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Surviving and Thriving as Physicians in General Internal Medicine Fellowship in the Twenty-First Century

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General internal medicine (GIM) fellowships play an important role in the development of physician scientists and clinical educators, as well as leaders in academic medicine. Nevertheless, the challenges of developing another novel aspect to one's career, along with balancing coursework, research productivity, clinical duties, and personal life during fellowship, can be overwhelming. Similarly, successfully securing a job at the end of fellowship can be a daunting process. In this article, we discuss the foundational tenets and themes of the GIM fellowship. These themes include (1) finding your purpose and passion, with a focus on selecting research coursework and developing an area of study; (2) the role and importance of mentorship, including the various kinds of mentorship that fellows require (traditional and peer mentorship, sponsors, and coaches), as well as how to be an effective mentee; (3) securing research funding; (4) landing a job; (5) and protecting time to meet personal goals. There is an increased need for a vibrant, diverse, and successful generation of general internal medicine researchers to advance our understanding of complex issues in clinical medicine and healthcare delivery and to inform health policy. It is our hope that this piece helps to support that mission.

KEY WORDS: general internal medicine; research; fellowship; mentoring.

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INTRODUCTION

The thrill of scientific discovery. The joys of writing and teaching. The opportunity to generate evidence that informs

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clinical care and health policy. These are just a few reasons why physicians pursue careers in academic medicine. Nevertheless, competitiveness for funding often places the early career physician in a state of apprehension when embarking upon an academic research or education career. One strategy to prepare general internists is a general internal medicine (GIM) or health services research fellowship.^{1, 2}

GIM fellowships have grown in number since the early 1980s, including national programs, such as the National Clinician Scholars Program³ and the Veterans Affairs National Quality Scholars Program,⁴ and institution-based fellowships funded by the National Institutes of Health (NIH), Health Resources and Services Administration (HRSA), and Agency for Healthcare Research and Quality (AHRQ).^{5, 6} As recently graduated GIM fellows, we are often asked to provide career advice to current or prospective fellows. The main question is typically, how can one be *successful* during a GIM fellowship? Remarkably, this question was posed in *JGIM* over 20 years ago.^{7–9} Twenty years later we wondered, do the same strategies for surviving and thriving as a GIM fellow apply today?

Herein, we focus on several topics relevant to GIM fellowship including deciding on an area of investigation, initiating research/scholarly projects, balancing coursework, finding mentors, identifying funding opportunities, and navigating the transition from fellow-to-faculty (Table 1). We highlight contemporary issues not addressed 20 years ago, including how to navigate email and social media, challenges and opportunities that pertain to diversity, and balancing professional and personal pursuits. We hope this article offers guidance and support for anyone looking to advance their careers through a GIM fellowship.

FINDING YOUR PURPOSE OR PASSION

A benefit of being a generalist is that all diseases and aspects of the healthcare system are within our domain. While exciting, this can present a challenge for fellows who need to focus on a scholarly area and develop a track record of productivity. Therefore, planning a research agenda and reviewing this plan

Table 1 Recommended Timeline of Academic Medicine Fellowship Activities

Activity	Year 1 (1st half)	Year 1 (2nd half)	Year 2 (1st half)	Year 2 (2nd half)	Year 3 “Gap Year” (optional)
Research projects	Brainstorming research ideas; identifying passion project; meeting with potential mentors	Select primary career, research, and methodological mentor(s); identify mentors or peers with data for early research abstract submission	Obtain IRB approval; data collection and/or analysis on primary research project; begin second research project	Draft manuscript on primary research project; data analysis on second research project	Draft manuscript for second research project; draft career development award aims/ideas
Professional network	Regular meetings with mid- to senior-level faculty	Attend 1–2 regional/national conferences in your research or professional field	Connect with peers and research leaders through networking programs or social media platforms	Present research at 1–2 national conferences	Continue to grow national network of mentors, sponsors, and peers
Career development	Focused on coursework	Focused on project work, applying skills gained in coursework; meet leaders at research conferences	Make list of possible institutions to consider for future jobs, where professional and personal fulfillment is likely	Present job talks, receive job offers	Present job talks, receive job offers
Coursework	Begin introductory/required coursework	Complete any final coursework toward graduate degree	Consider taking advanced-level statistical/epidemiologic coursework	Grant writing/academic leadership coursework	Grant writing coursework; development of clinical teaching skills

with mentors early and often is critical. Be genuine—that is, pursue what excites you and follow your passion(s). The best research projects are those derived from clinical intuition or personal experiences. Immerse yourself in the literature and follow dialogue from experts at conferences. Learn to scan the literature for gaps and use social media platforms to engage with thought leaders and peers. Identify role models and ask them how they have pursued their career. Be diverse in your methodology as well; learn and pursue projects that include quantitative and qualitative methods, as well as research based on both primary data collection and secondary analyses. Determining what you want to study is daunting but recognize that it is an iterative process that starts early and continues throughout your career.

Integrating Coursework and Research

Many fellowships will offer formalized coursework, culminating in a graduate degree. Take advantage of this training, as the skills offered are essential for a strong foundation in research, be it in clinical, medical education, health services research, medical informatics, or implementation science. As courses can be time consuming, integrate coursework and research as much as possible. For example, while taking biostatistics, bring a dataset you wish to analyze and practice your coding with the class, rather than examples from a textbook. Note that there may be skills you seek that your fellowship does not offer, such as community-engaged research or implementation science, or even material from disciplines outside of medicine, such as law, management, engineering, or public health.^{10–12} Consider taking courses via another institution, online, or as a conference pre-course.¹³

“Publish or Perish”—Still Exists and Matters More Than Ever

Competition for tenure-track faculty positions and grant funding ensures that this aphorism remains relevant.¹⁴ This

is particularly true for women and minorities, who are affected by bias during the publication and grant funding process,¹⁵ and may be disproportionately burdened with requests for academic service.¹⁶ Unlike in prior decades, today’s fellows often need to emerge from fellowship with several published manuscripts to land a clinician-investigator job. *How does one do this?* Develop a mission statement which moves your research agenda (and subsequent papers) forward. Recognize that not all papers are created equal; first-authored manuscripts count more than reviews, commentaries, or editorials. Co-author manuscripts with peers when opportunities come along and take advantage of calls to contribute to special journal issues. Understand that writing takes time and leading a project from idea to publication can take one to two years. Having projects at various stages of development is key for productivity; however, you *must* finish what you start. Most critically, writing is a skill that needs to be developed. A good research paper starts with a good research question, but also requires a thoughtful approach to study design, rigorous analysis, and careful writing and rewriting. If writing does not come naturally to you, consider a formal course in scientific writing or obtaining one of several books on the topic.¹⁷

THE IMPORTANCE OF MENTORSHIP

Mentorship is critical for success in fellowship and for a research career.^{18, 19} A mentor provides guidance with time management, productivity, manuscript development, oral presentations, grant writing, and modeling effective work/life balance. Additionally, mentors teach fellows how to navigate the unwritten rules and culture of an institution and academia at-large.

Finding the Right Mentor(s)

The traditional mentor-mentee model consists of a long-term, symbiotic relationship between a mentor and a mentee. This

traditional relationship, however, is often not enough for sustained growth and success. That is, one mentor cannot do or be all things. As such, we encourage fellows to seek additional mentors or a panel of mentors, who can provide different skillsets and areas of expertise.

Finding a mentor can be a challenging process. At the beginning of fellowship, meet with a variety of faculty members. During these meetings, consider these questions: (1) Is this person an expert in what I find interesting? (2) Do they have skills I wish to obtain? (3) Do they enjoy mentoring? (4) Do they have time? (Regular meetings every 1–2 weeks is typical.) (5) Have they successfully mentored fellows before? (6) Do they put their mentee's interests before their own? Revisit these questions as the relationship grows and as your career advances. Also, identify mentors and advisors beyond your institution, research area, and professional home, as these individuals can offer overall career and confidential support, particularly during the job application process.

In addition to a traditional mentor, fellows may benefit from coaches and sponsors. As recently outlined in the literature, coaches provide guidance on a particular skill or content area.^{20, 21} A sponsor can use their influence to make fellows visible broadly, including recommendations to serve on local or national committees or present workshops at scientific meetings.²⁰ The role of the sponsor has been shown to be particularly helpful for female and minority trainees for whom academic opportunities may not be as readily available, and thus, these groups especially should actively seek sponsorship.²²

Be a Good Mentee

It is critical that fellows put their best foot forward during meetings with mentors.²¹ Show up prepared and with an agenda, set timelines, follow-up on tasks, and discuss short-term (e.g., conducting a literature review) and long-term goals (e.g., submitting a grant). Being prepared and following through will make the best use of the mentee and mentor's time. Successful mentees also maintain clear, consistent and respectful communication with mentors, especially through thoughtful and targeted use of email, request support and feedback early and often, and remain authentic and enthusiastic.²¹

Peer Mentorship

Peer mentorship, or a reciprocal, supportive relationship between two colleagues at similar professional stages, is particularly important for fellows' professional and personal growth. One reason for this is because a peer is going through many of the same experiences themselves and can thus offer helpful insights.^{23, 24} As such, they can offer guidance on navigating a new institution and its resources, share code for statistical analysis, offer feedback on study questions or specific aims, and share materials that are helpful for advancement, such as job talk slides or funded grant proposals.^{25, 26}

Local and national research conferences are an excellent place to meet and network with peers. Thanks in part to videoconferencing and social media, these relationships can be sustained at long-distance. Additionally, fellows may find peer networks in their research areas of interest (e.g., #ProudToBeGIM, #CardioTwitter, and #HealthEquity on Twitter).²⁷

IDENTIFYING AND PURSUING FUNDING OPPORTUNITIES

Although funding is not a requirement for most GIM fellows, identifying, pursuing, and obtaining funding is necessary for a research career in academic medicine. Thus, during the latter years of fellowship, familiarize yourself with the grant writing process and learn to identify funding opportunities. This can be accomplished through formal coursework or guidance from mentors and/or coaches or at conference workshops. Becoming familiar with submission guidelines,²⁸ as well as the process of writing and receiving feedback, will make larger grant opportunities feel less daunting in future years. Additionally, early success with funding may strengthen future grant applications.²⁹

Pilot Grants

Pilot intramural or foundation grants offer fellows the opportunity to conduct a small project and generate data to inform future studies and larger grants. Typically, these applications are shorter and less competitive than larger grants. Consider professional society grants (e.g., Society of General Internal Medicine Founder's Grant)³⁰ local department, hospital, or institution-wide grants (e.g., Clinical and Translational Science Award programs),³¹ and nonprofit foundations. Funding opportunities are advertised through university/society listservs, on social media platforms, or on government or foundation websites. Given the lower rates of research awards among racial-ethnic minorities,³² minority fellows (and their mentors) should strongly consider submitting NIH Diversity Supplements (PA-18-906),³³ which are mentored research grants within an existing NIH-funded project (typically an R, P, or U series grant).

Career Development Awards

The goal of most research fellowships is to prepare fellows for an independent research career. One mechanism is through a career development award—an extramural grant that protects early investigators' time for scientific research and additional career development.³⁴ These awards are offered by various NIH institutes, the Patient-Centered Outcomes Research Institute (PCORI), VA research divisions, the AHRQ, and professional societies like the American Heart Association.^{35, 36}

Career development awards require that the applicant has a publication track record (3–5 publications, often with a

primary mentor), evidence of prior funding, and a primary mentor that is a funded investigator. Therefore, you may not be ready to apply until the third year of fellowship or within the first 3 years of a faculty appointment. Given the complexities and competitiveness of this award mechanism, it is important to learn about the various career development award opportunities and spend 6 to 12 months planning prior to submission.^{37, 38} Institutions vary in their expectations for new faculty: while most only ask for ideas for a career development award, some may expect developed career development award aims or a proposal. Regardless, be prepared to discuss the trajectory of your research portfolio and potential mechanisms for funding on the job trail.

SUCCESSFULLY SECURING AN ACADEMIC OR “TRANSLATION” JOB

The culmination of a GIM fellowship will be to seek and successfully secure a job, whether in academia, public health, policy, or other forms of scholarship or leadership. We hereafter describe public health, policy, and quality improvement positions under the umbrella of “translation” jobs, in which physician-scholars play a role in implementing research or policy or take on health system leadership positions. While we discuss translation jobs, we note that most GIM fellowships train fellows for clinician-investigator roles. Nevertheless, the recent spread of learning healthcare systems, which couple rigorous quality improvement with scientific research,³⁹ should finally erode the traditional silos of academic and translation roles in the next decade.⁴⁰ For both job categories, the job search is a journey and requires a significant time commitment during the final year of fellowship. Below we present an overview of this process.

Defining your Dream Job

Think first about what you would call your “dream job.” This involves considering and mapping your top professional and personal priorities. The basic components of a clinician-investigator position include scholarship/implementation, education/supervision, and clinical activities. Consider what ratio you would be satisfied with among these three categories. Which category do you want to lead with? This helps define what kind of job you will be looking for. For traditional GIM clinician-investigator jobs, the ratio of research to clinical medicine will be 80:20 or 70:30.

Searching for Available Options

Start searching for available options toward the end of your first year of fellowship and certainly by the beginning of your final year of fellowship. For translation jobs, the timeline is rolling, as job opportunities open on a continual basis. Start early and cast a wide net, while being realistic about where in

the country you are willing to go. The start of this process often involves the following steps:

- Describe your dream job and seek recommendations from mentors, colleagues, family, and friends.
- Seek opportunities for networking at conferences, including job fairs where outside institutions are present and/or directly with division leaders from an institution of interest.
- Conduct informational interviews with senior-level individuals and recently graduated fellows, describing your dream job and asking for advice on where to look and who to contact.
- Look for postings in academic journals, government (e.g., USAjobs.gov) and institutional websites, and social media. (Note: Most organizations will not have a formal job posting, so reach out to institutions not formally advertising a job opportunity.)
- For translation positions, consider doing an internship or other brief experience in your area of interest to develop focused skills and build job-securing connections.

Cover Letter/Email Introduction

Once you have generated your list of available job options, start reaching out. For academic jobs, emailing potential supervisors (e.g., division chiefs) with a curriculum vitae and structured cover letter is standard (Table 2). This is where a supportive peer mentorship network can help; fellows ahead of you may be willing to share prior cover letters and/or etiquette tips for engaging with institutions of interest. If you have not heard back from an institution, consider sending a

Table 2 Components of an Academic Medicine Cover Letter

Introduction	<ul style="list-style-type: none"> • Describe your education to date (e.g., medical school, residency, fellowship, advanced degrees). • Highlight your research training, including relevant coursework. • Reference any personal connection to the supervisor or institution (e.g., prior training experiences, connections via current mentors, or meeting at a conference).
Research Overview	<ul style="list-style-type: none"> • Describe your vision or research framework. • Describe your principal research objective and/or area of expertise. • Describe fellowship research projects and publications. • Discuss future directions for your research and potential funding sources.
Select Accomplishments	<ul style="list-style-type: none"> • Mention relevant clinical experiences, skills, and interests. • Discuss teaching experience. • Describe unique awards and leadership opportunities.
Dream Job Characteristics	<ul style="list-style-type: none"> • Describe your preferred ratio of scholarship, education, and clinical activities (e.g., “80/20 faculty position”).
Your Fit in the Institution	<ul style="list-style-type: none"> • Name potential mentors, collaborators, institutes, or other ways you could be integrated into the institution as well as personal or family location priorities.

follow-up email, or having your mentor or fellowship director send one on your behalf.

Phone Calls, Interviews, and Job Talks

After an initial phone call, you may be invited for an in-person interview. Visit any institution for which you have at least a small chance of working, as you will both learn more about the institution and broaden your professional network. During the first interview, you will meet with potential mentors or collaborators, and for academic jobs, you will give a job talk. The job talk is a critical part of the first impression you make on potential supervisors and its components include:

- Introduction to you and what motivates your work.
- Discussion of prior projects and accomplishments, including a project you completed during fellowship.
- Outline of your vision for future work, including potential funding sources.
- Expression of your passion for teaching and clinical work.

If your first interview goes well, some institutions will offer you a second interview, which is more commonly done for academic than translation jobs. Unlike first interviews, you should only go to a second interview if you are reasonably sure you would accept the position if offered. The purpose of this visit is for the institution to showcase their strengths and for you to see if the institution would be a good fit for you. Most importantly, consider whether you share the values of the faculty with whom you will be working and if there are people you can collaborate with. In addition to individual meetings, you may be scheduled for a housing tour, and significant others or family are usually invited. At some institutions, you may be asked to give a second, less formal talk.

Table 3 Factors to Consider in an Academic Medicine Faculty Position

Protected Research Time	Clarify how much time will be spent on different activities (e.g., research, clinical, teaching, and administrative). Note: percentage effort is calculated differently at each institution.
Clinical Requirement	Clarify whether clinical work will be inpatient, outpatient, or both. Ask about teaching or precepting expectations. Ask how many days per week or weeks per year clinical activity equates to.
Start-up or discretionary funds	These funds will be available for academic research positions to successfully pursue your research, including purchasing research databases or hiring research staff.
Infrastructure support	This may include administrative personnel, office space/location, and computer along with statistical software
Salary and benefits	Along with salary and insurance, request information related to funds for continuing medical education, relocation fees.
Family considerations	Some institutions may be able to help significant others locate new positions and/or find support with childcare.
Additional considerations	These may include start date, loan repayment, signing bonus, parking, university sponsored mortgages in high cost of living locations.

Reviewing and Negotiating Job Offers

You may receive job offers at any point in the search process, but typically after a first or second interview. It is best to review no more than a handful of offers concurrently, and to actively negotiate with 1 or 2 institutions at a time. To successfully negotiate, it is ideal to have at least one alternative offer⁴¹ and to explicitly ask for what you need to be successful in the position (Table 3).⁴²

The negotiation process is a discussion between you and your potential supervisor of what the position would look like and how it would set you up for success. Remember that while no job is “perfect,” pros should outweigh cons. Furthermore, the individual you are negotiating with is someone you may work closely with for years. Thus, keep the discussion as respectful and non-adversarial as possible.⁴³ Be honest about what you need to be successful. Do your homework by reviewing the American Association of Medical Colleges salary report,⁴⁴ other job offers, or asking trusted peers to share their offer letters. Seek advice from sponsors and coaches, including those not at your current institution, with whom you can have confidential conversations.

Accepting a Job Offer and Politely Declining Others

After reviewing your final job offers and discussing with your potential supervisors, select the position that best meets your professional and personal needs. Call your future boss to graciously accept their offer and celebrate! It is best practice to call other institutions you have been considering, letting them know about your decision soon after you accept an offer. These are people who will remain colleagues in your field and it is important to maintain these relationships. Finally, remember to thank all the people who helped get you to this stage.

SUMMARY

GIM fellows have the unique opportunity to conduct research, take advanced methodological coursework, and practice clinical medicine. To be a successful fellow in the current era, it is important to identify an area of scholarship early, solidify mentorship with productive working relationships, and conduct studies that result in publications. Fellowship will culminate with a job search, the goal of which is to identify a position that provides optimal professional and personal fulfillment. The healthcare system continues to produce seemingly unsurmountable problems. We hope that equipped with the advice provided, a new generation of GIM clinician scientists and educators will be well-prepared to take on these problems, improve healthcare in a meaningful way, and to not only survive but also thrive in academic medicine.

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REFERENCES

- Society of General Internal Medicine. Policy statement for general internal medicine fellowships. *J Gen Intern Med*. 1994. <https://doi.org/10.1007/BF02599222>.
- Simon SR, Shaneyfelt TM, Collins MMN, Cook EF, Fletcher RH. Faculty training in general internal medicine: A survey of graduates from a research-intensive fellowship program. *Acad Med*. 1999. <https://doi.org/10.1097/00001888-199911000-00022>.
- Bromley E, Jones L, Rosenthal MS, et al. The national clinician scholars program: Teaching transformational leadership and promoting health justice through community-engaged research ethics. *AMA J Ethics*. 2015. <https://doi.org/10.1001/journalofethics.2015.17.12.medu1-1512>.
- Splaine ME, Ogrinc G, Gilman SC, et al. The department of veterans affairs national quality scholars fellowship program: Experience from 10 years of training quality scholars. *Acad Med*. 2009. <https://doi.org/10.1097/ACM.0b013e3181bfdfef>.
- Agency for Healthcare Research and Quality. Research Training Programs. <https://www.ahrq.gov/funding/training-grants/nrsa.html>. Published 2018. Accessed 9 December 2019.
- Society of General Internal Medicine. Fellowship Training Directory. <https://www.sгим.org/career-center/training-directories/fellowship-directory#search>. Published 2019. Accessed 15 August 2019.
- Saha S, Christakis DA, Saint S, Whooley MA, Simon SR. A survival guide for generalist physicians in academic fellowships. Part 1: Getting started. *J Gen Intern Med*. 1999. <https://doi.org/10.1046/j.1525-1497.1999.12138.x>.
- Saha S, Saint S, Christakis DA, Simon SR, Fihn SD. A survival guide for generalist physicians in academic fellowships. Part 2: Preparing for the transition to junior faculty. *J Gen Intern Med*. 1999. <https://doi.org/10.1046/j.1525-1497.1999.12148.x>.
- Chin MH, Covinsky KE, McDermott MMG, Thomas EJ. Building a research career in general internal medicine: A perspective from young investigators. *J Gen Intern Med*. 1998. <https://doi.org/10.1046/j.1525-1497.1998.00028.x>.
- Gonzales R, Handley MA, Ackerman S, O'Sullivan PS. A framework for training health professionals in implementation and dissemination science. *Acad Med*. 2012. <https://doi.org/10.1097/ACM.0b013e3182449d33>.
- Mensah GA, Stoney CM, Freemer MM, et al. The National Heart, Lung, and Blood Institute Strategic Vision Implementation for Health Equity Research. *Ethn Dis*. 2019. <https://doi.org/10.18865/ed.29.S1.57>.
- Handley MA, Gorukanti A, Cattamanchi A. Strategies for implementing implementation science: A methodological overview. *Emerg Med J*. 2016. <https://doi.org/10.1136/emered-2015-205461>.
- Ford BS, Rabin B, Morrato EH, Glasgow RE. Online resources for dissemination and implementation science: Meeting demand and lessons learned. *J Clin Transl Sci*. 2018. <https://doi.org/10.1017/cts.2018.337>.
- Halvorson MA, Finlay AK, Cronkite RC, et al. Ten-Year Publication Trajectories of Health Services Research Career Development Award Recipients: Collaboration, Awardee Characteristics, and Productivity Correlates. *Eval Heal Prof*. 2016. <https://doi.org/10.1177/0163278714542848>.
- Lundine J, Bourgeault IL, Clark J, Heidari S, Balabanova D. The gendered system of academic publishing. *Lancet*. 2018. [https://doi.org/10.1016/S0140-6736\(18\)30950-4](https://doi.org/10.1016/S0140-6736(18)30950-4).
- Guarino CM, Borden VMH. Faculty Service Loads and Gender: Are Women Taking Care of the Academic Family? *Res High Educ*. 2017. <https://doi.org/10.1007/s11162-017-9454-2>.
- Silvia PJ. How to Write a Lot. 2000. <https://doi.org/10.1017/S0261444804002216>.
- Chopra V, Edelson DP, Saint S. Mentorship malpractice. *JAMA*. 2016. <https://doi.org/10.1001/jama.2015.18884>.
- Waljee JF, Chopra V, Saint S. Mentoring millennials. *JAMA*. 2018. <https://doi.org/10.1001/jama.2018.3804>.
- Chopra V, Arora VM, Saint S. Will you be my mentor? - Four archetypes to help mentees succeed in academic medicine. *JAMA Intern Med*. 2018. <https://doi.org/10.1001/jamainternmed.2017.6537>.
- Vaughn V, Saint S, Chopra V. Mentee missteps: Tales from the academic trenches. *JAMA*. 2017. <https://doi.org/10.1001/jama.2016.12384>.
- Milkman KL, Akinola M, Chugh D. What happens before? A field experiment exploring how pay and representation differentially shape bias on the pathway into organizations. *J Appl Psychol*. 2015. doi:<https://doi.org/10.1037/apl0000022>.
- Colvin JW, Ashman M. Roles, risks, and benefits of peer mentoring relationships in higher education. *Mentor Tutoring Partnersh Learn*. 2010. doi:<https://doi.org/10.1080/13611261003678879>.
- Decastro R, Sambuco D, Ubel PA, Stewart A, Jaggi R. Mentor networks in academic medicine: Moving beyond a dyadic conception of mentoring for junior faculty researchers. *Acad Med*. 2013. <https://doi.org/10.1097/ACM.0b013e318285d302>.
- Varkey P, Jatoi A, Williams A, et al. The positive impact of a facilitated peer mentoring program on academic skills of women faculty. *BMC Med Educ*. 2012. <https://doi.org/10.1186/1472-6920-12-14>.
- Bussey-Jones J, Bernstein L, Higgins S, et al. Repaving the road to academic success: The IMERGE approach to peer mentoring. *Acad Med*. 2006. <https://doi.org/10.1097/01.ACM.0000232425.27041.88>.
- Teruya SA, Bazargan-Hejazi S. Social Media and Mentoring in Biomedical Research Faculty Development. *J Fac Dev*. 2014;28(3):13-22.
- Berg KM, Gill TM, Brown AF, Zerzan J, Elmore JG, Wilson IB. Demystifying the NIH grant application process. *J Gen Intern Med*. 2007. <https://doi.org/10.1007/s11606-007-0301-6>.
- Sehgal AR. Number of grant applications needed to fund research faculty: a probabilistic analysis. *J Gen Intern Med*. 2018. <https://doi.org/10.1007/s11606-018-4464-0>.
- Society of General Internal Medicine. Founders' Grant. <https://www.sгим.org/career-center/awards-and-grants/grant-awards/founders-grant>. Published 2019. Accessed 26 February 2020.
- Sweeney C, Schwartz LS, Toto R, Merchant C, Fair AS, Gabrielove JL. Transition to Independence: Characteristics and Outcomes of Mentored Career Development (KL2) Scholars at Clinical and Translational Science Award Institutions. *Acad Med*. 2017. <https://doi.org/10.1097/ACM.0000000000001473>.
- Naik RP, Derebail VK, Grams ME, et al. Association of Sickle Cell Trait With Chronic Kidney Disease and Albuminuria in African Americans. *JAMA*. 2014;312(20):2115. <https://doi.org/10.1001/jama.2014.15063>.
- National Institutes of Health. Research Supplements to Promote Diversity in Health-Related Research. <https://grants.nih.gov/grants/guide/pa-files/pa-18-586.html>. Published 2018. Accessed 24 February 2020.
- Gill TM, McDermott MM, Ibrahim SA, Petersen LA, Doebbeling BN. Getting funded: Career development awards for aspiring clinical investigators. *J Gen Intern Med*. 2004. <https://doi.org/10.1111/j.1525-1497.2004.30293.x>.
- Mentz RJ, Becker RC. Funding opportunities for clinical investigators in the early stages of career development in cardiovascular research. *J Thromb Thrombolysis*. 2013. <https://doi.org/10.1007/s11239-013-0970-4>.
- Sumandea CA, Balke CW. Funding opportunities for investigators in the early stages of career development. *Circulation*. 2009. <https://doi.org/10.1161/CIRCULATIONAHA.107.752691>.
- Wisdom JP, Riley H, Myers N. Recommendations for Writing Successful Grant Proposals. *Acad Med*. 2015. <https://doi.org/10.1097/acm.0000000000000811>.
- Lindman BR, Tong CW, Carlson DE, et al. National institutes of health career development awards for cardiovascular physician-scientists recent trends and strategies for success. *J Am Coll Cardiol*. 2015. <https://doi.org/10.1016/j.jacc.2015.08.858>.

39. **Atkins D, Kilbourne AM, Shulkin D.** Moving From Discovery to System-Wide Change: The Role of Research in a Learning Health Care System: Experience from Three Decades of Health Systems Research in the Veterans Health Administration. *Annu Rev Public Health.* 2017. <https://doi.org/10.1146/annurev-publhealth-031816-044255>.
40. **Atkins D.** Are We Growing the Right Health Services Research Workforce of the Future? Thoughts from a National Delivery System Health Serv Res. 2018. <https://doi.org/10.1111/1475-6773.13032>.
41. **Fisher R, Ury W.** Getting to Yes, Negotiating Agreement Without Giving In (Harvard Negotiation Project). 1981.
42. **Babcock L, Laschever S.** Women Don't Ask: Negotiation and the Gender Divide. 2009.
43. **Sambuco D, Dabrowska A, Decastro R, Stewart A, Ubel PA, Jagsi R.** Negotiation in academic medicine: Narratives of faculty researchers and their mentors. *Acad Med.* 2013. <https://doi.org/10.1097/ACM.0b013e318286072b>.
44. **Dandar, VM, Lautenberger DM.** Garrison GE. Promising Practices for Understanding and Addressing Salary Equity at U.S. Medical Schools. 2019.

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