Lessons for the Next Generation of Scientists from the Second Annual Arthur and Sandra Irving Cancer Immunology Symposium

Christopher Alvarez-Breckenridge[1], Kristin G. Anderson[2,3], Ana Luisa Correia[4], Shadmehr Demehri[5], Huy Q. Dinh[6], Karen Olivia Dixon[7], Gavin P. Dunn[8], Laura Evgin[9,10], Jeremy Goc[11,12,13], Zinaida Good[14], Nir Hacohen[5], Patrick Han[15], Pavel Hanč[16], John Hickey[17], Kelly Kersten[18], Beiyun C. Liu[19], Aitziber Buque[20], Yuxuan 'Phoenix' Miao[21], J. Justin Milner[22], Yuri Pritykin[23], Ferdinando Pucci[24], Nicole E. Scharping[25], Lisa Sudmeier[26], Yufei Wang[27], Andreas Wieland[28,29], and Michelle M. Williams[30]

ABSTRACT

The Arthur and Sandra Irving Cancer Immunology Symposium has been created as a platform for established cancer immunologists to mentor trainees and young investigators as they launch their research career in the field. By sharing their different paths to success, the senior faculty mentors provide an invaluable resource to support the development of the next generation of leaders in the cancer immunology community. This Commentary describes some of the key topics that were discussed during the 2022 symposium: scientific and career trajectory, leadership, mentoring, collaborations, and publishing. For each of these topics, established investigators discussed the elements that facilitate success in these areas as well as mistakes that can hinder progress. Herein, we outline the critical points raised in these discussions for establishing a successful independent research career. These points are highly relevant for the broader scientific community.

Introduction

In July 2022, the second annual Arthur and Sandra Irving Cancer Immunology Symposium took place in Boston, MA. The goal was to provide participants (starting faculty and postdocs in cancer immunology) a chance to develop strong ties with faculty mentors (**Table 1**) and learn about the different paths to success in cancer immunology research. The symposium sessions consisted of talks, interviews, roundtable discussions, and breakout groups to address areas not covered explicitly during our years of training as students and postdocs. Topics included leadership, mentorship, developing a scientific and career trajectory, managing the lab including hiring, teamwork, collaboration, and publishing. The lessons we, the participants, learned from the faculty mentors and from each other during the symposium were invaluable. To share them with the broader scientific community, we were encouraged to write up a summary of lessons. During the symposium, we were asked to ensure that we gained the knowledge to address two questions for each area: What do you need to do to succeed in this area? What mistakes are frequently made in this area? In writing this commentary, we formed subgroups of 3 to 5 people to tackle each

[1]Department of Neurosurgery, The University of Texas MD Anderson Cancer Center, Houston, Texas. [2]Department of Microbiology, Immunology and Cancer Biology, Carter Center for Immunology Research, University of Virginia, Charlottesville, Virginia. [3]Department of Obstetrics and Gynecology, University of Virginia, Charlottesville, Virginia. [4]Champalimaud Research, Champalimaud Foundation, Lisbon, Portugal. [5]Center for Cancer Immunology, Center for Cancer Research, Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts. [6]McArdle Laboratory for Cancer Research/Department of Oncology, Department of Biostatistics and Medical Informatics, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin. [7]Department of Neurology, Harvard Medical School and Brigham and Women's Hospital, Boston, Massachusetts. [8]Department of Neurosurgery, Massachusetts General Hospital and Harvard Medical School, Boston, Massachusetts. [9]Michael Smith Genome Sciences Department, BC Cancer Research Institute, Vancouver, Canada. [10]Department of Medical Genetics, University of British Columbia, Vancouver, Canada. [11]Jill Roberts Institute for Research in Inflammatory Bowel Disease, Weill Cornell Medicine, Cornell University, New York, New York. [12]Joan and Sanford I. Weill Department of Medicine, Division of Gastroenterology and Hepatology, Weill Cornell Medicine, Cornell University, New York, New York. [13]Department of Microbiology and Immunology, Weill Cornell Medicine, Cornell University, New York, New York. [14]Stanford Cancer Institute and Department of Biomedical Data Science, Stanford University School of Medicine, Stanford, California. [15]Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts. [16]Department of Immunology, Harvard Medical School, Boston, Massachusetts. [17]Department of Pathology, Stanford University School of Medicine, Stanford, California. [18]Department of Pathology, University of California San Francisco, San Francisco, California. [19]Department of Immunology, St. Jude Children's Research Hospital, Memphis, Tennessee. [20]Department of Radiation Oncology, Weill Cornell Medical College, New York, New York. [21]Ben May Department of Cancer Research, The University of Chicago, Chicago, Illinois. [22]Department of Microbiology and Immunology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina. [23]Lewis-Sigler Institute for Integrative Genomics and Department of Computer Science, Princeton University, New Jersey. [24]Department of Otolaryngology and Cell, Developmental and Cancer Biology, Oregon Health & Science University, Portland, Oregon. [25]Division of Biological Sciences, Section of Molecular Biology, University of California, San Diego, La Jolla, California. [26]Department of Radiation Oncology, Winship Cancer Institute and Emory University School of Medicine, Atlanta, Georgia. [27]Department of Cancer Immunology and Virology, Dana-Farber Cancer Institute and Harvard Medical School, Boston, Massachusetts. [28]Department of Otolaryngology and Pelotonia Institute for Immuno-Oncology, The Ohio State University Comprehensive Cancer Center, Columbus, Ohio. [29]James Cancer Hospital and Solove Research Institute, The Ohio State University, Columbus, Ohio. [30]Department of Pathology, University of Colorado Anschutz Medical Campus, Aurora, Colorado.

Corresponding Author: Nir Hacohen, Cancer Center, Massachusetts General Hospital, Charlestown, MA 02446. E-mail: nhacohen@mgh.harvard.edu

Cancer Immunol Res 2023;11:1571–7

doi: 10.1158/2326-6066.CIR-23-0522

Table 1. Faculty mentors.

Name	Institution
Shawn Demehri, MD, PhD	Massachusetts General Hospital
Gavin Dunn, MD, PhD	Massachusetts General Hospital
Phil Greenberg, MD	Fred Hutchinson Cancer Center
Nir Hacohen, PhD	Massachusetts General Hospital
Nick Haining, BM, BCh	ArsenalBio
Liz Jaffee, MD	Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins
Max Krummel, PhD	University of California San Francisco
Tak Mak, PhD	Princess Margaret Cancer Centre, University of Toronto
Sergio Quezada, PhD	University College London Cancer Institute
Bob Schreiber, PhD	Washington University School of Medicine
Ton Schumacher, PhD	Netherlands Cancer Institute
Jennifer Wargo, MD	The University of Texas MD Anderson Cancer Center
John Wherry, PhD	University of Pennsylvania
Cathy Wu, PhD	Dana-Farber Cancer Institute; Broad Institute

area and write up a bullet list of recommendations. The results are organized by topic below.

Scientific and Career Trajectory

What do you need to do to succeed in this area?

1. Make time for personal and professional reflection

Being able to get "to the balcony" so that you can "see the dance floor" will help you to refresh your vision for your career, your lab's direction, and how you fit into your field. Doing so will enable you to be a more effective mentor and leader in your lab to inspire students to see beyond the next experiment and think more broadly. This is important to do regularly because science, society, and your lab will change over time. One specific method that can help during reflections is to keep and revisit a running list of big ideas that you may now have the money, technology, or people to tackle. Keep a notebook or file with your scientific and leadership vision and approach (with at least all areas covered in this symposium), and update it yearly or more often. Similarly, personal reflection also enables you to identify your unique skills that let you address problems which really are opportunities. A question that Tak Mak said to pose to yourself is "Why do you think you have an advantage in this field or project?"

2. Be prepared and flexible for opportunities

Not everything goes as planned. New technology will be developed and will require investment in both time, learning, and money. People who read broadly across fields will be able to leverage such advances, but also see how to apply them uniquely to solve challenges in their own field. Other than technology, opportunities around a new idea or collaboration can springboard you to an opportunity unique to your success. Unexpected events can also be good as Phil Greenberg said, "Be ready for the first big bump", which he expounded on meant to capitalize on new and exciting findings that may take your lab and the field in new directions. Learn to pivot.

3. Resilience is key in an ecosystem full of rejection

Grants and manuscripts will be rejected, even the good ones. It is important to take a day or more to feel "down" about it and to decompress. If you are the type of person that instinctively looks for fixing problems, set apart some time to get involved with organizations that aim to change the endless rejection ecosystem (for example, Solving4Science) or to come up with your solutions. Then, it can be very helpful to carefully review the comments to learn from them, not as much at the details level, but as a big picture: what were the common themes reported as weaknesses? Any shared concern(s) between at least 2 reviewers? Your idea might be great, but you need to convince the reviewers you can do it or have the roadmap and support and collaborators to do it. This is becoming increasingly important for large, complex, interdisciplinary projects. For each grant or manuscript, ask others outside your immediate expertise for feedback on clarity of rejected papers and grants. Always welcome constructive feedback.

What mistakes are frequently made?

1. Misframing the problem at hand

One example of this is not understanding "technical versus adaptive challenges." One of the biggest mistakes leaders make is treating an adaptive challenge as a technical challenge. A technical challenge requires time, organization, and resources that have a clear path to being fixed. An adaptive challenge is unclear, it requires learning to solve it. To solve an adaptive challenge, first ask, "Why can't I fix it now?" and then "How can I find/learn what I need to fix it?" This is also an issue for leadership as described below.

2. Misframing your relationships

It can be easy to focus on "your" scientific success, but as a leader of a group, you should value the success of your trainees. In the long run, this equates to your success. This can be tricky when stressed as an Assistant Professor with tenure demands, but misplaced pressure on mentees is often counterproductive in the long run. Misframed relationships may be based on assumptions you have made about the people in your lab. For example, just because you did a 5-year postdoc doesn't mean that is what the postdocs in your lab have planned. Similarly, as junior faculty it is common to receive applications only from less experienced postdocs, thus expectations about their performance and productivity often need to be appropriately reduced and time for their wet lab trials and errors needs to be allowed. Therefore, early and frequent communication between you and lab members is key, especially when it comes to their own career goals. Finally, the mindset that hiring personnel that think like you or share the same expertise as you is often problematic for sustained success. In contrast, you should welcome or embrace diversity in the composition of the people that will in turn bring a diversity of scientific ideas. Since every individual has unique strengths and weaknesses, try to understand each trainee and then work to enhance their strengths and minimize their weaknesses.

3. Improper time management

There will always be more opportunities or commitments than you have time for, so learning to say "no" to demands on your time is incredibly important. One way to measure your time is to think about the products that should be produced from your lab. These include grants, manuscripts, and trainees. Spending too much time on any one of these items will cost the other "products" of your lab. While it is important to become integrated and involved in collaborations and service, consider that every new commitment you take on requires you to give up effort/time on something else (for example, lab products or work/life balance). Part of this decision making comes with prioritizing appropriately: (i) ensuring lab survival, which often is a financial decision impacting lab staff/

trainees; (ii) building a strong group of people who are motivated and hardworking; (iii) finding the right mentor(s); (iv) getting involved in commitments or collaborations you are passionate about but that also are likely to support your trajectory; and (v) considering balance, as young faculty too often prioritize grants over papers and experiments. Keep in mind that successful grants require publication of great science.

4. Rushing hiring decisions

As an early career investigator, navigating the pressures and demands of the new position can often lead to impatience or rushed decisions. One example is rushing to hire as you want to get started on experiments. However, one 'bad egg' or rushed hires who are incapable of accomplishing the goals of the project can often cost more time and energy in the long-run and negatively affect the progress and morale of other lab members. While it can be challenging to know if you are making the best decision on a hire, on a commitment, or in pursuing an idea, in general "trust your gut." If something doesn't feel right, often it is not. Be sure to seek advice and mentorship as weighing the pros and cons of every important or tough decision can help guide successful efforts. Because the lab environment is critical, have any potential new lab member meet with all lab personnel to confirm all are compatible. This will avoid difficult interactions/conflict later.

5. Avoiding new scientific directions

It is easy to follow "popular" science trends. However, as you begin to carve out your own scientific niche, it is important to "skate to where the puck is going and not where it has been." In other words, consider pursuing ideas, questions, technologies that scientists in your field haven't considered.

6. Being impatient or perfectionistic

Balancing productivity and perfectionism can be tough, as it is easy to get caught up in making things too perfect early on (for example, first grant, first manuscript, first hire), but this can often delay your progress. This is particularly true early on in your career when you need to establish a lab and a reputation. Nick Haining said it best with, "You can't hit a grand slam without someone on base."

Leadership

What do you need to do to succeed in this area?

Different skills are required for being a "manager" versus "mentor" of the group for all levels of lab personnel, and developing this skill is a life-long learning process.

1. The role of principle investigator as a problem solver requires differentiation among technical versus adaptive challenges

Technical challenges are usually clear (I can fix this) with accessible solutions and the responsibility is with available experts. In the case of technical challenges, the major obstacle is finding the right resources. Conversely, adaptive challenges are unclear (why can't I fix this), hence the solutions are unknown, and the responsibility for finding the solutions is with everyone affected by the challenge. In the case of adaptive challenges, the major obstacle is to change people's hearts and minds, because solutions usually imply exploring, innovating, encouraging strategic thinking from your team, and crossing boundaries that can put you and everyone involved in solving the challenge out of your bubble.

2. The role of the principle investigator as a manager requires many skills, including

a. *Developing an intentional lab culture* by using both introspection and extrospection. Critically think about what type of leader you want to be and how you can develop shared goals that group members feel inspired to attain. Take time to celebrate and reflect on group and individual accomplishments and how these relate to the shared vision.
b. *Raising awareness for background diversity* by identifying and understanding that each member has different weaknesses and strengths, values and expectations.
c. *Being an active listener* during one-on-one meetings with all group members used to check-in on more than just project progress. An open-door policy can also encourage communication with team members. Overall, it is key to learn to listen and let your team do the talking.
d. *Being a self-aware observer* by inhabiting other perspectives and defining your own perspective. Think of this as asking how you see yourself and how can you embrace other's perspectives?
e. *Prioritizing personal development* for both you and your team. This includes reflecting on your leadership style and ensuring that it develops and adapts with your career.
f. *Facing change by remembering* that people don't resist change, they resist loss of competency, value, connection, and identity. At stake is their stability, indemnity, and human connection. Thus, try to frame change by discussing what group members will gain from the experience rather than what they will lose.
g. *Addressing conflict actively and early* through open communication with the entire group. Never place the blame on your group members and take into consideration that words have a lot of weight and can be perceived differently (try prefacing advice as 'I say this because I want to help you'). For difficult or sustained conflicts seek advice from external mentors or groups including campus resources like Ombuds.

3. Building a lab requires the ability to

a. *Create a mission* that everyone in the lab is passionate about. This is the central brand/doctrine of the lab that your group members will adopt and help build upon. Giving talks and spreading the lab's brand within and outside your institution will be critical to establishing oneself in the field. Also, use social media to achieve this goal!
b. *Be adaptable* to new scientific directions and to incorporating technological advances. Shifts in direction will require building collaborations, and taking the time to find and assign the right person to a project even if that means a longer timeline to initiation. Allowing trainees to be comentored can expose them to the best of both labs and introduce new techniques and expertise into your lab. However, choose collaborators and co-mentors wisely, and don't rush to hire just to fill an open position.
c. *Hire* with defined purpose and upfront commitment (for example, funding availability, need to write grants). Clarity on "what the most important question this person needs to work on" and the career development needs of the candidate is very important for both parties. Drafting a Project Aims document is a good exercise to facilitate mutual understanding of your respective scientific and professional requirements, and also to evaluate the person's scientific writing abilities. You want this person to succeed, and successful people will, in turn, help recruit more. Some of the key things to look for when hiring are outlined in Box 1.

Box 1. A checklist on what to look for when hiring.

1. Will they treat everyone with respect?
2. Are they a good fit for everyone in the lab and will they contribute to a good lab environment? Making sure they meet most or all lab members will help ensure this is addressed.
3. Is this a compatible person that can respectfully challenge you?
4. Did you look for people who have already been successful? If this is difficult, look for the "Diamond in the Rough". Spousal hires are recommended for this!
5. Some principle investigators (PI) like to start with PhD students, rather than postdocs, since it is sometimes easier to recruit excellent students who will work on your projects, but an experienced postdoc is often productive more quickly.
6. Did you have other colleagues (different PIs) and your current group members interview them?
7. Did you call their references and ask hard questions about their initiative, skills, work ethic, creativity, and social interactions?
8. Are you hiring people to answer specific questions, rather than to fill a position?

What mistakes are frequently made?

1. Mistakes PIs make as problem solvers

a. *Not recognizing that different challenges have different solutions.* For example, as previously mentioned, one of the most common mistakes is to treat an adaptive challenge as a technical one. Challenges are usually more complicated than the initial frame, therefore it is necessary to pause, set the go-go mode aside, and look around. This will help to reframe a challenge to make it more straightforward; for example, consider that people do not resist change but loss (dressed as invisibility, value, identity. . .). Define your own perspective but inhabit that of others too.

b. *Hiding from awkward situations*. There are going to be many awkward situations, but a PI cannot hide from them, face them and try to align with your colleagues to make the best of the work. Importantly, evolution is not perfect so be prepared to take a step back and restart.

2. Mistakes PIs make as managers

a. *Mistakes in lab management.* This includes framing upcoming change as a loss, rather than framing it as what will be gained—help your trainees remain optimistic. Do not strive for perfection—as a junior PI, you suddenly become someone with more power, and with this power comes a change in how others will perceive you. You must learn how to correctly identify problematic situations, learn how to protect yourself, and learn to make sure that what you do/say is correctly perceived; know that you will not learn to do these things perfectly immediately. Do not be too insecure to ask for feedback on how you are doing as a leader, as this feedback will allow you to grow and improve.

b. *Mistakes in approaching lab problems.* This includes not setting appropriate boundaries, such as using a personal rather than a business response to problems or treating each problem with the same approach (i.e., different problems require different solutions). Do not avoid addressing problems, even though it may be an awkward situation and sometimes you won't know what to say. Addressing a problem, even imperfectly, is better than avoiding the problem. Remember, you are not alone and there are resources within your peer and senior mentors, and at the institution to help guide you.

c. *Mistakes in approaching personnel problems.* This includes not giving all people and projects the same attention and energy, even if one project is moving more slowly. Do not pit people against each other to drive a project forward. Mental health issues, motivation issues, attention to detail are the hardest subjects to talk about and approach—seek resources to help you address these issues with lab personnel.

3. Mistakes to avoid when building a lab

a. *Not being deliberate about the culture of your lab.* You are only as good as your people, thus build a team that embodies your vision and propels you forward.

b. *Hiring to fill an open position rather than for fit.* While wishing to move projects faster, consider that getting the right person for the project to move it forward is as important as not putting the wrong person on a project to avoid pushing it backward. Getting less experienced passionate people who you can mentor is better than hiring people you cannot shape or work with.

c. *Adding two or more people with the same skill set to a project just so it moves along faster.* It will likely not, and rather will raise issues with ownership and generate tension between those involved.

d. *Keeping someone who is not the right fit.* A lab member who is not the right fit is a disruptive force and, especially in a small lab, can significantly slow down research progress. Sending them to a position at an institution inside or outside academia with a better fit is a good option. Often, young faculty worry that they will look bad if they guide a bad fit out of the lab. However, keep in mind that it may also be in that person's benefit to help them find the job that best fits them. A PI will learn from this and also be considered a good mentor and not one who failed to help a lab mentee. This turns a potential failure into a success for both parties and for your lab's reputation.

e. *Not getting advice from senior colleagues and lab members when hiring.* Have them read the person's *curriculum vitae* (CV) and interview them.

f. *Losing sight of the fact that, with the maturity of your lab, it can be easier to allow for negative results, mistakes, and innovation*. In the beginning, when/if you have several failures, remember that you are in this for the long haul and you can learn and build from each setback.

Mentoring

What do you need to succeed in this area?

1. Mentoring the people in the lab requires

a. *Recognition that mentoring comes from everywhere.* The entire team may play a role in mentoring. Peer mentoring and mentoring from more senior members both play a critical role in the education of a well-rounded trainee. When putting together the team, it is therefore important to have clarity for what incoming individuals may contribute. Over time, students can grow into leadership positions in the lab, and it is both helpful to other students and a part of their own training to take on more mentoring responsibility. To facilitate all these connections, be intentional about fostering a supportive environment and a safe

culture to talk openly about challenges; encourage people explicitly to get input from each other to make their science better. Train people on how to mentor their technicians and students.

b. *An individualized approach based on the needs and goals of each trainee.* It is helpful to understand what science motivates a person, and the settings that enable them to learn and be creative. At the core of the mentor/mentee relationship, there should be an alignment of scientific, career trajectory, and personal expectations. Carve out time to discuss career plans and timelines for everyone. Ensure that all members of the team receive equitable support and attention. Make sure to show you care about each person by understanding their challenges and needs. Ask trainees when things are not working; bring in other mentors if you can't do it alone for a trainee.

c. *Understanding that effective communication is the cornerstone of the mentor/mentee relationship*. Set clear expectations to develop trust. Have trainees repeat key messages in their own words. Difficult situations can (sometimes) be mitigated by presenting a pivot as a new opportunity rather than a failure. Dedicate time for one-on-one meetings. Be honest in a professional and constructive way—one of the hardest challenges is to learn to give feedback in a positive way. Also, don't use emails or texts to solve problems. Face to face meetings are required to avoid misunderstandings that can elevate into crisis.

d. *Setting professional limits with lab members*. Now that you are the leader, it is harder to manage a lab if you try to be an equal and friend with lab members. It is sometimes lonely at the top, but it is more productive.

2. Receiving mentoring

a. *Seek out multiple mentors whom you respect and trust to advise you on discrete aspects of your career and scientific program.* Just as trainees need a team to help guide their education, PIs need a variety of sources with different perspectives and experiences to provide a circle of trust.

b. *Lean on peer mentors* who can help brainstorm, troubleshoot, and navigate difficult situations because they have similar (and current) lived experiences.

What mistakes are frequently made?

1. *Not recognizing that the lab requires both a microscopic and wide-angle lens.* Self-awareness and introspection can help to understand where biases lie, and when and where to seek help. Trainees may also initially need hands-on training, and it is important to have a clear understanding of the data output to ensure the quality of the science. On the flip side, don't get lost in the weeds. Set aside the time to zoom out and create and share a vision for the lab.
2. *Taking things personally.* Separate the personal situation from the data. Try to inhabit the perspective of the other person.
3. *Not avoiding biases against nonacademic career trajectories.* Create the space and opportunity for each trainee to explore their own path.
4. *Not addressing problems that arise early and objectively.* Don't hesitate to bring mentors and or institutional resources into conflicts/difficult situations. Minimize lab tension by addressing issues with the group rather than calling out individual behaviors.

Collaborations

Collaboration is critical to a successful career.

What do you need to do to succeed in this area?

1. *Ensure that all trainees learn to collaborate and share data*. Science is multidisciplinary and no one will ever have all the tools to address the most important questions. Teaching lab members to collaborate early will benefit them in any job they take in the future. Sharing data is critical because it provides more rapid solutions to a problem even if you don't always get to be the first to publish. But it also helps you identify problems in the data to fix before publishing. This could avoid problems in the future.
2. *Take advantage of your whole environment*. Seek out people with complementary expertise (increasing "double positive" skill sets) and diseases of interest (from disease models and clinical sample availability). Conduct joint lab meetings with senior Principal Investigators' labs (do this early) and seek out clinical collaborators (to identify important research questions). Form collaborations with value-add by working together. Create your niche and leverage the expertise in the surrounding environment.
3. *Be realistic about what you can do yourself and where you need help*. Find collaborators for all areas outside your expertise. This is especially important for grant writing.
4. *Embrace interdisciplinary collaborations by forming teams*. Develop collaborations (within and outside the lab) between people with different expertise and form a unique team of fundamental and applied scientists from different but related fields, e.g., computational biologists, computer scientists, biophysicists, bioengineers, biochemists, technology developers, genomics expert, etc.
5. *Communicate early and often*. Talk about who will do the work, where the funding will come from, and what the order of authors on any publication will be at the start of any collaboration. Revisit throughout the collaboration in case anything needs to be adjusted.
6. *Elevate the whole community*. If you cannot commit to something, recommend someone else who could also do it well. This "win-win" situation helps everyone because everyone's needs are met.
7. *Set clear boundaries*. Earning others' respect can be hard; setting clear boundaries is critical. Remember that perceptions of you change when you transition from a trainee position to an Assistant Professor position. Figure out how to be present in this space, navigate new perceptions, and not take things personally.
8. *Learn to recognize your own biases and work on overcoming them because relationships are critical.*
9. *When you commit to something, do it well.* This establishes your reputation as someone who is trustworthy and reliable. If you cannot do something well, practice saying no in a collegial way (reminder: set clear boundaries).
10. *Establish a collegial lab culture with internal collaboration*. Encourage your group to talk to each other, work together, and learn from each other (and encourage "secret experiments" where students and postdocs work together to plan and execute them). Lead by example. Be available and teach people how to communicate respectfully. Collaborations within the lab are critical for your lab's success. A competitive lab culture can make the lab a difficult place for everyone to work and impede progress.
11. *Share everything*. You will get "burned" once in a while, but then you will know who to not collaborate with again.

12. *Look for opportunities to turn your competition into something that elevates you both*, like cosubmission to higher impact journals.
13. *Basic/translational scientists should get involved with clinical teams*. These collaborations are excellent sources of exciting new scientific questions. Mentor clinical fellows in your lab, present at Grand Rounds, attend tumor board meetings, and ask questions, offer to be the scientific expert for clinicians with translational interests who write grants (and write together), engage intellectually, and/or shadow in the operating room. Treat the clinical group like members of the team.
14. *Good collaborators can also be good comentors*.

What mistakes are frequently made?

1. *Saying yes/no at the wrong time*. Saying "yes" or "no" too much are both problems; find a balance, prioritizing activities that benefit you and your lab's success while also being a helpful colleague. Reflect on if the opportunity will require sacrificing time elsewhere, or if it will build new skills, result in authorship, or lead to more opportunities. Has anyone been overlooked who could also accomplish this task well?
2. *Trying to be perfect in everything*. Perfectionism impedes progress. Don't make perfect the enemy of the good. But know what cannot be compromised. The data and analyses you publish have to be perfect, but for some things (like Institutional Animal Care and Use Committee protocols) 80% is good enough.
3. *Taking on too much/spreading yourself too thin*. Take time to step away from the detailed view and think about the big picture/focus of the lab. Are you on track? If not, pivot.
4. *Not establishing clear expectations/boundaries*. Many early career researchers take on too much and get spread too thin.

Publishing

What do you need to do to succeed in this area?

1. Plan ahead

a. *Start by asking the most important questions* that address open problems in your area and plan a path to answering part of the problem.
b. *Decide on the target audience (journal) early*. Especially in interdisciplinary research, figure out what your angle is and prioritize experiments that drive the story accordingly. As the science matures and evolves, if need be, adjust the targeted journal accordingly.
c. *Richard Feynman was quoted as saying that you should be able to explain the answers to your questions to a 5-year-old*. Think about this when writing a manuscript.

2. Keep an eye on things as they develop

a. *Get other people's perspective* on the direction a story is taking—there are likely may be avenues to follow that you haven't thought about. Additionally, presenting your results early enables potential competitors to have a chance in approaching you should the avenues of research be similar. Open communication between labs that may be working toward similar goals will help both labs, either in the form of copublishing, or in collaborating in the same project. When cosubmitting a publication with another lab, such findings will have more weight with the journal since they have already been confirmed independently.
b. *All data being published needs to be solid*. This is true regardless of career stage, but this is doubly the case as a starting PI. Academic publishing is a marathon, and you want solid data that can be built upon over the long run. This mindset helps with dealing with overall anxiety surrounding publishing as well. It's worth obsessing over data details to make sure your data are sound. You need to know the benchmarks of your work being perfect and hold everyone in your lab to the highest standards for data quality. Make sure the claims in your title, abstract and results are each strongly supported by the data.
c. *Start planning out the manuscript story early* and keep an updated slide deck that outlines the work toward the paper. Make a timeline and know which team member is responsible for each outstanding experiment or figure.

3. Don't get sidetracked and be efficient when wrapping up the story

a. *Know when to publish your paper*. Be realistic and resist the temptation to add just that one more thing. In deciding when a story is complete, a complete story should be summed up with one key message, often the title of the manuscript. Refrain from adding extraneous data that may dilute rather than support the message. Whole figures and paragraphs often need to be removed from the first draft to make the message concise. Those additional items can be used as preliminary data for grants and the next paper.
b. *Present work that is close to submission at conferences*. This may generate interest from editors, as they often also attend and may reach out after the talk.
c. *Keep calm when another publication title sounds uncomfortably close to your topic*. Most of the time there will still be significant differences in the experiments or ideas being presented. Moreover, at least some journals have shifted toward publishing "Independent First Confirmation studies for important findings."
d. *Presubmission inquiry is not always helpful*. The editors still need to read the full paper to make decisions. However, when you have competitors, presubmission inquiry can help you narrow down the journals that are interested in your study and can publish it rapidly.
e. *Publishing a preprint can help establish priority* and can be valuable for applications. However, the novelty of research may suffer for journals. There is no clear consensus on preprints, with some highly successful labs publishing all papers right away, and others only publishing a preprint if they have to (that is, if the first author is applying for a job or fellowship).
f. *Ask colleagues and people in the field for feedback* on your manuscript before submitting.

What mistakes are frequently made?

1. *Too much focus on publishing a big paper* in Nature/Science/Cell can be counterproductive. Your portfolio of smaller publications will help to maintain a sense of accomplishment, boost morale and confidence in your team. Externally, a steady stream of publications that show proof of work will help early-stage scientists show productivity, obtain promotions, form collaborations, and grow the lab organically.
2. *Not recognizing that research articles weigh more than reviews in your bio*. When writing reviews, use materials that have already been developed for your grant proposal, fellowship application, etc. instead of starting from scratch. Only consider high-impact journals for review publication.

3. *Not scrutinizing the data early*. Don't wait until you're putting the paper together. It's better to catch issues early than to be surprised by something when you're writing a manuscript.
4. *Not resisting the urge to 'scoop' your competitor*. Scientific findings will have more impact if copublished together. It's important to be collegial in science, and it is your reputation in the field that determines tenure promotion.

Conclusions

While there are many lessons above, a key lesson is to be thoughtful and intentional about the choices you make when you start your lab (for example, in hiring, in the invitations you accept and decline, in the first papers and grants you choose to write). These choices set the tone for your lab, and establishing your lab culture early will open (or close) doors to opportunities for your research.

Remember that in addition to being a mentor, junior faculty also need mentorship. Take time to identify and establish relationships with more than one mentor who can provide constructive feedback on your research and career.

When writing grants and papers, budget extra time to send drafts to colleagues for feedback. Many colleagues will gladly provide constructive comments on your ideas or written drafts, but they need ample notice to fit this in their schedule (and you need ample time to incorporate their suggestions). Asking someone to read your grant or paper with less than a week until the deadline is a sure way to frustrate your new colleagues.

In conclusion, we hope that this commentary provides a helpful tool for early career scientists in the cancer immunology field and beyond, to successfully navigate the many challenges and opportunities associated with embarking on the next step to academic independence.

Authors' Disclosures

Z. Good reports nonfinancial support from 10x Genomics; personal fees from Standard Biotools; and grants from Parker Institute for Cancer Immunotherapy outside the submitted work. N. Hacohen reports grants from Arthur, Sandra, and Sarah Irving Foundation during the conduct of the study. K. Kersten reports personal fees from Foundery Innovations outside the submitted work. M.M. Williams reports grants from NIH/NCI outside the submitted work. No disclosures were reported by the other authors.

Acknowledgments

The authors thank the Irving family for the establishment and support provided to bring the cancer immunology community together for the second Arthur and Sandra Irving Cancer Immunology Symposium. They thank the faculty mentors for sharing their experiences that have formed this commentary.

Received July 3, 2023; revised August 7, 2023; accepted October 6, 2023; published first October 31, 2023.