NEXT GENERATION RESEARCHERS INITIATIVE

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My background:

Ph.D. in Biochemistry
  Summer Physiology course at MBL, Woods Hole
Baylor College of Medicine Houston:
  Six months as a postdoc
  Instructor, Assistant Professor and Associate Professor
  Senior Scientist, Weis Center for Research, Geisinger Clinic,
  Professor and Chair, Department of Cell biology, OUHSC,
  Oklahoma City
To evaluate:

1) legislative, administrative, educational and cultural barriers that prospective researchers encounter as they transition to independent research careers.

2) the effects of Federal budgets and Federal agency policies and procedures on the transition to independent research careers.

3) the extent to which employers can facilitate smooth transitions for early career researchers into independent research careers.
Outline

1) Barriers to successful transition.

2) What we’re doing and need to do better

3) Ways in which the Federal government is, and can, facilitate the transitions for early career researchers into their independent research careers.
Historical Perspective: Transition to Faculty or Industrial positions

This was mostly unguided.

Few student or postdoc supervisors provided guidance or preparation for the “next step”.
In Academics

A faculty hire was supposed to develop their research program and fit into the teaching profile of the department.

The ideal faculty member had an active research program, trained graduate students and postdocs, and taught in the undergraduate (or Medical School) curriculum....
Historical Perspective: Transition to Faculty or Industrial positions

Research oriented institutions were growing, jobs were available and NIH was funding a significant percentage of researcher initiated grants.
Have things changed?
The number of earned doctorates has continued to rise

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>2500</td>
<td>400</td>
</tr>
<tr>
<td>2008</td>
<td>3500</td>
<td>3500</td>
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The Number of Tenured and Tenure-Track Faculty Positions Has Remained Constant

<table>
<thead>
<tr>
<th></th>
<th>Tenure Track Faculty</th>
<th>Tenured Faculty</th>
<th>Academic Postdocs</th>
<th>Other Academic</th>
</tr>
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<tbody>
<tr>
<td>1981</td>
<td>8,000</td>
<td>22,000</td>
<td>5,000</td>
<td>9,000</td>
</tr>
<tr>
<td>2010</td>
<td>8,000</td>
<td>22,000</td>
<td>8,000</td>
<td>21,000</td>
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</table>
Changes in Employment Patterns

1973: 55% of US doctorates in the biological sciences secured tenure-track positions within six years of completing their PhDs, and only 2% were in a postdoc or other untenured academic position.

2006: 15% were in tenure-track positions six years after graduating

Cyranoski et al. The world is producing more PhDs than ever before. Is it time to stop? Nature 472, 276-279 (2011)
The Average Age of Funded Faculty has Risen

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Age All NIH PIs on RPGs</th>
<th>Average Age Faculty at US Medical Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>42.5</td>
<td>43</td>
</tr>
<tr>
<td>2015</td>
<td>51</td>
<td>49.5</td>
</tr>
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</table>

AAMC faculty information from 1980 to 2010 were based on AAMC data drawn on 9/4/2011. AAMC faculty information from 2011 to 2013 were based on AAMC data drawn on 11/5/2014. All AAMC numbers are subject to change.
Where are We Now

An aging faculty
Lower funding success rates overall

An aging funded faculty
Lower funding success rates for junior faculty*

*Increase in the age at which first grant is obtained
An aging faculty is leading to a shortage of teachers.
Increasing the pressure on new, junior faculty to teach.
Institutional Changes IN Support of Early Researchers

Recognize the needs of junior faculty

Working with the administration to provide for those needs

- Tenure decisions
- Financial support
- Protected time
Institutional Changes IN Support of Early Researchers

Recognize the needs of junior faculty

Tenure decisions
Institutional Efforts IN Support of Early Researchers

Financial Support

Start-Up Packages

Why hire a candidate and not provide the tools necessary for success?
Institutional Efforts IN Support of Early Researchers

Protected time
Institutional Changes IN Support of Early Researchers

IDP
Mentoring
  Career Development
    Research oriented:
       grant writing
       grant administration
       compliance
  Teaching oriented
       lecture preparation
NIH Efforts IN Support of Early Researchers

Starting with PhD and Postdoctoral Training....

Preparation for the “Next” step

Structured programs that assist with pedagogical skill development and academic professional development.
New and Early Stage Investigators

A New Investigator has not previously competed successfully as PD/PI for a substantial NIH independent research award.

A New Investigator is considered an Early Stage Investigator (ESI) if he/she is within 10 years of completing his/her terminal research degree or is within 10 years of completing medical residency (or the equivalent).
Ongoing NIH Efforts IN Support of Early Researchers

Special Awards for New Investigators

Pathway to Independence Award (K99-R00/K22)*

NIH Director’s New Innovator Award (DP2)

NIH Director’s Early Independence award (DP5)

RFA-GM-16-003 (R35), the Maximizing Investigators’ Research Award (MIRA) for New and Early Stage Investigators pilot program

* Other Mentored Research Career Development Awards, e.g. K08, K23
Proposed NIH Effort IN Support of Early Researchers: Funding

A new award for new faculty investigators

R02?

An “R00” type award for New Investigators in Academia who have not been awarded a K99/R00, K08,R03 or K22

But with a difference
Proposed NIH Effort IN Support of Early Researchers: R02 Funding

Criteria could include

- Salary guaranteed for three years by the sponsoring academic institution
- Significant start-up funds from the sponsoring academic institution
- A full-time faculty position with an unmodified title
- Required Mentoring program similar to K99/R00 etc.
- Required Individual Development Plan

AHA: Beginning Grant-in-Aid
# K99/R00 and R02 Comparison

<table>
<thead>
<tr>
<th>Requirements</th>
<th>R00</th>
<th>R02</th>
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<tbody>
<tr>
<td>Faculty Position</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Protected Time</td>
<td>Required 75%</td>
<td>Required 80%</td>
</tr>
<tr>
<td>Mentoring</td>
<td>Required#</td>
<td>Required</td>
</tr>
<tr>
<td>IDP</td>
<td>Encouraged</td>
<td>Required, yearly</td>
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<tr>
<td>Apply Before Position Accepted</td>
<td>Yes</td>
<td>Yes</td>
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## Budget Information

<table>
<thead>
<tr>
<th>Budget Information</th>
<th>R00</th>
<th>R02</th>
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</thead>
<tbody>
<tr>
<td>Salary</td>
<td>*</td>
<td>$25,000/yr</td>
</tr>
<tr>
<td>Program-Related Expenses</td>
<td>$249,000/yr*</td>
<td>Matching University to a total of $400,000/3 yrs. $30,000 supplies</td>
</tr>
</tbody>
</table>

*The total cost for the independent phase (R00) may not exceed $249,000 per year. This amount includes salary, fringe benefits, research costs, and applicable F & A costs.*
Proposed NIH Effort in Support of Early Researchers: Mentoring

Mentor

1 *capitalized*: a friend of Odysseus entrusted with the education of Odysseus' son Telemachus

2a: a trusted counselor or guide
   b: tutor, coach
What is our definition of a mentor?
Proposed NIH Effort in Support of Early Researchers: Mentoring

**K23 Mentor(s):** The candidate must name a primary sponsor/mentor, who together with the candidate is responsible for the planning, direction, and execution of the program. The mentor should be recognized as an accomplished investigator in the proposed program and have a track record of success in training similar investigators.

The mentor should have sufficient independent support to cover the costs of the proposed project in excess of the allowable costs of this award.

Candidates may also nominate co-mentors as appropriate to the goals of the program. Where feasible, women, individuals from diverse racial and ethnic groups, and individuals with disabilities should be involved as mentors to serve as role models.
Mentor/Mentoring

Where does it start?

What is their degree of commitment?

How do we select mentors for junior researchers.

Do we need to train mentors

Generational gaps in expectations

life vs. work

Generational gaps in world view

Incentives?