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A Crucial Conversation: Talking with your mentees about their future

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OCPD

10/27/19

About me

- Chemical Engineer
- MS, Counseling Psychology and University Administration
- 27 years career counseling with STEM trainees, mostly PhD-level life scientists
- Work with physical scientists and engineers at LBNL and NSF PrePARE program
- Co-PI, NIH-funded BEST program grant
- Co-author, *ScienceCareer's* myIDP

x 2000+ PhD counselees plus

100's of group presentations

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Learning objectives

- Describe what graduate students are thinking about their futures and the need for structured career planning
- State the dual uses for a well-constructed Individual Development Plan (IDP)
- Identify several different IDP formats
- Consider conflicting roles played by a research mentor and identify when the career mentor role is appropriate
- List concerns and interests of mentors who are preparing to discuss their mentees' careers
- Implement strategies for future IDP/career mentoring discussions with your trainees

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UCSF Students' and Postdocs' Career *Primary Interests*

Survey of UCSF trainees' career preferences

-***Most considering multiple options***

-***Express low confidence in any option***

Avoid the "default postdoc"!

Career Path	% Students	% Postdocs
PI in an academic setting	45.3	53.2
Other research in academia	4.5	6.8
Research in biotech/pharma	20.3	27.8
Research in government	1.6	1.4
Teaching-intensive or education	5.8	3.1
Other science-related careers	22.3	7.8

Fuhrmann, Halme, O'Sullivan, Lindstaedt, CBE Life Sciences Education, 2011

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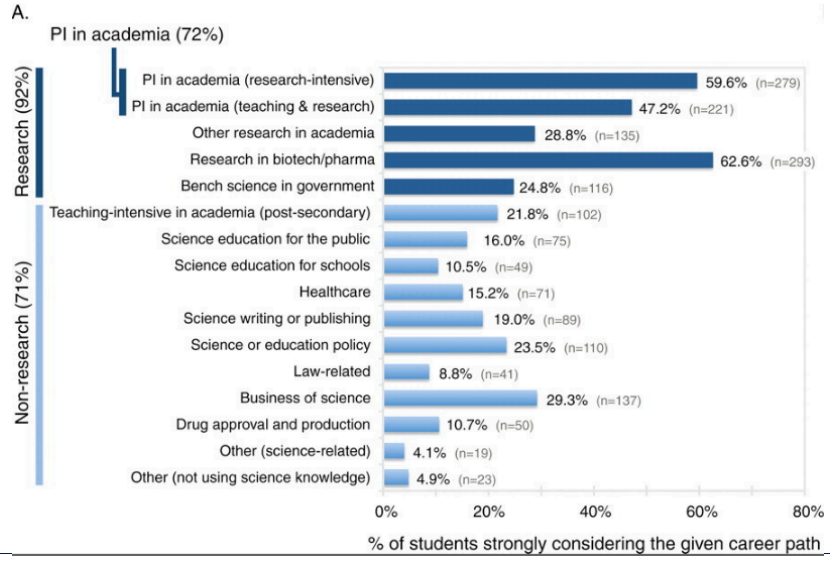
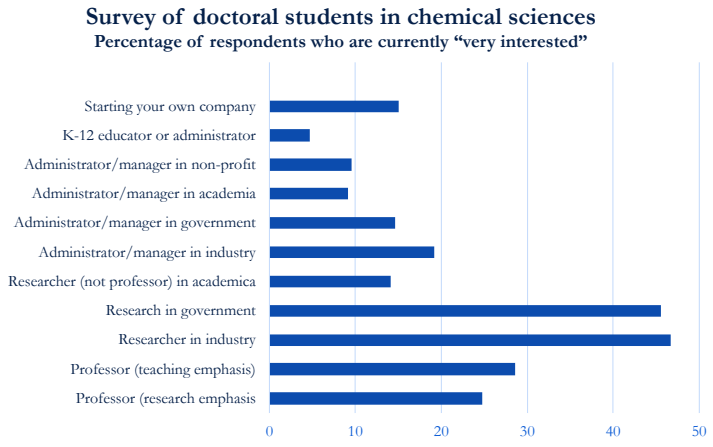
PhD students strongly consider multiple careers at the same time



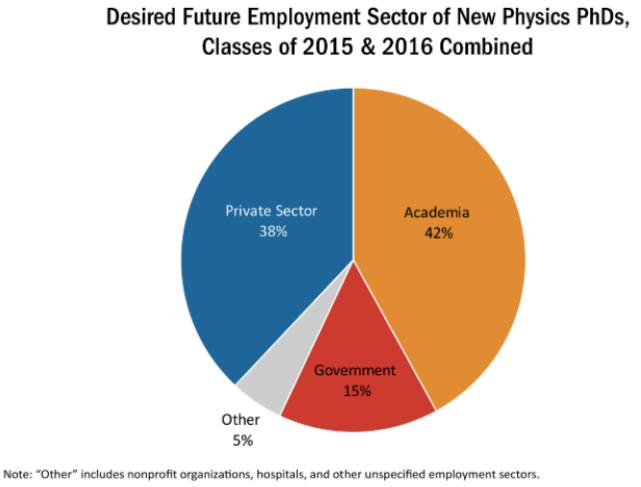
Fuhrmann, Halme, O'Sullivan, Lindstaedt, CBE Life Sciences Education, 2011

Chemistry PhDs have varied career interests



2013 ACS Graduate Student Survey
https://www.acs.org/content/acs/en/education/students/graduate.html

Physics PhDs have varied career interests



AIP Data on Employment for PhD Recipients
https://www.aip.org/statistics/employment/phds

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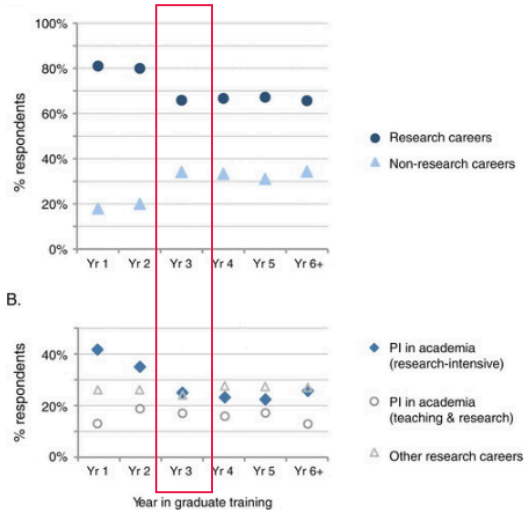
Career interests shift, particularly in 3rd year



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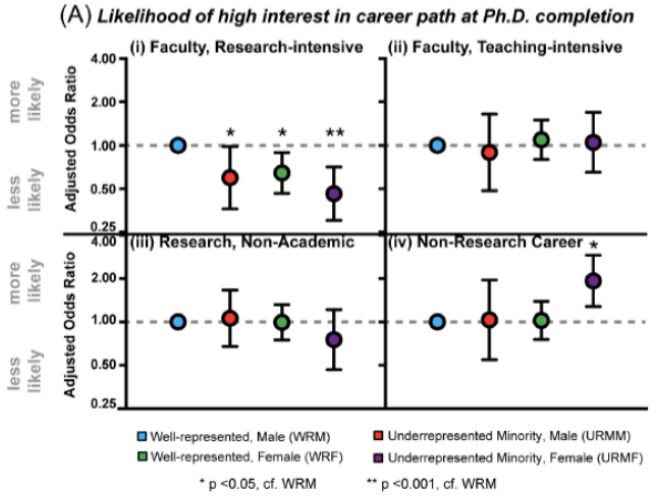
White men are most likely to retain interest in research intensive faculty positions; women of color are the least likely



Gibbs, Kenneth D., Jr., John McGready, Jessica C. Bennett, and Kimberly Griffin. "Biomedical Science Ph.D. Career Interest Patterns by Race/Ethnicity and Gender." *PLoS ONE* 9: e114736. https://doi.org/10.1371/journal.pone.0114736.

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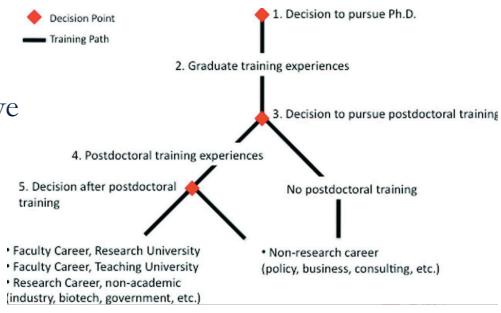
Career decisions are shaped by experiences and values

- Students initiate pursuit of a PhD out of a love for science and without a career goal in mind
- Objective performance and quality of advisor relationships do not necessarily determine career decisions
- Vicarious learning (experiences) play a large role in career decisions; women, particularly women of color describe negative marginalizing experiences in academic science
- Values, and their alignment with career of interest, play a large role in decision



Gibbs, Kenneth D., and Kimberly A. Griffin. "What Do I Want to Be with My PhD? The Roles of Personal Values and Structural Dynamics in Shaping the Career Interests of Recent Biomedical Science PhD Graduates." *CBE-Life Sciences Education* 12, no. 4: 711–23. https://doi.org/10.1187/cbe.13-02-0021.

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Students report that so many career options for PhD's are dizzying

- Dozens of career options:
  - 20 categories
  - 58 job titles in myIDP
  - myIDP.ScienceCareers.org

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SCIENTIFIC CAREER CATEGORIES AND THEIR DESCRIPTIONS

CAREER CATEGORIES	EXAMPLES/DESCRIPTIONS
Principal investigator in a research-intensive institution:	Independent researcher at a medical school, private research institute, government lab or university with minimal teaching responsibilities
Research staff in a research-intensive institution:	Staff scientist or researcher in academia or government, lab manager, director of a multi-user research facility in an academic institution
Research in industry:	Discovery or preclinical researcher; manager of a research team or facility
Combined research and teaching career:	Faculty at a liberal arts college, masters-granting university, or doctoral-granting university whose job includes **both** research and major teaching responsibilities
Teaching-intensive careers in academia:	Faculty in a research university, liberal arts college, community college with major teaching responsibilities
Science education for K-12 schools:	Classroom teacher; curriculum developer; science specialist
Science education for non-scientists:	Education or public outreach specialist such as at a science museum or scientific society
Clinical practice:	Clinician such as genetics counselor, therapist, physician
Public health related:	Public health program analyst or evaluator; epidemiologist; biostatistician; medical informaticist
Scientific/medical testing:	Testing specialist in an environmental, public health, genetics or forensic science setting (intelligence agencies, federal/state departments of justice); clinical diagnostician
Science writing:	Science, medical or technical writer or journalist; science editor; science publisher
Research administration:	Research administrator in private or public research institutions, government or academia, including compliance officers, grants and contracts officers; deans or directors of research programs
Science policy:	Public affairs/government affairs staff at scientific societies, foundations, government entities or think tanks
Intellectual property:	Patent agent; patent attorney; technology transfer specialist
Business of science:	Management consultant; business development professional in a biotech company; venture capitalist; market researcher; investment analyst
Entrepreneurship:	Starting your own business
Sales and marketing of science-related products:	Medical science liaison; technical sales representative; marketing specialist
Support of science-related products:	Technical support specialist; field application specialists; product development scientist or engineer
Clinical research management:	Clinical research project/trials manager or coordinator
Drug/device approval and production:	Regulatory affairs professional; quality control specialist

Summary: What do our students think about their careers?

- Students start thinking seriously about their post-graduation careers around post-quals (whether or not they tell you)
- Students think about multiple career options at once
- Under-represented students, particularly underrepresented women, are more likely than WRS to experience a decline in interest in research-intensive faculty positions
- Students' career decisions are not necessarily shaped by objective success
- Career decisions are shaped by myriad factors, in particular professional experiences and interactions, and value systems

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How do I *confidently* plan for a long term career goal?

- Research training does not provide knowledge about careers
  - How do I locate resources for finding out about my career options?
  - How do I choose a path?
  - How can I gain confidence that one career option is a better fit than others?
  - How can I find, meet and build relationships with role models to help me along after my training?
  - It's all competitive: How do I get the skills and experience to transition successfully onto my new path?
- Propose that a *structured* career planning and goal setting process is part of the solution –
  Individual Development Plan, or IDP

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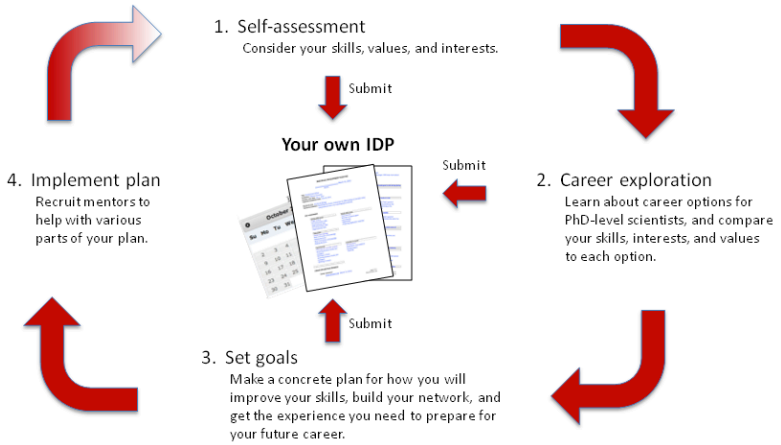
4 Phases of the IDP ***Process***



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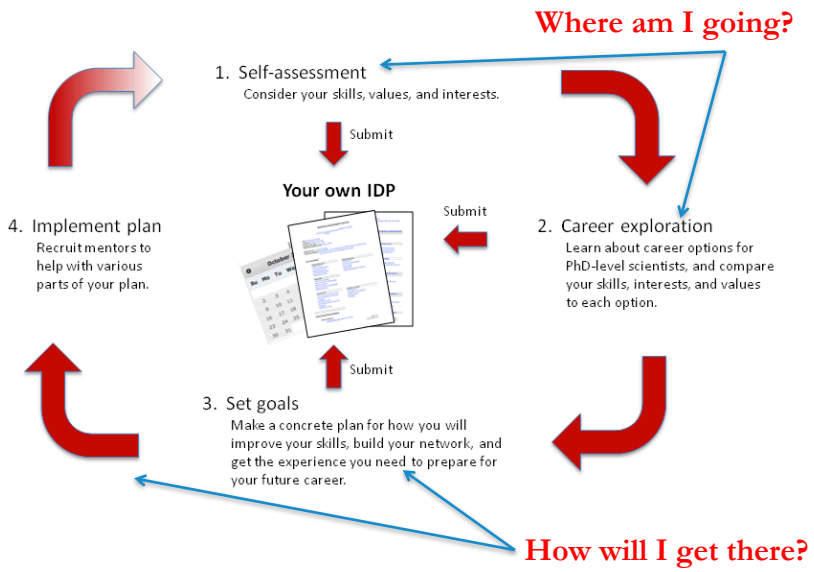
4 Phases of the IDP *Process*



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What does an "IDP" *product* look like?

- A written list of goals, mapped onto a timeline
- goals lead to a desired career outcome
- major goal areas reached through action items

PROJECTS: (research checkpoints)
Collect data and analyze AB-Complex x-ray structure
- By end of November – Collected data (done!)
- By end of December – solve crystal structure
- By mid-February – list significant findings from structure, including questions we had previously defined. Align with and compare to previously solved structures, and the conclusions already published about these structures. Mock up figures and start writing paper during this time if it helps with analysis.

Write and submit paper
- December – draft Materials & Methods section
- January – confirm with PI where we should submit paper
- February-April – draft figures and results (and discussion?) section as a way to help with the data analysis/interpretation process
- May – finish Discussion and Introduction sections (doing so will free my time in June/July to prepare for conference)
- June – submit paper

Attend Gordon Research Conference on Computer Aided Drug Design (July 2014); try to present at corresponding Gordon Research Seminar for trainees
- December - Apply to meeting (GRC and GRS)
- February – update abstract based on research results
- March - if do not get accepted to GRC, then apply to September conference
- June – draft poster (and prepare talk?)
- July – attend conference

SKILLS DEVELOPMENT:
Crystallographic skills (data collection and analysis)
- November-December – read HKL Manual and textbook suggested by labmates, research advisor, and TRAC; get support from postdoc in lab as needed while solving structure
- December – Have postdoc review my data after it is processed, and then review with research advisor. Check in with postdoc periodically as I solve and refine structure.
-

CAREER ADVANCEMENT:
Learn more about industry trends
- December-April: Subscribe to BioWorld and read at least one article each week (weekends).
- Monthly: attend an E-Club event monthly
- ACCOUNTABILITY: have lunch with Amber and David every Thursday and compare notes about what we have heard about industry (at least 15 minutes during meal; we each contribute one update)

Real results: Sigma Xi Postdoctoral Survey

- 7,600 postdocs nationwide

What variables are correlated with… ?

- Satisfaction
- Best advisor relations
- Least lab conflicts
- Most productivity

*Study by Geoff Davis, "Improving the Postdoctoral Experience: An empirical approach", 2005

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Real results: Sigma Xi Postdoctoral Survey

Greatest Impact on Postdoc Satisfaction/Success? Having a Plan

Compare postdocs with a plan to postdocs without:

- More productive
  - 30% more first-authored papers
  - 25% more grant proposals
- Higher satisfaction scores
- Higher advisor ratings

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IDP Process: Faculty/Mentor perspective

- What the IDP process does is ask the faculty/mentor to engage in an open minded, structured conversation about career plans with each of their trainees or advisees
- The student does the preparation
- How can faculty/mentor career advisors help ensure these discussions are positive and productive?

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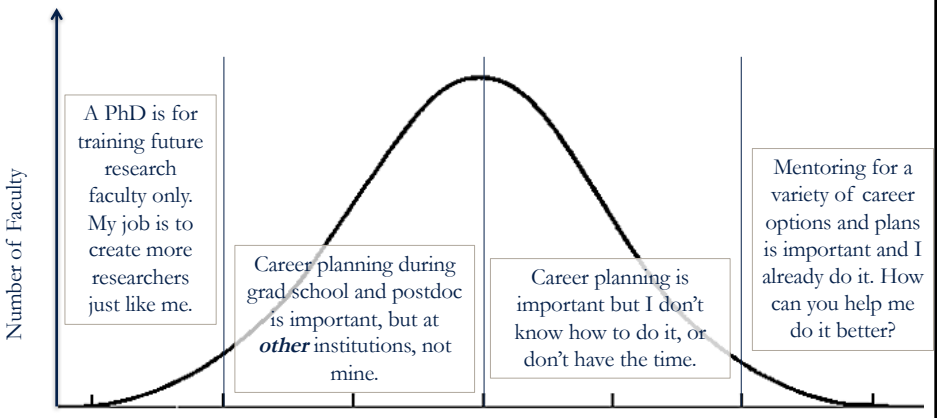

Faculty attitudes about career planning

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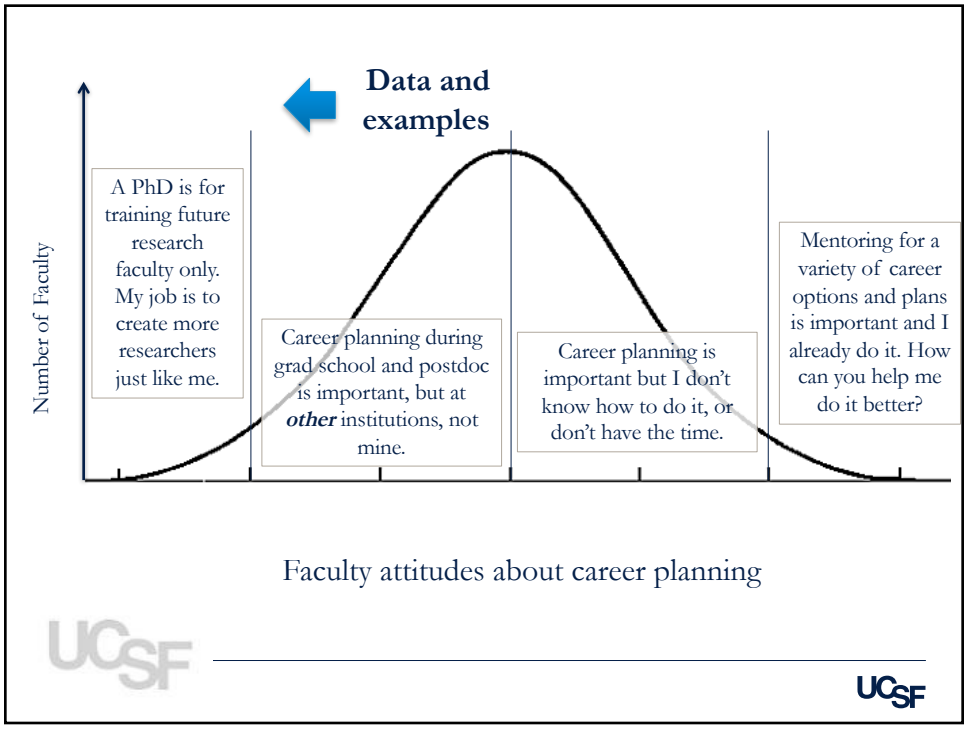
Data and examples
Number of Faculty
A PhD is for training future research faculty only. My job is to create more researchers just like me.
Career planning during grad school and postdoc is important, but at *other* institutions, not mine.
Career planning is important but I don't know how to do it, or don't have the time.
Mentoring for a variety of career options and plans is important and I already do it. How can you help me do it better?
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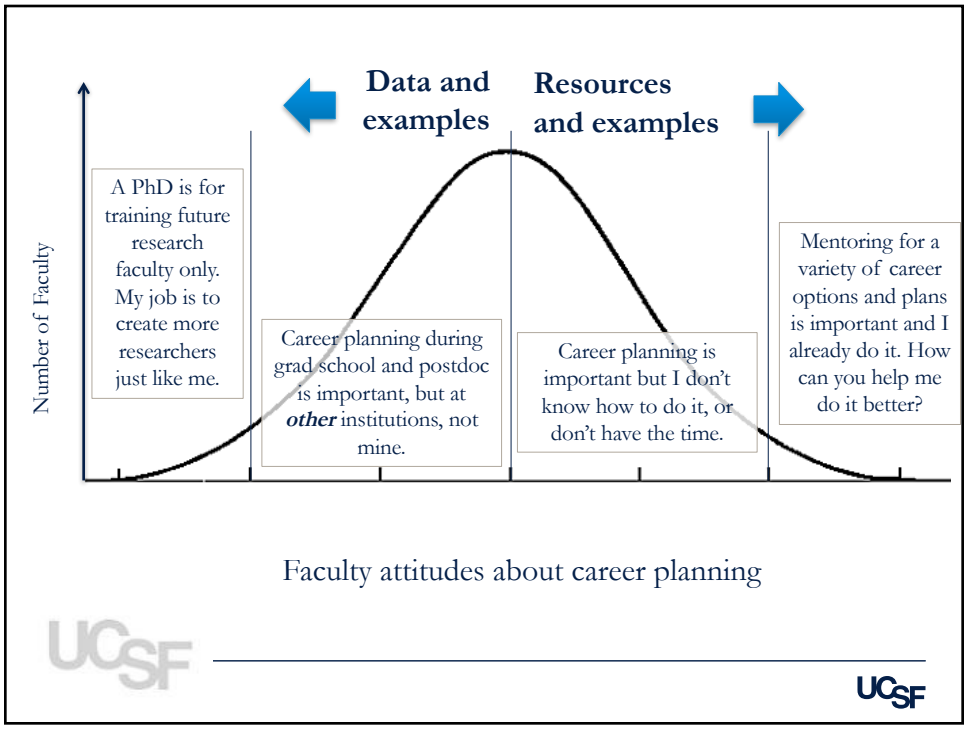
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Resources and examples
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From focus of groups of supportive faculty:

- Supportive faculty says: "OK, great! Good luck in your non-academic path"
  - *-Student hears: "My labmates going into academia are going to get all the help."*
- If the IDP discussion points to non-academic career pursuits: "My first thought is still, 'What did I do wrong?'"
  - -Was I overly hard on them? Did I drive them away?
- "This is a distraction from research."
  - -How do I keep a non-faculty-track trainee productive?

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What can individual faculty do?

- Initiate the conversation
- Use a structured career planning document such as IDP, but select one appropriate for your goals/style
- Talk to trainees about career planning/IDP's early, particularly with postdocs
- Encourage trainees to participate in career and professional development programs

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What can individual faculty do?

- Recognize and acknowledge role conflict, and clarify your role (Supervisor vs Career Mentor vs Educator/Advisor)
- Refer to campus or professional society resources when you don't know answers
- Beware the perceived performance evaluation!
  - Learn to provide constructive feedback

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What can individual faculty do? Initiate!

Discontinuity between faculty willingness to assist with career planning and trainee perception of same: *CBE Life Sci Ed 2014*

"The primary reason mentors cited for not helping their postdocs develop an IDP or some other type of career plan was that their postdocs had not asked for help"

"…why postdocs did not complete an IDP or discuss their IDPs with their mentors…postdocs thought their mentors were not interested in the IDP concept, thought their mentors were unwilling to assist them with the process, or thought faculty discouraged them from completing an IDP."

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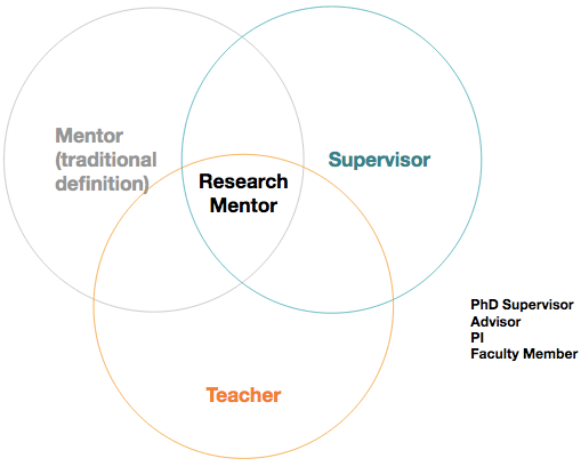
What can individual faculty do?

- Recognize faculty/mentor roles and clarify with your student (Supervisor vs Career Mentor vs Educator/Advisor)



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Sharing three IDP models

1. Conversational five-prompts model
   - What did you say you were going to do?
   - What did you do?
   - What are you going to do in lab in the next year?
   - Where are you headed when you finish?
   - What are you going to do this year to get there, is that reasonable, and how can I help you?

Student writes out responses in preparation for annual meeting, and questions guide the conversation.

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Sharing three IDP models

2. Angela Depace (Harvard) model – student and mentor free write about
   - Accomplishments for past year
   - Research goals for coming year
   - Professional and Personal Goals for coming year
   - Feedback for student/Feedback for mentor
   - Monthly planning calendar

Yearly Planning Meetings: IDPs Aren't Just More Paperwork
https://www.cell.com/molecular-cell/pdfExtended/S1097-2765(15)00307-X

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Sharing three IDP models

3. Highly structured step-wise model – student works through the process then engages mentor in summary discussion

   Where am I headed?

   What will I do this year to get there?

   myIDP: myIDP.ScienceCareers.org

   ChemIDP: ChemIDP.acs.org

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I3IDP project – Do IDP's really help?

NSF Innovations in Graduate Education (IGE) Grant

-Impact Indicators and Instruments, for IDP's (I3IDP)

-Goal is to create a toolkit and process for measuring the effectiveness of IDP models

-Major award made to American Chemical Society

-Questions? Want to be involved?

Joerg Schlatterer, PhD -- Co-PI for I3IDP

Manager, Graduate and Postdoctoral Scholars Office

American Chemical Society

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IDP conversation guidelines – delivering and receiving constructive feedback

Feedback is valuable but few scientists are trained to give it constructively

Many of us think that constructive criticism means saying something nice before you say something harsh. Though this can soften a blow, it misses deeper guidelines governing how to mitigate the sting of giving and receiving criticism. As scientists we have to critique often and it can be quite painful. These guidelines can help.

1 **Mutual Respect** Constructive criticism has to come from a place of respect. Everyone is a decent person doing her or his best: there can be no character indictment. We are more able to act on both positive and negative feedback if it comes from someone we respect, who we believe has our best interests at heart.

2 **Be Specific** Specific problems have specific solutions. Vague problems or dissatisfactions don't have solutions, and they invite frustration or commiseration. Being specific is also the easiest way to avoid character indictment. When you stay focused on the specific issue, what might be motivating it, and how it can be resolved, you can avoid unproductive accusatory generalities such as "you always…" or "you never…". Even if you don't have a solution in mind, describing your issue as specifically as possible will allow others to help.

3 **Keep, Discard, Improve** Giving constructive criticism is like editing: you need to define the stuff to keep (what's going well?), stuff to get rid of (what's not working at all?) and stuff to fix (what has some value but could be improved?). All of these components are critical. Focus only on the good and you lose the opportunity to improve. Focus only on the bad and you lose motivation.

4 **Mindset: How can I help?** Coming into a meeting with a helpful mindset sets a good tone. PIs and trainees ideally have the same overall goal—for trainees to reach their full potential and succeed scientifically while working with the PI and then to move on to satisfying positions elsewhere. Both of these goals serve both parties. PIs need scientific productivity to maintain the lab. Trainees need experience creating scientific knowledge to earn their credentials and secure their next posts. Instead of considering what the other person can do for you, flip it around. What can you do to help them?

Cell PRESS *Molecular Cell* 2015 58, 718-721DOI: (10.1016/j.molcel.2015.04.025)

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How can I be prepared for these conversations?

- **Scenario discussions**
  - What are the issues?
  - How does student perspective differ from faculty perspective
  - How does faculty role conflict enter (Supervisor vs Career Mentor vs Educator/Advisor)
  - What should be done?
  - What language would you use?

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Scenarios that might result from more structured career planning and goal setting

- A promising 4th year student tells you he is now considering moving away from academic research when he completes next year. After "careful consideration", he would like to pursue a career related to intellectual property law. You think he has real promise if he stays on the faculty track. You already had ideas for what he might work on in the future and even where he might do a postdoc and you believe he could make a big impact in the field if he persists. How do you respond?

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Scenarios that might result from more structured career planning and goal setting

You are looking forward to talking with your graduate student on Monday morning about his final committee meeting and plans for wrapping up. You have some thoughts about potential postdoc labs and want to writing a manuscript and possibly a review in the coming year before he defends. Things have been going well and you are optimistic about his final year in grad school; know that he will be very competitive for postdocs in the very best of labs.

The meeting starts off with some good science discussion; he shared some great data from the last few weeks and had several ideas for next steps. Toward the end of the meeting, just when you were preparing to give him your thoughts on reaching out to some colleagues about postdoc opportunities, your student asks for permission to start an internship in your university's Global Health Policy Office. He tells you that he plans to apply for a AAAS Policy Fellowship next June and that he learned at a workshop on policy careers that doing an internship in the policy arena during grad school would strengthen his application. Your student is a bit nervous about this conversation; the two of you often talk about postdocs and he thinks you will be disappointed in him. He would like for you to be supportive of his career goals, but beyond that he needs your permission to start the internship. Because he was stressed about asking you this, he put off this conversation and the internship is set to start next week. You are caught off-guard by the conversation, irritated that he applied for an internship without talking to you first, and stressed about how his shorter work-week might impact the renewal of your grant. You are also quite disappointed that he does not want to do a postdoc after all of the opportunities you gave him.

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Scenarios that might result from more structured career planning and goal setting

- One of your postdocs makes an appointment to share her annual IDP with you. Before the meeting, she sends ahead a two page list of tasks and goals mapped out for the next year. After a 1-minute scan, you are generally pleased with the progress she has predicted for near-term experiments, time for data analysis, and generating manuscript sections for her paper. However, you notice that during the summer, she has written several specific goals related to teaching a course at a local community college. You know that her long term goal is a tenure track teaching/research position at a state college setting and you believe that her teaching and presentation skills are weak, but you're concerned about her ability to get everything done in the lab AND prepare and deliver a three hour night lecture/lab once every week? And with funding running short, you need her to leave the lab soon. During the meeting, how do you respond?

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