

Commentary

Research vision workshopping: Peer mentoring to support the transition to independence

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<https://doi.org/10.1016/j.cell.2023.03.002>

The transition to independence requires shared enthusiasm for one's research goals from broad audiences. In this commentary, we describe the use of "research vision workshopping" within peer mentoring networks. We contend that this approach is broadly useful for the development and refinement of research visions for the academic job search.

Conveying short- and long-term research goals to wide audiences through a compelling research vision is a necessary step for postdoctoral scholars pursuing faculty positions. We define a research vision as the core focus of a scientist's endeavors. This vision functions as a compass for the prioritization of their work's direction, scope, and its potential impact over the next 5–10 years. A well-crafted research vision is innovative and comprehensible to broad audiences while maintaining sufficient detail for subject matter experts. Through our experiences transitioning to independence and our observations over the past two years as members of the [Leading Edge \(LE\) Fellow program](#) peer mentoring network ([Box 1](#)), we have observed that many postdoctoral fellows find developing and delivering an effective research vision to be challenging. Previous work has demonstrated that postdoctoral scholars may benefit from formalized training on expectations for the academic job search.¹ To fill this training gap, we developed tailored programming within our LE network, which we term "research vision workshopping" (RVW), where LE Fellows brainstorm and iterate on their research vision and delivery methods. By design, our workshop and the LE network's interdisciplinary make-up provide LE Fellows with an op-

portunity to practice the communication of research interests to an audience with diverse expertise, a skill required for the academic job search and development of a grant proposal. We argue that broad implementation of similar workshop structures in postdoctoral training could better prepare researchers for the academic job search and transition to independence.

Peer feedback through RVW

LE Fellows are women and non-binary scientists pursuing life sciences research who are selected for the program in a yearly competition. The LE program provides access to year-round career development support and peer mentoring, a form of mentoring between individuals at similar career stages with the overall goal of learning from each other.² LE Fellows present a short talk at the LE Annual Symposium, which demands concise delivery of scientific identity and research goals to the LE Fellows network of peer scientists with diverse specialties. The inaugural LE cohort used these presentations as the starting point for constructing research visions for the academic job search. Throughout the job cycle, LE Fellows informally critiqued each other's peer research statements, seminars, and chalk talks (a unique component of the

academic job search where the candidate is expected to outline their research vision and how they will achieve their goals). This iterative peer feedback facilitated the development of precise descriptions of the LE Fellows' scientific identity and visual tools that quickly and clearly conveyed their future laboratories' research goals. For subsequent cohorts, we built programming to formalize these informal peer mentoring strategies that aided in the inaugural LE cohort's success on the academic job market. The annual programming for LE Fellows now includes RVW prior to the start of the academic job market in late summer to (1) enable LE Fellows to present their research visions to diverse audiences and (2) create a space to receive critical feedback. RVW is a useful, generalizable tool that enables LE Fellows to formally receive diverse feedback on their overarching research plan, as well as the visual elements used to deliver it, from LE Fellows that are peers or have recently transitioned to independence.

Here, we detail our experience using peer mentoring to provide feedback for the preparation and delivery of a research vision. We highlight some of the key expectations for preparing a research vision for the academic job search ([Figure 1A](#)). We next describe the specific details of



Box 1. Leading Edge Symposium

The **Leading Edge Symposium** is an initiative to address the under-representation of women and non-binary people among faculty in the biomedical sciences.^{14,15} The program, which launched in 2019, selects between 30 and 50 women and non-binary postdocs each year as Leading Edge (LE) Symposium Fellows and provides direct training and a strong community to support their postdoctoral trajectories and their postdoc-to-faculty transition. In partnership with the Howard Hughes Medical Institute's Janelia Research Campus, the LE Fellows present their work at an annual symposium, which has occurred virtually for the past 3 years due to the COVID-19 pandemic. In addition, the program provides year-round training and information on topics that would otherwise often be learned by osmosis or trial and error, including how to give a chalk talk and apply for grants at the postdoc and faculty levels. Both panel discussions and informal group communication also provide opportunities for learning and troubleshooting on topics ranging from parenthood to navigating multiple marginalized identities to negotiating job offers. In addition to top-down advice and feedback from established investigators, a critical component of the program is peer mentoring, and both past and current LE Fellows work together to workshop their materials for their job search and the delivery of their laboratory's visions as part of the yearly programming. The sense of belonging and shared experiences among the LE Fellows builds a trusted support network during the transition to independence.

the LE approach to RVW, including the format, feedback structure, audience, and timing (Figure 1B), which we expect can be replicated in other peer group settings. Lastly, we describe the nature of the feedback one should seek, discuss the importance of iterative incorporation of this feedback, and suggest the development of similar programs at the institutional level. The approach we outline here for effective research vision communication applies beyond the academic job search. Researchers will continually revisit the methods, content, and form of communication we describe in grant applications and other scientific activities after establishing their own research group, underscoring the importance of developing this skillset early.

Expectations for a research vision for the academic job search

The research vision is one of the primary components that a faculty search committee evaluates for departmental fit and potential success as an independent investigator. The most effective research visions are built on insights derived from accumulated interests and technical expertise obtained during training. These overarching goals should carve out an innovative direction for the researcher that, crucially, shows deviation from the work of previous mentors.³ To compete for an independent academic research position, an applicant must convey their research vision via multiple different communication methods—written during the initial application and orally throughout the interview process—to an academic search committee and possible future colleagues and trainees.⁴ Logistically, the written portion is comprised of the cover letter and the research plan.

The cover letter serves as a more succinct, but tailored, letter to the search committee that states exactly why the applicant thinks they are a good fit for the institution. In the research plan, the applicant describes their (1) scientific identity, (2) past research achievements, (3) short-term and long-term research goals, and (4) outlook for the future and the impact of their proposed vision. An executive summary figure provides a valuable medium to encapsulate one's scientific identity and vision in the research plan, highlighting their uniqueness and major future directions. Early career researchers can use such visuals and summaries beyond the faculty search—for example, in early career development awards, grant applications, recruitment tools, and for their lab website. In addition, an applicant will have to discuss their research orally during the screening interview, seminar, and chalk talk, and even provide a succinct “elevator pitch” during one-on-ones with faculty who may not have been able to attend the seminar (Figure 1A). Next, we will describe how RVW supports LE Fellows in the development of a research vision and the visual elements required to deliver it.

Preparation and format of the workshop

RVW takes place throughout September to help the LE Fellows formulate their ideas and devise an executive summary figure ahead of most application deadlines. These workshops have made use of virtual mentoring because LE members span international institutions⁵; however, this format could be easily adapted to in-person mentoring and at varying scales. Preparations for the workshop begin during the summer by identifying facilitators

that have recently secured an independent position or have attended RVW previously (Figure 1B). RVW involves matching experienced LE Fellows with less experienced ones. We term them “facilitators” and “presenters,” respectively. Presenters volunteer to workshop their research vision prior to their academic job search. Although most presenters are actively preparing for the job search, occasionally, more junior LE Fellows have participated. This allows for research vision preparation early in their training or in preparation for other complementary efforts, such as career development award applications. Importantly, other LE Fellows from various backgrounds and training stages are encouraged to attend as spectators to provide feedback (hereafter, “attendees”).

Creating an innovative research vision can be overwhelming; therefore, prior to RVW, we request that each volunteer prepares answers to the following questions to aid in conceiving their research vision, as well as providing attendees with information to help discover the unique features of their research. These questions include (1) what is the knowledge gap I hope to fill or the problem I aim to solve? (2) Why is it important to the field that this problem is solved? (3) Why am I the best person to answer this question? (4) How is my work distinct from my research advisor or other researchers in my topical area? (5) Which model systems or technologies will I use or adapt in my research program (Figure 1A)?

To initiate the small group workshop, the facilitators begin by detailing their unique research niche using the above questions and the visual elements (and executive summaries) they used during their job searches as an example. These

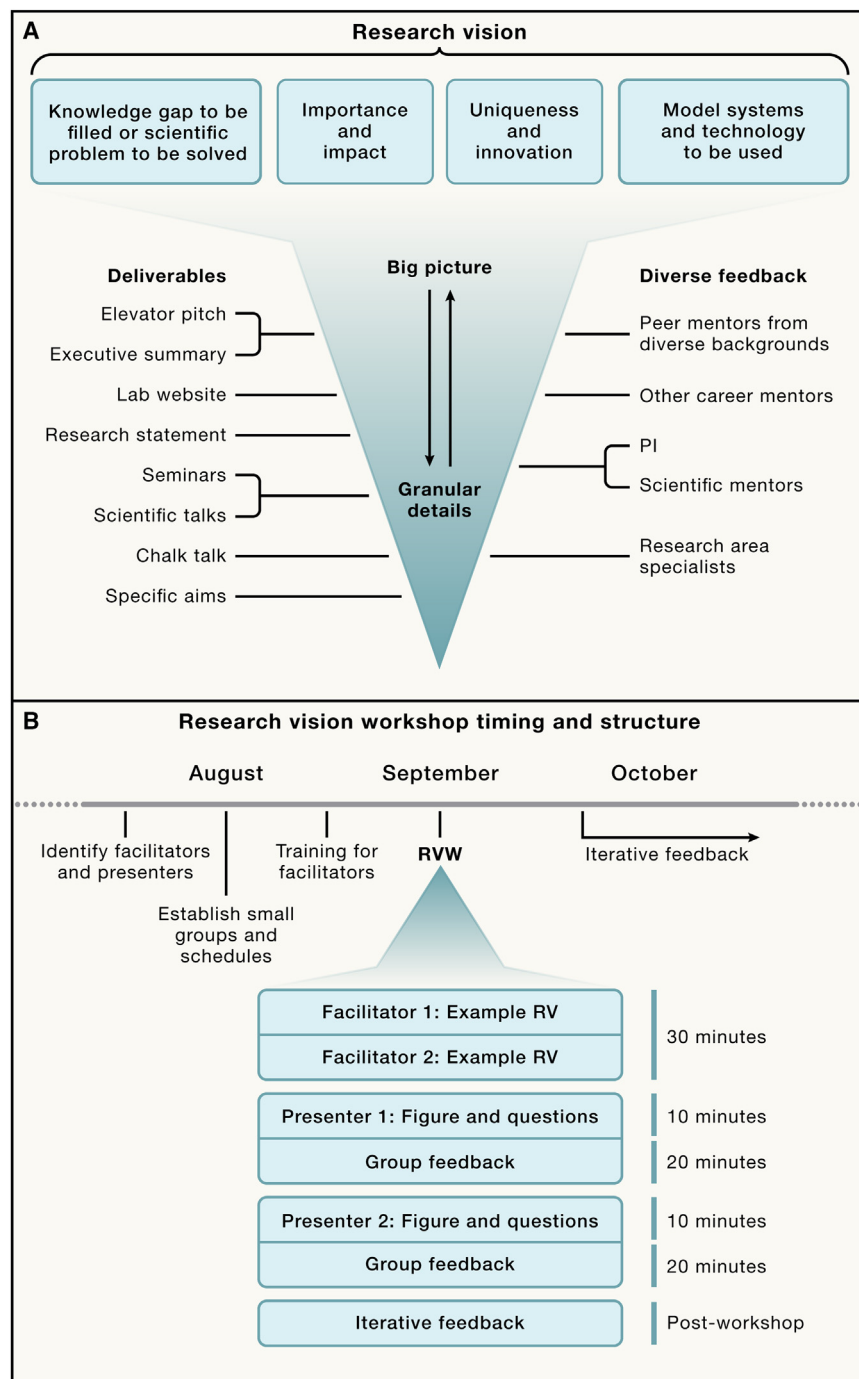


Figure 1. Research vision and workshop structure

(A) Key contextual elements and considerations for stages in the development and iteration of a research vision during and beyond the transition to independence. Various deliverables contain different levels of specificity (left) that should be considered when selecting individuals to provide feedback (right) on a research vision.

(B) Suggested timing and format of RVW; facilitators should first present their successful research visions followed by a 30-min discussion of the presenters' prepared research visions (RVs) that address the key concepts shown in (A) and an executive summary figure.

illustrations are most effective when the facilitators share the process they went through to construct their research vision, including highlighting strategies they ultimately found effective or ineffective. We believe that it is critical to have at least one facilitator who recently underwent the faculty search to relay evolving expectations (e.g., virtual components that became more popular due to social distancing during the COVID-19 pandemic⁶). Following facilitator examples, two presenters then workshop their unique research niche and visual elements within the group for feedback and open discussion.

Workshop feedback structure

Prior to the workshop, facilitators undergo a short training in August to emphasize goals for providing constructive feedback to ensure uniformity across different small groups. The training focuses on providing constructive and positive feedback to empower the workshop volunteer to revise and improve their research vision. We have found that excessive focus on deficits can be detrimental to the goal of the workshop. Presenters should come to the workshop prepared with (1) the answers to the questions provided before the workshop and (2) an executive summary figure. We encourage images that range anywhere from a drawing on a napkin to a mature research visual. Having a low bar for the figure draft has enabled the LE Fellows, who otherwise did not feel ready to share their research vision, to volunteer to receive feedback at early stages. The goal of RVW is to provide feedback on the overarching description of the presenter's research niche and how effectively this is communicated by their executive figure. It is not to provide a detailed critique of the research aims; however, the diverse perspectives and constructive criticisms received during the workshop often aid with the refinement of more detailed scientific aims and research priorities for an application package.

Our feedback mechanism builds on other discussion-based frameworks, such as the Harvard Macy Institute Step-Back Feedback Method, which enable structured feedback for the presenter.⁷ Unlike the Harvard Macy Institute approach, which requires presenters to

passively listen to discussion among attendees, we have found that active exchange between the facilitators, presenters, and attendees has been the most valuable arrangement for RVW feedback. Given the participants' diverse backgrounds and their research visions, the facilitators direct the discussion, rather than using a rubric for formalized feedback, to achieve the above-stated goals.

Workshop timing

Small group workshops typically include 2 facilitators, 2 presenters, and between 2 and 8 additional attendees. Each facilitator takes up to 15 min to show examples from their research vision, answer the provided questions, and describe the individual process they used to develop their research vision. Next, the first presenter will spend 10 min describing their research vision figure and answering the previously provided questions. Discussion between the presenter and the group about the research niche of the presenter and ways to clarify the research figure then continues for 20 min (Figure 1B). The second presenter repeats the same format as the first, and the first joins the facilitators and attendees in providing feedback. The session concludes with any final questions for the facilitators about their individual academic job search. An ideal length for a workshop is one and a half hours, and sticking to time is important to provide equal opportunities for both presenters.

Having an audience outside of your field

A particularly important element of the RVW approach is the inclusion of subject matter-naïve peers with diverse expertise. One cannot expect that all academic search committees will have the same background knowledge or scientific focus; therefore, it is critical to have some aspects in the application materials that can be broadly identified as important and impactful. When crafting a research vision, there are two main parts that require critical feedback: (1) feasibility and impact of the stated scientific goals and (2) ability to deliver that research vision to wide audiences. While feedback on the former component can come from other experts in a researcher's field, start-

ing with mentors and lab members, receiving feedback from wider audiences is crucial to effectively fulfill the latter aspect. We found that when LE Fellows first presented their research question during RVW, common pitfalls included overly complex explanations, undefined technical jargon, or narrowly presented research directions. We also observed that executive summary figures suffered from data overuse that could be challenging for subject matter-naïve viewers to interpret, and we therefore recommend that applicants use actual data sparingly to explain a research direction. Some presenters did not adequately present an overarching research question and undersold key aspects of their research program but delineated specific experimental goals too quickly, which can cause confusion for the subject-naïve audience. The discussion structure during RVW helped identify these pitfalls via group input on a common scientific problem with shared expectations, which were communicated prior to the workshop, similar to productive strategies employed in team science.⁸ The group input continues after RVW, as the presenters received iterative feedback on their visual elements through the LE Slack channel described below. Overall, we found that the interdisciplinary composition of the LE Fellow audience provided invaluable feedback on how to frame the novelty of research to broad audiences due to the attendees' diverse personal and scientific backgrounds.

Peer feedback from a trusted community with shared experiences

One important goal of RVW is to increase presenter confidence, enabling them to express excitement about their own work and highlight its importance and impact. This can bolster performance during the application and interview process. Previous studies have demonstrated that lack of confidence is a contributing factor to the attrition of historically underrepresented groups from scientific careers.⁹ Having a trusted network of peer mentors with whom future applicants feel comfortable making mistakes can be invaluable as a sounding board during research vision development.^{10–12} The success of the LE work-

shop may be attributed in part to the establishment of trusted peer networks during postdoctoral training. The power of these peer relationships can be leveraged during the transition to independence. Having a trusted peer networking group can immensely impact confidence¹³ and therefore academic job search preparation.¹

The LE network provides support beyond RVW. An important component of the LE network is access to a private Slack workspace. The Slack workspace includes peers across multiple cohorts facilitating discussion among LE Fellows who are at different stages of their research vision development process. The workspace has a feedback channel where LE Fellows can post their visual aids after RVW for quick comments to continuously improve their research delivery materials. Continued iterative feedback helps LE Fellows to generate aesthetically pleasing, easy-to-comprehend figures. Over time, we anticipate that the LE network will provide not only peer feedback but also enable discussion among colleagues at varied stages in their careers. Although our primary goal is to focus on visual tools to efficiently deliver a research vision, LE Fellows also receive feedback on their short- and long-term aims through the Slack channel.

Early assessment through programs such as RVW is especially important because it provides the opportunity to receive candid comments: it is unlikely that a feedback provider will tell a researcher to scrap their talk the day before a presentation, even if they think such drastic action might be warranted. Our experience with RVW has demonstrated that the earlier one begins to define their unique research niche, the more time they will have to thoughtfully revise and iterate on it. Thus, postdocs at all stages can benefit from RVW. Envisioned long-term career plans are not set in stone, and early brainstorming exercises can provide applicants with more opportunities for feedback and refinement. Importantly, a research vision is always a work in progress, and therefore, researchers should routinely incorporate scientific and stylistic changes into their visuals as an ongoing practice. As such, RVW is a useful framework to revisit after an individual secures a faculty position,

when prioritizing lab goals, or while writing grants.

Conclusion

Formulating and communicating a research vision is a continuous process that requires constant feedback from one's network (Figure 1). Faculty search committees evaluate a candidate's overarching goals from their compiled application materials and must make decisions about how those directions would fit within the institution's existing research portfolio. Therefore, the applicant must quickly communicate their research program's innovativeness, which can be daunting if one has not received appropriate training and practice to do so. Based on these challenges, we have found that RVW can serve as an invaluable training tool to distill research goals into executive visual summaries that faculty with wide-ranging expertise can easily digest. The LE program leverages the power of iterative feedback from trusted peer mentors with broad research interests. Therefore, we advise postdoctoral fellows to participate in or establish peer networks consisting of colleagues with diverse backgrounds to receive feedback during their transition to independence. RVW by design can be readily incorporated into trusted institutional networks, such as within postdoctoral associations or departments as well as in other peer groups that are assembled based on shared identities. Continuous and constructive feedback through such networks demystifies the transition process, improves the candidate's confidence and communication skills, and helps prioritize scientific goals. Most importantly, we anticipate that greater dissemination of faculty job search expectations and incorporation of forward-thinking research visions during formal training will likely increase the roster of qualified candidates recognizable to academic search committees.

ACKNOWLEDGMENTS

We acknowledge the LE Fellows for their support in developing these initiatives, including facilitators and workshop participants that enabled the success of the program. We thank HHMI Janelia, the Tara Health Foundation, and anonymous donors for their support of the LE program. We also thank Dr. Seemay Chou and other faculty participants that contributed to early career panel discussions as part of the LE programming. N.S.B. is supported by NIH/NINDS K99/R00 NS112605-01 and core support from Wellcome to the Gurdon Institute. K.L.M. is supported by NIH/NICHD R00HD101021-03. K.L.M. is a New York Stem Cell Foundation-Robertson Investigator. L.M.L. is supported by NIH/NCI 5K22CA258957-02. KLM is a New York Stem Cell Foundation -Robertson Investigator. The authors were supported by K99NS112605-02 (N.S.B.), R00HD101021-03 (K.L.M.), K22CA258957 (L.M.L.).

DECLARATION OF INTERESTS

The authors declare no competing interests.

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