



Starting and Maintaining Your First Laboratory

Tips, Advice and Task Checklist

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Starting and Maintaining Your First Laboratory (Tips, Advice, and Checklist)

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Forward

Congratulations! If you are reading this, it means that you are either a newly minted assistant professor, or well on your way towards becoming one. Running your lab is an exciting venture filled with success, discovery, and the opportunity to pursue novel research of your own. With such excitement comes **great responsibility**, whether in the form of mentoring graduate students, helping postdocs find jobs, publishing a steady stream of research, and not least, securing tenure at your university or research institute. In addition, the combined logistics of managing startup (and additional grant) funding, ordering supplies and setting up a functional lab, not to mention relocating and finding housing, can be very overwhelming and stressful, to the point of impeding productivity. But it doesn't have to be.



BioData (producer of [Labguru](#), the innovative lab and research management system) believe that lab productivity and researcher happiness boils down to planning, organization, and implementation. To that extent, with the input of other assistant and young professors, along with our team of writers and scientists, we have put together a thorough, easy-to-use checklist that will act as your framework as you transition into your new laboratory. Use it to plan every detail several months ahead as you wrap up your postdoc and as a handy reference all the way through the early days of your new lab, and then shift your focus on what's really important—producing your first paper as a Professor.

For your ease, we have ordered this checklist by important categories and hallmarks as you transition your current project, move, and establish your new lab.

Good luck!



Make a List, Check it Twice

From the moment you receive the news that you've received a tenure track position, begin a plan to organize, prioritize, and strategize. The easiest way to do this is to start and maintain a master list containing everything you will need to do and have to start up and run a lab. Include all decision-making in the list, including an equipment wish list, reagents for your first experiments, hiring plans, and any other salient notes.

Everything should be listed in the greatest detail possible, so take the time while you're in your post-doc position to see what the host lab is using, what you liked and what you didn't (especially if you might be using similar methodologies).

Plan how many students and researchers you will want in your first few years (don't hire more than you feel you can comfortably mentor) and plan equipment purchasing accordingly. Estimate how much lab ware each researcher uses by talking with your current lab's manager about orders and use.

Evaluate the space required for all the devices and make sure you submit this space allocation demand with your start-up finance demand.

Don't forget to list *all* materials and solutions that are required to perform experiments. This will be further explored in individual sections below.



*For illustrative purposes.
Not a real PI.
As far as we know.*



Wrapping Up Your Postdoc

Before embarking on the excitement of starting a new lab as a PI, it's important to leave your current lab and research project in good hands and with proper closure:

- Schedule meetings *well ahead* of your departure date with your advisor and new project scientists to go over any ongoing experiments, tricky protocols, answer questions, or troubleshoot hands-on.
- Properly archive ALL protocols, notes, reagents, cell lines, and other specimen, including digitally into your Labguru lab management system.
- Scan lab notebook and archive copies digitally - lab notebooks sometimes either perish or are lost, so preserve your work for future owners of your project.
- Prepare a final talk for your lab mates before you leave, both to present your finished project and what you'll be working on as a professor.



Relocation Essentials

It's time to move! Chances are very good that your new appointment is at a different university, and you will have to pack up your current apartment or house and relocate to a new one.

Have you planned ahead?

Sold or given away unwanted household essentials?

House or apartment hunted in your new city? Note that many universities will offer housing planning help (and sometimes even subsidize houses) for new professors as a part of startup package negotiations. Make *sure* to ask your hiring department for information.

Hired a reliable moving company to transport your furniture to your new location? Did you know that summer months, when many academics are settling into their surroundings, are also the busiest for moving companies? Make a reservation *well* ahead of time.

Gotten major utility information for your new abode? Electricity, Internet, phone, water, gas, electric, and other utility companies often need a few days (and sometimes weeks) for installation. Plan ahead and save the numbers.

Start an Excel spreadsheet with all of the above information, organized by dates, timeline, and other pertinent information.



Movin' on up



Grants and Startup Money

As you start out your organizational process for money management - arguably the most crucial aspect of keeping any lab afloat - use the major checkpoints outlined below:

- Assess total startup money and formulate a loose budget for your first few years of operation, leaving room for either new staff or unexpected project-related costs:
 - Recurring staff costs (i.e. monthly salaries)
 - Basic equipment and all lab technology - you can keep adding on later, but start with what the essentials of setting up the lab will cost
 - Monthly budget for reagents and other usable expenses
 - Lab subscriptions to essential journals, management and other software
- What grants will you be applying for during your postdoc and as a new professor? Start organizing sections that can easily be rewritten for different guidelines, keep due dates and deadlines on one sheet for easy tracking, and gather reference materials for a smart introduction well ahead of time.
- Stuck on ideas about which grants are right for you? Start by talking to your advisor and other professors in your field and survey what grants they applied for and begin gathering a list or ask colleagues if they'll share theirs. More often than not, your peers will not only be willing to help you, but are also the source of tremendous inspiration and ideas.



Ulysses \$ Grant



Campus and Department Contacts

Any major academic position often involves a steady stream of paperwork and other official bureaucratic processes. Having a list of major contacts both across your future campus, as well as within your department, at your fingertips can be helpful and save time when you need to reference help with setting up your lab.

Who are the major contacts on campus that you will need access to? As you go through each of the major sections in this checklist, add names to your Excel spreadsheet that correspond to a campus contact. Start with your main department office, then major academic and business contacts, and finally lab-related maintenance contacts.

Classes and Syllabi

Chances are great that you will know what class you will be teaching with plenty of time to prepare ahead of schedule. Ideally, you can organize a good portion of your class before you ever get to campus.

Choose a textbook that you'd like to use for your class and make sure the campus bookstore approves it. Likewise, if your university will be using a standard-issue textbook (i.e. for a year-long biology series), familiarize yourself with it to build lesson plans.

Outline your syllabus for the quarter or semester and start outlining at least a few weeks' worth of PowerPoint slides for each class. Write a couple of exams. The pressure of having to do additional lesson planning in the middle of grant writing and research launching can greatly affect the quality of your lectures and teaching.

Decide what you will delegate to your teaching assistant, if there is a laboratory component to your class.



Interviewing and Hiring Staff

Every PI knows that carrying out great research requires a great staff. Every PI also knows that interviews are critical for recruiting the best person for the job. It can be difficult to carry out interviews effectively, especially if you haven't done so before. So here are a couple of tips to get you started:

When interviewing, whether formally or informally, start by introducing yourself and the lab's main themes. Pose some questions to the student to see if he/she knows you or what you are doing and then elaborate more precisely. This is a good litmus test to assess if the student took the time to read about your project in your website or to talk to the rest of your lab.

Interview undergraduates (for graduate school) - Ask mainly about what fields interest the applicant, what they aspire to learn and do in their project. Try to assess their motivation and ambition to pursue challenging projects and career choices to see if the student will be a good fit in your laboratory.

Interview masters graduates - In this type of interview your goal will be to assess the way the applicant can cope with scientific conduct: working in the face of uncertainty, troubleshooting unsuccessful experiments, the way s/he analyzes new results and type of PI management that applicant had in their masters studies.

Interviewing post-doctoral fellows/lab managers - Check recommendations, expected aspirations and verify whether the applicant is choosing your lab as a last resort as it might affect their long-term employment future.



Besides graduate students and postdocs, will you be hiring a staff (admins, laboratory technicians, a vivarium specialist, etc.)? Create job listings for the university to expedite your search leaving plenty of time to interview and integrate new lab members.

Recommendations from previous PI's - these are very important though require a degree of caution and verification. While you can learn a lot about the candidate research-wise from their previous experience, PI's can give either over-rated or under-rated assessments of the applicant, which are subjectively influenced by PI's personality and the nature of the relationship between the PI and the applicant.

Regardless of your applicant's professional level *you* should set your professional and personal expectations from the future employee. Don't forget: a lab is first of all a social framework. It takes only one rotten apple to spoil the whole bunch.

Whether in hiring or any other business-related venture (and make no mistake, your new lab is a type of small business), we can miss and realize we've made mistakes. Make sure you set a two-way bailout term (usually six months is sufficient) in which each party can decide to withdraw from the PI-student relationship without repercussions. This is highly recommended because (a) you can't really predict the applicant's chemistry with you and with the rest of the new lab members and (b) the applicant can find the lab, you or the subject unfitting. It is better to lose a student than to keep an unmotivated person in the lab.



Computers , Equipment and other Toys

Start planning ahead regarding what computers and related equipment you will order for your lab (and how many), as bulk orders often receive discounts.

Don't think of just office computers. Most major lab equipment (i.e. protein purification machines, HPLCs, gel boxes, dark rooms, etc.) requires its own computer station.

Large Equipment

These are major equipment purchases that will either be one-time or very rare. Most of the equipment will be very expensive, so unless it will be crucial to your day-to-day research, ask neighboring labs or research centers if they have a piece of equipment that you might be able to use every once in a while before investing in it right from the start.

Buy equipment that you are familiar with and that you know how to operate. When considering product A over product B from different companies (carrying different price tags) it is better to pay more to include an extended warranty as current experience with manufacturer's products show that these products operate without a hiccup up to the warranty limit and not much more than that. Always try to negotiate for an extended warranty. The costs of technician visits and parts can be outrageously expensive! Sometimes it is worth investing in expensive equipment, especially if this specific equipment is expected to be heavily used as one of the core devices in the lab.

Examples include:

- Refrigerators/freezers (including cooling units for FPLC or mini-fridges to keep under a benchtop)
- Laminar flow cabinets
- Darkroom materials
- Any major purification equipment (for cold room and lab)
- Glove box
- Large centrifuge or ultracentrifuge
- Hoods and incubators for tissue culture room
- Shaker



Equipment - Small

This is less expensive equipment that is considered “standard” benchtop equipment, and may be bought in bulk to keep in each room. Take advantage of new lab promotions. Many companies offer [discounts](#) and [specials](#) on furniture, supplies and even reagent packages for professors starting their own labs.

- Small tabletop centrifuges
- Non-CO₂ incubators and water baths for molecular biology work
- Electrophoresis equipment
- Small microscopes
- Pipettes

Reagents, Chemicals and Specimens

[Project planning](#) and preparation (in conjunction with a good management system that lets you manage a specimen collection will go a long way in helping you amass your collection. Consider:

- Chemicals for buffers, agar broths, and cell growth media
- Electrophoresis and blotting
- Microscopy
- DNA and protein purification (including basic kits)
- Disposable equipment
- Protective and safety equipment



Offices and Student Areas

Finally, as you set up equipment and the lab gets up and running, are there any additional modifications that need to be made in the offices and leisurely areas?

Is the lab in a brand new building or will there need to be renovations and installation?

Furniture needs to be measured, cut and ordered weeks ahead of an installation date, so take a walk through your lab months before you move in to make any architectural decisions

Are the benches and lab space set up in an ideal manner for your research? Do you need additional benches and/or cabinet space? Pre-order so that they are waiting or completed when you are ready to begin research.

If you will be doing high-containment research, is the lab perfectly commissioned and adapted for your pathogen of choice?



Promote Yourself

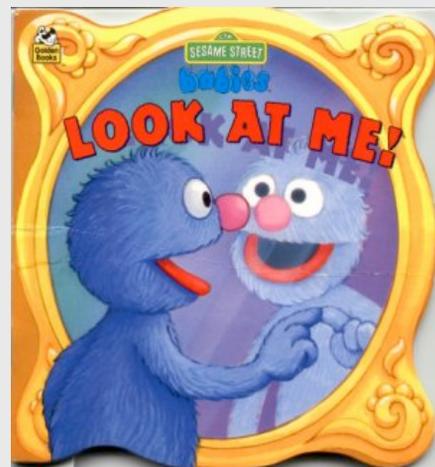
So you've moved into your lab space, ordered your equipment, begun your research project, and started teaching classes. Now what? Advertise yourself! Not only will this help you in the interview and recruitment process of your staff and future students, you will make new connections with potential collaborators and colleagues, and most importantly, raise the profile of your research around the globe. Start promoting yourself at least six months before arriving to your lab. Recruitment takes a lot of time and it helps for fellow faculty to know a bit about you when you arrive on campus.

Spread the word – When visiting your new university's campus, make sure you visit with several of your future colleagues and talk with them about your research. Introduce yourself to everyone in the administrative office of your department.

When calling for graduate students and post-docs, prepare a visually appealing color ad that promotes your research and defines the optimal candidate's knowledge or expertise. Try to be as enthusiastic as possible in your ad writing style.

Website - If you don't have one, start working on one or hire a designer to make one while finishing your postdoc. Given the global reach of the digital age, this is by far the best way to showcase your work, expertise, project aims and success. This is also a good place to advertise whether you are currently hiring since it can reach candidates from all over the world.

For examples of some great lab websites, check out these 'Lab of the Week' winners on Labguru's Facebook page at www.facebook.com/labguru.





Social Media - Harness the reach of Facebook and Twitter to engage with fellow scientists, potential students, and postdocs and show your expertise in a given field. Build a Facebook fan page or group page to showcase the lighter side of your lab, with group photos, outings, fun videos and a place where your group can share memories long after they've left your lab. Potential students want to see that a lab where they'll be spending countless hours also has a collegial environment.

Once advertised, you can expect to be approached by a few students, preferably while still in your post-doctoral lab. It's important to talk with the students (via Skype or other videoconferencing tools) and not "close" any position by email alone. You can even ask a faculty member that you trust to interview the applicant in person.

Laboratory Management Software

Lastly, and *most* importantly, don't forget to invest in top-notch laboratory management software to help maximize your lab's efficiency and productivity. Not only can you implement and monitor all of the aforementioned checklist items, your research can take off with a sprint.

Labguru's flexible system is perfectly tailored to individual lab personnel, offers [scalable pricing plans](#), including a FREE individual plan, and offers great customer support to help you start a smart, well-managed, efficient lab that produces stellar publications, and continue keeping it that way as your career burgeons. And we even have an absolutely [FREE iPad application](#), allowing you to organize, plan and implement your new lab on the go!

A system like Labguru let's you keep all aspects of your lab and research centralized and backed-up - meaning that even as students come-and-go, you'll have a detailed record of where they've stored their frozen samples, what protocols they used, and how their project fit in to your future research plans

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Appendix:

New Lab Checklist



New Lab Checklist

On behalf of the [Labguru team](#), congratulations on your new appointment as an Assistant Professor and journey to starting your own laboratory and area of research. All of your talent and hard work has paid off!

To help you plan the logistics of wrapping up your current project and starting up your laboratory, [Labguru](#) has put together this worksheet as a companion to our “Starting a New Lab” ebook. Use this flexible worksheet to set a template of key areas of focus, and then to hone in on and track progress of the organizational details of each area as you move into your new lab and start your research project.

Area of Focus	Milestone Dates	Completed?	Additional Notes
Wrapping up postdoc			
Relocation + housing			
Grants + funding			
Campus/Department Contacts			
Planning Classes			
Interviews/Hiring			
Computers and tech purchases			
Offices/Lab Architecture			
Equipment - Large-scale			
Equipment - Small-scale			
Reagents			
Specimen			
Promotion + Advertising			
LIMS/Management			http://www.labguru.com/



Wrapping Up Your PostDoc

Before embarking on the excitement of starting a new lab as a PI, it's important to leave your current lab and research project in good hands and with proper closure. Maintain close connection with colleagues and collaborators, especially if you're taking your current project into your new lab. Plan your additional tasks below:

Task	Date(s)	Completed?	Additional Notes
Exit meeting with PI			
Final group meeting(s)			
Meeting with grad student(s)			
Meeting with grad student(s)			
Meeting with grad student(s)			
Meeting with grad student(s)			
Collaborator meeting			
Laboratory Notebook finalized			
Laboratory Notebooks scanned			
Protocols digitized/stored			
Reagents documented/stored			
Cell lines documented/stored			
Specimen documented/stored			
Boxes in fridges/freezers			
Final Talk scheduled			



Moving Essentials

It's time to move! Chances are very good that your new appointment is at a different university, and you will have to pack up your current apartment or house and relocate to a new one. Scheduling the logistics of a cross-country move can be very stressful, but don't have to be, with the right amount of organization. Have you planned ahead?

Task	Date(s)	Completed?	Additional Notes
Sell unwanted household goods			
Selling current home/notice on lease			
House hunting: candidate visit			
House hunting: candidate visit			
House hunting: candidate visit			
House hunting: candidate visit			
House hunting: candidate visit			
Real estate agents in new city			
Moving companies and rates			
Utility companies in new address			



Funds Management

As you start out your organizational process for money management - arguably the most crucial aspect of keeping any lab afloat - use the table below to keep track of current funding and plan future grant applications:

Funding Source	Current or Future	Application Date	\$ Amount	Notes



Campus and Department Contacts

Any major academic position often involves a steady stream of paperwork and other official bureaucratic processes. Having a list of major contacts both across your future campus, as well as within your department, at your fingertips can be helpful and save time when you need to reference help with setting up your lab.

Campus Contact	Phone	Email	Address	Fax	Other Notes



Planning Classes and Teaching Responsibilities

Chances are great that you will know what class or classes you will be teaching with plenty of time to prepare ahead of schedule. Ideally, you can organize a good portion of your class schedule, syllabus and outline before you ever get to campus!

Task	Date(s)	Completed?	Additional Notes
Pick and order textbook			
Syllabus design			
Class schedule			
Planning individual lessons			
PowerPoint slides/outlines:			
Class 1			
Class 2			
Class 3 ...			



Interviewing and Hiring

Every PI knows that carrying out great research requires a great staff. Every PI also knows that interviews are critical for recruiting the best person for the job. It can be difficult to carry out interviews effectively, especially if you haven't done so before. Plan and keep track of all interview information, notes, and contact information in one place here:

Interviewee	Phone	Email	Address	Rank	Start Date?	Notes



Advertising and Promotion

So you've moved into your lab space, ordered your equipment, begun your research project, and started teaching classes. Now what? Advertise yourself! Not only will this help you in the interview and recruitment process of your staff and future students, you will make new connections with potential collaborators and colleagues, and most importantly, raise the profile of your research around the globe. Whatever you do, start promoting yourself at least six months before arriving to your lab. Recruitment takes a lot of time and it would be helpful for fellow faculty to know a bit about you when you arrive on campus.

Task	Date(s)	Completed?	Additional Notes
Place ad for students + staff			
Website planning			
Designer(s)			
Establish group Facebook page			
Establish professional Twitter			
Campus meeting date			



Equipment

Equipment, furniture and other technology for the lab will comprise by far your biggest initial expenditures. Large equipment purchases are major equipment purchases that will either be one-time or very rare. Small equipment is less expensive equipment that is considered “standard” benchtop equipment, and may be bought in bulk to keep in each room. Take advantage of companies that offer significant discounts on reagents and “startup kits” for new professors, such as the ones [here](#) and [here](#). Finally, as you set up equipment and the lab gets up and running, are there any additional modifications that need to be made in the offices and break areas?

Equipment	Small/ Large	Company	Discount	Order Date	Warranty?	Classification



Reagents, Specimens and Kits

Project [planning and preparation](#) (in conjunction with a good management system that lets you [manage a specimen collection](#)) will go a long way in helping you amass your collection. As you begin planning your initial projects, and the disposable, reusable supplies they will necessitate, start a list of essentials here. Then, transfer the list to your laboratory management software to help maximize your lab's efficiency and productivity. Not only can you implement and monitor all of the aforementioned checklist items, your research can take off with a sprint.

Reagent/Kit	Company	Discount?	Order Date	Classification	Notes