



## 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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### **Nature Takes Steps Towards Gender Equity**

The editors of the journal *Nature* have been engaging in self-reflection, largely in response to a [Correspondence](#) they published recently commenting on the low proportion of their News and Views articles written by women. Grateful for this wake-up call, the editors considered representation of women in other aspects of their journal, and found some disturbing results. For instance, while women make up 53% of the reporters and editors responsible for generating content, they comprised only 14% of the scientific reviewers in 2011 and only 18% of the scientists profiled in the journal in the last two years. Considering recent literature on the gender gap among scientists, the editors suspect that unconscious bias might be responsible for some of this discrepancy, and they've issued a call for action addressing the problem. *Nature* is now requesting that all of its editors be aware of these issues, and that they consciously consider female candidates when commissioning work for the journal. By taking the time to ask the question "who are the five women I can ask," *Nature* hopes to improve representation of distinguished women scientists among its pages.

[Nature's Sexism](#)

### **New Study of Medical School Graduates and their Potential to Enter Academic Medicine**

A recent article in *Academic Medicine* examined data on medical school graduates between the years of 1998 and 2004, in order to elucidate the relationship between sex/gender and full-time faculty appointment. Of the 66,889 medical school graduates included in their study, 18% held full time academic appointments. Although women currently make up only 33% of physicians with faculty appointments, there is hope that contemporary cohorts will have greater

representation of women among academic physicians. The authors reported that of the recent graduates included in the data set, women were more likely than men to hold full time faculty appointments. Interestingly, there were sex differences found in the characteristics associated with holding an academic faculty position. While some factors were common for both men and women, such as attending a research-focused medical school or participating in research in medical school, other factors correlated for male graduates only. Men who incurred higher debt during medical school were less likely to pursue academic medicine, while men who had participated in a research experience in college, had planned to pursue a research career at the start of medical school, had published research papers during medical school, or had specialized in pediatrics or psychiatry were more likely to enter academic medicine. For women, none of these variables correlated with the probability of obtaining a faculty position. Notably, underrepresented minorities and Asian/Pacific Islander graduates were considerably less likely to obtain faculty positions, regardless of gender. Further study is needed to elucidate the relative influence of the sex-specific and general variables affecting the likelihood of entering academic medicine.

[The Road to an Academic Medicine Career: A National Cohort Study of Male and Female U.S. Medical Graduates](#)

## **New Factors Contributing to the Gender Gap in Publication**

Women are underrepresented as faculty members in scientific disciplines, particularly at the advanced levels of associate and full professor, and have been found to publish at lower rates than men. To examine field-specific issues that may contribute to this discrepancy, the authors of a new study built a database to examine publications by 4292 scientists in research universities across the United States. They used their database to test two distinct hypotheses about the relationship between gender and publication. The first hypothesis was that women would publish less than men in fields that require vast resources (for instance to run a laboratory, support students, and buy supplies). On the other hand, according to their hypothesis, fields that require fewer resources (perhaps because the work is more computational or theoretical) would have greater equity in publication rates between men and women. Indeed, the authors found that their data supported this hypothesis, showing an inverse correlation between the sex difference in publication rates and the cost of running a research program. Fields like molecular biology, where experiments are expensive and scientists require vast institutional support to survive, have a greater gender gap in publication than do fields like industrial engineering, where the cost of research is much lower. The second hypothesis involved the relative risk of pursuing an academic career in each discipline, considering factors such as the average length of time to obtain an academic position and the possibility of finding relevant non-academic jobs as a safety net. The authors hypothesized that women in high risk disciplines would only pursue academic jobs if they were extremely highly qualified, and thus more likely to succeed. Using their publication database, they used impact per publication as a proxy for being highly qualified, and found that women in high risk disciplines (such as ecology) published higher impact papers than their male counterparts. In contrast, men and women in lower risk fields (like chemistry) published articles of similar impact. These findings add new perspective to the gender gap in publishing and ascending the career ladder in academic science, and the authors suggest that their findings might serve as a starting point for policies and interventions that help level the playing field for talented scientists from all groups interested in research careers.

[The Possible Role of Resource Requirements and Academic Career-Choice Risk on Gender Differences in Publication Rate and Impact](#)

## **Sex Differences in Presentation Rates at Scientific Meetings in a Female-Dominated Scientific Field**

In some fields of science, such as primatology, women are actually over-represented compared to men. The authors of a new study examined whether gender bias still occurs in scientific disciplines rich in female scientists. They analyzed data from the last 21 annual meetings of the American Society of Physical Anthropologists in order to examine female participation in poster presentations, oral presentations, and symposia related to primatology. These forms of presentations represent different levels of prestige, with posters being the least prestigious and symposia being the most prestigious, as symposium presenters are personally invited by the organizer. In 1992, women gave 45.8% of the presentations at the annual meeting. This number increased to 66.5% in 2012. However, in every year since 1994, women were more likely to give poster presentations than talks, whereas men were more likely to give talks than poster presentations. The percentage of women participating in symposia differed according to the sex of the symposium organizer. Women were the primary authors (and thus likely presenters) of symposium presentations 29% of the time when there was a male organizer, 64% of the time when there was a female organizer, and 58% of the time when there

were both male and female organizers. This data is surprising given the large number of prominent women in the primatology field, and suggests that gender bias occurs even in fields where women are well-represented.

[Stag Parties Linger: Continued Gender Bias in a Female-Rich Scientific Discipline](#)

## **NIH Holds Causal Factors and Interventions Workshop Focused on Women in Biomedical Careers**

Several years ago, on behalf of the NIH Working Group on Women in Biomedical Careers, the National Institute of General Medical Sciences (NIGMS) published a Request for Applications (RFA) to support research on causal factors and interventions that promote and support the careers of women in biomedical and behavioral science and engineering. In 2009, NIH funded 14 grants submitted in response to this RFA, with support from multiple NIH Institutes and Centers (ICs). This past November, NIH invited the grantees to convene for a workshop on the NIH campus, sponsored by NIGMS and the Office of Research on Women's Health. The goals of this Causal Factors and Interventions Workshop were to allow the grantees to share preliminary results, discuss the implications and applications of their findings, and to brainstorm on next steps to promote recruitment, retention, and sustained advancement of women in biomedical and behavioral research careers. Two of the grantees, Dr. Molly Carnes of the University of Wisconsin-Madison, and Dr. Joan Reede of Harvard University Medical School, served as chairpersons for the workshop. In addition to research presentations by the grantees, the meeting included a keynote address by Dr. Shirley Malcom, Head of the Directorate for Education and Human Resources Programs of the American Association for the Advancement of Science (AAAS). Dr. Hannah Valentine, Senior Associate Dean for Diversity and Leadership at the Stanford University School of Medicine, provided additional remarks, highlighting recent Stanford initiatives to improve faculty retention and support a diverse workforce. A report from the workshop will be made available on the NIH Working Group on Women in Biomedical Careers website.

[NIH Working Group on Women in Biomedical Careers](#)

## **Women Scientists in Action—Dr. Ofelia Olivero, Ph.D., ATS**

Dr. Ofelia A. Olivero has two professional passions—science and mentoring. She is originally from Argentina, where she received her masters degree in zoology and her doctorate in cytogenetics from the National University of La Plata. She came to the National Cancer Institute (NCI) in 1987 to pursue postdoctoral work, and has remained there since, rising to the position of Senior Staff Scientist in the Laboratory of Cancer Biology and Genetics.

Shortly after arriving at the NCI, Dr. Olivero demonstrated the ability of certain carcinogens to bind directly to the DNA of cultured cells. She extended these findings to chemotherapeutic drugs, such as the nucleoside analogs used to treat AIDS. She found that culturing cells in the presence of the nucleoside analog AZT resulted in AZT binding directly to the DNA, with a genotoxic effect. Dr. Olivero was intrigued when AZT started being prescribed to HIV-positive pregnant women, and she started to explore potential effects of AZT on fetal DNA after being administered to the mother. Using a mouse model, Dr. Olivero and colleagues demonstrated increased tumor formation in offspring one year after treatment of the pregnant mother. As a result of this work, the NCI Director convened a panel of experts, which made several policy recommendations, including packaging the drug with insert material clearly stating that the drug acts as a carcinogen in rodents, and that children exposed in utero should be carefully followed throughout their lifespans. This was a pivotal moment in Dr. Olivero's career, both because of the satisfaction she received from making a substantial contribution to the women's health field, and because her contribution was rewarded with a promotion to a visiting scientist position. Dr. Olivero continues to work on transplacental carcinogenesis, with a focus on drugs used to treat HIV and AIDS. Over the years, she has published more than 70 scientific articles, presented at 180 conferences, and received numerous awards for her achievements. In 2010, she was awarded the distinction of becoming a fellow of the Academy of Toxicological Sciences (ATS).

Based on her own experience working with a range of mentors, Dr. Olivero's career has evolved to include mentoring efforts as well as science. While she raves about her current mentor and supervisor of 25 years, she has had past mentors who were unsupportive. Rather than letting this interaction serve as a roadblock, she allowed it to propel her own interest in mentoring. Talking about the challenges of working with one particular mentor, she said, "That was good actually, because he was the force behind my decision to change mentoring in Latin America." Along with a group of colleagues, Dr. Olivero designed and implemented a mentor training session in Chile. Representatives from different Latin American countries were invited to attend the workshop for free on the condition that they each follow up by organizing mentor training sessions in their home countries. Since then, she has given mentoring workshops and

participated in mentoring events in Colombia, Argentina, Brazil, Puerto Rico, and the United States. In addition, Dr. Olivero has developed mentoring programs for several scientific societies.

As a Hispanic female scientist, Dr. Olivero stands at the intersection of two communities traditionally underrepresented in the sciences. She takes this responsibility seriously, and has served as a mentor and role model for students in high school, college, and in her NCI laboratory. She believes that mentoring students has enriched her life tremendously. She says, "Mentoring is a great learning experience for both mentor and mentee. It is a rewarding way to learn how to walk the paths we chose to walk." In early November, Dr. Olivero presented a workshop to the new NIH chapter of SACNAS, the Society for the Advancement of Chicanos and Native Americans in Science. Her workshop, entitled "Mentoring, the engine behind personal growth", was an interactive presentation highlighting the importance of mentoring and identifying responsibilities of both the mentor and the mentee in sustaining a successful relationship.

Dr. Olivero is active in many professional societies, and derives much satisfaction from serving in leadership positions. She currently serves as Chair of the Excellence in Science Award Committee of the Genetic Toxicology Association and as Vice-President of the Environmental Mutagen Society. She has also served as president of the NIH Hispanic Employee Organization, and is an active member of several professional groups designed to increase representation of women and minorities in scientific workforce, including Minorities in Cancer Research, Women in Cancer Research, and Women in Toxicology.