How to succeed and have fun during a lab-based research year

(and tips for anyone considering an intensive research experience)

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What do you want out of a scholarly year?

• Be honest about your goals:
  – Are you contemplating pursuing a career in research?
  – Do you wonder what it really means to be a physician-scientist?
  – Do you ‘need’ a scholarly year and/or publications for a competitive residency?
  – Are you burnt out from med school?
  – Are you afraid to go into the match?

• A year is a short time, but also a very long time.
What do you want from your lab?

• Learn techniques to get around in a 21st century basic science lab?
• Publications?
• Mentorship from a practicing investigator, e.g., learn how to “think like a scientist”, ask the right questions, troubleshoot
• Total freedom and access, i.e., complete autonomy to plan your own work and guide your own project

Going into a research year with at least an outline of your goals will not only make choosing a lab and a project much easier, but it will also allow you to hit the ground running when you begin.
A research year: a brief moment in time

• A research year is a singularly unique opportunity to do science with very few constraints, distractions or obligations:
  – Don’t need to worry about funding
  – Don’t need to worry about writing grants
  – Don’t have to publish
  – You have a day job to fall back on
  – Can afford to make mistakes and learn from them

The luxury of not having these obligations is perhaps the greatest gift of a research year – take advantage of it!
Choosing a lab

- **Step 1:** Figure out the general area of basic science or clinical research that interests you
  - Try to be focused, but also be open: if you think you might be interested in leukemia research, also consider tumor immunology
  - Understand that even an extremely well-designed project that is highly focused can take unexpected turns and end at a place far away from where you originally planned. That is the amazing part of science—embrace it!
  - Planning in basic science is largely oxymoronic

- Or, skip Step 1 and proceed directly to Step 2...
Choosing a lab, cont.

- **Step 2:** What type of PI do you want?
  - Career stage: young, new and still working at the bench vs. big name, cachet
  - Management style: micromanager, controlling vs. hands-off, advisor
  - Personality: approachable vs. deified
  - Training record: where are previous students now? what do they have to say about the PI?
  - Availability—very important: how often will you meet with your PI? Do you need to make an appointment, or is there an “open door” policy?

Remember, a great PI can make the most boring project interesting, and a bad PI can torch an exciting and promising project.

Choosing a lab, cont.

- **Step 3: what type of lab environment do you want?**
  - Big vs. small lab
  - What is the primary language of communication?
  - Collaborative vs. independent: do people turn to each other when they need help?
  - What are the hours? Do lab members have flexibility in making their own schedules?
  - Do lab members socialize with each other outside of lab?
  - When are lab meetings? Saturday mornings? How are they conducted?
  - What are the opportunities to improve scientific literacy and currency, e.g., is there a standing journal club?

A good or bad lab environment can make or break a research year. Choose a lab where you’re treated like a colleague with an eye toward your future career development, not as cheap assembly-line labor.
Choosing a lab, cont.

Step 4: Will I be working with someone? An oft-forgotten question with big consequences.
- Will I be working completely independently or with a postdoc?
- If I’ll be independent, who can I turn to for advice or help?
- If I’ll be working with a postdoc, what type of experiments will I be conducting?
  - Will I be repeating a single technique for the entire year? Or will I have exposure to a wide range of experiments with an opportunity to design them?
  - How many experiments will I be conducting per week? A good project should allow you to conduct multiple experiments per week, if not daily, to become proficient in engaging the scientific method and analyzing data.
- Meet and shadow the postdoc with whom you’ll be working. If there are personality differences, glaring or subtle, consider them carefully. You’ll be spending more time with this person than anyone else during your research year.
A word on publications...

• Contrary to popular belief, publications:
  – Are not the purpose of a research year
  – Are not guaranteed in any line of research (a year of research in *no way whatsoever* entitles you to a publication)
  – Are not a commentary on your productivity during a research year
  – Should not detract from your primary focus during a research year, which is LEARNING and SCIENCE
  – Are often due to luck (“being at the right place at the right time”)

But you should still be writing!

- Even if you don’t yet have enough data for publication, your project is in its nascent stages, or most of the results you’ve collected are “negative data”, you should still be writing about your science.
  - Every few weeks, sit down and write a “running abstract” that you would send to a colleague or collaborator. This is an invaluable opportunity to review the basic questions you’re asking, interrogate old hypotheses, distill complex methodology into clear and concise explanations, re-visit old data with a fresh eye, and re-focus yourself should you have gotten side-tracked.
  - This type of writing can serve as a platform for submissions to conferences and meetings where works-in-progress are more commonly accepted.
  - Additionally, when it comes time to eventually present your data formally (manuscript, etc.), you will have a time capsule of your analyses and how your thinking changed and progressed over the course of your project.
Learning outside of the lab

- A research year, wherever you do it, provides you with the opportunity to constantly expand and refine your scientific literacy, both in your discipline and beyond.
  - All academic institutions with a biomedical focus have a plethora of seminars, lectures, journal clubs and grand rounds
  - As medical students, we frequently overlook these opportunities since our time is pre-scheduled.
  - Now is the time to take advantage of them—many of the speakers have been chosen for their teaching ability and their expertise in the field
  - Attend at least one lecture per week that is completely outside your field; you’ll be surprised how “unrelated research” can significantly inform your own project.
  - Always sit near the back and bring other reading: if you’re bored or are no longer following, either leave or do other work. Your time is valuable; take ownership of it.
Life outside the lab

- A research year is an intensive, intellectually demanding experience (perhaps even harder than medical school), but it also allows one to:
  - Take up old hobbies
  - Take up new hobbies
  - Get in shape
  - Make new friends
  - Explore a new city (if you’re moving) or the one you’ve been living in (if you’re staying put)
In Summary...

- A research year is a rare opportunity to completely and totally immerse yourself in a basic science or clinical research project.
- Research is hard and demanding, but offers a constant challenge and the addictive, dizzying “thrill of discovery.”
- Science is an incredibly social endeavor which will:
  - Introduce you to people from all over the world.
  - Hone your public speaking skills as you constantly communicate and explain your data and theories to your colleagues.
- Don’t sweat the small stuff; remember the whole reason you’re doing it—to learn!