Managing Your Research Career: Basic and Translational Sciences

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Getting Started:
What I Wish I Knew

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Managing your startup funds

Startup funds represent your major source of money for the first 2-3 years
Spend Wisely!

With startup money you may have to:
1. Buy equipment
2. Pay part of your salary
3. Pay for staff, student, postdoc salaries
4. Pay for reagents
5. Pay for instrument user fees
6. Pay for maintenance contracts
7. Pay for renovations (maybe)

Salary covered in years 1 and 2 ($110,000+ per year= >$220,000)

Hires: 2-3 RAs or postdocs--$60,000/year each (salary + benefits)
That is already >$150,000K + $220,000 for years 1 and 2

Remaining purchases:
Purchases -$150,000 for big equipment
UV spec, FPLC, centrifuges, PCR machine, glassware

- Don't overspend
- Better to have a lab full of people and sparse in equipment

Setting up your laboratory-equipment and reagents

- **Establish relationships with critical vendors**
- Negotiate price, accessories, delivery date remember…some instruments take time to deliver
- Assure that space is available and appropriate for a given purchase
- Think about service contracts
- Who are your neighbors? Can you share equipment/co-purchase?
- Understand the basics of the university procurement system

Getting people in your laboratory

- First, Determine your true needs
- What will be the initial focus of the laboratory?
- Who will train the members of the laboratory?
- What is the "talent pool" like?
- Don't be flattered!

Staffing is the most important aspect of starting a lab
Three categories:
• graduate students (undergraduates)
•postdoctoral researchers
• technical staff

Invite for an interview--NEVER hire someone sight-unseen

Getting people in your laboratory

Recruiting Graduate Students
• Get yourself known: give a seminar, attend retreats, help teach a graduate class
• use rotation system as way to get your laboratory known
• choose wisely
• make your expectations clearly known
• lead by example--first graduate students are often the key to success
• build slowly

Getting people in your laboratory

Recruiting Postdoctoral Fellows:
• start looking immediately
• ads **don't work**
• go to conferences/meetings to get yourself known
•would you postdoc for you? Remember that we live in the Bay Area…

Good postdoc(s) is the key to early career success

• Check references, best from people you know and trust
• Call--people often tell you the truth over the phone.
• Request 2-3 letters of recommendation

Getting people in your laboratory

Hiring technicians, lab manager, etc (your staff)
• Think hard about this…..they are real employees
• What tasks will you have them do?
• Define the job precisely.
• What are the advantages/disadvantages?
The SRA versus Junior Specialist

Undergraduates
• UC Berkeley and San Francisco State University
• Summer research programs
• Do you have the bandwidth or a lab member with the time to mentor?
• What is the appropriate project?

UC Berkely URAP program, https://urap.berkeley.edu/
work-study program https://financialaid.berkeley.edu/work-study

Getting people in your laboratory

- Structure the interview day (not too much)
- If post-doc or senior scientist: candidate should present a seminar
- Judge their scientific approach and their skill set
- Their ability to think critically, answer questions
- ❑ Why do you want to work in my lab?
- ❑ What are your career goals?
- ❑ What projects have you led?

- Their personality—how do they interact? Answer/respond to difficult questions?
- Candidate should meet with individual lab members

Offering a position in your lab

- Term of employment—what is the position?
- Salary--usually set by university--use NIH guidelines and get HR involved early
- Usually University has an official wording of an offer letter-check with your HR and get them involved early
- Visa issues for foreign fellows….usually J-1
- Contact others who have interviewed and tell them politely that you will not be offering them a position

Managing your lab: personnel

- Have clear expectations.
- Be available for your growing group and provide mentorship, especially to students.
- In addition to frequent informal interactions, have regular individual or subgroup meetings and group meetings.
- For postdocs and staff scientists, if notable performance concerns arise, consult HR immediately. Document.

Managing your lab: finances

Budgeting is critical.

Arrange regular meetings with your post-award analyst.

Ask for help in developing budget (pre-award, mentors).

Encourage your students and postdocs to apply for fellowships (there are many benefits irrespective of funding outcome).

Managing your lab: authorizations and protocols

Authorizations (Ground Rules):
BUA: Biological Use Authorization
IACUC: Animal Protocol
CSA: Controlled Substance Authorization
CUA: Chemical Use Authorization
RUA: Radioactivity Use Authorization
IRB: Institutional Review Board (protecting human subjects)

- Meet the officers personally to establish a rapport and review the submission process.
- Ask colleagues for examples for boilerplate language.
- Do it yourself the first time, then delegate.

Managing your lab: Support

Your mentors and colleagues

Diversity, Equity, and Inclusion Training
https://differencesmatter.ucsf.edu/when-and-how

The National Center for Faculty development and diversity
https://www.facultydiversity.org/home

Howard Hughes
https://www.hhmi.org/science-education/programs/making-right-moves

Publishing Your Research

@FRASER_LAB

I think a lot of old advice is very bad…

- Prioritizes the "game" and satisfying reviewers, sucking up to editors at journals, imaginary ideas about impact

My advice

- Prioritize value added to scientific community: openness, speed of sharing, and control of disclosure

  - PREPRINTS, open code, sharing resources in repositories (addgene, etc), encouraging collaboration via early disclosure (at meetings, on twitter, etc)

Writing papers

- Work with your trainees - they should be in charge of their drafts

- If they have trouble getting going, hover over and dictate, let their fingers do the work (lots of literature on pair coding! great for getting over blank page syndrome)

- Figure preparation is important and should be scripted as much as possible - make sure you review primary data going into figures

- Identify "eagle-eyed" members of the lab to proof read

- Involve collaborators early in writing process, but direct them to where they can be most helpful (google docs with paperpile for citation management is wonderful)

- Ask colleagues to read to help eliminate annoying language (priority claims) and identify blindspots/unclear reasoning.

- Post pre-prints prior to submission - gather feedback openly then submit to a journal via transfer service.

- Most journals don't care about formatting for initial submissions - embed figures for ease of reading/reviewing and don't worry about word limits until you are "almost" accepted

Determining Authorship

- Order of authorship

  - Determined by senior corresponding author

    - Now situations with multiple corresponding authors. In general this doesn't matter as much as people probably think…

  - First author drove the project

    - Now situations with multiple first authors, discuss early and recommend ordering by flip of coin or alphabetical as a lab policy. Else you really have a "first author".

  - Discuss authorship expectations with collaborators early and often (esp. as experiments develop and scope of paper shifts)

  - Manuscripts with previous mentors

    - Try to wrap up as fast as possible. Nothing says "independence" to an NIH study section like your first last author paper without previous mentors

Journals are dying slowly- let's make it go faster!

- Don't obsess about "aiming appropriately high" - get advice on the right audience for your work. Be part of the change you want to see in science (DORA values, etc)!

- But you can have your open cake and eat the "game" too: Productivity matters more for NIH funding than journals, but work that opens up new subfields is important for getting your trainees jobs (highly correlated with journal of publication)

- Writing review articles is mostly a waste of time - be very careful about accepting requests to do this

- Almost all basic science journals are accepting (some surprising ones, e.g. Nature family, even highly encouraging) of preprints on BioRxiv, ChemRxiv, MedRxiv, Arxiv - more resources:

  - https://asapbio.org/ (COI - I'm on the board)

Revisions and Feedback

- Look at reviews (both journal solicited and otherwise) as opportunities to make your paper clearer - encourage comments privately or in public on preprint page!

- React unemotionally - 24 hour rule is a good one

- Do reasonable experiments, but also be firm in limiting the scope of the paper (if you care about journals, then this is the one place where editors COULD help, but in my experience very few editors have a backbone here)

- Be kind in writing rebuttals for unreasonable or misguided or misinterpreted comments

- Always incorporate reviews when rejected in submitting to another journal

Lab Administration > _Writing/Reviewing Papers >

How to Respond to Your Paper's Reviews

Prior to composing the response, take a deep breath. The most important thing to have empathy for the reviewer. It is usually our fault that something isn't clear and most of the time, the reviewer isn't out to get us, but rather just confused. Write from the point of view of clarifying what we really mean rather than defending it as written.

It's probably a good idea to hold off on assembling this document until 24 hours after you have first read the reviews!

1. Assemble all the reviews in one google document. I favor keeping the entire text of all reviews and any editor comments, even the positive comments that don't need a response. This should be plainly formatted.

for example:

Reviewer #1:

https://ucsf.box.com/s/xkbhdgn73dg09c5gl9wng9rzjku8ced6

Reviewing papers

- Be kind to authors - give them the benefit of the doubt

- Your role is to make sure the conclusions are justified and that the results are communicated clearly, not to rewrite the paper or tell them how you would have done it

- Collaborative review at journals like eLife can be a very educational experience

Lab Administration > _Writing/Reviewing Papers >
How to Review a Paper with JF

1. Read the paper fully, making notes about what is clear and what is not.
2. Note technical issues:
   - are there experiments or analyses that need to be done (or reframed)
   - is the paper creating new methods - if so how does it compare to other methods
   - are the intellectual leaps properly justified
3. Note any stylistic issues:
   - are the figures clear or do you need to parse the legend carefully
   - spelling/grammar
   - needless acronyms
   - missing/wrong references
4. Format your first draft
   1. Write 2-3 sentences on the major goals of the paper
   2. Assess whether the paper accomplishes those goals

The Balancing Act
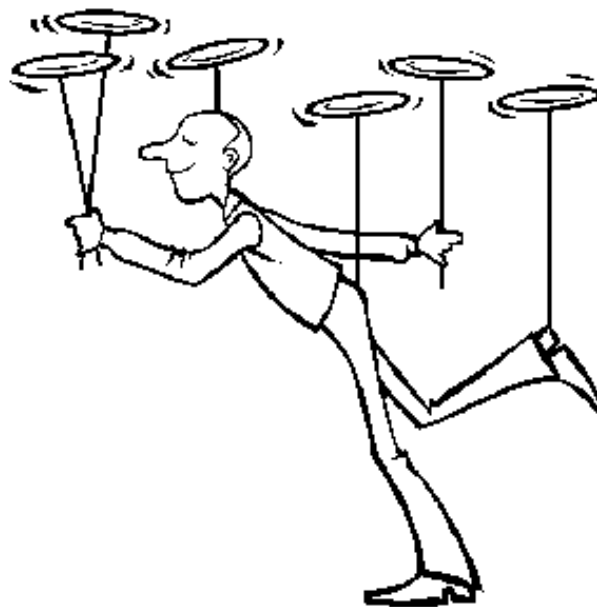
Peter W. Hunt, MD

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ZSFG**

Often need to balance:

- Your Lab's Primary Research Agenda
  - Funding
  - Papers
  - Mentoring

- Collaborative Research

- Travel to Professional Meetings / Networking

- Clinical Responsibilities

- Teaching Responsibilities

- Departmental, University, and Professional Service

- Having a Life Outside of Work!

Understand the expectations of your position

Be strategic

Communicate

Understand Expectations for Promotion

- Financial and scientific independence

- National reputation (for Associate promotion)

  - Requires establishing a clear "identity" as a researcher

- Specific expectations of your Department / Division:

  - Teaching / mentoring

  - Dpt/University Service (increases with advancement)

  - Get advice from mentor(s) on balance

  - Talk to your Division Chief/Dpt Chair (annual review)

Primary Research vs Collaboration

- Traditional advice: Focus, focus, focus!
  - Benefits: quicker time to first R01, establish identity
  - Drawbacks: all eggs in 1 basket (scientifically & financially)
- Collaboration can be very good!
  - Benefits
    - Novel scientific opportunities / alternative directions, new ideas
    - Bring in additional resources and <u>diversify</u> funding portfolio
    - Increase networking / build reputation through collaboration
  - Drawbacks
    - Spread too thin, delays in advancing 1° research agenda
    - Competing demands on time

Advice on Balancing Collaborations

- Be <u>strategic</u> by engaging in collaborations that
  - Reinforce & enhance rather than distract from your <u>identity</u>
  - Provide scientific opportunities for growth of your program
  - Network you with key leaders in your field
  - Provide you with sufficient resources to do the work AND opportunities for additional grant support
- <u>Communicate</u> proactively with colleagues
  - Discuss up front what you *and your collaborator* need
    - Resources, data, authorship expectations (including mentees)
  - Be up front about competing demands
    - We're all busy people, most people will (or should) understand
  - Set realistic expectations, communicate proactively when delayed
  - Maintain engagement: meetings to discuss data, brainstorm, etc

Travel to Meetings (or Give Seminars)

- Benefits
  - It is important to "be seen" to develop reputation
  - Networking opportunities
  - New ideas from scientific meetings or informal discussions
  - Ask questions at poster sessions, talks
  - Schedule meetings with current and potential collaborators
- Travel not always possible
  - $ to travel
  - Less supervision in lab (can mitigate with a good lab manager and communication)
  - Demands out of work may make travel impossible (family responsibilities, etc)
  - Follow up with colleagues after scientific meetings by email

Clinical Responsibilities

- Benefits
  - Get ideas from observations in patients (bi-directional translational research)
  - Develop relationships with clinical colleagues who might be able to partner with you in research (refer patients, etc).
  - Inspire young physician-scientists in training
  - Maintain professional skills
  - Some additional salary support
- Drawbacks: Time!
- Advice
  - Limit clinical work to that which <u>enhances</u> your research
  - Coordinate schedules long in advance to avoid major clinical commitments around known grant deadlines, etc.
  - Be up front with your Division Chief/Dpt chair RE your needs

Teaching

- Benefits:
    - Exposure to potential trainees
    - Networking within University
- Drawbacks: Time!
- Advice:
    - Avoid signing on to teaching commitments that require developing completely new material
    - Steer toward teaching that draws on material that you already have prepared or can easily repurpose

University and Professional Service

- University service should be limited at Assistant level
  - Focus on establishing your identity and independence
  - Possible exceptions: when the service enhances or reinforces your <u>identity</u> as a researcher
  - When promoted, seek service activities from which you can learn something useful or address issues important to you
- Study section service (local, NIH, or foundations)
  - A time commitment, but you can learn a lot about writing <u>successful grants</u> by seeing how they are evaluated by study sections.
- Reviewing papers
  - Can learn a lot by this process and develop your reputation in the field
- National organizations
  - When it synergizes with your career goals and identity
- When doing service, be a good citizen.
  - As a reviewer, treat the submitter how you would want to be treated

Maintain a Healthy Life Outside of Work

- Too much work can be unhealthy / overly consuming
  - Set limits for yourself
  - Your partner/family may help set limits for you!
- You will be more effective in work if you are happy outside of work.
- Just as you prioritize what reinforces your <u>identity</u> as a researcher, prioritize your identity as a person.
  - Make time and be present for your partner and family
- Maintain things that enrich your life outside of work
  - "Beethoven in the Attic"