Successful Strategies for an Effective Job Talk:

made for science postdoctoral educators and researchers in the process of job searches

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Introduction

The job talk--a moment of gravitas, is a revered process that postdoctoral scientists eagerly await at the end of their training. However, preparing this part of the job search can feel like a mysterious process. So how does a seasoned postdoctoral scholar learn how to give a job talk that will result in being hired for a faculty position? The goal of this document is to begin to demystify questions you may have about preparing for preparing this important part of the hiring process.

This document also provides some optional reading that will help answer additional questions. See the end of the document for references, including a book that was first published in 1997, but still holds some wonderful granular descriptions for not only a successful job talk, but a long-term career in academia. This book is called *"Tomorrow's Professor"* by Richard M. Reis. The book can provide insights in research, professional responsibility, teaching philosophy, and questions to consider and ask before taking on a faculty position.

Before we discuss the components of an effective job talk, it is important to do some homework. First, think about career expectations from the future institution where you would like to work. Your working climate will be an important component of tailoring your science journey, your intellectual and personal growth, and your career. The process of creating a job talk that will lead to employment is based on three components: **1) the criteria, 2) the prep work, and 3) the talk.** You are welcome to start reading any section of this document. However, reading them in order will help garner the best result.

1. The criteria

"What is required to land a coveted position among other exceptional colleagues?", you may ask. The job search in academia first requires documents respective of the institution, department, and field. The process of creating requested documents for each job application will require tailored changes to several of your pre-written works. However, the perspectives that should be considered include deep thought about the purpose for requesting them and what these documents demonstrate about the candidate. In a relatively non-bias way, the documents display criteria the department hopes to find in their next colleague. The criteria exist to help members of the department assess which candidates will make the best fit for the future the position. The ideal candidate can foster collaborative projects that will impart salient contributions to the field and that will withstand the test of time. The general and common criteria assessed from requested documents in applications include the following.

In brief, is the candidate:

1) Effective?
2) Rigorous?

3) A visionary?
4) Creative?
5) Collegial?
6) A good fit?
7) Proposing and demonstrating a fundable research program?
8) Effective teacher and mentor?

Effectivity: This criterion assesses whether the candidate has been productive with publications, and within their work, has conducted the most impactful experiments to answer their hypotheses directly.

Rigor: This criterion evaluates the quality of investigation the candidate has demonstrated in their work. Did the candidate critically examine their experiments from several angles to eliminate biological/scientific possibilities, explanations that can lead to the same phenotypic outcome?

Vision: This criterion examines whether the candidate's research plan for bench work or education/pedagogies is likely to produce important scientific insights in 5-10 years.

***Creativity*:** This criterion assesses whether the candidate has thought of alternate routes of investigation. Can the candidate pivot when options become limited or require a new idea to launch a research or educational project.

Collegiality: Institutions aim to build peaceful, productive, and inspiring working environments; anything that disrupts constructive progress is not a desired attribute.

A good fit: The "fit" aspect includes whether the candidate is in a field of science within the scope of the departmental focus/themes.

Fundable Research Program: Institutions and departments look for candidates that will or have raised funds to support their research program. Those that have raised funds are at an advantage, but it's not the end-all-be-all of the selection process. This criterion can be flexible with respect to the requirements of the institution and department.

Effective teacher/mentor: The bread and butter of academia are the student body, whether undergraduate or graduate. Institutions and departments search for candidates with the right temperament, charisma, and patience that will not only recruit the best student scholars, but also employees. They also recruit faculty that will instill foundational scientific concepts in future scientists, capable of making breakthroughs from seeds left behind by the composite body of literature the scientific community provided.

The selection: The process of getting selected in the latter half of the application is exclusive and beyond the control of the applicant. The composition of documents takes a long time if an applicant prepares them with deep perspectives and thoughtful considerations of their current and future academic climate. These documents should show whether the applicant can maintain and improve

upon the academic responsibilities of a tenured track faculty. This is a daunting process, but worth the effort for future consideration.

However, once past the screening process, and invited for a job talk, the applicant finally can showcase their talents, their unique ideas that will make an important contribution to the institution, department, science field, and most importantly the student body--our future scientists in the making. The job talk is the pinnacle of opportunities to demonstrate the candidate's potential; it's their moment to shine. However, how does a candidate begin the process of preparing for a job talk?

There is a wealth of insightful literature that describes the process of generating an effective job talk, I recommend starting with these two articles, Sura et al., 2019 and Naegle, 2021 [1, 2]. The best way to get started is to investigate what type of science research or educational focus most interests you. This process of brainstorming is the first part of what we call "prep work".

2. The prep work

The prep work to giving a successful job talk begins with your passion. What kind of research do you want to do independently? How does your research story seed/nucleate a new branch of science or education? And after being hired to your future position, what does that entail? What is the percentage of teaching vs. research? What are your professional obligations? Considering these aspects can help you craft the appropriate slide deck for your job interview.

The science story: However, the most important prep work for a successful and effective job talk is crafting the science story. It's easier "read" than done. There is a lot of preparation that goes into creating a great talk. First you must learn how to tell a story, captivate your audience, and then maintain their interest with your proposed future work. Weaving these elements into your science story takes a lot of time. The foundation should be your graduate and/or postdoctoral, are the foundation for your talk. Most importantly, have you crafted your slides into a story?

How scientists tell stories includes a process of questions and answers embedded in their slides. As you've heard and practiced, the work proposed must be rooted in scientific inquiry, or hypothesis driven research. You may be thinking, "Sure, however, how does a seasoned postdoctoral scholar begin to construct a compelling story?" For the most part, you may already have the initial slides of your talk, that set the stage, but the end of your talk must demonstrate vision. The visionary element cements a compelling story, leaving the audience wanting more, which can only be quelled if they hire you. To create this atmosphere while presenting, it is crucial to be excited about your past, current and future work. If not, then the audience will feel it. If so, you will execute a successful job talk.

The audience: Crafting a compelling ending to a talk means successfully fleshing out prospects of their future work before completing and delivering their talk. The candidate also took into consideration the makeup of their audience. In the room, young scientists and professionals, in and outside your field, will attend. Both should be captivated by your talk. The truth is that young viewers require more background and more visual cues to help them understand your topic. Professionals

outside your field do, too. A slide initially too busy, is off putting; slowly introducing key pieces of your slide, as if you were building a figure, make complex topics or figures more palatable. Test your presentation by giving a lab meeting, another lab meeting with a neighboring lab outside your field, and then present in a seminar. All these presentations of the edited slide deck will help the candidate distill what works for different audiences, and what doesn't.

The stage presence: These rehearsed presentations also recruit a diversity of questions from different audiences that the candidate can prepare to answer and anticipate during their job talk in a new environment. If the candidate does not test these different environments, then the outcome of the presentation will be unexpected. The confidence-building that arises from multiple presentations contributes to the candidate's stage presence.

Your talk must demonstrate your potential for growth and creativity in your science and stimulate curiosity and interest amongst your colleagues. Your talk must also show fundability of your proposed future work.

The future work: The preparation for your future work in a job includes all the data you generated as a scholar (published and unpublished), and data available in literature. Both will provide foundational and compelling evidence for your future work. Once you compile ideas of what your future work will entail, the next step is to make them granular and tangible. Ask yourself if your proposed ideas are each big enough for research projects that can result in publications for 5-10 years? Maybe, no, not yet? Then polish, modify, or reconstruct them. Make your ideas granular; flesh them out and ask yourself, "are these ideas fundable?" The most effective way to identify if your research is fundable is to attempt to get them funded.

The funding: Before stepping into the room for the talk, you need to have thought and distilled grant funding mechanisms that will or have funded your research. It's important to have considered more than three funding mechanisms. Acquiring funding is a feat and a huge learning process. The best way to learn is to try, fail, and eventually succeed. And the best grant writers often experience this turnover. Just do it! Intramural funding within your parent or future institution, extramural funding from NIH, NSF, and the military are not enough funding mechanisms to consider. You should apply to all of them, if possible, at some given time. However, investigate foundations and private funding mechanism that can also support your research. It only takes one grant to help a candidate get started, but the point is to prepare to showcase other avenues of research funding if a candidate is not initially successful with others. Applying for grants while you are a postdoctoral candidate can provide a huge advantage, however, if the opportunity to apply for funding during a postdoctoral stage is no longer possible, that's okay. Begin the process of applying to funding mechanisms to learn the hurdles and limitations that must be overcome to get funding.

After you have completed your prep work, now you can construct or edit your slide deck.

3. <u>The talk, a slide deck in action</u>

There are several successful mechanisms utilized by professionals that showcase the talents of the applicant. One way is the job talk: a slide deck showcasing a portfolio of critically examined

scientific work, composed of research vignettes weaved into a compelling story. This seemingly mythical presentation can be achieved.

A good slide deck is rooted in hypothesis-driven research. A hypothesis-driven talk includes an overarching hypothesis, and several mini hypotheses that are converted into questions. The questions are "tested" and answered throughout your talk. This style guides the audience through your journey of discovery. A sign of a good talk is the interest of the audience demonstrated by passionate inquiry during or at the end of your performance. How is a hypothesis driven talk achieved?

Constructing a hypothesis-driven slide deck

The title: the first slide of your deck describes in one phrase or sentence the overarching result or question your work will demonstrate in your talk.

Setting the stage for the story (background): if your work is medically related or translational, the classic way to commence a talk is to introduce the disease and its anatomy, what is known, what is not, and how the work in your slides, at least in part, will answer aspects of longstanding questions of the disease and in the scientific field. However, if the work is rooted in fundamental aspects of biology, then construct the introduction to describe a phenomenon, a process, or a tissue. Next identify the gaps in knowledge and potential prospects of filling in those gaps. Those gaps are your questions.

***The question/s (hypothesis-driven research)*:** Usually, one to three questions, carefully positioned on a slide, are presented. This is your initial inquiry slide. However, in your presentation, each question is the introduction to your scientific vignette. One question is converted into a hypothesis and then investigated in the following slides. The following slides describe the process of conducting your scientific investigation; this includes your experimental design and your data. Your generated data may present several possible explanations, which can be reconstructed as novel, mini hypotheses. These hypotheses are then tested in your next slides, one at time, to slowly distill and clarify mechanisms of your biological work in research or education. Then the presenter gives a quick summary of the results and introduces novel ideas of prospects the work will uncover. The presenter then pivots to the next overarching question. This next question is listed as "second" on the list of the initial inquiries. As you surmised, your collective scientific vignettes form the core of your science story.

***The future work*:** The grand plan of the crafted science story is to generate compelling evidence that supports the future work introduced by the candidate. What are some questions that can inspire future advances in bench research or education? One question includes how does the proposed work begin to chip away at other longstanding questions in the field? What is the ultimate goal or vision of your work? Your goals may include generating targeted therapies to treat a disease, regenerating tissue, designing new technologies, or in education, uncovering the best educational pedagogies, learning practices and environments. The answer to these questions lies in the prep work prior to completing the job talk. See the section titled "The prep work".

Thanking your mentors, contributors, model systems, and funding: Thank everyone you can at the end of your presentation. Successful science and education are born from community of scientists and so are trainees.

Questions: Complement and thank the scientist for their question; it's a form of insight in the field that can be easily overlooked and underappreciated. Keep calm, cool, collected, and non-defensive. Your professionalism affects your chances of landing your position.

Inhale/Exhale: Congratulate yourself for embarking on another learning adventure that will make you a better speaker, educator, scientist, and colleague.

The chalk talk

Scientists are all hopeful for the opportunity to be asked back to give a chalk talk. However, some institutions will request chalk talks the same day of your slide presentation, or the next day. For those of you interested in learning how to give a chalk talk, it's best that someone who has been successful show you how they constructed theirs. Attempt to see several. There are different presentation styles, many of which are acceptable, and appropriate for you. The chalk talk is based on your prep work, work not in vain. The prep work helps you develop ideas for research grants that are fleshed out and finally are put into play for a successful final step in your interview. A primer for an effective chalk talk is provided here [3].

Good luck, fellow scientists, and join us again at **Black In Anatomy** for any future questions: https://www.blackinanatomy.org/

References:

1. Naegle, K.M., *Ten simple rules for effective presentation slides*. PLoS Comput Biol, 2021. **17**(12): p. e1009554.
2. Sura, S.A., et al., *Ten simple rules for giving an effective academic job talk*. PLoS Comput Biol, 2019. **15**(7): p. e1007163.
3. Sehdev, M. and J.B. Richards, *A Primer for Developing Chalk Talks*. ATS Sch, 2023. **4**(3): p. 265-281.