
What do the Reviewers Look At?

Presenters 1, 2 and 3 –

• The entire application
• Your published papers
• Key references

All the other reviewers –

• Specific aims page
• Biosketch
• Career development plan timeline
Calculating a Final Score

Each 1 - 9

Average Score
1.0 - 9.0

Final Score (10 - 90)

x 10
Get the Reviewers on Your Side

- **Narrative**: create a story about you
- New training = career development
- Research project is the training vehicle
- Hypothesis driven, high impact aims
- Preliminary data supports key points in approach
- Focused, focused, focused!
If You Are Not Funded

• **Not** the end of the world
• Get reviews
• Discuss with mentors
• Write an A1
The Reviews

• Have a thick skin

• Reviewers may disagree

• Reviewers are always ‘right’

• Identify & respond to all specific issues

• The ‘fundamental flaw’ issue
Review of the A1 Application

- Reviewers may be different
- Reviewers have the old review
- Asked to review afresh
- “Responsiveness” not a guarantee of success
Resources at Chicago

- Little Red Schoolhouse
- ITM K-writing workshop
- Section grant writing workshops
- BSD seminars / workshops
- R Studio
Questions