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# SUPD Responsible Conduct of Research Workshop Series

## Workshop 1: Developing a Career Progress Plan

This workshop is sponsored by The National Post-Doctoral Association and the Stanford Office of Post-Doctoral Affairs

*RCR topics addressed:* Management, lab values and academic environment, mentor responsibilities, and communication and difficult conversations.

### *Motivation for workshop series*

1. *Post-docs need a plan:* Many post-docs spend long periods of time after obtaining their PhD in post-doctoral training without a coherent plan to transition into a faculty position. This program will encourage participants to identify their post-doctoral training goals and develop a timeline and plan to transition from a training phase into a permanent position whether in academia or Industry.

2. *Post-docs need new skills:* Often post-docs consider post-doctoral training to be a continuation of their graduate training and a time to broaden experimental expertise and increase publication record. Transitioning successfully into a faculty position however, requires development of different skills from those emphasized in a graduate program. This program will engage participants in interactive tasks to develop such “soft” skills and will complement the lecture series “laboratory management” currently offered to post-docs at Stanford.

3. *Post-docs need to learn to be mentors:* Mentoring and communication are key responsibility for principal investigators yet very few PIs receive formal training in strategies for communicating, mentoring, and building relationships with a diverse student population. Now more than ever, as university communities embrace cultural diversity, it is critical that the next generation of academic leaders be properly equipped with the cultural tools necessary to lead, mentor, and motivate a diverse student demographic.

**Please fill out an evaluation form before you leave today – Thanks!**



## SUPD Workshop 1: Developing a career progress plan - Evaluation



The SUPD would like to thank you for taking the time and effort to respond to this questionnaire. Since this is our first workshop, your feedback is invaluable. This form should take 3 minutes to complete.

### Section I: YOU

1. Postdoctoral Affiliation: School of Medicine  Other
2. Number of months as a Postdoc at Stanford: \_\_\_\_ Number of months as a Postdoc at other institutions: \_\_\_\_

### Section II: The Workshop (check only one)

- |   | Strongly Agree                     | Agree                           | Neutral                                 | Disagree                      | Strongly Disagree                  |
|---|------------------------------------|---------------------------------|---|-------------------------------|------------------------------------|
| 1. The length of the workshop was ideal:  | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 2. The technical level of the workshop met my needs:  | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 3. The instructor presented the material in a clear and understandable manner:                                    | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 4. The instructor was prepared to teach the workshop:   | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 5. The instructor moved at an appropriate pace:   | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 6. The handouts were very helpful:  | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 7. Overall, I learned and benefited from this workshop:   | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 8. I plan to use the skills presented in this workshop:   | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| 9. The time of the workshop was convenient for me:  | <input type="checkbox"/>           | <input type="checkbox"/>        | <input type="checkbox"/>                | <input type="checkbox"/>      | <input type="checkbox"/>           |
| a. If the time was inconvenient, please specify the time at which you would have preferred to attend: _____       |                                    |                                 |   |                               |                                    |
| 10. My overall rating of the workshop is (check one):   | Excellent <input type="checkbox"/> | Good <input type="checkbox"/>   | Average <input type="checkbox"/>        | Poor <input type="checkbox"/> | Very Poor <input type="checkbox"/> |
| 11. I learned about the workshop series from (check all that apply):  | Web <input type="checkbox"/>       | E-mail <input type="checkbox"/> | Other Postdocs <input type="checkbox"/> | PI <input type="checkbox"/>   | Other: _____                       |
| 12. I would recommend this workshop to other Postdocs:   Yes <input type="checkbox"/> No <input type="checkbox"/> |                                    |                                 |   |                               |                                    |
| 13. Comments and suggestions:   |                                    |                                 |   |                               |                                    |

Optional: If you would like feedback on your comments or suggestions, please give us your contact information and we will respond promptly.

Name:

E-mail:

Thank you for completing this SUPD survey.

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"The number one thing that every postdoc needs to think about is what they want to do when they grow up." - Ida Chow, executive officer of the Society of Developmental Biology

**Not Your Father's Postdoc**

Beryl Lief Benderly  
United States  
29 April 2005

**In today's scientific labor market, just doing good science is no longer enough. Postdocs need realistic expectations, good information, and an entrepreneurial attitude toward their careers.**

On 18 March, 100 years and a day after 26-year-old Albert Einstein sent off the first of his 1905 papers that were destined to revolutionize physics, National Institutes of Health (NIH) Director Elias Zerhouni invoked the name of another Nobelist, biochemist Marshall Nirenberg, at a meeting held to unveil a new report on the plight of young researchers today. Nirenberg won his Nobel Prize at 41--even younger

than Einstein. "In today's world," Zerhouni noted, "Marshall Nirenberg would get his Nobel Prize before he got his first NIH grant."

Today's young biomedical researchers, notes the National Research Council (NRC) report *Bridges to Independence*, don't win their first independent faculty appointment until a median age of 36, and they don't reach the milestone that marks their real debut as independent investigators--their first competitive NIH research grant--until a median age of 42. This late start doesn't just stunt individual careers, warns the report. It also threatens the vitality of the nation's scientific enterprise.

Moreover, for most aspiring biomedical scientists, there won't be an academic job at the end of that long apprenticeship: There are simply far more people in the pipeline than there are available academic positions. Given that inescapable arithmetic, experts advise today's budding biomedical Einsteins and Nirenbergs to think more broadly about their future scientific careers. "The number-one thing that every postdoc needs to think about is what they want to do when they grow up," says Ida Chow, executive officer of the Society of Developmental Biology.

**Funding patterns and holding patterns**

NIH funding is itself largely responsible for the slowdown, explains the report. Over the past several decades, NIH has financed a swift rise in the number of life science Ph.D.s and then supported them--mostly by means of extramural research grants made to universities--in postdoctoral appointments that have become, in the report's words, "a 'holding pattern' for thousands of young scientists" who find themselves unable to move on to traditional faculty posts. The postdoc--a de facto requirement for an academic research career--now averages just under 5 years. For many life science postdocs, especially among the 80% paid out of NIH grants to principal investigators, " 'postdoctoral training' ... has turned into 'postdoctoral employment'--with the postdoc remaining at the same professional position with little advancement of professional training," the report says.

"Simply put," notes the report in a model of understatement, "there are not enough tenure-track academic positions for the available pool of biomedical researchers." Between 1993 and 2000, the number of U.S. life science Ph.D.s under age 35 holding coveted tenure-track jobs in major research universities declined by 12.1%, to 543; meanwhile, the number of U.S. biomedical Ph.D.s in that age range increased by 59%, to nearly 20,000, and tens of thousands more scientists with foreign Ph.D.s came to fill postdoc positions in U.S. labs.

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<p><b>Albert Einstein</b> b.1879</p> <p><b>Age</b></p> <p>23 Began work at Patent Office</p> <p>26 <i>Annus mirabilis</i></p> <p>32 1st permanent post</p> <p>42 Won Nobel Prize</p>	<p><b>Marshall Nirenberg</b> b. 1927</p> <p><b>Age</b></p> <p>21 Received B.S. in zoology from University of Florida, Gainesville</p> <p>25 M.Sc. in zoology from University of Florida</p> <p>30 Ph.D. in biochemistry from University of Michigan, Ann Arbor</p> <p>32 Postdoc at NIH</p> <p>33 Appointed research biochemist at NIH</p> <p>35 Made section head, Biomedical Genetics, NIH</p> <p>38 Won National Medal of Science</p> <p>41 Won Nobel Prize</p>	<p><b>Thomas Cech</b> b. 1947</p> <p><b>Age</b></p> <p>19 Entered Grinnell College</p> <p>23 Started grad school at UC Berkeley</p> <p>28 Earned Ph.D. from UC Berkeley</p> <p>Started postdoc at MIT</p> <p>31 1st faculty position (University of Colorado, Boulder)</p> <p>41 Appointed Howard Hughes Medical Institute Investigator</p> <p>Albert Lasker Award in Basic Medical Research</p> <p>42 1989 Nobel Prize in chemistry</p>
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**Researchers today win their first competitive NIH grant at a median age of 42. These three scientists won Nobel Prizes at that age.**

**CREDITS: (LEFT TO RIGHT) HULTON ARCHIVE/GETTY IMAGES; KEYSTONE/GETTY IMAGES; AAAS**

The traditional "linear progression" from "graduate school to postdoctoral positions to assistant professorships, then obtaining funding and tenure" now works for only a small minority of young scientists, the report explains. Instead of this simple progression, young scientists confront "a complex network of current career pathways" to a variety of occupations using scientific training, many of them outside academe. In addition, increasing numbers of scientists hold non-tenure-track university posts, a type of appointment that increased 55% between 1990 and 2001, a rate approximately seven times faster than that of tenure-track posts. The great majority of postdocs seeking stable career employment must therefore take what the academic world has long regarded as "alternative" jobs with unfamiliar professional cultures and skill requirements that scientists generally do not encounter in graduate school or a mentor's lab.

### Building bridges to opportunity

In light of these changes, what can postdocs do to prepare themselves to move beyond the training phase, wherever that move might take them? A first step is to jettison the notion of jobs outside academe as "alternative" work, advises Chow. "The word 'alternative' gives a bad connotation of second class," she says. A far better term, she believes, is "career choices," specifically "the many career choices that science graduates--from the bachelors to the doctorate--have today compared to a generation ago."

Opportunities include industry--which in 2001 employed some 35% of life science Ph.D.s, up from 15% in 1981--as well as government, science policy, writing, and nonuniversity teaching. "Even Wall Street needs people with science backgrounds to work as analysts," Chow says. "There are many more choices than just university jobs."

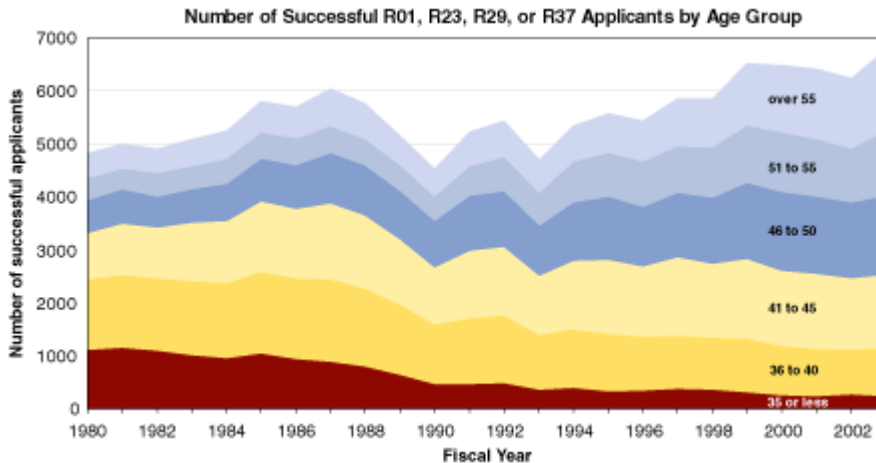
Setting a personal course for the future is particularly important at the postdoc stage, when young scientists no longer have the structure and goals automatically supplied by graduate school, says Andrea Stith, science policy analyst at the Federation of American Societies for Experimental Biology (FASEB): "There your goal is defined for you, and you have the evaluation of grades."

At one time, most postdocs' goals were also clear--a faculty job--and the guidance and help of the PI played a major role in getting there. But as the range of jobs scientists occupy has expanded, the help their advisers can provide has diminished. Faculty members who have spent their careers within academe often lack the knowledge and contacts needed to help their protégés find jobs in other sectors. So postdocs considering opportunities outside academic science need to assume far greater

responsibility for their own futures. Key to taking charge, says Stith, is systematic planning. An effective approach to doing so, Stith continues, is to create an Individual Development Plan (IDP), a document that states specific goals and outlines specific means of achieving them.

### Doing science on yourself

Widely used in the business world, the IDP is unfamiliar to most academic scientists, although some universities and funders now use IDPs to help plan the postdoctoral period. FASEB has developed a 3-hour instructional IDP seminar, complete with interactive exercises, that it piloted at the Experimental Biology 2005 meeting in April in San Diego, California, and plans to present at other venues. "An IDP is appropriate for every stage of your life," says Stith, who served as one of the seminar presenters.



**Delayed independence. Researchers under 40 now account for less than 15% of NIH grant awards.**

SOURCE: NIH

Like doing an experiment, the four-step process of creating an IDP involves thinking strategically, gathering data, and evaluating results. It begins with a self-assessment during which the individual determines his or her own values, interests, preferences, priorities, strengths, weaknesses, talents, and tolerances. "Is the amount of pay important to you?" Stith asks. "Is time with family? Is independence, as far as determining the project you're working on? How much and what are you going to compromise?"

Next comes the career-assessment stage, when the postdoc identifies and learns about occupations that appear to meet his or her needs. Information gathered should include the skills, knowledge, and characteristics needed to enter and succeed in the fields of interest and how to go about acquiring them. Sources of information can include university career centers and postdoc offices, professional associations, libraries, the Internet, and networking with people who have firsthand experience.

In the third stage, the postdoc composes the document. "Write down your goals and parse out your long-term and short-term goals," Stith says. Explicit timelines add specificity. Finally, in stage four, the individual puts the plan into effect, periodically measuring progress toward those goals and revising the plan as needed. "We expect people's interests to change," Stith says.

### Weaning or weeding?

The entrepreneurial spirit symbolized by FASEB's IDP could be particularly handy for postdocs in the next few years if the recommendations in *Bridges to Independence* are adopted. The recommendations would create opportunities for some postdocs and insecurity for others, allowing--indeed, forcing--many postdocs to "grow up" to some form of independence more quickly.

On the opportunities side, one prominent proposal would reallocate NIH research funds to hundreds of new awards each year to postdocs doing their own research. Another would strengthen support for the growing cadre of investigators on soft money in non-tenure-track positions. Yet even the downside of these proposals is likely to have a secondary weaning effect: Given current budget constraints, these initiatives would most likely take funding away from some current investigators--and paychecks from their postdocs.

From a postdoc point of view, perhaps the most significant recommendation is one that would limit to a total of 5 years the postdoctoral support any individual could receive from all NIH sources combined, whether fellowships or employment on PI grants. This would eject the longest-serving postdocs from their current jobs and could endanger the immigration status of many noncitizens, who account for more than half of the postdocs working in U.S. labs. *Bridges* urges PIs to promote scientists remaining on

after their NIH eligibility ends to staff positions with pay, benefits, and clearly defined institutional status commensurate with their experience and responsibilities. But doing so would be expensive, and the source of money to support it is unclear.

The weeding out that would occur is consistent with the goals of the NRC committee. "This is not a full employment system for postdocs," said National Academy of Sciences president Bruce Alberts at the 18 March briefing. "The system will select out those of real ability [so that] the very best have a chance to see what they can do." The changes "might be painful to some people," acknowledged the report committee's chair, Thomas Cech, president of the Howard Hughes Medical Institute in Chevy Chase, Maryland--who, incidentally, won the Nobel Prize in chemistry just as he turned 42--but they "should have a wonderful effect on encouraging early consideration of career opportunities."

Whether or not these recommendations are adopted--and the report itself points out that earlier recommendations were not--the career picture for most postdocs remains complex for the foreseeable future. "Each year, both new and experienced investigators compete in a Darwinian-like system," the *Bridges* report states. It should therefore come as no surprise to life scientists that those who adapt strategically to rapidly changing circumstances have the best chance of prospering in the years ahead.

*Beryl Lieff Benderly is a contributor to Science's Next Wave (www.nextwave.org).*

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Suggested Guidelines  
**PI/Postdoc Career Progress Mentorship Meeting**

*(To be completed by the postdoctoral scholar)*

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*Postdoctoral scholars and their PIs are encouraged to hold an annual meeting to discuss career progress. Although it is recognized that postdoctoral scholars ultimately are the ones responsible for their career trajectory and success, PIs are encouraged to offer them periodic mentoring and career development sessions. To this end, postdoctoral scholars are encouraged to respond to invitations to meet with their PIs to discuss career progress, and to request career progress and mentoring discussions if such sessions are not otherwise scheduled for them. In short, arranging such an annual meeting is a joint responsibility of the postdoctoral scholar and the PI.*

Name: \_\_\_\_\_ Meeting Date: \_\_\_\_\_

Department: \_\_\_\_\_

PI \_\_\_\_\_

\_\_\_\_\_ years \_\_\_\_\_ months since initial Stanford appointment

*Postdoctoral scholars are asked to complete parts 1-3 and to update their Curriculum Vitae prior to meeting with the PI. This form is intended to facilitate a discussion between your PI and you regarding your career development to provide an opportunity for mentorship. This discussion is not intended to provide a substantive evaluation of your performance.*

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**Part 1. Research progress: Overview of the last year**

- Overview of accomplishments in the past year (e.g., publications, patents, honors or awards, teaching experiences, presentations at professional meetings, grants or fellowships):

- Brief overview of research progress (and/or clinical activities) in the past year:

- Describe/list any unusual or unanticipated challenges experienced in research efforts or goals:

- Identify assistance, resources, or mentoring that might help to better tackle the challenges mentioned above:

- Describe/list teaching and mentoring of students:

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## **Part 2. Research growth and development: Plans for next year**

- Goals for research project(s) in the coming year:
  
  - Anticipated publication(s) (tentative titles and time lines):
  
  - Anticipated meeting or workshop attendance (identify meeting/workshop and date):
  
  - Anticipated Fellowship or Grant application submissions (indicate name of award, due date):
  
  - Identify any additional professional training desired (e.g. course work, teaching):
  
  - Identify actions that your mentor might take to help you accomplish your immediate research and training goals:
-

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### **Part 3. Career development**

- Current career goal(s):

- 1)

- 2)

- Primary factors driving career goals, plans, and decisions (e.g., interests in research, teaching, business, government, writing; geographic priorities; family commitments; financial objectives; international trainee with an assured position in home country, etc.):

- Describe/list additional training or skills that would enhance your ability in achieve these goals:

- Projected time line for completing postdoctoral projects:

- Projected time line for a job search:

- Describe/list actions that your advisor could take to assist you in achieving your career goals:

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*Postdoc: Please update your CV to include current changes and attach to this form.*

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