Resources about Women of Color in Academic Science, Engineering and Medicine Disciplines

These references were compiled from a literature review of journal articles, published reports, and conference proceedings on the following topics related to the representation of women, underrepresented minorities and/or women of color in academic science, engineering, and medicine disciplines.

An Overview of the Pipeline
The Academic Experience for Women of Color
Legal Efforts and Benefits of Broadening Participation
Exploring Bias
Barriers and Challenges
Recommendations and Policy Implications
An Overview of the Pipeline

In 1975, a seminal report “The Double Bind: The Price of Being a Minority Women in Science” was published, which examined the lack of representation of women of color in STEM fields. While progress has been made in increasing their representation, the number of underrepresented minority (URM) women in tenure-track positions at the top 100 research universities in 2007 was still abysmally low and not growing at the same rate as the doctoral degrees awarded to this subset of women. The references in this section describe some recent data trends for women and/or URM at various stages of the academic pipeline in science, engineering and medicine fields, in addition to reviewing potential reasons for their lack of growth in representation in the academy.

Annotated Bibliography


This report summarizes the data gathered from a survey of the top 100 departments (according to research funds expended) in each of 15 science and engineering (S&E) disciplines, as ranked by the National Science Foundation (NSF). Underrepresented minorities (URMs) among S&E faculty are underrepresented despite increased representation among B.S. and Ph.D. recipients. In most disciplines, representation drops at each transition point until the rank of full professor, reflecting increased recent hiring in those disciplines. In some disciplines, there are virtually no blacks, Hispanics, or Native Americans among assistant professors, with Hispanics generally encompassing the largest segment of URM professors.


The review examines the underrepresentation of women of color and non-Hispanic white women in the scientific workforce by race and ethnicity. Aggregated data obscures significant differences that can result in ineffective policies. Female scientists are more likely to earn a bachelor’s degree at a research university and are only represented at 43 of the top 50 universities. Men are four times more likely to have full time faculty positions in S&E positions, even as women’s representation in doctoral degree programs is increasing. There is an inverse proportion of institutional prestige and proportion of female faculty members and URM women were less likely to be in tenured positions. Female faculty members have lower salaries than their male counterparts and are less likely to negotiate other factors of employment. Implementing institutional change requires cohesive and integral efforts of understanding the issues/problems, reviewing the most effective practices, reexamining tenure and hiring processes, and strong leadership within the institutions.


This review gives a comprehensive summary on the state of the literature from journal articles, books, dissertations, reports and book chapters regarding the topic of faculty of color in higher education from 1988-2007. After analyzing the topics in all of the literature, the authors created a framework for assessing the issue on a departmental, institutional or national context and found both unique and overlapping themes in the challenges and support in each context. The authors also compile recommendations to
address these challenges and track the main methods for researching faculty of color throughout the years, including the surge in interest in examining faculty of color in STEM and the health fields between the years of 2003-2007. Finally, the authors describe the five main research gaps in the current literature.


This study evaluates whether gender differences exist in the likelihood of obtaining a tenure track job, promotion to tenure, and promotion to full professor using the 1973-2001 Survey of Doctorate Recipients. Women were less likely to take tenure track positions in science, but this gender gap is entirely explained by fertility decisions. In science, there is no gender difference in promotion to tenure or full professor after controlling for demographic, family, employer and productivity covariates. Single women do better at each stage than single men. Women with children are less likely to advance up the academic job ladder beyond their early post-doctorate years, while both marriage and children increase men's likelihood of advancing.


This study examines the educational transition rates in the biomedical sciences by gender, race, and ethnicity, from high school to academic careers in biomedicine using a number of educational databases. This was followed a multivariate regression to examine faculty career outcomes using the National Science Foundation's Survey of Doctorate Recipients. While transitions between milestones are distinctive by gender and race/ethnicity, the transitions between high school and college and between college and graduate school are critical points at which underrepresented minorities are lost from the biomedical pipeline, suggesting some specific targets for policy intervention.


This study examines the characteristics of minority faculty with science, engineering and health (SEH) doctorates in 2008, including the types of schools from which they earned their doctorates and in which they teach, and compares them with non-minority faculty. SEH fields include biological/agricultural/environmental life sciences, computer and information sciences, mathematics, statistics, physical sciences, psychology, social sciences, engineering and health fields. African-American and Hispanic doctorates were employed in education at a higher percentage than most other racial/ethnic group, though they also had a higher likelihood of a social or behavioral sciences degree. African-American SEH faculty are employed at master's-granting institutions at a higher percentage than at research universities with very high research (RUVH) activity, even when their degrees were awarded by RUVH. This trend is unique to this racial/ethnic group and can be due to employment at historically black colleges and universities.

This report highlights that the racial composition of the science and engineering (S&E) degree holders is shifting due to increased numbers of minority group members, particularly Hispanics/Latinos, attending college. The proportion of S&E bachelor's degrees between men and women has been unchanged in the last 10 years and has decreased in computer sciences, math and engineering. For graduate education, the number of S&E doctoral degrees earned by women, African-Americans and Hispanics grew faster than the number of degrees earned by white men from 2000-2009, while the numbers of Native American degrees has been largely unchanged.


This article discusses data on African American, Hispanic, and Native American faculty in STEM disciplines based on data from the NSF in 2007. When examining the number of tenured/tenure track faculty at the top 100 research institutions, for every science discipline, the numbers of underrepresented women in each racial group compared with the total number of faculty is well below 1%, while underrepresented minorities comprise 9% of the general population.


This report documents data from the Computing Research Association on the trends in student enrollment, degree production, employment and salaries of computer science (CS), computer engineering (CE) and information in the United States and Canada. The data shows that the number of PhDs awarded has increased dramatically since 2002, yet only 20.8% of the CS PhD recipients and 16% of the CE PhD recipients are female. In addition, only 1.3%, 1.4%, 0.1% and 0.7% of the CS PhD recipients are African-American, Resident Hispanic, American Indian and Native Hawaiian/Pacific Islander, respectively. Similar percentages apply when examining the gender and race/ethnicity of newly hired faculty in these fields, though the data of current full professors shows drops in the percentage of full African-American faculty.


This report examines the trends in mathematics faculty members at different types of universities and breaks down the numbers by gender and type of faculty appointment. The data shows that growth of women faculty members in mathematics departments was minimal from 2002-2009, with tenured/tenure-track female faculty members only making up 13% of the total faculty at doctoral granting universities, but 27% of the faculty at Master's granting universities in 2009. Female faculty are employed at higher percentages in non-tenure track (37%) and part-time (39%) faculty positions at doctoral-granting universities compared to male faculty members.

**Bibliography**


The Academic Experience for Women of Color

While the references in the “Overview of the Pipeline” section provide a quantitative assessment of the state of women of color in STEM disciplines, there are many qualitative studies that examine additional, and more personal, details about the academic experience of women of color. Studies show that there are often differences between the issues and struggles of women of color faculty members when compared to both all women and men of color counterparts. Common themes that emerge from these qualitative assessments revolve around feelings of sexism/racism, campus climate before and after the affirmative action cases, feelings of isolation and lack of self-confidence in their coursework and/or profession.

Annotated Bibliography

Settles, I.H. (2006). The Climate for Women in Academic Science: The good, the bad and the changeable. Psychology of Women Quarterly, 30, 47-58. This study examined the attitudes of female faculty at various stages in their careers in natural science, social science and engineering at a large Midwestern University. In this sample set, white women scientists had a greater likelihood of being higher in rank and felt more influential in their departments than women of color faculty. For women faculty, the greater the feeling of sexism exists within the department, the less the women perceived their influence and job satisfaction. Factors that could improve outcomes include strong leadership among the department chair, encouragement of collegiality, ensuring gender equity, discouragement of sexist behavior, and facilitating mentorship relationships.

Malcom, L.E., & Malcom, S.M. The Double Bind: The Next Generation. Harvard Education Review, 81(2), 162-171. This paper reflects how the experiences of women of color in STEM have changed and remained the same over the last thirty-five years. The understanding of the route to STEM for students has evolved due to increased enrollment in community college. While much progress has been made, there is variability by discipline, with social science and medical degrees increasing while others (such as computer science) remaining constant. Many of the current challenges deal with support structures and increasing the institutional responsibility for facilitating change.

Turner, C.S.V., et al. (2011). Faculty Women of Color: The Critical Nexus of Race and Gender. Journal of Diversity in Higher Education, 4(4), 199-211. This study provides results of a qualitative analysis from focus groups of women of color in various academic positions in major public research universities. The study underscores the need for institutional renewing and expanding of a commitment to diversity and for disseminating knowledge about campus-wide opportunities. The faculty who were surveyed suggested that the climate on campuses after affirmative action cases (Gratz and Grutter) is more negative than before the cases. As a result of the focus group formation, women of color from across campus were able to form an informal network which allowed for the sharing of knowledge and experiences.

This report describes the results of the first five years of the study of retention of undergraduate women in science or engineering (S&E) disciplines by the Women in Engineering (WIE) Initiative at the University of Washington. Factors that positively affect retention of women S&E students include a continued interest in math and science courses, importance of career opportunities, gaining acceptance into the department, positive influence of advisor and/or mentor, ability to work independently and involvement in the WIE Big Sister Program. Perceived barriers to retention of women in S&E fields include lack of self-confidence, not being accepted into the department, discouragement about grades, poor advising, financial problems, and feelings of intimidation. There is a significant drop of self-confidence among women in science and engineering during their first and second years that increases by their senior year, yet never returns to the level of entering first year students.


This study describes a model of science identity based on the experiences of 15 successful women of color from their undergraduate degrees to their science-related careers. The results identify three science identity trajectories: research scientist; altruistic scientist; and disrupted scientist. Research scientists were passionate about science and were recognized by themselves and science faculty as scientists. Altruistic scientists regarded science as a vehicle for altruism and created innovative meanings of “science”, “recognition by others”, and “woman of color in science”. Disrupted scientists sought, but did not often receive, recognition by meaningful scientific others and had more difficult trajectories because their bids for recognition were disrupted by the interaction with gendered, ethnic, and racial factors. These different identities and ways that women of color experience and negotiate science suggest a rethinking of recruitment and retention efforts.


This paper describes a study of ten minority women from the University of California System who received Ph.D.s between 1980 and 1990 that describes the graduate school experience of these women and presents the multiplicity of answers which individual women find for themselves. In general, the women in this study reported positive experiences such as support from teachers and families, support from their advisor, ability to secure funding, participation in various forms of formal and informal minority support mechanisms. However, they also noted negative experiences such as discriminatory behavior directing them away from pursuing higher education, inadequate preparation of their post-graduate careers, and subtle racism within their departments. Even with these external environmental factors, these women completed their PhD degrees due to their character, persistence, deep commitment to science, and tremendous personal discipline.


The study explores how factors in women’s precollege and college experiences contribute to their persistence as STEM majors and explores these trends across racial
and ethnic groups. The study suggests that women’s experiences in their universities are more influential than their prior experiences in high school, suggesting the crucial role of undergraduate institutional climate. It sheds light on the role of faculty and peer interactions, pedagogy, and college selectivity, among other factors, in STEM persistence.

Bibliography


Legal Efforts and Benefits of Broadening Participation

Recent studies have highlighted the need to broaden the participation of diverse groups in STEM disciplines in order for the United States to remain competitive in the global workforce. Other studies have described the power of diverse groups in decision making processes and the effect that diverse faculty may have on the student body at universities. Therefore, the need for increasing diversity has been recognized and legal strategies must be employed to facilitate the inclusion of diverse groups into the workforce. The references in this section identify the need and benefits of broadening participation, in addition to presenting legal efforts to ensure that these goals are achieved.

Annotated Bibliography


This study examined the connections between time allocation and satisfaction for STEM faculty within the context of a critical mass of women in the discipline. Using a weighted sample of 13,884 faculty from the 2004 National Study of Postsecondary Faculty, we found a gendered division of labor that is mitigated by a critical mass of women faculty in the discipline. Results lend empirical support to theories that argue critical-mass attainment positively impacts equity in resource distribution and time allocation.

Chubin, D.E., et al. (2009). *Understanding Interventions That Broaden Participation in Research Careers: Embracing a Breadth of Purpose*. Washington, DC: American Association for the Advancement of Science. This report summarizes the presentations and discussions from the Third Annual Conference on Understanding Interventions that Broaden Participation in Research Careers in 2009 that was held by the Minority Affairs Committee of the American Society for Cell Biology and the AAAS. The report was structured into five sections: a) The big picture; b) Theory in practice; c) Pathway programs; d) Data and evaluation; and e) Technology. Several success stories for broadening participation for postdoctoral researchers and faculty are described including the SPIRE program at University of North Carolina, the Preparing Future Faculty movement, the NSF ADVANCE program and the Forward to Professorship program.

the participation of minorities in science and engineering and urges campus leaders to specify diversity goals within their institutional missions even without the legal guidance from the U.S. Administration.

**Bibliography**


Exploring Bias

Studies show that individuals often display bias toward others solely due to their gender or race/ethnicity in an implicit and unconscious manner. These biases can affect aspects of the individual’s career though altering perceptions in performance evaluations, his or her perceived abilities and likelihood of obtaining grant funding, in addition to negatively impacting an individual’s self-confidence and perceived notion of success and achievement. The following references describe the effect of explicit and implicit bias on female and underrepresented minorities’ ability to succeed in math and science disciplines and progress in their careers.

Annotated Bibliography

The study investigated the association between a U.S. National Institutes of Health (NIH) R01 applicant's self-identified race or ethnicity and the probability of receiving an award by using data from the NIH grant database and other sources. Even when proposals had strong priority scores, Asians were 4 percentage points and African-American applicants were 13 percentage points less likely to receive NIH investigator-initiated research funding compared with whites. After controlling for the applicant’s educational background, country of origin, training, previous research awards, publication record, and employer characteristics, black applicants were 10 percentage points less likely than whites to be awarded NIH research funding.

This study analyzed the perceptions of college preparatory students on the competence, interpersonal skills and legitimacy of either humanities or science professors of different races and genders, based on sample CVs. African-American professors were regarded as less competent and have less interpersonal skills as Asian-American and Caucasian professors, while Asian American professors were perceived to have less interpersonal skill than Caucasian professors. Women professors were voted less competent than a male professor in science and African-American women were rated the lowest in terms of competence, interpersonal skills and legitimacy compared to all other groups.

This study tested a stereotype inoculation model, which proposed that contact with same-sex experts in academic environments involving STEM disciplines will alter women’s attitudes toward STEM and motivation to pursue STEM careers. The studies revealed that exposure to female STEM experts promoted positive implicit attitudes and stronger implicit identification with STEM, greater self-efficacy in STEM, and more effort on STEM tests. The authors suggest that the benefit of seeing same-sex experts is driven by greater subjective identification and connectedness with these individuals, which in turn predicts enhanced self-efficacy, domain identification, and commitment to pursue STEM careers.

Using results from more than half a million Implicit Association Tests completed by citizens of 34 countries, this study revealed that about 70% of people held implicit stereotypes associating science with males more than with females. Nation-level implicit stereotypes predicted nation-level sex differences in 8th-grade science and mathematics achievement, while self-reported stereotypes did not provide additional predictive validity of the achievement gap. The authors suggest that implicit stereotypes and sex differences in science participation and performance are mutually reinforcing, contributing to the persistent gender gap in science engagement.


The study examines over 300 letters of recommendation for medical faculty at a large American medical school in the mid-1990s. Letters written for female applicants were found to differ systematically from those written for male applicants in extremes of length, in the percentages lacking in basic features, in the percentages with doubt raisers, and in frequency of mention of status terms. Further, the letters commonly reinforce gender schema that tend to portray women as teachers and students, and men as researchers and professionals.


This paper examines faculty and scientists’ recommendations of applicants to the National Science Foundation’s (NSF) Graduate Fellowship Program, spanning the years from 1976 to 1991 and regression analysis was used to test the double bind hypothesis that minority women are doubly disadvantaged simply because they are both minorities and women. The findings generally support the double bind hypothesis: being a minority significantly lowered the Reference Report ratings of women NSF applicants and being a woman significantly lowered the Reference Report ratings of minority applicants. This was supported by data showing that certain women, by virtue of their appearance or language, are unmistakable as minorities and impact faculty recommendations in a manner distinct from non-identifiable minority women. Compared to white women and minority men, being a Black, Puerto Rican, and other Hispanic woman significantly lowered faculty/scientists’ recommendations.

Bibliography


Barriers and Challenges

While progress has been made to assist women and underrepresented minorities in advancing their careers in STEM disciplines, barriers and significant challenges still remain. Due to the small number of women of color in the academy, difficulty remains for women of color to form same gender/race mentorship relationships, to avoid being stereotyped and to feel like they belong at their institutions. These factors can significantly affect a faculty member’s ability and motivation to progress in their career. In addition, women of color often feel the stress of being underrepresented in their gender and race, as well as stress from cultural expectations. The following references describe some of the unique challenges for women of color in the academy.

Annotated Bibliography


This study uses organizational network theories to study the differences between the function and value of informal professional networks (IPNs) for men and women STEM faculty at universities in the Southeastern University Research Association. In this study, IPNs encompass either mentoring or other informal work or social relationships and the authors found that woman had significantly fewer IPNs, yet perceived IPNs as very important in their professional development compared to the male faculty. Women were more likely to have a gender-diversified IPN than male faculty and a high percentage of women perceived that gender and/or ethnic background were a barrier for IPN access, while the majority of men did not believe those factors were relevant.


This article discussed the results from the Bayer Corporation survey that shows a significant number of today’s women and underrepresented minority chemists and chemical engineers (40%) say they were discouraged from pursuing a STEM career at some point in their lives. Leading workplace barriers for the female and minority chemists and chemical engineers include managerial bias, company/organizational/institutional bias, a lack of professional development, no/little access to networking opportunities, and a lack of promotional/advancement opportunities. Nearly three-quarters of the chemists/chemical engineers say it is harder for women to succeed in their field than it is for men, while more than two-thirds think it is more difficult for minorities to succeed than it is for non-minorities.


The study investigates the experiences of women of color who transfer from community colleges to a four-year institution, an increasingly common path for STEM majors. The study finds that women of color who transfer feel that their new institutions sent them signals that they do not belong because of their age, ethnicity, and gender, as well as because of preconceptions that transfer students are not adequately prepared or are not “high-quality students”.

This paper identifies unique barriers faced by women of color in science, technology, engineering and mathematics (STEM) in faculty positions, as well as positions of leadership within the STEM industry. Stereotyping, bicultural stress, and tokenism are barriers that ultimately affect the extent to which women of color advance to tenure, receive research funding, obtain leadership positions, and remain in long-term faculty and leadership positions. Solutions to overcoming these barriers lie primarily in awareness, understanding, and training of women of color and the administrators, faculty, and STEM management involved in advancing their status.

Bibliography


Recommendations and Policy Implications

While there are limited studies that specifically examine women of color in academic STEM disciplines, there have been proposed recommendations for policy interventions to increase the representation and support of this subset of faculty members. The following references describe some of the recommendations that have been proposed in journal articles, reports from the National Academies and various workshops.

Annotated Bibliography


The report captures the presentations and discussions at the Committee on Equal Opportunities in Science and Engineering (CEOSE) Mini-Symposium on Women of Color in STEM in October 2009. A list of recommendations resulting from this conference was presented to the CEOSE and includes: (1) Increase funds for programs that help to augment the number and success of women of color in STEM fields; (2) Increase the knowledge base on women of color in STEM through more research, evaluations, and support for publishing; (3) Develop and support a centralized, digital clearinghouse of information about women of color in STEM; (4) Create and sustain a professional network for women of color in STEM; (5) Recognize and study transitions that represent the greatest points of loss of women of color from STEM fields; (6) Hold grantees to greater accountability for meeting the NSF Broader Impacts criterion of broadening participation; (7) Give recognition awards to grantees who demonstrate outstanding work in broadening participation in STEM; (8) Protect the funding of and ensure the mentoring of minority and female graduate students, postdoctoral fellows, and junior faculty; and (9) Support efforts to educate the public about the status of women of color, minorities, and women in STEM through citizen science efforts, informal science education, and other channels.


This article presents the experience of 19 U.S. universities, funded by the National Science Foundation’s ADVANCE Institutional Transformation program, that have embraced comprehensive transformation for improved gender representation and inclusion in science and engineering disciplines. It describes the facilitating factors, program initiatives, institutionalization, and outcomes of their transformation, and suggests a transformation model that all organizations can use to create an inclusive and productive workplace for a diverse workforce.


This paper summarizes national trends of women and minorities in U.S Academic Medicine programs and further highlights six programs funded by the National Centers of Excellence in Women’s Health initiative that were required to develop a specific focus on careers of minority women faculty. The programs include Harvard Medical School,
University of Illinois in Chicago, University of Puerto Rico, Tulane and Xavier Universities, University of Wisconsin and University of Washington. The programs implemented at these schools addressed many issues for women faculty such as networking for support, informal and formal mentoring, faculty development, dissemination of information and installment of awards for women faculty members. The authors proposed 4 recommendations for institutions to address the underrepresentation of minority women faculty: (1) Measuring progress; (2) Institutional support for recruitment; (3) Leadership commitment to faculty retention; and (4) Further research and funding to define issues relevant to advancing minority women faculty.

This research suggests that there is a pool of women of color with interest in science and the academic skills to pursue that interest. Given the support necessary to persist in science, these women will choose careers that address many other needs, domestic and international, including schooling and science education; rural and urban healthcare, public health and medical research; the environment; and other public service fields. Investing in the retention of high-achieving women of color in science yields a return on multiple levels.

This meeting included recommendations that were specific to women of color that were discussed in a Mentoring Minority Women in Biomedical Research Workshop. These recommendations include (1) Create overarching initiatives involving academic institutions and professional associations; (2) Conduct and support both quantitative and qualitative research to capture and document experiences of women of color; (3) Support practice recommendations in training and teaching for mentors regarding issues of women of color and provide resources for an ongoing dialogue on issues regarding women of color; and (4) Support policy recommendations to disaggregate data on women of color and incorporate themes and issues regarding women of color in future meetings.

The workshop summary of the Workshop on Understanding Interventions That Encourage Minorities to Pursue Research Careers: Major Questions and Appropriate Methods is addressed to a number of different stakeholders, including researchers and prospective researchers on the efficacy of interventions from a variety of disciplines; program directors and others involved with undergraduate research and mentoring programs; funders and other program supporters; individuals and institutions committed to recruiting and fostering the success of diverse student populations; professional societies, and others with interest in these issues.

This paper provides a synthesis of empirical research produced over the last forty years,
highlighting the variety of factors that support or challenge underrepresented minority women in STEM undergraduate and graduate programs. The findings reveal that existing initiatives may not be effectively serving minority women and the perceived lack of interest in STEM among women of color is a myth. The authors recommend a) institutional policy should support the advancement of underserved populations through engagement in rigorous research, student-faculty mentoring relationships, and access to professional development and publishing opportunities; b) states should have transfer policies between two- and four-year institutions; and c) researchers to disaggregate data on women of color in STEM to further understand how the intersection of race and gender manifests in different subfields.

Office of Research on Women’s Health. (2008). Women in Biomedical Research: Best Practices for Sustaining Career Success Meeting Proceedings (NIH Publication No. 09-7366). Washington, DC: National Institute of Health. This report summarizes the proceedings of a 2008 meeting planned by the Women in Biomedical Research Workgroup at the NIH that highlighted the best practices in place or under development at academic health centers and in private industries to increase the participation of women in biomedical careers. Top-down strategies by many private corporations have retained and promoted talented women during a time when academic institutions were not able to achieve similar success in these goals, though isolated academic institutions have achieved successes that were highlighted at the meeting. Common themes that were discussed at the meeting demonstrate the importance of the following: analysis of programs to determine best practices, securing strong commitment from top management, having transparent policies for hiring, salaries and promotions, rewarding success, increasing recruitment pools, celebrating achievement, instituting “family-friendly policies, establishing support programs at each career stage and including women of search committees.

Office of Research on Women’s Health. (1992) Women in Biomedical Careers: Dynamics of Change: Strategies of the 21st Century. Washington, DC: National Institute of Health. This report is a summary of the NIH-sponsored workshop from July 1992 that discussed the issues and barriers that women face when considering a biomedical career. It contains a section from Minority Women’s Perspective, which describes some of the obstacles that African-American, Asian-American, Native American, Latino and other women face. It states that overemphasis on the common ground and the greater good of all women may cause minority women to suspend working towards addressing the biases attributed to their race/ethnicity or breaking through cultural norms that may limit promotion in the workforce. Recommendations for institutions to provide commitment to the special considerations of minority women include: (1) Trustworthy mentoring and guidance should be provided; (2) Clear institutional policies should be implemented; (3) Provide resources to facilitate women meeting expectations; (4) Thorough understanding of the pros and cons of early appointment into administrative roles; (5) Shift from traditional thoughts about affirmative action; (6) Provide non-threatening opportunities for minority women that downplay stereotypes; (7) Building programs with other minority men or women scientists; (8) Supporting faculty development in pre and post-doctoral programs without penalties; (9) Disaggregation of data on women faculty by race/ethnicity; and (10) Clarifying the pathway to promotion and tenure.
Bibliography


