



WOMEN'S HEALTH *In Focus* AT NIH

Newsletter of the NIH Office of Research on Women's Health

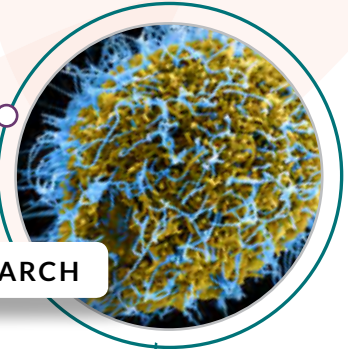
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DIRECTOR'S CORNER



BIOMEDICAL RESEARCH



FEATURE STORY

Women in
Biomedical Careers



FUNDING OPPORTUNITIES



WOMEN IN SCIENCE



SCIENTISTS IN THE MAKING



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- In the Journals
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Staying on Course: Navigating the Challenges Women Face in Building Their Biomedical Careers

An 8-year-old girl in England wanted to follow her grandfather's advice to become a professor. However, she lived in a disadvantaged mill and mining town, and no one in her family had ever attended college.

Yet she obtained her Ph.D. at age 23 and worked her way up to become the Director of the Division of Biomedical Research Workforce in the Office of Extramural Research at NIH; and Co-Chair of the NIH Working Group on Strengthening the Biomedical Workforce. That woman is P. Kay Lund, Ph.D., and she is enjoying a long and successful academic research career. Unfortunately, there are far too few stories of women rising to leadership positions in science, technology, engineering, and mathematics (STEM)-related fields, including that of biomedicine.



P. Kay Lund, Ph.D.

Women comprise more than 40 percent of medical students and 50 percent of Ph.D. students, yet they are underrepresented in academic biomedical faculty positions, especially at senior levels. This phenomenon has been called the “leaky pipeline.”¹

The downstream effect of this situation is that in the field of biomedicine in the U.S., women represent only 38 percent of tenure-track faculty and 22 percent of tenured faculty—and even fewer are department chairs (15.8 percent) or deans (16 percent).² Across the globe, women represent only 28.8 percent of the world's scientists employed in research and development³ and only 13 percent are in senior-level positions.⁴ Further, those women who do have successful careers in STEM earn less money than their male peers. In STEM positions, a woman earns 84 cents for every dollar earned by a man; a gender wage gap of 16 percent.⁵

Contrast those data with that of women in fields other than biomedicine. ORWH Director Janine A. Clayton, M.D., has noted that in the U.S., about 25 percent of all deans and department heads in the humanities are women. However, in science, the percentage of women who have become deans and department heads is 5 percent. Unfortunately, the attrition rate for women who fall out of the academic advancement pipeline has remained essentially unchanged for over 25 years.⁶

As women advance in STEM careers, research indicates that the conflicting priorities of family and career decrease career satisfaction and are predictors of career departure.⁶ Measures that will mitigate the high rate of attrition are greatly needed by research institutions.

Several factors may contribute to the problem, including:

- Women faculty still have consistently lower salaries, smaller start-up packages, and limited authorship roles.⁷
- Women with children experience insufficient institutional support, fewer publication opportunities, and lower self-perceived career progress and career satisfaction.⁸
- Studies show that women and minorities are disadvantaged in several areas that affect hiring and promotion decisions. For example, authors and editors, especially

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Women in Biomedical Careers

The NIH Office of Research on Women's Health (ORWH) is the first Public Health Service office dedicated specifically to promote women's health research within—and beyond—the NIH scientific community. Since the establishment of the Office almost 30 years ago, we have remained faithful to our mission to:

- Strengthen and enhance research related to diseases, disorders, and conditions that affect women.
- Examine sex and gender influences on health and disease.
- Develop opportunities and support for the recruitment, retention, reentry, and the sustained advancement of women in biomedical careers.

In this issue of Women's Health in Focus at NIH, we concentrate on the careers aspect of our mission.

With diversity in teams, comes a wider array of perspectives, insights, and creative problem-solving that is critical in scientific research and other endeavors. Not surprisingly, however, women in STEM and other disciplines generally experience greater challenges in their professional careers than their male teammates, which can understandably hinder not only their success, but sometimes even their health.

The problem of sexual harassment, for example, which is disproportionately experienced by women, might even

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if they are male, suggest women as reviewers less often than they recommend men.⁹

- Sexual harassment in the workplace, which affects both genders, is disproportionately encountered by women, which contributes to women leaving scientific fields.

Why Gender Diversity Is Needed

A growing body of literature supports the value of diversity in science. Researchers and professionals in the field make the case that gender diversity leads to better science. In a review of literature on the topic, researchers cited studies¹⁰ indicating that:

- Gender diversity and collective problem-solving are positively linked.
- Gender diversity can help stimulate new discoveries by broadening the viewpoints, questions, and areas addressed by researchers.

In related studies, researchers also found that:

- When more women participate on a research team, particularly in leadership positions, there is an increase in sex and gender analysis in that research, and vice versa.¹¹
- Older patients treated by women clinicians have fewer hospital re-admissions and reported deaths in a given time period than when treated by male physicians.¹²

Studies examining the characteristics of supportive institutional structures have found that the right conditions must be in place for organizations to fully realize the benefits of gender diversity. As Dr. Clayton maintains, "Simply recruiting more women is not enough." She emphasizes that the issue is a systemic one "that's going to require systemic solutions."

Navigating the Path to Career Success

Within the scientific community, several activities are recognized as crucial to job retention and career advancement. They include, but are not limited to, the receipt of grants, invitations to conferences, nominations for professional awards, forming professional collaborations, and serving as peer reviewers for publications. For aspiring and new scientists, however, creating or taking advantage of such opportunities can prove daunting, even for the most ambitious young researchers.

There are several steps women scientists can take to create their own advantages, such as seeking mentorships; building resiliency; and valuing and managing their time and contributions. These processes are described below.

Mentoring: One Size Does Not Fit All

In the biomedical field, as in other areas of the workforce, mentoring is considered one of the most important vehicles for developing young talent. However, mentoring as a teaching and learning tool is complex and idiosyncratic, since a variety of theories, philosophies, and structures are advocated as effective for the mentor-mentee relationship.

Dr. Rachelle Heller, George Washington University School Computer Science Professor, finds that many mentoring relationships have one thing in common: "[They] start off

prompt some women to leave science, and thus not advance to leadership positions, where they can effect greater policy changes to help future women researchers.

Other challenges have included women with children having less institutional support, bias and microaggression by male colleagues, and unfair hiring practices, particularly for women seeking to reenter the workforce after taking time for family matters.

In this publication, we explore such challenges and strategies to help women overcome them, so that they can be freer to bring their best to their professional lives, which will benefit everyone.



*Janine Austin Clayton, M.D.
Director, NIH Office of Research on Women's Health
NIH Associate Director for Research on Women's Health*

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with enthusiastic mentors and mentees—and then they fail.” Some fail because the pair lack chemistry; other times, job demands prevent regular meetings.

Whatever the reason, Dr. Heller says that for women, including women of color and LGBTQ women, a failed mentoring relationship can be problematic and difficult to replace. Women in general are often more isolated in their careers, tend to be reluctant to seek mentoring relationships for fear of being perceived as inadequate, and usually have smaller professional networks.

Literature on biomedical workforce diversity indicates that race, ethnicity, gender, skin color, social status, and other identifiable characteristics can affect mentoring “within the pipeline.”¹³

While pointing out the limitations of mentoring, researchers still acknowledge its effectiveness, especially when formalized or augmented with other assistive techniques, such as coaching. And, while “one size does not fit all,” Dr. Heller asserts that effective training for both the mentor and mentee, along with a specific plan, can help both parties anticipate and address individual differences and institutional issues that may arise. Effective planning can go a long way toward ensuring that the mentoring experience meets each individual’s goals and expectations.



Dr. Heller’s suggestions for “good” mentoring include the following:

- Support from leadership,
- Structure,
- Mentor and mentee training,
- Confidential communication between both parties,
- Mentee creating meeting agendas,
- Annual review arrangements,
- Ongoing monitoring by the organization.

Creating Personal Resiliency for a Career in Research

Even with mentors and other support systems, the life of a scientist—with tight deadlines, long hours, and professional ups and downs—can be stressful. Add to that the additional pressures faced by women both in the field and at home, and it is not surprising that many drop out of the profession early or decide against entering it altogether. Recognizing what allows some women to stay in the profession and what causes others to leave may come down to an understanding of the concept of resiliency.

The American Psychological Association defines resiliency as the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress, such as serious health problems or workplace and financial stressors. In lay terms, it means “bouncing back” from difficult experiences.

Daniel Ford, M.D., M.P.H., Professor of Medicine and Director of the Institute for Clinical and Translational Research at Johns Hopkins University, and a Building Interdisciplinary Research Careers in Women’s Health Principal Investigator, describes the concept of resiliency as having four primary components: social competence, problem solving, autonomy, and a sense of purpose that includes belief in a bright future.

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In his experience, Dr. Ford says, “Success can have as much to do with self-awareness and the ability to handle stress as it does with academics and job performance.” Because the life of a biomedical scientist often includes repeated failure and rejection, burnout, and multiple relocations and life changes, building resiliency can be important to career advancement and longevity, as well as to personal fulfillment.

For women, he says, building resiliency in the workplace could require becoming more comfortable with one’s natural abilities. “Sometimes women feel pressured to create a work environment that is actually unnatural for them or inauthentic, which can create additional problems and stress.” Dr. Ford urges women to value the natural sensibilities they often bring to the workplace and to lead the way in supporting fellow faculty members as well.

In general, everyone is bound to experience personal or professional adversity at some point during his or her career. When this occurs, some work-related stress can be managed through simple personal resiliency techniques, such as planning ahead; communicating often, especially with team members; asking for help early on; and understanding one’s strengths and weaknesses.

Claiming Credit and Managing Time

Dr. Lund recalls several lessons she learned during her journey from coal mining country to NIH Division Director. She notes that women in science often face challenges that prevent active participation in career development activities. Whether it involves family commitments or caring for children and aging parents, “Time is always an issue for women,” she says. As a result, she recommends that women carefully weigh the value—and cost—of undertaking certain activities, and not be afraid to say “no” or to eliminate nonessential tasks.

Dr. Lund stresses the importance of networking as an effective career advancement strategy at all stages and recommends “judicious” participation in development and leadership workshops, professional societies, and select committees. While along the path to greater opportunities, she urges women to speak up and articulate their achievements, needs for administrative support, and aspirations for a raise or promotion.

She also suggests asking colleagues for input about funding application processes; seeking multiple mentors, both within and outside one’s home division, department, or institution; and only collaborating with colleagues who are willing to work with others on a project. “Women should always keep in mind what they offer in terms of skill and ability, and when considering a move, be prepared to negotiate for sufficient salary and resources,” she says. “If you don’t ask for enough—you won’t receive it.”

Dr. Lund also offers these tips for professional communication:

- Keep email communication as brief as possible. Use the subject heading and a few sentences to inform or describe.
- Avoid providing unnecessary detail when unable to say “yes” to a request.
- Focus on solution(s), rather than dwelling on the problem.

NIH Office of Research on Women’s Health

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Investing in Women Scientists

As women navigate the challenges to a successful career, it is also important for those in leadership and decision-making roles to ensure they are providing suitable environments for their career growth and success. This might include creating modern, more sensible family-friendly policies; implementing interventions for sociocultural effects, such as bias and micro-aggressions; ensuring that hiring is objective and fair; and supporting young scientists in the grant application process.

Resources for Women in Biomedical Careers

NIH/ORWH develops and supports opportunities to recruit, retain, and advance women in biomedical careers through programs and activities such as the following:

The [NIH Working Group on Women in Biomedical Careers](#) is comprised of individuals in leadership positions at NIH. It sponsors national workshops on mentoring and other career aspects. On the group's main site (www.womenin-science.nih.gov), you will find inspirational videos, called [Pearls of Wisdom](#), in which prominent women in science and medicine share words of wisdom about advancing in the biomedical field.

The [NIH Reentry into Biomedical Research Careers](#) program supplements existing NIH research grants to assist full- and part-time researchers returning to the biomedical workforce following a qualifying interruption in their research careers.

The [Women of Color Research Network](#), including the group's LinkedIn site, provides women of color, and others, with information about the NIH grants process, advice on career development, and a forum for networking and sharing information.

For more information on the topic of women in biomedical careers, visit the ORWH website at <https://orwh.od.nih.gov/career-development> and also view presentations from the **Third Annual NIH Vivian W. Pinn Symposium: Leveraging the Network to Advance Women in Science** at <https://bit.ly/2MuWbjh>.

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NIH Welcomes Helene M. Langevin, M.D., C.M., as the New Director of the National Center for Complementary and Integrative Health

NIH Director Francis S. Collins, M.D., Ph.D., recently announced that Helene M. Langevin, M.D., C.M., was selected as the new Director of the National Center for Complementary and Integrative Health (NCCIH). Dr. Langevin is expected to join NIH in November 2018.

“Helene’s distinguished career and leadership in the integrative health community, along with her research on the role of nonpharmacologic treatment for pain, makes her ideally suited to lead NCCIH,” said Dr. Collins. “We are so pleased to have her join the NIH leadership team.”

As NCCIH director, Dr. Langevin will oversee the Federal Government’s lead agency for scientific research on the diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine.

Dr. Langevin received an M.D. degree from McGill University, Montreal. She completed her postdoctoral research fellowship in neurochemistry at the MRC Neurochemical Pharmacology Unit in Cambridge, England, and a residency in internal medicine and fellowship in



endocrinology and metabolism at The Johns Hopkins Hospital in Baltimore.

Her research interests have centered around the role of connective tissue in low back pain and the mechanisms of acupuncture, manual, and movement-based therapies.

The full release is available on the NCCIH website: <https://nccih.nih.gov/news/press/Langevin-NCCIH-Director-Selected>

INTERDISCIPLINARY RESEARCH

Introduction to Interdisciplinary Research: “Multidisciplinary, Interdisciplinary, Transdisciplinary Research, Oh My!”



Victoria Cargill, M.D., M.S.C.E., AAHIVS
Associate Director for Interdisciplinary Research

The best way to place the differences between multidisciplinary, interdisciplinary, and transdisciplinary approaches to research in perspective is to begin with a real-world example: treating an HIV-positive, pregnant mother. When I encountered my first example of such a patient, significant research did not exist on how to prevent transmission of HIV infection from mother to child. Preventing HIV transmission from a pregnant woman to a child involves more than just medication—it includes engaging in treatment, trusting a provider, working with her partner if she has one, identifying support, and so much more. This example demonstrates that women’s lives are complex and are at the center of the intersection of multiple factors—begging the question—what field is best positioned to include these competing demands?

When considering the answer to this question, women’s health requires one to examine it through multiple lenses—social,

economic, medical, interpersonal, public policy—the list goes on. These multiple lenses each present real and significant challenges, which require multiple approaches to find solutions. Multidisciplinary research addresses these challenges by bringing together different disciplines to examine the issue(s) under study, while maintaining separation of disciplines such that when the study is completed, those investigators present their findings in the context of their respective disciplines. The advantage of a multidisciplinary approach is having multiple experts from different fields collaborating. The limitation, however, is that the fields remain separated, which can make communication across fields more difficult, and an integrated approach difficult to construct. A multidisciplinary perspective would approach the pregnant, adolescent HIV-positive mother by considering a medical

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anthropology lens, an adolescent medicine lens, and an economic lens, since each of these facets of her personhood (age, socio-economic status, etc.) could affect her treatment. The multidisciplinary approach might lead to something like a peer-led adherence intervention for young women of childbearing age.

In contrast to multidisciplinary research, interdisciplinary research integrates information, data, techniques, and tools of two or more disciplines to advance knowledge and understanding that is beyond the scope of any one single discipline or practice.¹ Whereas in multidisciplinary approaches the disciplines remain separate, interdisciplinary approaches move beyond single disciplines, allowing this approach to engage a wider audience, explain more phenomena, and have predictive value beyond the existing circumstances. Circling back to the pregnant patient, instead of simply seeing a non-adherent adolescent pregnant female, interdisciplinary approaches would not only identify the sociodemographic aspects and the nonadherence, but also identify ways to intervene as well as try to predict how the patient might react to an intervention, given her background and history. The limitations of interdisciplinary research include the difficulty of learning a new discipline and the collaboration required to work effectively in teams.

Transdisciplinary research can be defined as creating a new discipline from two or more existing disciplines, for example the field of bioinformatics derived from computer science and biology. Transdisciplinary approaches move beyond the existing disciplines to create something totally new where the ultimate result is not simply derived from discrete disciplines, but goes further to create whole new methodology.² Transdisciplinary

research allows researchers to capitalize on innovations across various disciplines and increase understanding, while potentially affecting policy change thus including important stakeholders. It can also be difficult, however, as it requires complete integration to develop an entirely new approach.³

To encourage interdisciplinary work, the ORWH recently published a [funding opportunity announcement \(FOA\) for U3: Understudied, Underrepresented, and Underreported populations](#). The FOA announced the availability of “administrative supplements to support interdisciplinary, transdisciplinary and multidisciplinary research focused on the effect of sex/gender influences at the intersection of a number of social determinants, including but not limited to: race/ethnicity, socioeconomic status, education, health literacy and other social determinants in human health and illness.”⁴

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Bladder Cancer Outcomes Worse for Women

Uhlig, A., Hosseini, A., Simon, J., Lotz, J., Trojan, L., Schmid, M., Uhlig, J. (2018). [Gender Specific Differences in Disease-Free, Cancer Specific and Overall Survival after Radical Cystectomy for Bladder Cancer: A Systematic Review and Meta-Analysis. *The Journal of Urology*, 200\(1\):48-60.](https://doi.org/10.1016/j.juro.2017.11.150)
<https://doi.org/10.1016/j.juro.2017.11.150>

Women suffer significantly worse outcomes for bladder cancer than men. Uhlig and colleagues conducted a meta-analysis examining whether sex differences remain after stratifying by tumor characteristics in treatment regimens. This meta-analysis was the first to combine evidence on several crucial outcomes in patients treated with cystectomy. The meta-analysis included 59 domestic and international studies published between 1998 and 2017. Thirty of these studies representing 38,321 patients evaluated disease-free survival; 44 representing 69,666 patients evaluated cancer-specific survival. Twenty-six studies representing a total of 30,039 patients evaluated overall survival. Approximately 21% of patients with bladder cancer undergo radical cystectomy. While bladder cancer is more common in men, women typically have worse outcomes. Why? Uhlig and colleagues found that epidemiological and hormonal differences, disparities in health care including misdirected referrals to a gynecologist rather than a urologist, and disproportionate rates of smoking in women partially explain poorer outcomes for women. In addition to sex differences in survival rates, Uhlig and colleagues found that women were at increased risk for cystectomy complications.

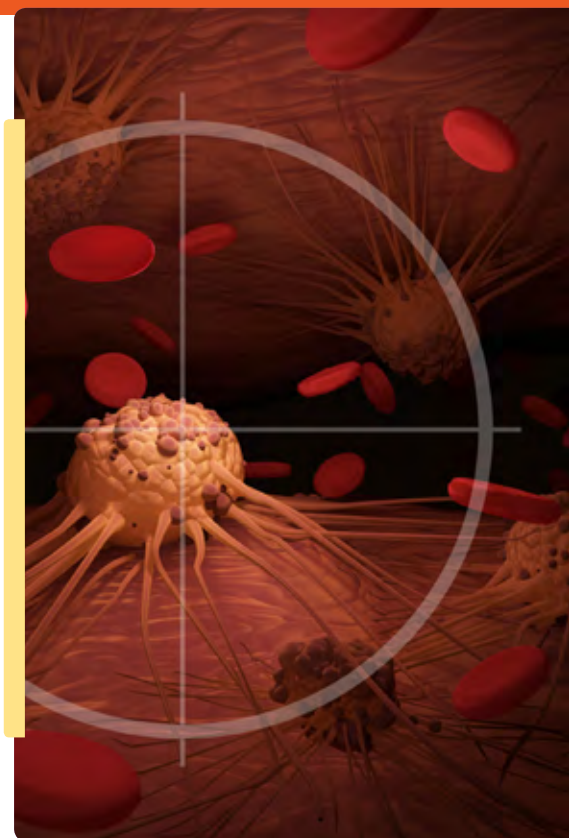
Selective reporting of study results, or the failure to include sex as a potential confounder in multivariable statistical models, led to the exclusion of 181 studies in the review. Uhlig and colleagues found some intriguing differences that further highlight the need to account for sex as a

biological variable. Women were more likely to present with more advanced cancer stage, grade, and nodal status. Subgroup analyses also showed that neoadjuvant chemotherapy mitigated gender-specific differences. Bladder cancer outcomes show regional variability and dependence on treatment strategy, and speak to the urgency for health care providers to understand sex differences in bladder cancer diagnosis and treatment and make prompt specialist referrals.

The Importance of Process Evaluation for Programmatic Effectiveness

Raymond, N.C., Wyman, J.F., Dighe, S., Harwood, E.M., Hang, M. (2018). [Process Evaluation for Improving K12 Program Effectiveness: Case Study of a National Institutes of Health Building Interdisciplinary Research Careers in Women's Health Research Career Development Program. *Journal of Women's Health*, 27\(6\):775-781.](https://doi.org/10.1089/jwh.2016.6174)
<https://doi.org/10.1089/jwh.2016.6174>

Process evaluations are often overlooked as a tool for continuous improvement in faculty training programs. Raymond and colleagues describe how a rigorous process evaluation can identify problems, generate solutions, and provide pathways to implement program improvements. The University of Minnesota's (UM's) Building Interdisciplinary Research Careers in Women's Health (BIRCWH) is a mentored career development program funded by the Office of Research on Women's Health at the National Institutes of Health. The UM BIRCWH program supports as many as four scholars per year to develop interdisciplinary research careers with a focus on women's health and sex differences. The program includes a mentoring team, career development plan, and financial and logistic support. Process evaluations can be conducted one time or on a regular



basis. They can use quantitative and qualitative measures for different aspects of program success, such as program satisfaction, fidelity to the intentions of the funding, and outcomes. Some specific programmatic changes due to the process evaluation include the following:

- Clarifying mentorship and scholarship roles
- Improving orientation process while emphasizing interdisciplinarity
- Elucidating expected program outcomes
- Formalizing discussion topics to guide mentoring sessions

This case study examined BIRCWH scholars and mentors who participated in the process evaluation program—motivated to both enhance their own experience as well as to improve UM's possibility of future funding—over the course of 10 years. Scholars and mentors reported a high level of satisfaction, and graduates were prolific in publishing 225 peer-reviewed articles along with securing 25 grants with leadership roles.



Women and Opioids: Something Different Is Happening Here

Mazure, C.M., Fiellin, D.A. (2018). [Women and opioids: something different is happening here. *The Lancet*, 392\(10141\):9-11. \[https://doi.org/10.1016/S0140-6736\\(18\\)31203-0\]\(https://doi.org/10.1016/S0140-6736\(18\)31203-0\)](https://doi.org/10.1016/S0140-6736(18)31203-0)

Action to address the opioid epidemic is doomed to fail if it does not sufficiently address the sex and gender aspects of use and treatment. There are a number of ways in which opioids affect women and men differently—some biological and some psychosocial. For example, medical providers are more likely to prescribe opioids for women in pain than for men. Some pharmacological treatments such as buprenorphine are less effective for women. Sociologically, women are more likely than men to use opioids to cope with negative emotions and pain. Because women experience greater stigma regarding substance abuse treatment, they are also less likely than men to seek professional help. Further, many traditional treatment programs do not provide child care or domestic violence counseling, and may place women at risk of having the custody of their children revoked. Understanding women's lives and biology are crucial to stemming the tide of the opioid epidemic.

Making the Voices of Female Trainees Heard (2018)

Rotenstein, L.S., Berman, R.A., Katz, J.T., Yialamas, M.A. (2018) [Making the voices of female trainees heard. *Ann. Intern. Med.* \[Epub ahead of print 17 July 2018\] doi:10.7326/M18-1118](https://doi.org/10.7326/M18-1118)

Despite progress attracting girls and women to medical careers, implicit bias remains largely unrecognized. Nationally, women make up almost half of the residency and medical school program leadership. Administrators at the Brigham and Women's Hospital in Boston conceptualized their program as forward-thinking and progressive in attracting diversity to the field of medicine. However, Rotenstein and colleagues noted that informal department emails sent to congratulate university-affiliated authors on their newly published work primarily reflected the success of their male colleagues. Underlying this gendered finding was a notable difference in comfort level with self-promotion among male trainees relative to female trainees. Rather than insisting that women promote their own accomplishments in the ways that male residents do, the authors suggest an implicit recognition of the stigma many women feel when they engage in professional self-promotion. The residency program's administrative staff created a systematic search for resident publications each month in the medical literature and the popular press and created ways in which residents could self-report publications through a formal, online process. These systems resulted in a change from 17% of the articles first-authored by women to 42% in the first five months. The implications of this work are many—not the least of which is that awareness and recognition of accomplishments is subject to implicit bias. This kind of unintentional bias is most certainly one of many contributors to disparities in other equity matters such as promotions and pay.

Nuancing the “Leaky Pipeline” in Research Careers

Hechtman, L. A., Moore, N. P., Schulkey, C. E., Miklos, A. C., Calcagno, A. M., Aragon, R., & Greenberg, J. H. (2018). [NIH funding longevity by gender. *Proceedings of the National Academy of Sciences of the United States of America*, 115\(31\), 7943-7948. <http://doi.org/10.1073/pnas.1800615115>](http://doi.org/10.1073/pnas.1800615115)

Leaky pipeline? Instead of constant attrition, Hechtman and colleagues discovered that the problem is at the joints. Although women are just as likely to complete a biomedical degree as men, they are still less likely to apply for their first research award and grant renewal. The National Institutes of Health is the world's largest public funder of biomedical research. Scientists depend on NIH grants to conduct ongoing research, propel their careers, and elevate their academic status. Hechtman and colleagues examined the research funding longevity of female and male investigators from 1991 to 2015. They accounted for the investigator's age and degree, how often investigators applied for grants, the grant review outcomes, and the overall level of funding for the investigator's institution. Women are less likely to hold a dual Ph.D./M.D., associated with longer funding success. Hechtman and colleagues found that women are less likely to apply for a first grant. NIH receives less than one-third of its new grant applications from women. Once they apply and are funded, women are generally just as successful as men. The small differences of grant success detected between female and male investigators are explained by the rates of application and not constant attrition. Yet, there are real gender differences in entering and staying in research careers generally. Hechtman and colleagues note that parity efforts may best be directed to support women entering research and supporting their continued grant success.

Featured Research and Perspectives

Sexual Harassment of Women: Climate, Culture, and Consequences in Academic Sciences, Engineering, and Medicine

National Academies of Sciences, Engineering, and Medicine. (2018). *Sexual Harassment of Women: Climate, Culture, and Consequences In Academic Sciences, Engineering, and Medicine*. <https://doi.org/10.17226/24994>

There has been much progress closing the gender gap in science, technology, engineering, and mathematics (STEM) fields. However, some of the most successful efforts in promoting interest and reducing barriers to advanced math and science education for girls are threatened by the persistent and pervasive sexual harassment they experience once in higher education and postgraduate STEM training programs. Fifty-eight percent of women in the academic workplace and 20 percent to 50 percent of female students report experiencing sexual harassment within the academy. Sexual harassment in academic science, engineering, and medicine affects individual psychological well-being and imposes a significant social and economic cost. Silencing diverse voices limits the free exchange of ideas, central within the sciences. In addition to limiting career opportunities, sexual harassment is associated with declines in productivity and workplace morale. The hierarchical relationships between teachers and students, department heads and faculty, and doctors and residents, and the often-isolating scientific work environments, such as research labs and hospitals, provide opportunities for sexual harassment to flourish. Five specific aspects of STEM are particularly associated with sexual harassment: (1) perceived tolerance for sexual harassment; (2) male-dominated work settings with men representing most or all leadership positions; (3) hierarchical power structures; (4) limited, symbolic compliance with existing equal opportunity laws and policies without addressing larger issues of diversity; and (5) uninformed leadership that fails to take on and widely share the responsibility to prevent sexual harassment. The National Academies of Science, Engineering, and Medicine

found that officially reporting sexual harassment is the least common response for women experiencing harassment because it is often associated with retaliation and other negative consequences. This is particularly true when the harasser is in a higher position (such as a supervisor) or serves as a mentor who has power to promote career advancement. Fifteen specific recommendations are provided in this paper, including incentivizing change through the Federal Government and nonprofits as well as taking workplace climate-related research into consideration during the accreditation processes. Federal agencies can assist by supporting leadership training programs for women as well as requiring regular monitoring and evaluation of gender climate-related data. Everyone has a responsibility to provide a welcoming environment where students and professionals of all genders may thrive.



Illuminating Hidden Figures: Jess Wade Has Written More Than 280 Bios of Women Scientists for Wikipedia

Zdanowicz, C. (2018). *A Physicist Is Writing One Wikipedia Entry a Day to Recognize Women in Science*. CNN

Amatulli, J. (2018). *This Physicist Wants Female Scientists to Get Noticed. So She Wrote 270 Wikipedia Profiles*. The Huffington Post

When a young person looks up “scientist” in Wikipedia, what does she see? When Jess Wade, a postdoctoral researcher in the field of plastic electronics at Imperial College London, began her project, the “face” of science was overwhelmingly male. All of that is changing, thanks in part to Wade’s efforts. Frustrated by her own minority status in many math and science classes, Wade vowed to “change things from the inside” to encourage more girls to participate in science. Wade quietly committed to writing one Wikipedia entry per evening, writing more than 200 meticulously researched biographies of female scientists in her first year! Her efforts have inspired others to recognize the contribution of female-identified scientists. Groups like Wiki [WomenInRed](#), and [Wiki Project Women Scientists](#) have leveraged their collective resources to assist. Slowly, the often-used reference source is becoming more reflective of the contributions of all scientists.



Nakela Cook, M.D., M.P.H.

Chief of Staff in the Immediate Office of the Director of the National Heart, Lung, and Blood Institute (NHLBI)

Dr. Nakela Cook is the Chief of Staff in the Immediate Office of the Director (IOD) of the National Heart, Lung, and Blood Institute (NHLBI), a division of NIH. In this role, she provides institutional leadership to support the NHLBI Director, serves as his liaison to senior officials, and provides oversight to the support operations of the IOD. Additionally, she provides institutional leadership to catalyze multidisciplinary initiatives. As such, she leads the strategy development for women's health research at NHLBI and serves as a spokesperson related to the health of women for the Institute.

Dr. Cook is board certified in internal medicine and cardiology. She received a B.S. in Materials Science and Engineering from the University of Alabama at Birmingham and a Doctor of Medicine from Harvard Medical School. In addition, she received her Master of Public Health and completed a fellowship in Health Services Research at the Harvard School of Public Health. She is also an alumnus of the Commonwealth Fund/Harvard University Fellowship in Minority Health Policy.

Prior to her current position, Dr. Cook served as a Medical Officer in the Clinical Applications and Prevention Branch in the Division of Cardiovascular Sciences at the NHLBI.

How has mentorship shaped your career?

Mentorship has been a cornerstone of my career. It has guided my career trajectory from suggesting that I consider medical school in Boston to encouraging me to pursue a cardiology fellowship. While in medical school, although I really loved cardiology, I had always thought I was going to pursue primary care, and I also think I was personally intimidated by not seeing people who looked like me in the field. One of my mentors explained to me that cardiology will never change, if I didn't help change it. They pushed me to step outside of my comfort zone and helped me realize that it was possible for me. I also had a mentor teach me a lesson on resilience. While completing my cardiology fellowship, I did not receive a research grant for which I applied. I was devastated. My mentor helped me learn and grow from that experience. I can give you stories like that over and over, of mentors influencing me and opening my eyes to the possibilities of dreaming and thinking about the opportunities that lay ahead of me.

What do you enjoy about being a scientist and what do you feel have been some of the most rewarding aspects of your career?

I enjoy that I can bring together my interests in research, public health, and medicine for large-scale health impact. Some of the most rewarding aspects are the privilege of training and mentoring others, and my role at the NHLBI. I serve as a catalyst to supporting cutting-edge scientific initiatives that have great potential to impact health outcomes. Some of the first projects that I worked on 10 years ago have today changed guidelines or brought new understanding. That is incredibly rewarding, in addition to the responsibility of imparting knowledge and advice to others to help bring them along.



Nakela Cook, M.D., M.P.H.
Chief of Staff in the Immediate
Office of the Director of
the National Heart, Lung,
and Blood Institute (NHLBI)

How has the trajectory of your career changed over time?

My career trajectory was never linear. I pursued a career in medicine because I was really struck by the disparities in health outcomes that I witnessed growing up. Early in my career, I realized I wanted to focus my efforts on influencing health policy and positively affecting people's lives thousands and a million at a time, rather than on an individual basis. So, soon after residency, I pursued a public health degree and gained research experience, as advised by my mentors. At the time, my professional career was in silos. I had my clinical cardiology work. I had some health policy work, and I was building a research portfolio. They were all taking place in different departments of Harvard. I never thought that I would end up at NIH integrating all of my domains of interest. I was very much on the path of trying to place myself academically at my institution. But I had a mentor who suggested that I look into a career at NIH, and another mentor who helped me navigate this unique path toward my long-term goals and aspirations. I feel like there was a natural evolution toward bringing together my domains of interests and using research to help drive changes in health and health care.

What are some of the characteristics you see for successful scientists?

My vision of a successful scientist has changed over time. To me it is about continual learning, reinvention, and resilience. We have to have the flexibility to pivot or shift when new information comes to light, or the resilience to pick ourselves back up when—whether it be a hypothesis-driven experiment or a clinical trial or a grant application—something doesn't go the way that we think it will. Successful scientists know how to do this well.

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Lastly, what are the barriers to women in science and why is it important to support and encourage the next generation of women scientists?

Women are underrepresented in certain scientific fields and we lack a critical mass of women scientists at senior level positions. The impact is that it can be difficult for women scientists to find role models and scientific leadership may lack the diversity of perspectives that is important to help cultivate the culture for women scientists to strive and thrive in their fields. That is why it is so important to support and encourage women scientists

and pave the path for the next generation of women scientists. Although women scientists today may only go so far with our efforts in our career spans, hopefully, we have opened a door for the next generation so that they can go even further. There has to be a progressive chipping away at the glass ceilings and some of the barriers related to representation so that it becomes easier for future generations. The next breakthroughs are theirs. It is really about fostering that for the next generation of women scientists.

INSTITUTIONAL SPOTLIGHT



Massachusetts General Hospital (MGH), in collaboration with the Harvard T. H. Chan School of Public Health, has launched the Women, Heart, and Brain Global Initiative. In partnership with the Women Heart Alliance and WomenAgainstAlzheimers, this initiative focuses on the co-occurrence of depression and heart disease among women and its implications for memory decline and Alzheimer's disease. The findings from this initiative will help inform therapeutic treatment and policy.¹

This initiative could not come at a more critical time. By 2020, major depression and heart disease are expected to be the leading causes of disability worldwide, with women twice more at risk than men for depression.^{2,3} Major depression and heart disease are both independent risk factors for Alzheimer's, and Alzheimer's is more common in women than men.⁴ Jerrold F. Rosenbaum, M.D., Psychiatrist-in-Chief at MGH, commented, "Collaborations such as this speak to the importance of understanding the shared causes of diseases such as heart disease and depression. Further examining how one's gender impacts the course of—and relationship between—each illness will further advance how we diagnose, treat, and advocate for those who are at greatest risk."¹

The Women, Heart, and Brain Global Initiative is a cross-disciplinary effort involving hospitals and divisions within MGH as well as the Harvard T. H. Chan School of Public

Mass General Hospital and Harvard Chan School of Public Health: Women, Heart, and Brain Global Initiative

Health's Women and Health Initiative and Department of Epidemiology. The program pursues scientific advances, explores the implication of these findings for clinical practice, and promotes awareness among the public in the United States and throughout the world. Leading this effort is Jill Goldstein, Ph.D., a clinical neuroscientist and Professor of Psychiatry and Medicine at Harvard Medical School. Dr. Goldstein is the former Director of Research at the Connors Center for Women's Health and Gender Biology at Brigham and Women's Hospital (BWH). Since 2004, she has led efforts at BWH to train scientists and clinicians in the importance of sex differences in medicine. Jeffrey Ecker, M.D., Chief of MGH Obstetrics & Gynecology, noted:

"Dr. Goldstein uses a life cycle framework in her research, and we are thrilled that, among other efforts, she will help study how exposures and events during pregnancy affect the later health of both mothers and their children. She also has a long record of guiding and supporting trainees early in their academic careers, and we look forward to the mentoring and intradepartmental collaboration her arrival will bring."

Maurizio Fava, M.D., Executive Vice Chair, MGH Department of Psychiatry, commented, "We are very excited to have Dr. Goldstein launch this new initiative here at MGH, given the impact both depression and heart disease have on women."¹



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About MGH

Massachusetts General Hospital is the original and largest teaching hospital of Harvard Medical School. The MGH Research Institute conducts the largest hospital-based research program in the Nation, with an annual research budget of more than \$912 million.^{1,5} The MGH topped the 2015 Nature Index list of health care organizations publishing in leading scientific journals and earned the prestigious 2015 Foster G. McGaw Prize for Excellence in Community Service. In 2017, the Executive Committee on Research at MGH provided \$13.2 million in institutional support for 122 investigators, helping fill in gaps in Federal research funding and support young investigators, women who are balancing families and careers, and individuals who are underrepresented in medicine.³

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A PERSONAL JOURNEY

Anna María Nápoles, Ph.D., M.P.H.

Nápoles, A. M. (2018, June). One woman's path to Scientific Director. Presented at the Women of Color Committee of the Trans-NIH Working Group on Women in Biomedical Careers, Bethesda, MD.

Setbacks can inspire motivation, according to Anna María Nápoles. In a refreshingly frank talk with the Women of Color Committee of the Trans-NIH Working Group on Women in Biomedical Careers, Nápoles described the impediments of microaggressions, divorce, imposter syndrome, financial stress, sabotage, and racism that have threatened her research career. Nápoles felt these strains particularly acutely through the intersectional lens of her gender and race. Yet, Nápoles turned these stumbling blocks into opportunities as she elevated in her leadership role to advocate for culturally competent and effective health care services for vulnerable populations. At the Division of Intramural Research of the National Institute on Minority Health and Health Disparities, she oversees a broad research profile. Her work is guided by transcreation: the processes of planning and delivering interventions to reduce inequities among targeted communities fraught with health disparities. Nápoles notes that while we have made great progress identifying effective health interventions, more work is needed to reduce these disparities and ensure that healthier outcomes from evidence-based work are reflected in all communities.



Anna María Nápoles, Ph.D., M.P.H., Scientific Director of the National Institute on Minority Health and Health Disparities



ORWH Takes a Long-Term Perspective to Address Gender Bias in STEM

ORWH continues to support and promote gender equality in academic science and engineering long after the 2007 National Academies' report "[Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering](#)" noted serious and widespread barriers for women achieving upper-level positions in science, technology, engineering, and mathematics (STEM) careers. The National Academies report spurred concerned senior leaders from across NIH to create an NIH Working Group on Women in Biomedical Careers.

Since 2007, the working group and its seven committees have actively developed programs and policies that aid the recruitment, retention, and advancement of women in biomedical faculty and leadership positions at all levels of their education and careers. Among their achievements is issuing the trans-NIH request for applications (RFA): [Research on Causal Factors and Interventions that Promote and Support the Careers of Women in Biomedical and Behavioral Science and Engineering](#). With support from 11 NIH Institutes and Centers and 4 Offices within the NIH Office of the Director, the RFA funded 14 research grants totaling \$16.8 million over 4 years. The NIH Working Group on Women in Biomedical Careers held workshops in [November 2012](#), [June 2014](#), and [July 2016](#). Published proceedings from these meetings highlight and promote successful interventions. Participants also discussed the often-difficult work of transformational change, including addressing a culture of acceptability of sexual harassment, disrupting implicit bias among selection/promotion committees, and increasing efforts to document and share information about progress toward equity goals.

The grant that spawned a movement

The work to promote women's STEM careers did not end with the grant funding. R01 grantees formed a Research Partnership that thrives today—10 years after the release of the RFA—and grantees continue to meet. The causal factors Principal Investigators (PIs) formed a grassroots movement that continues to actively look for additional ways to further the work spurred by the RFA. Grantees have gone on to conduct directly relevant as well as related research on the health of women. Many have become PIs on other NIH-funded work.

Some of the research partners have become part of the ORWH Advisory Committee. While ORWH helped to stimulate and support the Research Partnership, its advocacy is sustained beyond ORWH's direct efforts. The Research Partnership members continue to propel gender equity in their home institutions while serving as an example for others. In the

July *Journal of General Internal Medicine* article titled "[A Summary Report from the Research Partnership on Women in Science Careers](#)," Carr and colleagues chronicle the impact of the 2008 RFA, which produced over 100 publications, including two special journal issues in [Academic Medicine](#) in 2016 and the [Journal of Women's Health](#) in 2017. The article notes that these publications feature six main themes and the authors outline strategies to address each.

These include:

1. Barriers to career advancement—providing opportunities for perspective-taking and counter-stereotype imaging, as well as adopting zero-tolerance policies for sexual harassment and sexism in the workplace;
2. Mentoring, coaching, and sponsorship—supporting culturally, racially, and ethnically diverse mentors and sponsors who can advocate for talent beyond traditional networks;
3. Career flexibility and work-life balance—providing awareness and changing culture from one of “opting-into” sponsored family benefits to “opting-out of” benefits;
4. Pathways to leadership—encouraging women to participate in leadership training and networking opportunities;
5. Compensation equity—providing negotiation skills training for women and tying Federal- and State-level funding to the institution's provision of a gender and minority equity plan;
6. Advocating for change and stakeholder engagement—using evidence-based tools to address explicit and implicit bias.¹

The efforts of the NIH Working Group on Women in Biomedical Careers and the sustained Research Partnership of R01 grantees represent an ongoing success. Their collective efforts help us better understand the individual and institutional factors that influence career choices. They have unearthed evidence-based strategies and interventions to guide workplaces for recruitment, retention, and advancement of a talented female workforce. The work of the Research Partnership is just beginning.

The NIH Working Group on Women in Biomedical Careers, co-chaired by NIH Director Dr. Francis Collins and the Director of ORWH, Dr. Janine Clayton, meets regularly to monitor implementation of best practices.

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Career and Family—The Ultimate Balancing Act

The issue of career-life balance is a popular topic today as individuals struggle to manage the competing demands of work and home. While the problem disproportionately affects women—who represent nearly 60 percent of the U.S. workforce, yet report doing most of the family caregiving—two-career couples grapple with this dilemma as well.

When one or both partners work in the sciences, managing a family with two careers can be particularly difficult, since long hours, relocation, and professional networking are typically required for career success.

The solution? A recent *Harvard Business Review* article¹ on career planning suggests that couples re-think adopting one of the traditional career-life models in which one partner (typically the woman) leaves the workforce temporarily to take care of responsibilities at home. Instead, the writer recommends that couples get creative, do some brainstorming, and engage what is known as *lifetime family career planning*. This type of exercise asks couples to focus more on long-term goals than current realities. Couples may also look for opportunities to switch roles or combine them, rather than making decisions based on who has the higher income.

“This is a whole new, potentially delightful ballgame,” wrote the article’s author Avivah Wittenberg-Cox. “It wasn’t possible in an earlier era of single-earner families where the financial burden historically fell to the man. Nor is it true today among the growing number of couples who simply flip the gender roles but still stick to the same model. These options have little flexibility and less security in increasingly volatile economic times.”

Which model works best for a family—single career, lead career, alternator, parallelogram, or complement—totally depends on how couples define and negotiate priorities. Whatever the model, Wittenberg-Cox insisted, “the secret lies in the co-design.” [Read more about lifetime family career planning here.](#)



United in Science and Through Science—2018 Gender Summit 15

The 2018 Gender Summit took place June 18–19, at the iconic Bush House on the campus of Kings College in London, England. The meeting—the 15th sponsored by the Science and Engineering South Consortium of leading universities in the South of the United Kingdom—brought together world-renowned researchers and scientists, gender scholars, and influential policy makers from around the globe to examine new scientific evidence concerning when, why, and how sex/gender affects research and innovation, and differentiates outcomes for women and men. The goal was to identify gaps in knowledge, new applications for existing knowledge, and discoveries that create new opportunities for innovation, and to explore cross-cutting benefits.

This year’s 2-day program was organized under the theme “United in Science and Through Science,” and featured a mix of keynote, plenary panel, and parallel sessions, as well as a poster exhibition, professional networking activities, and inter-linked public engagement side events. Sessions focused on the following timely themes:

- Opportunities and methodologies for novel interdisciplinary and cross-sector collaborations
- Integrating the values of inclusion and sustainability into research and innovation agendas and projects
- Strengthening cooperation between key actors in and outside the science landscape
- Connecting the reality of the UN Sustainability Development targets with that of the fourth industrial revolution to prevent digital inequality
- Science knowledge making and application in the context of political and policy drivers

[For more information about Gender Summit 15 and the event program, click here.](#)

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Inaugural Ruth L. Kirschstein Lectureship Will Take Center Stage at the 2018 BIRCWH Meeting

ORWH has created the Ruth L. Kirschstein (RLK) Memorial Lectureship, which will be a centerpiece of the annual meeting for the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Program in 2018 and beyond. The RLK Memorial Lectureship honors the life and achievements of Dr. Kirschstein, who provided direction and leadership to the NIH through much of the second half of the 20th century, imparting a lasting effect on public policy, public health, and the training of several generations of biomedical researchers. This year's BIRCWH Meeting will take place on November 28, 2018, in the Natcher Conference Center on NIH's main campus in Bethesda, MD.

Dr. Kirschstein was an exceptional polio vaccine researcher, mentor, and health administrator. In 1974, she became the first woman to direct an NIH institute, the National Institute of General Medical Sciences, a post she held until 1993. Dr. Kirschstein then served once as Principal NIH Deputy Director and twice as NIH Acting Director. In recognition of her leadership and support of NIH-funded training programs, Congress renamed the National Research Service Award (NRSA) Program in Dr. Kirschstein's honor in 2002. The Ruth L. Kirschstein

NRSA Program continues to provide essential mentored research training support for the Nation's next generation of biomedical and biobehavioral scientists. Dr. Kirschstein's leadership contributed immensely to the early growth of ORWH, an increase in the number of women in biomedical careers, the pivotal Women's Health Initiative, and many other innovative research programs.

Jeanne-Marie Guise, M.D., M.P.H., will deliver the first RLK Memorial Lecture at the 2018 BIRCWH Meeting. Dr. Guise is Director of the Oregon Institute for Patient-Centered Comparative Effectiveness and Associate Director of the Oregon Evidence-based Practice Center, Oregon Health & Science University. She is also a Professor of Obstetrics and Gynecology and a practicing obstetrician/gynecologist. Dr. Guise has a distinguished record of creating innovative training and career development programs and has published several articles in this space.

The 2018 BIRCWH Meeting will also include a panel discussion on creating new curricula to incorporate Sex as a Biological Variable (SABV) concepts into the career development of the BIRCWH Scholars. These new curricula represent

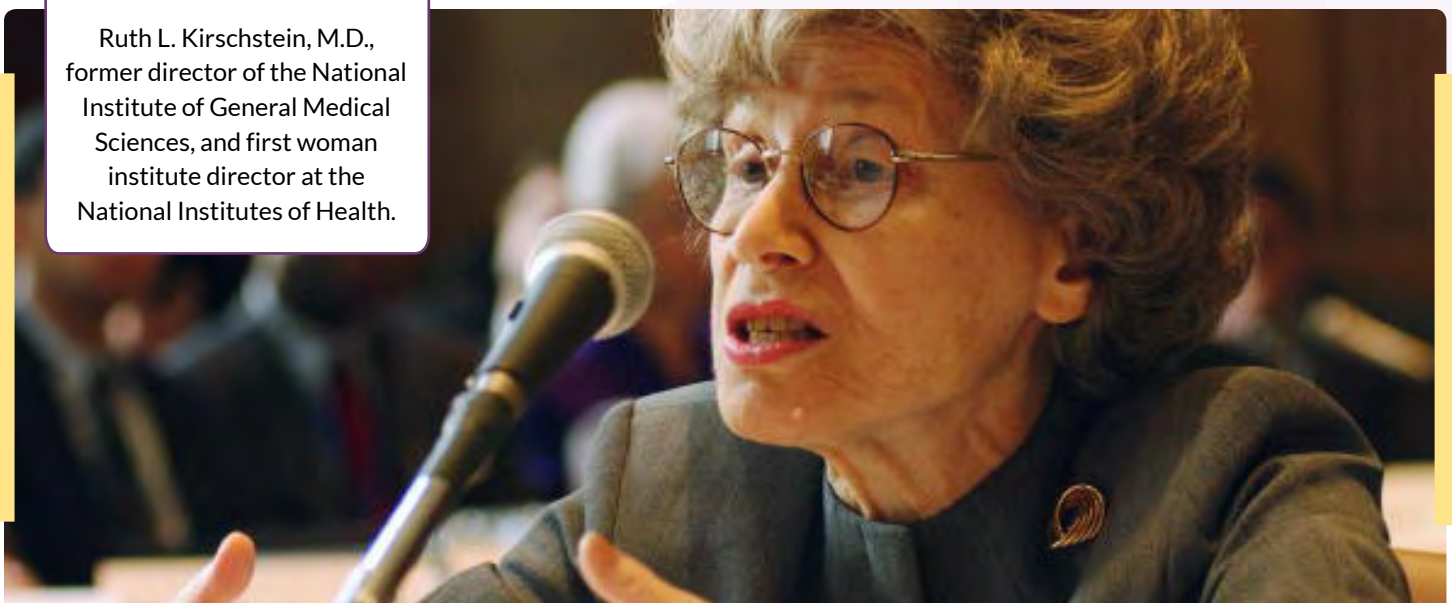


The photo is credited to NIH.

[Ruth L. Kirschstein, M.D.](#)

an outcome of the NIH policy requiring investigators to consider SABV as part of their NIH-funded research. The four panelists for this discussion represent different areas of science, spanning basic, preclinical, and clinical research; which will provide beneficial perspectives to a broad range of career development programs. The most competitive BIRCWH Scholars will present their research in a poster session, and Scholars with the top four posters will give podium presentations of their high-impact research. For more information about the 2018 BIRCWH Meeting, visit nih.gov/women.

Ruth L. Kirschstein, M.D., former director of the National Institute of General Medical Sciences, and first woman institute director at the National Institutes of Health.



ORWH Women's Health Seminar Series: Sex and the Head-Heart Connection

ORWH held its Women's Health Seminar Series on Sex and the Head-Heart Connection on Thursday, June 7, 2018, at the Lipsett Amphitheater on the NIH campus. The seminar was designed to raise the visibility of heart-brain comorbidities as seen through the lens of sex differences. Four speakers presented at the seminar: (1) Nakela Cook, M.D., M.P.H., F.A.C.C., Chief of Staff, National Heart, Lung, and Blood Institute (NHLBI), who spoke on advancing a scientific agenda that addresses vascular disease and neuro-cognitive function; the importance of sex and gender influences on cardiovascular disease, vascular dementia, and cognitive health; and the heart-brain connection; (2) Jill Goldstein, Ph.D., Professor of Psychiatry and Medicine, and Executive Director, Women, Heart, and Brain Global Initiative, who spoke on tackling comorbidities by understanding the shared sex differences in terms of brain circuitries, physiology, and the development of the

vasculature; on applying a sex differences lens to effectively develop sex-dependent therapeutics in health care systems; and addressing the major public health challenge of depression, cardiovascular disease, and metabolic disorders being independent risk factors for memory decline and Alzheimer's disease; (3) Virginia Miller, Ph.D., Director of the Sex Differences Research Laboratory at the Mayo Clinic, who spoke on developing a strong rationale for integrated sex-based research, identifying program opportunities for research to integrate these concepts, and acknowledging that the body has a feedback loop that prevents the separation of the brain from the rest of the body or the hormonal function from cardiovascular function and brain activity; and (4) Ana Langer, M.D., Professor of the Practice of Public Health, Harvard University, and Coordinator of the Dean's Special Initiative on Women and Health, who spoke on the translation of evidence and

new knowledge into action, how women often postpone their own health care to prioritize the needs of others and therefore delay diagnosis and treatment of disease, and how often providers misinterpret symptoms and attribute them to anxiety or hysteria or other factors that further delay treatment. The presentations were followed by a panel discussion and question-and-answer session.

View video: <http://bit.ly/2AmZfKY>

NIH Office of Scientific Workforce Diversity Offers Diversity Toolkit

The NIH Office of Scientific Workforce Diversity offers a [toolkit](#) on promoting diversity in the workplace at the junior and senior levels. Topics highlighted include reducing implicit bias, conducting unbiased talent searches, outreach, networking, and mentoring.



ORWH Deputy Director Elizabeth Spencer, RN; featured speaker Ana Langer, M.D.; ORWH Director Janine Austin Clayton, M.D.; featured speaker Jill M. Goldstein, Ph.D.; keynote speaker Nakela Cook, M.D., M.P.H.; and featured speaker Virginia M. Miller, Ph.D.

NINDS Hosts “NeuroFest” Event for Local High School Students

On May 3, the National Institute of Neurological Disorders and Stroke (NINDS) hosted 50 female high school students from Maryland’s Prince George’s County Public Schools (PGCPS) as part of a pilot program that encourages high schoolers to pursue education in the biomedical sciences and showcases the diversity of neuroscience principal investigators. NINDS, led by the Office of Programs to Enhance Neuroscience Workforce Diversity (OPEN), partnered with PGCPS and the organization “Women in Bio” to offer this event.

Rita Devine, Ph.D., Assistant Director for Science Administration at the NINDS Division of Intramural Research, welcomed the students, who were provided opportunities to speak with their host scientists while touring labs in the Porter Neuroscience Research Center.

Representatives from each lab presented a “show and tell” on their current research efforts, ranging from axon guidance in *Drosophila* (fruit flies) to movement disorders and brain tumors. Edjah Nduom, M.D., a Staff Clinician in surgical neurology, discussed the use of immunotherapy in fighting cancer and captured the group’s interest with videos on brain tumor removal.

Nina Schor, M.D., Ph.D., Deputy Director of NINDS, spoke to the students about her career path in science and medicine, which led to her work as a pediatric neurologist. Dr. Schor fielded questions from the students and provided valuable advice on becoming the next generation of female leaders in science. Throughout the day, the students were actively engaged in all activities, and based on their enthusiasm when learning about internship opportunities at NIH, we might see them in the halls in the not-too-distant future.



Students visit the lab of Dr. Craig Blackstone (L) to learn about the cellular and molecular mechanisms underlying hereditary movement disorders.



Dr. Nina Schor, Deputy Director of NINDS, talks to the students about her experiences as a woman who pursued a career in science and medicine.

Daughter of ORWH Medical Officer Places Second in Langley High Science Fair

Molly Buckler is a junior at Langley High School in McLean, VA, and her mother, CDR Gretchen Buckler, is a medical officer on the Clinical Research Team in ORWH. Molly has long taken an interest in her mother’s important line of work, so it came as no surprise when she expressed this interest in her recent science fair project. The younger Buckler coded a data mining algorithm in the Python programming language, and she used her program to explore suggestive patterns in death certificate data published by the Centers for Disease Control and Prevention. She validated her algorithm by showing well-established patterns, such as a correlation between smoking and lung cancer, as well as a higher rate of skin cancer in Caucasians compared to other races. Molly went on to use her algorithm to detect less widely known relationships worthy of further investigation, such as a correlation between high blood pressure and osteoarthritis. As Molly was awarded second place in the Computational Biology and Bioinformatics category of her school’s science fair on January 17, her project was able to compete in March in the Fairfax County Regional Science Fair, where it was awarded third place in the Bioinformatics category.



Molly Buckler was awarded second place in the Computational Biology and Bioinformatics category of her school’s science fair on January 17.

UPCOMING EVENTS

Sex and Gender in Health and Disease Scientific Interest Group

November 20, 2018

3:00 p.m.–4:00 p.m. (Eastern Time)

NIH Main Campus, Building 35A,
Room 620/630

Building Interdisciplinary Research Careers in Women's Health Annual Meeting

November 28, 2018

8:00 a.m.–5:00 p.m. (Eastern Time)

NIH Main Campus, Building 45,
Natcher Auditorium

Women's Health Seminar Series December 6, 2018

More details to come

FUNDING OPPORTUNITIES

Analytical and/or Clinical Validation of a Candidate Biomarker for Pain

This Funding Opportunity Announcement (FOA) is intended to promote the validation of strong candidate biomarkers and endpoints for pain that can be used to facilitate the development of non-opioid pain therapeutics from discovery through Phase II clinical trials. Specifically, advanced analytical and clinical validation of pain biomarkers, biomarker signatures, and/or endpoints using retrospective and/or prospective methods. Research supported by this FOA will demonstrate that biomarker or endpoint change is reliably correlated with variables such as clinical outcome, pathophysiologic subsets of pain, therapeutic target engagement, or response to a pain therapeutic; in addition, biomarker response will demonstrate specificity to the pain condition or therapeutic as demonstrated at multiple clinical sites. The goal of this FOA is to facilitate the advancement of robust and reliable biomarkers, biomarker signatures, and endpoints of pain to application in Phase II clinical trials and beyond and in the spectrum of clinical practice. First applications are due by November 27, 2018. For more information, see FOA number RFA-NS-18-046. Contact ORWH at ORWHinfo@nih.gov if you have questions.

Notice of Intent to Publish a Funding Opportunity Announcement for Specialized Centers of Research Excellence (SCORE) on Sex Differences

ORWH recently published a notice to inform the scientific community that it, in partnership with the NIH Institutes and Centers, intends to publish a funding opportunity announcement (FOA) "Specialized Centers of Research Excellence (SCORE)

on Sex Differences (U54 Clinical Trial Optional)." The notice is being provided to allow potential applicants sufficient time to develop a robust Centers of Excellence program to support an innovative interdisciplinary research program focusing on sex differences and major medical conditions affecting women in the U.S., and to support established scientists at centers across the country who conduct ground-breaking research that integrates basic, clinical, and behavioral research approaches to incorporate sex differences. First applications are estimated to be due in January 2019. For more information, see notice number NOT-OD-18-232. Contact ORWH at ORWHinfo@nih.gov if you have questions.

NIH ORWH Science Policy Scholar Travel Award to Attend the Annual Meeting of the Organization for the Study of Sex Differences (OSSD)

Apply to receive an ORWH award of up to \$3,000 if your abstract on women or sex/gender differences policy is accepted for a poster, oral session, or symposium at the OSSD 2019 Annual Meeting, Washington, D.C., May 5-8, 2019.

Application and Award Details

- Application Period: October 15, 2018 to February 1, 2019
- Announcement of Award Recipient: March 15, 2019

Additional Information: Please refer to the full details posted here: <https://orwh.od.nih.gov/science-policy>. For further information, please contact Samia Noursi, Ph.D., samia.noursi@nih.gov.

Visit www.nih.gov/women to learn more.

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