

## Scientific Life

### Strategies on how to maximize the moment as a junior faculty

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**Transitioning from a postdoctoral to a faculty position in science, technology, engineering, and mathematics (STEM) is a cumbersome process, and it is easy for postdocs to become lost in the sea of opportunities. Here we provide a blueprint to navigate this transition and suggestions to survive in the STEM faculty arena.**

Obtaining a faculty position can be an incredibly indelible experience. After surviving many trials by fire as a postdoctoral fellow, overcoming the hurdles of becoming a faculty member is a different beast altogether. Understanding the process early will provide time to develop negotiation strategies, obtain sufficient funds for your research program, determine the availability of your laboratory (lab) space and environment, recruit personnel, and collect ‘**data in the drawer**’ (see [Glossary](#)) prior to assuming the new position. We also discuss how to develop an action plan, and suggest options to help navigate the landscape of a new faculty position. We will focus mainly on helping new faculty traverse the academic maze of a tenure-track position and provide a blueprint for what to do before and after signing your contract.

#### Before signing the contract: get what you need

##### Negotiating start-up funds

Prior to signing the contract, the department chair will ask you for a wish list, which is the

time to negotiate how much you will receive in start-up funds, space, and equipment. Start-up funds will allow you to make informed decisions on hiring and procurement for your lab (i.e., equipment, consulting services, travel, editing services) before you obtain alternative funding sources such as grants and sponsored research funds. Before leaving your postdoc position, it is helpful to talk to your mentor about any possibility of taking supplies such as reagents, probes, and other materials to help kickstart your new lab [1,2].

To hit the ground running, you will need a detailed and justifiable wish list to help determine the total amount needed for your multi-year start-up funds. In the USA, the average STEM start-up funding package for most **research 1 universities (R1s)** is approximately \$500 000 to \$1.5 million dollars for the duration of your initial faculty appointment [2], but it depends on the necessity of the project and whether it is a **wet lab** or **dry lab**. The amount of start-up funding offered will depend on your research equipment needs and the novelty of your work. At some R1 institutions, start-up funds have an expiration date that can vary from 3 to 5 years after contract execution. If this is the case, this is the time to negotiate for indefinite access to your start-up funds and for the **unrestricted funds** to be reserved for use only by you. Aside from start-up funds, department chairs and deans – at their discretion – may earmark additional funds for you to procure **capital equipment** that will be shared by others. Signing bonuses and relocation funds should also be included in your start-up funding request. Optional requests may include forgivable mortgages for housing, especially if you have a family that you are uprooting.

Setting up a new lab space can be challenging; therefore, we recommend looking for vendors that offer lab start-up programs that will support your research. Information about purchases is often found

## Glossary

**Capital equipment:** equipment that costs over \$5000 and/or will be used for at least a year.

**Dark room:** dark environment for various laboratory (lab) procedures such as imaging with UV light or development of X-ray films.

**Data in the drawer:** data which your postdoctoral mentor agrees you can ‘take with you’ to publish your first senior-author papers.

**Dry lab:** labs which do not use chemicals and research is focused on computation.

**R01:** a National Institutes of Health (NIH) federal grant.

**Research 1 university (R1):** a university recognized by the Carnegie Classification of Institutions of Higher Education for their research activities.

**Unrestricted funds:** funding without any restriction on use or application supplied by the institution.

**Wet lab:** physical lab which includes the potential usage of biological matter and chemicals. Also referred to as an experimental lab.

in the hiring department or the institution's purchasing division. Organize a meeting with the institution's purchasing representatives who can explain the ordering process. Meet with the procurement representative to discuss contracts, compliance, cost-saving opportunities, etc.

#### View your laboratory space

During your campus visit and prior to signing the contract, view the space(s) where your lab will be located. If the space is not acceptable or workable, this is the time to negotiate for adequate space or to determine whether you can remain at your current postdoctoral position longer to allow your new institution time to make renovations, thus ensuring a smooth transition. If the lab space requires renovation, get an estimate of when this work will commence and be completed. The department chair may be able to offer temporary space if your lab will not be available for any extended amount of time, but this needs to be negotiated up front. Also, ask whether other principal investigators (PIs) will be sharing the same space and any equipment. This will affect how and when your research gets done as you will have to share time on equipment usage and cleaning after each use [2]. To ensure these needs are properly met, we recommend a set of

questions to begin asking to get a better idea of the lab space (Box 1).

Overall, make sure you have dedicated lab space to conduct your research, but also a quiet administrative space that will allow you to work on data collection, analysis, and writing. Working in the same space in which your research is proceeding and with other researchers can be distracting and eat away at your productivity and creativity [2].

### After signing the contract: welcome to academia

Congratulations and welcome! You are now a fully fledged faculty member ready to set

up your new lab and begin cutting-edge research: a myriad moving parts that never look the same. Most academic settings are like a maze with winding pathways and dead ends. It is up to you to determine your goal, what you want out of your faculty position, and – most importantly – to remain focused on that goal.

Your blueprint will be based on the type of institution and position that you have obtained. You will need do preparatory work such as reading the faculty handbook and talking to the department chairperson, other faculty, and staff at the Faculty Affairs office should any questions arise such as

paid time off, health insurance, and tenure and promotions expectations. For example, some institutions offer junior faculty mentoring committees to make sure new faculty are progressing at the appropriate pace. Understand what is needed to survive and thrive in this new environment. Do not assume that what occurs at one institution will apply at another.

If you have been hired into a tenure-track position, determine what you will need to get tenure. Do not assume that you will be asked to participate in activities that will help you get tenure. If in talking to people and reading the handbook it appears that tenure is based on the common activities of research, teaching, and service, it will be outlined in your contract. Contracts are commonly set in 3-year increments, with the possibility of renewal depending on your research accomplishments. Renewals should be done in writing at least 6 months prior to the end date of your current contract.

### Getting your research up and running

In your blueprint, prioritize setting up your lab and commencing your research before becoming involved in any other work such as committees, teaching, and service initiatives. Keep your eyes on the prize and remain focused. We suggest that you augment your research portfolio to have some ‘data in the drawer’ to acclimate in your new position, so you will quickly have a paper in the works. Data in the drawer is defined as data which your postdoctoral mentor agrees you can ‘take with you’ to publish your first senior-author papers. This is the time to pull out your data-in-the-drawer material and start writing every day such that you get into a habit of writing in your new environment. Writing every day will help you stay research-focused and will generate continued enthusiasm for your research. Researchers have found that when new faculty were placed into two groups: one group that wrote only 15 min a day and the other group that wrote in large blocks of time,

#### Box 1. Preparing to enter the academic maze

Figure 1 depicts a young faculty standing before the academic maze. She has viewed her lab space and negotiated for needed renovations, which are under construction, before starting her new position and entering the maze that will lead to academic success and tenure.

#### Example questions to ask during and after viewing lab space

- How much space will equipment require, and will the space accommodate the equipment I have or need?
- Will I have to share lab space with others?
- Will there be allocated funds for renovations for the lab space?
- Does the square foot measurement of the lab space include the office space?
- Is there a break room for a common eating area, or will that be included in the space?
- Is it an open lab concept or is it a closed lab space?
- Has the hood and other critical machinery in the lab been recently serviced?
- Is there a common place for a special need (e.g., a **dark room** or tissue culture hoods), or are renovations required?
- How many other labs are in its vicinity, and what research are they conducting?
- Have all gas pipes, water spickets, and air pipes been serviced?
- Do all electrical outlets work, and are there existing outlets for varied voltage for specific equipment that requires it?
- How many outlets are already in the lab, and what is the capacity to expand this number?
- Do I have the option of adding whiteboards to the lab?
- How many card accesses for the lab exist in the department?
- Does the office already come with furniture?
- Are there any labs that are going to close, and if so, is it possible to utilize their closings to outfit your upcoming lab?
- Where will the animals be housed, and what animal procedures are allowed in the lab?
- What facilities are within the department to house model animals?
- Is the under-sink area visible to check for flooding damage?
- What are the maintenance requests for the area across the previous 2 years?
- How often is lab waste picked up?
- How often are inspections carried out?
- Is there a dedicated area within the department for certain chemicals?
- When will the renovations be made and will departmental money be used to make those renovations?
- What shared equipment is available and where is it housed?
- Who is responsible for calling maintenance and the building engineers if there are problems?
- How far will your lab be from the cold room, dry ice, and liquid nitrogen tank storage, autoclaves?
- Does the university maintain stockrooms where supplies can be purchased?
- What is the procedure for hazardous waste disposal?
- How far is your lab and office from the operations of the department (mail room, xerox machine, departmental printers, accountants, departmental staff, and seminar rooms)?

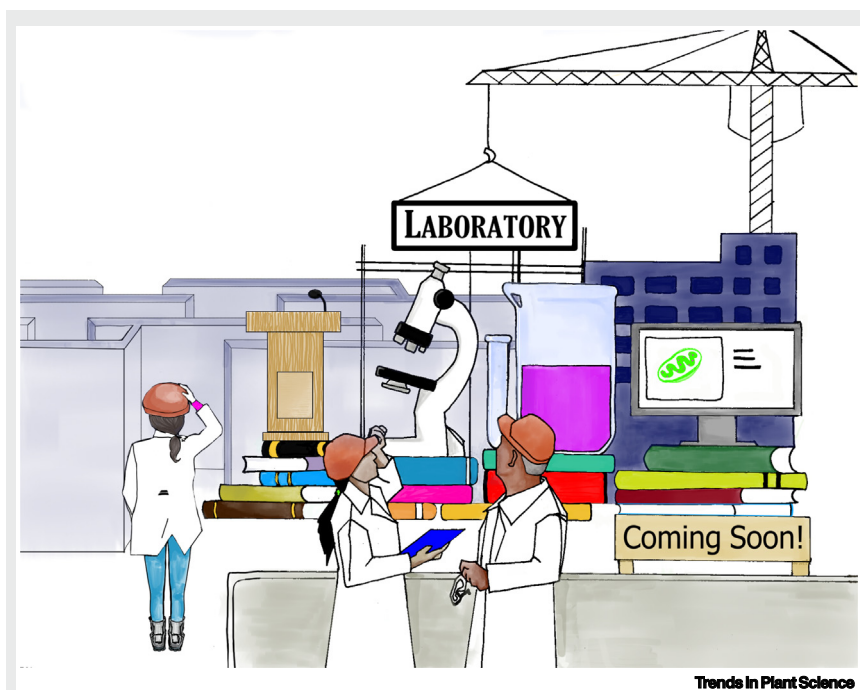


Figure 1. Preparing to enter the academic maze.

the group that spent 15 min writing per day was more productive at the end of the year [3]. Writing lends itself to publishing, which helps to get tenure.

### Financial acumen and hiring staff

An overlooked personal responsibility of faculty is to constantly review your professional financial portfolio. It is imperative to meet monthly with the finance staff in your department and understand the institutional fiscal processes. Understand what your institution's fringe and indirect cost rates are and how they are applied in budgets. Obtain monthly balance statements to review your financial portfolio use rate that details your expenses, encumbrances, and available balance. Take advantage of training opportunities that your institution may offer to become well versed in this important business aspect of your faculty position.

Another step in getting your research up and running is to hire qualified and

valuable staff as soon as possible. They can assist with ordering materials, tracking down shipments, and keeping an inventory of your lab. When hiring staff, new PIs need to ensure that they recruit and hire the correct individuals for their labs, which is just as important as your timeline to fully staff your lab. During the interview process, the PI can ask questions to find an incumbent's fit and willingness to work. The PI can ask the candidate to perform basic lab procedures to ascertain their level of competence. A PI may also have to recruit locally in advance to acquire individuals who have the expertise that closely matches the job requirements and possibly preferences. Additionally, the PI should ask for three professional letters of recommendation and conduct follow-up calls with the candidate's PIs and previous working colleagues to make sure they had a good working relationship. The PI can also ask for a personal statement or letter of intent as part of the application process. Both will highlight the

candidate's research lab experience. During the actual interview, a PI can inquire about mentoring styles, how they work best when being mentored, and whether your mentoring style will work well with their learning styles. This will reveal whether the candidate is a good fit and highlights their willingness to learn. A PI may also want to find out if the individual's expectations of career pathways coincide with your future research goals, that is, whether they plan to teach or to go into industry.

While setting up your lab and building your research program, this is a key time to train and foster the development of undergraduates and graduate students by giving them research projects that will expand your data in the drawer. Undergraduates and graduate students are furthermore typically eager to learn, especially if your interests align with theirs. They can continue to explore and be more cost-efficient to employ than more senior positions.

Please remember: too many students, or the wrong student, can be a drain on your time. Balance is important. Establish a clear set of goals and expectations that you articulate to your staff as a way to establish timelines and responsibilities for individual tasks, and to create deliverables. Whether you are the primary or secondary mentor of undergraduates, one must be patient. Remember that although undergraduates can be a positive asset to a lab, you must take the time and utilize patience to train them and appreciate their work in a professional and friendly manner. Furthermore, consider writing mission, teaching, and diversity, equity, and inclusion (DEI) statements, and a mentoring contract to further advance your niche and brand [4], while giving your lab members clear expectations.

### Teaching plan

Teaching is typically an important part of being a faculty member, and setting up a new course may seem tempting. However,

Table 1. Suggested and critical hacks during the faculty transition

Critical hacks	
Prior to executing contract	<ul style="list-style-type: none"> <li>Negotiate start-up funds to support salaries and purchase equipment for a precise number of years</li> <li>Anticipate possible problems that you may encounter during the first year and create potential solutions for each snag</li> <li>View your lab space and determine whether it is adequate</li> <li>Consider requesting renovation funds for your lab space</li> <li>Research potential discounts or lab set up promotions and meet with account representatives so they can provide you with 'inside information' such as upcoming discounts or promotions</li> </ul>
Understanding how to get funding and tenure	<ul style="list-style-type: none"> <li>Publishing is a critical component to being a successful and funded faculty member. This goes without saying, and publishing and funding are heavily evaluated by your department chair and the Tenure and Promotions Committee members</li> <li>Based upon the type of faculty position you are pursuing, the rules for tenure may be different. For example, at a medical college or R1 intensive institution, to get tenure, on average one must have two <b>R01</b> or equivalent grants. However, when one is discussing what is required for tenure, they may also consider the status of multi-PI grants, and check with their institution whether they count toward tenure</li> <li>One should check whether senior-author papers which include your prior PI as co-senior author count for tenure</li> <li>Each department has a different number of papers required for the tenure process, so you should ask the chair how many papers must be published and how many of those manuscripts must be published in field-specific or high-impact (10+) journals</li> <li>One may ask how many students or postdocs are required to have been trained under them in order to get tenure</li> <li>Ask whether or not teaching, mentoring, and service (i.e., diversity, equity, and inclusion efforts) are weighted equally when going up for tenure</li> </ul>
After signing the contract	<ul style="list-style-type: none"> <li>Review your faculty handbook and channel questions to your department chairperson and Faculty Affairs</li> <li>Find out what components comprise tenureship and how these categories are weighted</li> <li>Start writing every day so that you get into habit of writing in your new environment</li> <li>Publish data in high-impact journals</li> <li>Continually review your financial portfolio and understand institutional business functions</li> <li>Hire staff as soon as possible</li> <li>Create a mission for your lab that will advance your niche and brand</li> <li>Reach out for help whenever you are struggling or hit a roadblock</li> <li>Minority faculty, who traditionally are asked to serve on a lion's share of committees, must strive to stay research-focused and be willing to fight the urge to agree to serving on committees unless it is clear that such service will count toward tenure. Usually this is not the case. You do not have to experience John Henryism to make the point that you belong [8]</li> </ul>
Building a team	<ul style="list-style-type: none"> <li>When selecting individuals, at the time that you know you will begin interviewing, it is important to look for people who may want to do a second postdoc at the university you will be going to</li> <li>Look for undergraduates who want to be technicians for a couple years prior to medical school. In this way, these can be mutually beneficial relationships and you can find individuals who can start in your lab early</li> <li>Be aware of labs that are closing down, such as PIs retiring, and recruit senior personnel, such as staff scientists, from those labs</li> <li>Staff scientists may also be recruited from other places if they are looking to not pursue a PI position or desire to stick with the research side of labs</li> <li>If you are not able to find anybody at your new or prior institutions, one may use the power of social media to find individuals. For example, announcing on social media your new position, and the positions you are hiring for, can allow you to get your message out more broadly</li> </ul>

remember it is a very time-consuming task that in the end may count less than your research, depending on your institution and the position for which you were hired [3,5]. Talk to other faculty members before signing your contract to see what is included in their teaching loads. After all, you want to be a good team player in terms of teaching, but make sure you are not overwhelmed with teaching in the beginning [3,5].

### Service

Getting on the 'right' committees – such as budgeting, space, and equipment, and networking up – are reasons to join a committee. This strategy will also allow you to get the inside scoop of the institution's key players and priorities. However, maintain a healthy balance of your time in this effort. Joining a few committees that permit you to make a difference is feasible, but do not become consumed with this area of your faculty obligation. Learning to say 'no' [6] and turning down opportunities that could cause you to burnout and derail you from your goals is vital [3,6,7]. Make sure that you include your mentors in your service plans to help you avoid burnout [7,8].

### Concluding remarks

The suggestions discussed in this paper (Table 1) are intended to help postdocs transition to new faculty and understand the faculty process early in their careers. These strategies include developing a blueprint to help navigate negotiation strategies, obtaining and auditing funds for your research program, determining the adequacy of your lab space and environment, recruiting personnel, and collecting data in the drawer. All of these tips will help ensure a smooth transition into what can be the most important and exciting transition in your career. Incorporating these suggestions will also put you on a trajectory for success in your faculty position while keeping you focused and on track for your future professional endeavors.

## Data availability

All data and materials are available in the main text.

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## Declaration of interests

The authors declare that they have no competing interests.

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