



NIH **U**pdates on Women in Science News for Yo**U** to Use!

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NIH Updates on Women in Science is brought to you by the [NIH Working Group on Women in Biomedical Careers](#). We encourage you to share this e-newsletter with colleagues.

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Feature Articles

The Effect of an Intervention to Break the Gender Bias Habit for Faculty at One Institution: A Cluster Randomized, Controlled Trial

Carnes M, Devine PG, Manwell LB, Byars-Winston A, Fine E, Ford CE, Forscher P, Isaac C, Kaatz A, Magua W, Palta M, Sheridan J. Acad Med. 4 Nov 2014 [epub ahead of print]

<http://www.ncbi.nlm.nih.gov/pubmed/25374039>

The authors implemented a pair-matched, single-blind, cluster randomized, controlled study of a gender-bias-habit-changing intervention at a large public university. Participants were faculty in 92 departments or divisions at the University of Wisconsin–Madison. Between September 2010 and March 2012, experimental departments were offered a gender-bias-habit-changing intervention as a 2.5-hour workshop. Surveys measured efficacy, and outcome expectations to reduce bias; and gender equity action. A timed word categorization task measured implicit gender/leadership bias. Faculty completed a work–life survey before and after all experimental departments received the intervention. Control departments were offered workshops after data were collected. Linear mixed-effects models showed significantly greater changes post intervention for faculty in experimental versus control departments on several outcome measures, including self-efficacy to engage in gender-equity-promoting behaviors ($P = .013$). When $\geq 25\%$ of workshop (26 of 46 departments), significant increases in self-reported action to promote gender equity occurred at three months ($P = .007$). Post intervention, faculty in experimental departments expressed greater perceptions of fit ($P = .024$), valuing of their research ($P = .019$), and comfort in raising personal and professional conflicts ($P = .025$).

Women in Academic Science: A Changing Landscape

Ceci SJ, Ginther DK, Kahn S, Williams W. Psychological Science in the Public Interest. 2014; Vol 15(3)75-141.

<http://www.psychologicalscience.org/pdf/Women-Academic-Science.pdf>

This article compares the trajectories of women and men in math-intensive fields with their counterparts in non-math-intensive fields to gain insight into nature of women’s under-representation in academic science. The authors present a comprehensive literature review supplemented with primary descriptive analyses using recent government data on scientists and engineers in the United States. They take a life course approach, examining representation at each juncture along the path from high school involvement to senior-level positions in academic science. They find that gender differences in attitudes toward math careers and ability are evident by kindergarten and increase thereafter, including women’s lower representation in college majors in math-intensive subjects. Post-college, they find that men and women appear to have comparable access to tenure-track academic jobs, and persist and are remunerated at comparable rates – with some caveats. They find parity between men and women in invitations to interview for tenure-track positions, as well as in employment offers, grant success rate, hours worked, and average citation per publication. They urge researchers to consider interventions that address women’s career choices in their considerations of the underrepresentation of women in STEM, specifically regarding occupational preference in HS and College and the influence of children on women’s workforce involvement.

Articles and Reports of Note

AAMC 2013–2014 Report: [The State of Women in Academic Medicine: The Pipeline and Pathways to Leadership](#). Posted by the [American Association of Medical Colleges](#)

This report presents the 2013–14 survey data from the Women in Medicine and Science (WIMS) Benchmarking Survey, as well as 2014 data from the AAMC Faculty Roster. Of 129 eligible schools, 117 (91%) responded. The report also supplements the discussion section with data from the AAMC Faculty Forward Engagement Survey. Although the number of women applying to medical school has increased since the last report, their proportion of the applicant pool (46%) has decreased. Women make up a little more than one third (38%) of full-time

academic medicine faculty; full-time women are 34% of associate and 21% of full professors in academic medicine. The percentage of permanent women department chairs (15%) and deans (16%) at U.S. medical schools remains low. The report also suggests that institutional support for WIMS programs at U.S. medical schools has increased very slightly over the past five years. The report concludes with a new section that highlights promising approaches for advancing women faculty.

See also the related AAMC report: [2014 Roadmap to Diversity and Educational Experience: Key Legal and Educational Policy Foundations for Medical Schools](#)

Biomedical Science Ph.D. Career Interest Patterns by Race/Ethnicity and Gender

Gibbs KD Jr., McGready J, Bennett JC, Griffin K. PLoS One. 2014 Dec 10; 9(12):e114736

<http://www.ncbi.nlm.nih.gov/pubmed/25493425>

The authors report results from a survey of 1500 recent American BMS Ph.D. graduates (including 276 respondents from under-represented minorities (URM)) that examined career preferences over the course of their graduate training experiences. On average, scientists from all social backgrounds showed significantly decreased interest in faculty careers at research universities, and significantly increased interest in non-research careers at Ph.D. completion, relative to entry. However, group differences emerged in overall levels of interest (at Ph.D. entry and completion), and the magnitude of change in interest in these careers. Multiple logistic regression showed that when controlling for career pathway interest at Ph.D. entry, first-author publication rate, faculty support, research self-efficacy, and graduate training experiences, differences in career pathway interest between social identity groups persisted. All groups were less likely than men from well-represented (WR) racial/ethnic backgrounds to report high interest in faculty careers at research-intensive universities, and URM women were more likely than all other groups to report high interest in non-research careers.

Sex Differences in Workplace Satisfaction and Engagement of Academic Pathologists: Opportunities to Enhance Faculty Diversity

Howell LP, Lyons ML, Thor A, Dandar V. Arch Pathol Lab Med. 2014 Dec 15. [Epub ahead of print]

<http://www.ncbi.nlm.nih.gov/pubmed/25506812>

The authors examine sex differences in career satisfaction among US medical school pathology departments participating in two surveys - the AAMC's Faculty Forward Engagement Survey and a survey of the Association of Pathology Chairs (APC). According to Faculty Forward Engagement Survey, women report more time in patient care and less time in research. Women consider formal mentorship, feedback, and career advancement more important than men do and are less satisfied with communication and governance. The APC survey shows that 20% to 40% of non-chair department leaders are women, and the majority of chairs report satisfaction with the sex diversity of their departmental leaders. The authors link this to the Faculty Forward data and suggest that targeted interventions to support career satisfaction, recruitment, retention, and career and leadership development for women in academic pathology would allow schools to capitalize on pools of high-potential women leaders.

Career progression of men and women doctors in the UK NHS: a questionnaire study of the UK medical qualifiers of 1993 in 2010/2011

Svirko E, Lambert TW, Goldacre MJ. JRSM Open. 2014 Nov 4;5(11):2054270414554050.

<http://www.ncbi.nlm.nih.gov/pubmed/25408921>

This study addresses the career progression of a cohort of UK medical graduates working in the National Health Service at the *mid-career* level, comparing men and women. The authors present survey responses (conducted in 2010-2011) from 2,507 1993 medical graduates, examining doctors' career specialties, grade, work location and working pattern in 2010/2011 and equivalent data in earlier years. Of doctors in the NHS, 70.6% of men and 52.0% of women were in the hospital specialties and the great majority of the others were in general practice.

Within hospital specialties, a higher percentage of men than women were in surgery, and a higher percentage of women than men were in pediatrics, obstetrics and gynecology, clinical oncology, pathology and psychiatry. In the NHS, 63% of women and 8% of men were working less-than-full-time (in general practice, 19% of men and 83% of women; and in hospital specialties, 3% of men and 46% of women). Gender differences in seniority lessened considerably when comparing doctors who had always worked full-time. Among these, 94% of men and 87% of women GPs were GP principals; in hospital practice, 96% of men and 93% of women had reached consultant level.

Current News

SPOTLIGHT: Heather Cross, DPhil and Elizabeth Murphy, PhD

Last year, the NIH began developing policy to increase consideration of sex as a biological variable in preclinical studies involving animals and cells. However, two prominent women scientists have been doing just that for many years. Elizabeth Murphy, PhD and her former postdoctoral fellow, Heather Cross, DPhil have published four reports on sex differences associated with recovery from ischemic injury in mice.

Their studies from the 1990s demonstrated several key findings associated with sensitivity to ischemic injury. First, they found that male mice overexpressing the sodium-calcium exchanger have reduced post-ischemic recovery compared to control males. Interestingly, this effect is not seen in females, presumably due to female-specific hormones. Second, they found that overexpression of the beta(2)-adrenergic receptor caused increased ischemic/reperfusion injury in males, but not females. Additionally, phospholamban ablation increases ischemic injury to a greater extent in males compared to females. Finally, in collaboration with Nobel Laureate Dr. Robert Lefkowitz, they found that nitric oxide protects females, but not males, from adrenergic and calcium induced ischemic injury. These key studies were some of the first to distinguish mechanistic differences between sexes in animal models. When asked what led them to focus on sex differences in their studies, Dr. Murphy said, "We did not start out to study sex differences. Heather was initially interested in examining the role of plasma membrane sodium-calcium exchange in triggering calcium overload of the cell and resultant cell injury. We obtained some transgenic mice that overexpressed the sodium-calcium exchanger from Ken Philipson at UCLA, and he sent male and female mice. Up until then, I am somewhat embarrassed to admit, we had only studied male mice. Soon after Heather started the studies she came to me and said that there were differences in the response of the male and female hearts to ischemia. After this finding, my lab became very interested in studying sex differences."

Drs. Murphy and Cross are both in the midst of highly successful careers. Dr. Murphy is currently the Head of the Cardiac Physiology Section, System Biology Center on the National Heart Lung and Blood Institute, which is within the NIH Intramural Research Program. Dr. Murphy received her PhD in Biochemistry and Biophysics from the University of Pennsylvania. She then completed her postdoctoral training and one year as an assistant research professor at Duke University Medical Center. From there, she joined the ranks of NIEHS and eventually came to NHLBI in 2006. Dr. Murphy has written 140 peer-reviewed publications and several reviews and book chapters. She serves on a number of leadership positions for both the International Society for Heart Research and the American Heart Association. She has also won several awards, including the Keith Reimer Distinguished Lecture Award, NHLBI Orloff Award, which recognizes outstanding research teams whose projects came to fruition in the previous year, and the NHLBI Outstanding Mentor Award. In addition to her research program, Dr. Murphy is also vice-chair of the Women Scientist Advisors (WSA). The WSAs serve as a liaison between the women in each institute and their Scientific Director.

Since 2013, Dr. Cross has been the Program Leader of a \$65M NIH network investigating antibacterial resistance (www.arlg.org). Within that role, she has been overseeing a group of project leaders who are responsible for more than 10 global studies. Dr. Cross received her DPhil in Biochemistry from the University of Oxford. She

then joined Dr. Murphy's lab as a visiting fellow at NIEHS. She continued her career at Duke University Medical Center as a research associate and assistant professor. Following her time at Duke, she held several industry positions until she returned to Duke University in 2010 to lead clinical trials. In addition to her scientific achievements, Dr. Cross has obtained several personal achievements. She recently gained her SCUBA Open Water Diver Certification. She is also an avid runner and has completed both the NYC and Paris marathons. When asked how she balances her time professionally and personally, she said, "prioritizing, being as efficient as possible and dedicating time to mentoring. No matter how many hours you work, there is only so much one person can do. Utilizing and developing talents of a team enables a work-life balance for all, and leads to incredible accomplishments".

Over their careers, Drs. Murphy and Cross have clearly shown the importance of understanding sex differences in preclinical studies while being exemplary role models for young female scientists.

[2014 Life Science Salary Survey](#)

Posted on November 1, 2014 by Jyoti Madhusoodanan for [The Scientist](#)

According to *The Scientist's* annual salary survey, compensation for those employed in the life sciences increased moderately from 2013, with more significant salary increases in the fields of genetics, genomics, and immunology. The highest paying fields (pharmacology, biotechnology, and drug development and discovery) remained the same since 2013. Additionally, salary correlated with age and corresponding increases in experience and qualifications. Finally, *The Scientist* reports a persistent wage gap between men and women. Worldwide, women are paid between 75 and 99 percent of their male counterparts. Within the US, where earnings are higher, the wage gap is also wider. A closer look at US academics indicated that the wage gap only exists at higher-ranking positions.

[Nature Jobs: Career Progress and The Role of Informal Relations for Female Scientists](#)

Posted on December 11, 2014 for [Nature](#)

This brief article details the results of a study that finds that women are more likely to realize career benefits from informal relationships with colleagues and others if they are in a discipline that comprises at least 15% women and are not simply tokens. The authors suggest that the benefits come from the extra support and opportunities these relationships can provide in fields where the numbers of women reach a tipping point of representation.

[Nature Jobs Feature: Family and Community Care](#)

Posted on October 8, 2014 by Helen Shen for [Nature](#)

This article details the challenges and strategies of caring for elderly and aging parents and family members. The author cites an estimated 17% of full-time workers in the United States juggle their careers with medical, financial or legal responsibilities for aging parents. Globally, the problem is expected to worsen: the World Health Organization estimates that nearly one in four people will be older than 60 by 2050.

[The Untold Story of Women in Science and Technology](#)

Posted for the [White House Administration](#)

Listen to women from across the White House Administration tell the stories of their personal heroes across the fields of science, technology, engineering, and math (STEM). Share and/or add your own.

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