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Alicia Pérez-Porro, MSc, PhD
Research Associate, NMNH IZ—Smithsonian Institution
Homeward Bound'18 Team member
AWIS member since 2015

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In my first year as provost, my chief of staff walked into my office one day while I was reviewing faculty files, and the first words out of my mouth as I looked up were, “Holy cow! Particle physics is fascinating!” You would not have heard me utter that phrase a few years ago, but I love being able to say it now.

Perhaps the most important part of my job as provost at Rice University is to develop an appreciation for the wide range of research and curricular interests of all of our faculty and students. It’s not hard. I can recall conversations with faculty members in every department at Rice and think, “How cool is that?”

It’s the primary benefit of a job that would appeal to anyone with a curious mind.

The great joy for me is that it doesn’t feel like work. I get to fulfill my deep curiosity about all the questions my faculty colleagues strive to answer. Best of all, I never know which formal event or informal chat will redirect my thoughts in ways I hadn’t considered. In addition, by showing interest in our faculty and student lives, they in turn open up to working together toward shared goals like, for example, improved diversity, stronger graduate programs or better teaching.

Innovation can be found anywhere, of course, but those with open ears, minds and hearts are better prepared to assemble seemingly diverging thoughts into novel ideas. This is especially true when the questions we ask require the creativity and collaboration of heterogeneous teams.

In my own research, I leverage a variety of disciplines but always with an eye toward the goal of using my specialty, geospatial informatics, to help children overcome difficult circumstances and fulfill their health, developmental and academic potential.

Some of the most interesting new approaches in my teaching and research came to me at the intersections between disciplines. I have training in mathematics, I have training in economics, I’m self-taught in toxicology, and I have a very strong quantitative-methods background. I have for a long time held an appointment in a pediatrics department and previously held an appointment in an OB-GYN department. But most importantly, I make a point of connecting and collaborating with people from varied backgrounds to form the strongest possible teams.

Eventually, as we were working with kids in neighborhoods, it became clear that we needed to understand how what they were exposed to shapes their outcomes. That brought us to geospatial informatics, which allows us to look at the many different exposures that children face – environmental and social – and how those factors combine to influence outcomes, as well as how to shape interventions to improve outcomes.

At each stage of my life, there always seems to be a next step, a missing knowledge base (or a missing collaborator) I know will help me get closer to my goals. I think, for example, of what happened the summer that I turned 40.

My husband and three children refer to it as the “nerdiest midlife crisis ever.”

I came to the realization that I had what could best be described as a Swiss-cheese understanding of organic chemistry, and I felt that was limiting my contributions to our collaborative research work – and that I was not able to support children and their families as fully as they deserved.

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So that summer, I took organic chemistry. The course gave me a better understanding of the classes of compounds we need to think about when we study children and their exposure to pollution — and it improved my ability to work effectively with the toxicologists on our research teams.

I've found the most interesting things to work on, the ones that generate new insights and lead to the most innovative approaches, are those where the edges of different disciplines meet. When they rub against each other, they reveal opportunities to solve problems.

That approach informs our work in children's environmental health. We're bringing it all to bear in a new project funded by the National Institute of Environmental Health Sciences to build data analysis tools to assess how exposure to environmental mixtures affect children. The exciting part is we're looking not only at environmental contaminants but also at the social stressors that shape children's lives.

Our earlier studies taught us that for all people — and especially for under-resourced children — the air they breathe, the water they drink, and the things they're exposed to in their homes are critically important to their development, their health and their educational outcomes.

If you spend enough time with individual children in their home environments, you begin to learn about the factors that affect them. Are they exposed to allergens? Are they exposed to asthma triggers? Are they exposed to lead? Are they exposed to other sorts of pollutants? You see where they live and what they do and what's going on with their families, and you realize that not only the environmental exposures but also the entire social context in which these kids are growing up has an impact on their development. So if we want to create programs that are more supportive of children, we need to think about those that address both their social and physical environments.

That's the goal of our current study, which combines a variety of quantitative methods using data gathered over two decades, primarily in North Carolina, that include birth records, blood lead levels for children ages 1 to 6, air pollution, housing quality and educational system information. The data provide snapshots of where children resided, when they lived there and, critically, what they were exposed to during these periods, including a whole series of social stressors.

This work includes collaborators in statistics, electrical and computer engineering, sociology and environmental engineering. I am in awe of both the talent and humility of our collaborators and always look forward to our challenging, sometime raucous, but always deeply meaningful meetings.

Geospatial informatics is all about marrying a lot of data, connecting them via shared geography. This allows us to link disparate data — air quality, crime, quality of housing, under-resourced schools, inadequate access to health care — into a single space-time data architecture. We tie all these data at the global level, but we can zoom all the way in to a family or school when we want to figure out what's going on with a particular child.

The study isn't specifically about North Carolina, though, because we want researchers to use our tools on other data sets. Part of our plan will bring us close to home when we use these approaches on data being gathered by Rice's Kinder Institute for Urban Research to analyze the widespread environmental impact of Hurricane Harvey on southeast Texas.

All of this challenges me as I balance my "day job" with research, but I feel fortunate that I can draw upon the expertise of such a talented faculty. As provost, I'm responsible for the academic enterprise across the entire campus. Fortunately for me, curiosity and a love of learning have connected every stage of my life, which make it a welcome responsibility.

For instance, when I was young, I developed a love of Jane Austen. I read her novels multiple times, but I'd never taken a course about them. So I was delighted when I happened to have a conversation with an Austen scholar at Rice.

Because of my environmental background, I was always interested in Austen's persistent references to the weather. And this amazing professor in our English Department, Helena Michie, PhD, helped me understand that because women then were more restricted in their ability to get around and were limited in their changes of clothing, the weather placed important constraints on their daily lives.

It occurred to me that some phenomena are universal. To a large degree, we're all creatures of our environment. I think it's a worthy goal to foster environments that will allow all people to be creative, to be innovative, to thrive. That worthy goal is the fundamental purpose of higher education, and makes our jobs a privilege.

Marie Lynn Miranda, PhD is the Howard R. Hughes Provost, professor of statistics and director of the Children's Environmental Health Initiative at Rice University.

Rice University has been an AWIS partner since 2014.
I am excited and honored at the opportunity to serve as the new President of the AWIS National Governing Board.

AWIS has achieved great success and my goal is to build upon our milestones and expand the ways in which AWIS is making contributions to STEM equity for all women by 2020.

The advocacy around gender equity in the STEM sectors has always been a focus for AWIS’ work. We now want to broaden our work to include the business imperatives—diversity and inclusiveness of thought, skills and perspectives—that are critical to reaching gender equity in STEM.

Women in STEM have been making significant, life-changing contributions to our nation for decades. This is why we were excited to endorse the bipartisan bill to recognize the contributions of Katherine Johnson, Dorothy Vaughan, Mary Jackson, and Dr. Christine Darden, to receive the Congressional Gold Medal, the highest award the United States can bestow to a civilian.

The talent pool of STEM women continues to grow across all disciplines but is not being sufficiently tapped, recognized or leveraged by the innovation sectors. My charge is to change that by breaking down these barriers that continue to impede women to achieve their full potential.

I invite all AWIS members, allies and supporters to join me and my colleagues on the National Board as we work together to promote, build and engage STEM talent that is diverse, highly skilled, and ready to support the global innovation economy. 🌐

Kind regards,

Susan Windham-Bannister, PhD
President
AWIS National Governing Board
We value the contributions and commitment of our AWIS members, partners, allies and friends to help us achieve global STEM equity across all disciplines and employment sectors.

Our award-winning awis magazine is just one of our many news which gives us the opportunity to provide members with unique perspectives, resources and information about issues related to STEM, gender equity, diversity, innovation, and leadership development.

We are proud to share stories about our members doing extraordinary work around the world. Whether it’s accelerating drone innovation, empowering women through mentorship programs, or treating musculoskeletal disorders, we strive to share diverse thoughts and perspectives about STEM equity.

Beyond sharing information and resources, we also hold ourselves accountable to help make the world a better place. That is why your comments and feedback are important to us.

One AWIS reader reminded us about the need to take care of the environment. We responded and quickly made sure that our magazine is produced through eco-friendly practices. It is. Aside from the words and images we share, the awis magazine uses recycled paper and we work with a printing plant that contributes to green living and practices that help with water, air and land pollution.

The awis magazine is a cornerstone of our history and legacy. It will continue to reflect our mission and vision not only through our stories, but how we work.

We appreciate and continue to welcome your comments and feedback to help us be stronger, better and more effective.

Thank you.

Maria Ibañez
AWIS Chief Communications and Marketing Officer
ibanez@awis.org
Gender Disparities in Mathematics Have Remained Stubbornly Stagnant at Best and Grown at Worst

Women’s Proportion of Mathematics Degrees: Then and Now

In recent years, women’s proportion of mathematics bachelor’s and master’s degrees earned has declined to figures below what they were in the 1970s.

While women hold approximately 35% of all mathematics degrees, they represent only 27% of mathematics jobs and comprise less than 16% of tenure track mathematics faculty in academia.


The extent to which a field attributes success to innate intelligence or brilliance actually predicts the proportion of women and African Americans in the field.

Are Leadership Styles in STEMM Gendered?

By Meredith Nash, Senior Lecturer and Deputy Director, Institute for the Study of Social Change, University of Tasmania

Robyn Moore, Researcher, School of Social Sciences, University of Tasmania

For the last 25 years, leadership scholars and commentators have argued that there is a difference between the ‘typical’ leadership styles of men and women (e.g. Vinkenburg, Eagly, & Johannesen-Schmidt, 2011). There is also a popular perception that differences in leadership style make one gender more suitable than the other for particular leadership roles. For example, male leadership is regularly characterised as “command and control”, whereas female leadership is deemed “facilitative and collaborative” (Sanchez-Hucles & Davis, 2010, p. 173). Consequently, women are often characterised as being more emotionally intelligent and aware in team work scenarios, whereas men are perceived to be more effective in situations requiring authority (Eagly, 2007).

Despite this limited acknowledgement of apparent differences in leadership styles, masculinity has typically been used as the standard for assessing leadership behaviors (Barbuto, Fritz, Matkin, & Marx, 2003). To address this issue, researchers have examined the relationship between gender and leadership using Bass and Avolio’s Full Range Leadership Model (FRLM) which incorporates leadership styles that are considered typical of either gender. The FRLM encompasses transformational, transactional, and non-transactional (laissez-faire) styles and is regarded as a leading model for describing leadership styles (Oberfield, 2012). The FRLM model originally proposed by Avolio and Bass (1991) contained five factors. However, as the evidence base regarding leadership traits expanded, they revised their model to include nine factors as outlined in Table 1 (Antonakis, Avolio, & Sivasubramaniam, 2003).

Research examining the role of gender in influencing leadership style using the FRLM has shown that effective female leaders tended to perform factors associated with transformational leadership more than men (e.g. Eagly, Johannesen-Schmidt, & van Engen, 2003). For example, using the FRLM, Antonakis, Avolio, & Sivasubramaniam (2003) found that in similar environments, male and female leaders enact different behaviours, with women exhibiting higher levels of individualized consideration and men adopting higher levels of management by exception. However, it’s not quite that simple. The factor or combination of factors required for a leader to be effective is dependent on the context in which the leader is performing. There are multiple combinations of factors in the FRLM that relate to effective leadership and these combinations are moderated by contextual factors including organization type and leadership role (Lowe, Kroeck, & Sivasubramaniam, 1996).

Moreover, leadership effectiveness is impacted by followers’ understandings and expectations of gendered leadership styles. Female leaders may struggle balancing leadership expectations while conforming to gendered norms. As Ely, Ibarra and Kolb (2011, p. 477) observe, “what appears assertive, self-confident and entrepreneurial in a man often looks abrasive, arrogant or self-promoting in a woman”. Similarly, transformational leadership is interpreted differently when enacted by men. ‘Command and control’ leadership is equated with attributes that are socially ascribed to men such as decisiveness, assertiveness and independence. By contrast, transformational leadership is perceived to be associated with femininity (Ely, Ibarra, & Kolb, 2011). Problematically, this reinscribes ideas of essential or biological differences between men and women in terms of their leadership styles. Consequently, transformational leadership appears exceptional when adopted by men, but not women (Stempel, Rigotti, & Mohr, 2015). This results in men receiving recognition for enacting transformational leadership. However, for women, it “looks like they are just doing what women do” (Fletcher, 2004, p. 654). When women lead in a relational, transformative manner, “their behaviour is likely to be...
Trendspotting

Gender and Leadership

Conflicted not only with femininity but with selfless giving and motherhood" (Fletcher, 2004, p. 655). When women's leadership is read in this way, it is assumed to be "natural". Hence, women do not receive the recognition and reward accorded to men who enact similar behaviours and women's access to leadership roles is hindered.

Therefore, the lower representation of women in leadership positions may result from 'female' leadership styles being perceived to be less effective compared to 'male' leadership styles rather than gendered differences when enacting leadership. Our research examined this question while controlling for gender and organisational type.

Is there a typical style of leadership exercised by women in STEMM?

There is very little leadership styles research that focuses on women in science, technology, engineering, mathematics, and medicine (STEMM) fields although women in STEMM continue to be underrepresented in senior leadership globally (UNESCO, 2018). While significant evidence describes the organisational factors underpinning the underrepresentation of women in STEMM leadership (e.g. caring responsibilities, gender bias and discrimination, masculine management cultures, etc.), it remains that little is known about how women actually exercise leadership in STEMM fields despite considerable institutional investment in leadership training and development in the US and elsewhere (for example, ADVANCE in the US; Athena SWAN in the UK and Australia).

To address these gaps, in our recent research, we investigated a key question: Is there a typical style of leadership exercised by women in STEMM? In 2016, we surveyed an international group of women in STEMM fields who were seeking to enhance their leadership skills.

<table>
<thead>
<tr>
<th>Leadership Type</th>
<th>Leadership Factor</th>
<th>Description</th>
</tr>
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</table>
| Transformational| Inspirational motivation | - motivate those around them by providing a vision and meaning for the work undertaken by followers.  
- display optimism and generate enthusiasm and individual/ team spirit  
- has clear goals and positive attitude for future |
|     | Idealized influence as an attribute | - demonstrates attributes that motivate respect and pride by association charisma  
- focuses on higher-order ideals and values. Followers build close emotional ties to the leader. Leader is trustworthy and inspires confidence in followers |
|     | Idealized influence as a behaviour | - communicates values, purpose and importance of mission  
- emphasises collective sense of mission and values, and acts upon these values. |
|     | Intellectual stimulation | - examines new perspectives on problem solving and task completion  
- challenges assumptions of followers' beliefs, their analysis of problems faced, face and solutions generated. |
|     | Individualised consideration | - act as coach/mentor by paying attention to individual needs for achievement and growth.  
- focuses on developing followers' skills  
- recognizes individual aspirations |
| Transactional | Contingent reward | - clarify expectations for followers  
- recognises/rewards followers when goals are achieved. |
|             | Active management-by-exception | - actively attends to deviations from rules to avoid these deviations; if necessary, corrective actions are taken |
|             | Passive management-by-exception | - waits until problems are severe before intervening  
- intervenes only after errors are detected or standards are not met |
| Non-transactional | Laissez-faire | - exhibits widespread absence and lack of involvement during critical junctures |

Table 1. Full Range Leadership Model and factor descriptions. Descriptions are drawn from Barbuto, Fritz, Matkin, & Marx, 2003; Antonakis, Avolio, & Sivasubramaniam, 2003; Lauber, 2014.
Where Psychological Science and Cancer Research Unite

S
ome of the most fascinating research happens on the edges of disciplines. When materials science overlaps with entomology, a clothing company can make a hat out of spider silk, grown in vats of yeast. When public health and anthropology overlap, one researcher can transform life in a whole refugee camp to improve hygiene, vaccinate dogs to prevent rabies, and clean up garbage in the streets through festive ‘health parades’.

The same goes for psychological science and cancer research. Scientists in those disciplines have collaborated for more than a decade to determine how behavior and mental processes might contribute to cancer development, growth, and recovery. Recently, behavioral scientists from Rice University, the University of Texas MD Anderson Cancer Center, Baylor College of Medicine, and the National Cancer Institute published a review in *Current Directions in Psychological Science* summarizing the research into behavior, stress, and cancer. They have found that acute stress, the hormones associated with the ‘fight-or-flight response’, and chronic-stress-induced inflammation can all contribute to the onset, progression, and post-treatment outcomes of cancer.

Large population studies have drawn a general correlation between chronic stress and cancer. For example, women in a 2003 study who experienced stressful life events like divorce or a death in the family during a 5-year study period were more likely to develop breast cancer in the next 15 years. But these data don’t identify the mechanisms by which psychological stress contributes to cancer progression.

The most convincing causal data arises from studies on the processes that happen after a tumor has formed. Scientists have linked life history events and social support to cancer progression. Study participants with basal cell carcinoma, a type of skin cancer, that had experienced childhood trauma had weaker immune system responses to a tumor than a matched group that had no trauma. Another group of ovarian cancer patients with elevated depressive symptoms, chronic stress, and low social support had tumors with elevated indicators of tumor aggressiveness compared to those who didn’t report those psychological symptoms.
Daily stress stimulates the autonomic nervous system, responsible for the fight-or-flight response. This cascade of chemical signals and physical behaviors includes elevated heart rate, increased blood pressure, and the release of catecholamines, a chemical family that includes adrenaline in humans.

Cancer cells multiply out of control partly because they evade natural processes of cell death. In studying cancer cells, scientists have found that many tumor cells show a high number of receptors for catecholamines. The same cells with lots of receptors also show resistance to cell death.

Those same cells show a propensity to wander beyond their original tumor, making metastases more likely. Metastases are secondary tumors that can spread to other areas of the body, grow, and cause damage in the new tissues. In mice with breast cancer, stress-induced activation of catecholamine pathways led to 30 times more metastases than unstressed mice.

The fight-or-flight response controls the immune system through the release of glucocorticoids, which include the human hormone cortisol. Cortisol is often used in laboratory experiments as an indicator of stress levels because of this relationship between the fight or flight response and its eventual release. Immune system suppression is one way stress may contribute to cancer growth and spread. A healthy immune system keeps cancer in check by identifying and eliminating abnormal cells from the body, but glucocorticoids may impair their ability to do so. A great number of different cancer types have been associated with abnormal immune responses, and female rats with stress-compromised immune systems developed more breast cancer tumors than a control group.

“Where Psychological Science and Cancer Research Unite” continues on page 51
How Social Media Helps Scientists Get the Message Across

Analyzing the famous academic aphorism “publish or perish” through a modern digital lens, a group of emerging ecologists and conservation scientists wanted to see whether communicating their new research discoveries through social media—primarily Twitter—eventually leads to higher citations years down the road.

Turns out, the tweets are worth the time investment. “There’s a compelling signal that citation rates are positively associated with science communication through social media. Certainly, Twitter provides an accessible and efficient platform for scientists to do a majority of that communication,” said Clayton Lamb, a University of Alberta PhD student and lead researcher on a new study out today.

“The good papers that get pushed on social media are what end up on people’s minds and eventually as PDFs in their reference manager,” he said.

As is common among scientists, what started as a personal curiosity turned into a full-scale study. Along with Sophie Gilbert, a former U of A post-doc now working in the Department of Fish and Wildlife Sciences at the University of Idaho, and Adam Ford, an assistant professor at UBC (Okanagan), Lamb explored the phenomenon of science communication in the social media age, measuring the association of altmetrics—alternative impact factors, which consider, amongst other avenues, social media attention surrounding science discoveries—with eventual citation of 8,300 ecology and conservation papers published between 2005 and 2015.
The three scientists, who use Twitter to communicate daily about their science (see @ClaytonTLamb, @SophieLGilbert, and @adamthomasford), found a positive correlation between social media engagement and traditional measures of scholarly activity.

“There’s a big hype when a paper comes out, but then there is this underwhelming lull for a year or two as you wait for citations to accumulate, so you don’t really know whether your science is reaching people. We quantified whether science communication may correlate with more citations. In the case of ecology and conservation science, it looks like it does,” said Lamb, who is completing his PhD tracking grizzly bear population patterns with supervisors Stan Boutin in the Faculty of Science and Scott Nielsen in the Faculty of Agricultural, Life, & Environmental Sciences.

Science communication is viewed as critical to ecology and conservation, where research findings are often used to shape public policy and mainstream media attention. Lamb said though much of scientists’ communication on social media is directed at other scientists, by virtue of the medium, information is making its way to the broader community, noting statistics showing that nearly half of ecologists’ followers on Twitter are non-scientists, environmental groups and the media.

“Ecologists and conservation scientists are dealing with applied problems that the public cares a lot about. So, when science gets stuck in the circles of academia and doesn’t make it out to the public, it’s doing that publicly funded research and its potential applications, a disservice,” said Lamb.

“In this era of alternative facts and some mixed messaging surrounding science, data-driven scientific information offers a light of truth. Twitter is one of the ways we can help share science with policy-makers, other scientists and the public.”

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Making Connections between Gender Stereotypes and the Underrepresentation of Women in STEM Fields

By Katrina Piatek-Jimenez, PhD, Professor, Department of Mathematics, Central Michigan University
Jennifer Cribbs, PhD, Assistant Professor, School of Teaching, Learning, and Educational Sciences, Oklahoma State University

Although there are now more women than men employed in certain STEM fields, such as biological/medical science, women continue to be underrepresented in many other STEM domains, such as engineering, physics, and computer science (NSF, 2017). As two women who have earned degrees in male-dominated STEM fields, we remain interested in why so few women tend to pursue many of the STEM fields and what can be done to change this trend.
While there are likely various contributing factors, research provides evidence that stereotypes, in particular, are connected to this underrepresentation. Scholars have investigated stereotypes of scientists, mathematicians, and engineers, as well as beliefs about STEM fields, and while many notable stereotypes have emerged, the most consistent is that these fields are a male-domain. As such, we wanted to study current college students’ beliefs about men and women, in order to better understand how certain gender stereotypes may be in potential conflict with how society views STEM careers and those who enter such careers. Rather than asking college students about their own personal stereotypes, however, we asked them to share with us what they believe to be society’s gendered stereotypes. This is what psychologists Charles Stangor and Mark Schaller refer to as “collective” or “cultural” stereotypes, and these scholars argue that culturally shared stereotypes can be most problematic, as they lead to the social positioning of individuals within society (Stangor & Schaller, 1996).

What we found in our study
Our study, which is detailed in the *International Journal of Science Education*, involved surveying 499 college students at two different universities in the midwestern United States. Our results were both refreshing in some respects and concerning in others. For example, we found that in general, college students report traits often associated with STEM fields, such as being inquisitive, analytical, and thinking logically, as stereotypically gender neutral personality traits. In other words, college students do not believe that society associates such traits as either male dominate or female dominate. This is a change from the body of research done back in the 1960’s and 1970’s which repeatedly found such traits to be seen as male dominate.
Perceptions of Gender Stereotypes

Participants were presented with the prompt: Please rate the following items on a scale from 1 to 7, with 1 representing “a stereotype society associates with the way women are” and with 7 representing “a stereotype society associates with the way men are.” The value 4 on the scale was labeled as “Gender neutral.” The table shows the mean value participants gave each category and are displayed from the smallest to the largest mean.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>Traits</th>
</tr>
</thead>
</table>
| Female Dominate | Mean < 3.00 | - Feminine  
- Cries easily when angry/upset  
- Feminist  
- Neat/organized |
| Slightly Female Dominate | 3.00 – 3.49 | - Creative  
- Multi-tasks  
- Earns good grades |
| Gender Neutral | 3.5 – 4.5 | - Expresses individuality  
- Academically motivated  
- Inquisitive  
- Concerned about future career obligations  
- Passionate about ones’ major  
- Likes working collaboratively  
- Likes to go against societal norms |
| Slightly Male Dominate | 4.51 – 5.00 | - Yells when angry/upset  
- Forceful with opinions  
- Self-confident |
| Male Dominate | > 5.00 | - Is a leader  
- Inclined to take risks  
- Competitive  
- Relates well to men  
- Athletic  
- Aggressive  
- Masculine |


Furthermore, we found that personality traits often associated with being a strong student, such as being academically motivated, earning good grades, and being willing to sacrifice personal time for their studies, were all considered either stereotypically gender neutral or even slightly female dominate by our participants. We believe this to be a positive result as it suggests that both women and men are viewed as smart and academically successful.

However, personality traits that are often seen as important for being successful professionally, such as being a leader, competitive, and inclined to take risks, were all rated as stereotypically male dominate. Moreover, all of the traits related to taking care of others, such as putting others’ needs above one’s own and showing concern for other people’s well-being, were distinctly rated as stereotypically female dominate traits. Therefore, while being a good student and strong academically are currently traits that college students claim society views as gender neutral or even slightly female dominate, college students still report that society sees men as having traits that allow them to be successful in the workforce and women as having traits that are related to care-giving.

When we analyzed our data by gender and by career goals, more interesting results emerged. For example, while the female participants in our study rated all of the traits related to taking care of others as strongly female dominate, the male participants rated them as only slightly female dominate. Furthermore, the female participants who were interested in obtaining a career in a STEM field more strongly rated “Puts others’ needs above one’s own” as being female dominate than male STEM participants and female non-STEM participants. These results seem to suggest that women in general feel a stronger societal pressure to put others’ needs above their own, more so than many men may even realize. Furthermore, women interested in STEM appear to be receiving this societal pressure even more so than women not planning on STEM careers.
Another important finding is that the personality trait of being “analytical” was rated as being more male dominate by women interested in STEM careers than by men interested in STEM careers or by women not interested in STEM careers. The personality attribute “thinks logically” was also rated as more male dominate by women interested in STEM careers than women not interested in STEM. Given that being analytical and thinking logically are often seen as important traits for many STEM professionals, we view these findings to be troubling, as they likely hint at additional messages women pursuing STEM careers may be receiving.

**Implications of this work**

When embarking on this study, we initially hypothesized that women interested in STEM careers would rate personality traits that were traditionally seen as masculine, feminine, or as related to STEM fields as more gender neutral than other groups. We anticipated this because we figured that women who were entering STEM fields, which tend to be male-dominated, may be less likely to buy into gender stereotypes. And while they, themselves, may not buy into them, we did not ask these students about their own personal beliefs. Rather we asked for their perception of society’s beliefs. As such, in some instances, we came upon the opposite finding of what we originally anticipated. We found that the women interested in STEM careers were more likely than other groups to rate society viewing certain traits as gendered.

While we do not know for sure why these women have a different perspective, we anticipate that it has to do with their experiences as women pursuing traditionally male-dominated fields. Through their experiences, it is likely that they are receiving feedback from others about their academic and professional choices, and how these choices go against historical gender norms and stereotypes. For example, it has been found that STEM careers are often viewed as demanding and incompatible with raising a family (Kim, Fann, & Misa-Escalante, 2009; Sax, 2001). Therefore, given our results that traits related to caring for others are seen as female dominate within society, women pursuing STEM careers could be receiving a message, whether intentionally or unintentionally, that their future career choice may not be compatible with society’s expectations for them as a woman. Furthermore, while our findings showed that being analytical and thinking logically are now considered to be gender neutral by our participants overall, the women pursuing STEM careers stated that society views these traits as more male dominate, as they had been historically. It is possible that these women, because of their choice of major, are frequently being presented with messages that they are not good enough or do not belong within the field.

Having a sense of belonging is critical in pursuing certain degrees or careers. For example, recent work by Good, Rattan, and Dweck (2012) found that, amongst college students, a sense of belonging to mathematics was the strongest predictor in their intention to continue pursuing mathematics in the future. Furthermore, these scholars found that amongst mathematically talented female college students, the stronger they perceived their peers to view men as better at math than women, the more likely they were to have a lower sense of belonging. This work emphasizes the importance of one’s sense of belonging when pursuing STEM careers, and how vulnerable this sense of belonging is to societal stereotypes.

So how can we, as STEM professionals, work to minimize these societal stereotypes and improve female college students’ sense of belonging in STEM disciplines? Here are a few ideas:

- **Female STEM professionals can model being intelligent, successful women who think logically and analytically, and though we may struggle with the work-life balance, we can provide our students with examples of women who have found ways to make it work.**
- **Male STEM professionals can model being active and involved in the caregiving responsibilities in their lives. By demonstrating for our students that men, for example, can run chemistry**

“Making Connections” continues on page 51
Women’s Leadership in Latin America

The Key to Growth and Sustainable Development

Women who will

Women are an emerging force for change across all areas of life in Latin America and the Caribbean. They make up over half (53 percent) of Latin America’s workforce, a rate that has climbed faster than in any other region in the world in the last thirty years. Increasing educational and employment opportunities for girls and young women, in particular, have been a major factor driving the region’s economic growth over the past two decades.

In politics and civil society, women have achieved significant, high-level positions. As of August 2016, the region has seen eleven female heads of state and ten female heads of government. The region has also made impressive strides in increasing the numbers of women in its parliamentary bodies. Bolivia, for example, ranks second in the world in the percentage of female legislators, and many governments have established legislative frameworks such as quotas to achieve gender equality. Moreover, women are an integral part of politics: Mexico has a total membership rate of women in political parties nearing 55 percent. The Americas, when the United States and Canada are included, rank second only to Nordic countries in female representation in parliamentary bodies. But the picture remains unfinished.

Despite the success stories of impactful female leadership, the extent to which such examples reflect a growing trend is unclear. Women’s modest, yet visible, progress remains hostage to the need for more mechanisms to sustain and expand female representation. While there have been major achievements in addressing the gender gap, women still face significant hurdles to inclusion and prosperity.

What’s preventing further progress? Was Latin America’s economic development in the last few decades a driver for women’s inclusion instead of vice versa? What can be done to realize women’s full potential for transforming the region?

The topic can be a lightning rod in political discussions, especially in government and business institutions where men have long dominated policy making. But analyzing gender issues is not just about comparing men and women. It is a useful tool for studying the difference in the
Figure 1. Government-Level Machioneries for the Advancement of Women in Latin America (Twenty Countries)

Latin America (20 countries): Level within governmental hierarchy of national Macheries for the Advancement of Women (by hierarchical level, percentages)

Entity accountable to a ministry (vice ministries, undersecretariats, institutes, councils, and other legal figures)

Entity attached to the office of the president or machinery whose head is directly accountable to the office of the president

Ministry or head of machinery with ministerial standing

Source: United Nations Economic Commission for Latin America and the Caribbean (ECLAC).

The inclusion of women in Latin America

Entity attached to the office of the president or machinery whose head is directly accountable to the office of the president

Entity accountable to a ministry (vice ministries, undersecretariats, institutes, councils, and other legal figures)

Ministry or head of machinery with ministerial standing

Impact of social, political, and economic policies on both men and women. Women, regardless of the social group to which they belong, are the targets of systemic discrimination. They are at a disadvantage compared to their male counterparts—and research shows that this has been a consistent factor in underdevelopment.

Closing this gap would have a significant impact. According to the McKinsey Global Institute, creating a labor market scenario with full gender parity could potentially increase global gross domestic product (GDP) by $28 trillion by 2025.

While such a figure is lofty, there is little doubt that the potential impact of gender-focused development on Latin America is enormous. By highlighting the constraints that affect half of the region’s population, a gender dynamics analysis can help devise proposals for economic growth and assist in identifying policies aimed at eliminating all forms of discrimination. This, in turn, can improve national competitiveness.

Research already demonstrates the economic multiplier effects of investing in women. The link between closing the gender gap and prosperity is now widely acknowledged by civil society organizations, the private sector, and the...
majority of states parties to international treaties that defend and protect the human rights of women.

But, to what extent has this consensus translated into real progress, and what else must be done to overcome the gap between the institutional advances and the day-to-day advances experienced by millions of women around the globe?

Conditions for women around the world have significantly improved since the landmark 1995 United Nations Fourth World Conference on Women in Beijing. At that conference, member countries agreed to a platform of action that set forth commitments to improve women’s lives. Today, the entire global community is committed to reaching the UN-established Sustainable Development Goals (SDG). International consensus exists on the importance of achieving full and effective gender equality. In particular, focusing on the advancement of girls and adolescent women is recognized as necessary to reach higher levels of societal development.

Here, we focus on two principal areas where women’s empowerment can achieve transformative change: democratic institutions and corporate offices.

**Figure 5. Share Price and Number of Women on Boards**

- No women on board
- One or more women on board

Source: Credit Suisse, Research Institute
Both policy arenas require a gender perspective that analyzes how Latin American women participate in—and are impacted by—the forces shaping the global economy. With this report, the Atlantic Council’s Adrienne Arsht Latin America Center seeks to leverage the region’s compelling case studies into a larger dialogue on how governments, corporations, and civil society can maximize recent progress to bring more women into positions of power. It focuses on women’s participation in public office, women in the c-suite, and the case studies of Mexico, Chile, and Bolivia. Concrete steps are then laid out that can be taken by governments, civil society, and the private sector to encourage the growth of female leadership across the Americas.

**Empowering women, enhancing prosperity**

Latin America and the Caribbean has one of the most ethnically, racially, and culturally diverse populations in the world. Its diversity has been a significant factor in generating economic growth and political stability over the past two decades, and it has set countries on a path to a more just, cohesive, and democratic society.

In recent decades, the region has developed social policies and programs to address traditionally vulnerable sectors of the population, including women. The majority of the countries in the region are also party to international human rights agreements that have sought to promote greater equality in public and private spaces.

Achieving gradual recognition of the role of women in social, economic, and political life involves overcoming many obstacles, but the benefits are clear. Advances in gender equality in the labor market, for example, have increased access to paid jobs and improved labor conditions. The region has shown the world’s greatest gains on women’s labor force participation, increasing by ten percentage points in the past two decades. Additionally, more girls are attending school, women are increasingly achieving tertiary levels of education—the number of women with university degrees in some countries exceeds that of men—and more women are participating at higher levels in business and government.

According to the World Economic Forum Global Gender Gap Index, three of the ten countries that have made the most progress in gender parity globally since 2006 are in Latin America: Nicaragua, Bolivia, and Ecuador. Six countries in Latin America and the Caribbean—the Bahamas, Barbados, Jamaica, Nicaragua, Uruguay, and Venezuela—have closed their gender gaps in relation to educational attainment, health, and survival, making it the only region with such positive figures.

The region still has a long way to go to attain full gender equality and its related deficits hinder social and economic development. As previously noted, according to the McKinsey Global Institute, the full participation of women in the global economy would generate a 26 percent increase in global GDP within ten years. The benefits projected by the McKinsey report would be especially notable in the developing economies of Latin America.

**Figure 6. Return on Equity and Price-To-Book Ratio, 2015**

<table>
<thead>
<tr>
<th>ROE %</th>
<th>PRICE-TO-BOOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1%</td>
<td>7.4%</td>
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<tr>
<td>1.8%</td>
<td>1.6%</td>
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Source: MSCI ESG Research, Inc.
Advances in gender equality in the labor market, for example, have increased access to paid jobs and improved labor conditions. The region has shown the world’s greatest gains on women’s labor force participation, increasing by ten percentage points in the past two decades.

So far, women’s civic and political participation in Latin America have risen partly due to international agreements and instruments ratified since World War II. The 1979 Convention on the Prevention, Punishment, and Eradication of Violence Against Women (known as “Convention of Belem do Para”) are among the measures that have expanded women’s rights and fostered gender equality.

How has this happened? In many countries, the implementation of these conventions has been associated with the promulgation of gender-focused laws and the creation of national Machineries for the Advancement of Women (MAW), the central policy coordinating unit inside governments with the task of mainstreaming gender-equality in all policy areas (see figure 1).

These new institutions and laws have helped women move up the government ladder, and have driven gender-conscious legislative reforms and policies in many countries. The creation of these institutions was the specific response of countries to the recommendations made by the United Nations following the 1985 Third Conference on Women held in Nairobi, which called for the creation of governmental machinery responsible for monitoring and improving the status of women. According to an analysis by the UN’s Economic Commission for Latin America and the Caribbean (CEPAL), “the feminist movement

Figure 7. Women on Boards per Country

Source: Credit Suisse, Research Institute and Deloitte
Indeed, the new political, institutional, and cultural spaces created by these measures represented transformative changes in the cultural practices and attitudes of states across the region.

Failures in political will, along with the inability of many national governments to convert their commitment into an agenda that transcended party politics have sometimes hampered progress. Nevertheless, the MAWs have become the most important regional institutions for promoting gender equality and respect for the human rights of women. Examples of MAWs include autonomous ministries (in the case of Chile), as well as agencies accountable to the office of the president or other agencies, such as institutes, secretariats, undersecretariats, and other legal bodies. In fact, 60 percent of Latin American heads of MAWs have cabinet-level status.

Today, the increase in female representation in national legislatures and political party leadership positions, the achievement of greater parity in presidential cabinets, and the trend of representatives of male power offering alliances to female counterparts (a trend that may in part reflect efforts to appear "politically correct") are often seen as direct consequences of the implementation and activities of MAWs.

Women in business getting to the C-Suite
Closing the gender gap is human rights imperative. It is also a key to greater prosperity. Even if countries simply matched the best equal-rights performers in their respective regions,
Failures in political will, along with the inability of many national governments to convert their commitment into an agenda that transcended party politics have sometimes hampered progress.

Global GDP would rise over the next decade by an estimated $12 trillion. Considering the levels of poverty in Latin America and the Caribbean, such estimates are hard to ignore.

Greater equality also makes a difference to the bottom line. A 2016 report by the Peterson Institute for International Economics, which included information for 21,980 publicly traded companies in ninety-one countries, found that an increase in the share of women from zero to 30 percent was associated with a 15 percent rise in profitability. As figures 5 and 6 demonstrate, the most profitable businesses have more women on their executive boards and in upper management.

In fact, companies with strong female leadership yield higher returns and have higher valuations [see figure 6]. These are results based on analyses of over 1,600 companies from developed countries. Similarly, an analysis shows there is a close relationship between the lack of gender diversity and the incidence of corruption, fraud, bribery, and shareholder disputes.

Still, the message has not always gotten through. The Peterson Institute report found that almost 60 percent of the companies surveyed had no female board members. It also showed that over 50 percent of these companies had no women executives and only 5 percent had women in the C-suite.

In Latin America and the Caribbean, there is also a long way to go. According to a study prepared by McKinsey in 2013, women occupied only five percent of the high-level positions in the largest companies. In 2016, that number had reached only seven percent for women on boards. The “Analysis of Diversity in the Boards of Latin America” showed that only 47 percent of the participating companies in Latin America had at least one woman on their board.

Figure 7 shows the percentage of women on boards in five countries in the region. The best performer in the sample is Colombia with 11 percent.

As can be seen in figure 8, the representation of women in this sample of Brazilian companies, declines as their position within the corporate structure rises. This suggests there are barriers for women’s ascension in the private sector.

Figures in Latin America are in stark contrast with developed countries in Europe, where 89 percent of the firms surveyed by McKinsey have at least one female board member, or in the United States and Canada, both of which achieve a figure of 80 percent.

Jefferson Science Fellowship

The National Academies of Sciences, Engineering, and Medicine is pleased to announce a call for applications for the 2019 Jefferson Science Fellows (JSF) program. Initiated by the Secretary of State in 2003, this fellowship program engages the American academic science, technology, engineering and medical communities in the design and implementation of U.S. foreign policy.

Jefferson Science Fellows spend one year at the U.S. Department of State or the U.S. Agency for International Development (USAID) for an on-site assignment in Washington, D.C. that may also involve extended stays at U.S. foreign embassies and/or missions.

The fellowship is open to tenured, or similarly ranked, academic scientists, engineers, and physicians from U.S. institutions of higher learning. Applicants must hold U.S. citizenship and will be required to obtain a security clearance.

The deadline for applications for the 2019-2020 program year is October 31, 2018. To learn more about the Jefferson Science Fellows program and to apply, visit www.nas.edu/jsf

The Jefferson Science Fellows program is administered by the National Academies of Sciences, Engineering, and Medicine and supported by the U.S. Department of State and the United States Agency for International Development.

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“A beautifully produced book which gives an excellent overview of just what makes us tick”
Affirmative action policies or quota laws have been used in many European countries to accelerate women’s entry into the “C Suite” just as they have in legislative chambers. During 2011, France, the Netherlands, Italy, and Belgium all enacted laws requiring a minimum quota for women in the decision-making spaces of businesses. In 2012, the European Parliament added to the momentum with a so-called “Women on Boards” strategy that encouraged legislation aimed at closing the gender gap in business and the public sector.

**Figure 9. LAC Compared to the World**

**FEMALE REPRESENTATION ON EXECUTIVE COMMITTEES**

- **Latin America**: 8%
- **Norway**: 15%
- **US**: 14%
- **China**: 9%
- **France**: 8%
- **Germany**: 3%
- **India**: 3%

**FEMALE REPRESENTATION ON BOARDS**

- **Latin America**: 5%
- **Norway**: 35%
- **US**: 15%
- **China**: 8%
- **France**: 8%
- **Germany**: 16%
- **India**: 6%

Source: McKinsey and Company
More recently, on November 27, 2013, the ruling coalition in the German parliament reached an agreement requiring a minimum of 30 percent female participation on the supervisory boards of companies publicly traded on the stock exchange. In March 2015, the German parliament also approved the Law on Equal Participation of Women and Men in Leadership Positions in the Private and Public Sector, which seeks to achieve a better gender balance on the supervisory boards of Germany’s largest companies.

Such comparisons, of course, should take into account the fact that Latin America and the Caribbean have lower levels of gender equality than developed regions; nevertheless, these comparisons have the advantage of setting the bar high, pushing Latin America to work harder toward these goals. If compared to Asia, however, averages of female representation on executive committees and on boards are far more similar (see figure 9).

Increasing women’s participation on boards is now an important aspect of corporate governance practices. Companies are increasingly viewing diversity as a strategic advantage, especially given the potential rise in profitability. The conclusion seems clear: As women’s participation increases, transparency and return on investment improves.

Excerpts from the Women’s Leadership in Latin America: The Key to Growth and Sustainable Development report was reprinted with permission from the Atlantic Council. For more information visit www.atlanticcouncil.org.
When Life Gave Me Lemons, I Made Antarctic Lemonade

By Alicia Pérez-Porro, PhD
Research Associate, Smithsonian Institution,
National Museum of Natural History
AWIS Member Since 2015

Two of the most important events of my life happened one week apart. I defended my PhD in September 2014. One week later, I got married. I was starting a whole new life, but while my personal life was blooming, my professional life felt like a road to nowhere. My passion for science, research and the ocean had slowly drained during my grad school years.

I battled through sexual harassment, bullying, discrimination, depression and anxiety. I suffered it all and was exhausted. I felt like a failure. I was not myself so decided to do something bold. I took a break from research.

The first thing that I did was to join AWIS and ECUSA (the Association for Spanish Scientists...
in the USA), and I got a job as a lab technician at the National Museum of Natural History (NMNH, Smithsonian Institution). I started attending ‘women in STEM’ events, science communications panels, science diplomacy conferences, and soon founded and chaired the Commission for Women in STEM (MECUUSA) at ECUSA. Thanks to my advisor and peers at NMNH, I recovered my passion for science and the ocean, but I also faced some challenges for being a woman in STEM. I was still feeling that I failed professionally and missing something. Then one day while on unpaid maternity leave, I found out about Homeward Bound.

**Taking a chance**

Homeward Bound is a global initiative that looks to fight climate change by challenging the leadership status quo and promoting gender equality. The innovative and ambitious idea
is to help 1,000 women over the course of 10 years to get to leadership positions to influence (or become) climate change policy makers. Each year, 100 women are selected from all over the world to participate in a year-long leadership and empowerment program for women in STEM that culminates in an all-female expedition to Antarctica. Homeward Bound is based on studies that demonstrate that women’s leadership in political decision-making processes improves them, and diversity in work teams encourages creativity in finding solutions to challenges.

The project immediately caught my attention so I decided to apply, despite having only 10 hours to submit my application. My self-esteem was yelling, ‘why bother? you’re not going to be selected.’

A little voice was also whispering, ‘this is perfect for you and you are perfect for it, you should try!’ Perhaps I was going nuts due to sleep deprivation—my daughter was only 3 months old—but I decided to ignore my impostor syndrome and go for it. I dictated my whole application to my husband while breastfeeding, and one month later I was notified that I got in! I’m not ashamed to say that I cried when I found out (and my husband did too).

I was in Antarctica from mid-February to mid-March of 2018 with 75 women, from all over the globe, with different STEM backgrounds and career paths, and different ages. It was a once-in-a-lifetime experience that helped me change my perspective about my career and about myself.

During our Antarctic journey we received communication, visibility, and leadership training. We had multiple conversations about gender equality in STEM, the problems and barriers women face, and how to overcome them. We shared personal experiences—most of them were surprisingly similar, despite coming from different countries. And what was most shocking to me is that we all, at some point in our careers, felt that we didn’t fit and were not supposed to be in academia.

One day, surrounded by icebergs, whales and seals, it hit me.

We don’t need to fit in, the system needs to change. This academia was not created with women in mind – so, of course, we don’t feel welcomed. I experienced an ‘it’s not me, it’s you’ aha moment that made me realize I didn’t fail. I learned to be stronger and better.

Getting out of my comfort zone
Believing that I was not good enough for research forced me out of my comfort zone and into exploring other aspects of science. By feeling like a failure, I became interested in science communications, science diplomacy, science policy, and advocacy. I learned how to be comfortable being uncomfortable. I learned how to silence my inner voices that said, ‘I don’t have what it takes to be a scientist.’ All of my bad experiences through my career until that point had broken me, but I took all the pieces and reconstructed myself in a 2.0 version. I believe it was my break from research that made me a better researcher, collaborator, and a stronger leader.

While sailing in the Southern Ocean, I understood that it was my time to go back to research, to be the role model that I didn’t have, and to contribute to build a more diverse, inclusive and kind academic ecosystem. Today, I give seminars, talks and workshops to women and men at universities, research centers and associations about my story and what it means to be a woman in science, overcome the obstacles, and become an ally.

I made lemonade in Antarctica with some of the smartest, talented, badass women in STEM. Together we toasted to re-imagining academia taking into consideration women and other minorities and pursuing gender equity as a solution for climate change. Cheers!

Alicia Pérez-Porro, PhD is a research associate at the Smithsonian Institution, National Museum of Natural History where she uses genomic tools to answer ecological questions about marine sponges. She is also the founder and chair of the Commission for Women in STEM at the Association for Spanish Scientists in the USA (ECUSA). She recently participated in Homeward Bound, the largest all-female expedition to Antarctica and is a current 92Y Women inPower fellow. Dr. Pérez-Porro was recently awarded the Gold Medal from the Red Cross of Spain for her efforts fighting climate change and gender inequality in STEM. The medal is presented by the Queen of Spain and is awarded to only a handful of people annually. www.aliciaperezporro.com | twitter: @aliciaprzporro

References


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Searching for Understanding and Meaning in Medicine and Life

By Kelly K. Hunt, MD
Hamill Foundation Distinguished Professor of Surgery in Honor of Dr. Richard G. Martin, Sr.
Chair, Department of Breast Surgical Oncology, The University of Texas MD Anderson Cancer Center

Like many other women in medicine, I wasn’t always welcomed with open arms. As one of the few women physical chemistry majors at Memphis State University, I faced my share of ups and downs.

I did extremely well with testing and homework, but the main professor who taught physical chemistry was not very accepting. In class he purposely asked the men questions and ignored me most of the time. When I went to his office to ask questions he was often very dismissive.

One day, I asked him how to do a graph he’d assigned. He responded by asking me, “What does it matter anyway? You’re just going to have children and get married, so you should just focus on that.” I was so taken aback. As I student, I was in no way lackadaisical – I was driven to succeed. I remember standing there with tears in my eyes, trying to keep it together. I decided that day not to accept that perspective. This professor simply did not understand me and my career goals. Even if I did want to have children and get married, I failed to see how that should influence my work in the classroom.

I decided I had to push through—not just for me, but for anyone else who might experience those types of preconceptions. Although this interaction hurt at the time, it ultimately served to shape my outlook and career in positive ways.

Fortunately, while learning about surgical oncology as a medical student at the University of Tennessee, I found someone who became invested in me. My mentor was a very compassionate and knowledgeable person who possessed an excellent bedside manner. He was involved with the full spectrum of oncology. Besides being an excellent technical surgeon, he truly enjoyed being in the operating room. I remember thinking that if I could achieve the type of career that he had — enjoying being in the operating room and enjoying being with the patient — then I would be fulfilled. His support buoyed my confidence and better prepared me for the challenges I would encounter as I moved into my residency and beyond.

As a general surgery resident, men in my peer group often didn’t notice the disparaging treatment I received. When an attending physician would address our group, it was as if I was invisible. Another woman in my class — who is now a liver transplant surgeon — and I supported each other. We knew we had to be so much better than the men in order to be considered simply acceptable as peers. And we were. Our first year, she was named intern of the year. And the following year, I received the award for resident of the year. We both recognized there were people who didn’t necessarily want us to succeed or weren’t invested in our training. When you’re a trainee, it’s essential that your educators and mentors be invested in you. This investment stems from understanding. My own quest for such understanding has shaped my career and life in many ways.

The importance of understanding
In my work as a breast surgical oncologist, I want to learn as I can about each one of my patients. My knowledge about her and her family, as well as her environment and how the disease is impacting her quality of life, is vital to helping her navigate the challenges of cancer. There’s so much information out there about this disease, and I try to direct each patient toward what is most relevant and beneficial to her.
The search for understanding also has profoundly influenced my mentorship style, both in my professional and personal capacities.

My patients look to me to help them understand what’s happening. One of my strengths is the ability to break down a very complex problem in a way that patients and their families can process. You have to navigate treatment, but you also have to navigate a person’s personal history and their emotions connected to cancer, a disease that has touched nearly everyone’s life, either directly or indirectly. Since everyone is unique, this search for understanding begins anew with each patient.

My goal is to have a patient tell me that she feels so much better after talking to me.

The need to find purpose
The search for understanding also has profoundly influenced my mentorship style, both in my professional and personal capacities. I enjoy helping people recognize their talents and find a career path supported by those strengths. I firmly believe people are more effective if they enjoy what they do. To enjoy their work, it’s essential that they find meaning and purpose in it.

And this belief extends to my family, as well. For example, because both my husband and I are surgeons, people assume we want our children to pursue careers in medicine. However, we would only want them to do that if it’s where their interests and passions lead them.

We need to know why we do what we do
I perform surgery. I conduct research. But why do I do it? I realized that it was my purpose in life to guide others and prepare them to serve. These efforts apply to my own children, as well as the fellows and junior faculty in MD Anderson Cancer Center’s Department of Breast Surgical Oncology, which I chair. We need to have a succession plan. By that I mean we need people to succeed us. That’s something I always think about: In the future, who’s going to be prepared to continue the work I’m doing?

As a woman in the medical field, it is especially important to prepare others like me to build on my accomplishments. We all have individual talents and perspectives that are vital to the growth of STEM professions. In the medical field, these talents and perspectives, combined with collaboration, shape the many aspects of patient care — everything from patient experience to the research conducted. We have to encourage those with the interest, desire and skills to pursue these types of careers, not only for their own benefit, but to further advance these fields in general.

Collaboration in all phases
At MD Anderson, the Breast Center includes specialists from several different departments, including Breast Medical Oncology, Breast Pathology, Breast Radiation Oncology, Diagnostic Radiology, Genetics, Cancer Prevention and Screening, and Plastic and Reconstructive Surgery. We employ a unique, collaborative approach to the creating a personalized treatment plan for each patient.

Rather than seeing a medical oncologist one day, a radiation oncologist the next day, and a surgeon the day after that, our

“Searching for understanding and meaning” continues on page 52

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The First Latina Senator Champions Women in STEM

By Senator Catherine Cortez Masto (D-Nev.)

AWIS: Why do you support giving the Congressional Gold Medal to four African American women mathematicians that worked at NASA during the Space Race?
CCM: Katherine Johnson, Dorothy Vaughan, Mary Jackson and Dr. Christine Darden are four incredible women who helped pave the way towards gender and racial equality in the workplace and set an example for NASA – and the whole country. Honoring women and minority trailblazers is very important to me – it is also deeply personal as the first Latina Senator. I know that it is our country's diversity that makes our businesses smarter and our communities stronger.

Dorothy Vaughan taught herself and her staff, who were predominately African American women, a brand-new programming language in the 1960s to ensure that NASA would be prepared for the introduction of machine computers. Mrs. Vaughan used her seat at the table to uplift the careers and aspirations of others, even when her own job was fraught with discrimination and uncertainty. Dorothy Vaughan and her colleagues at NASA were undeterred by the segregation and sexism they faced and showed up every day to a demanding job where their talents weren’t always properly appreciated. And in doing so, they changed the hearts and minds of their colleagues at NASA and challenged the stereotypes of a nation. These four women are a reminder to me to use my seat at the table to help remove the barriers that keep young women and minorities from entering politics, tech fields and leadership positions, and to ensure they are achieving their fullest potential.

But it’s not just about being the first, it’s about setting an example of what we can all achieve. My message to young men and women is that if I can do it, they can do it too. From a young age, my grandparents instilled in me the importance of fighting for what is right. If you have a passion and believe in something, you should use that to motivate them to make a change and get involved. Today, as we see too many of our nation’s leaders stay silent as the worth, intelligence and dignity of immigrants, women and minorities are questioned, young people of all backgrounds need to realize their voices matter and that they too can make a difference.

AWIS: What role should men play as allies to help correct equity issues that impeded women from achieving their full potential?
CCM: Our commitment to diversity as a nation is critical in business, government and education and should be a bipartisan priority. Can you imagine what we could do if we came together to provide more women the resources they need to get a higher education, start businesses and get the workforce training programs they need? Whether it’s through mentorships, peer-to-peer relationships, or advocating for legislation and policy, men can be allies to help bring women together to ensure we all have the tools and skills needed to succeed in achieving our full potential.

AWIS: What career hardships do you believe you have encountered or seen because of your gender?
CCM: When my grandfather came to America from Chihuahua, Mexico, he likely could have never dreamed that his granddaughter would be serving in the United States Senate. Yet it is because of my grandparents’ and parents’ hard work and perseverance that my sister and I were able to be the first in the family to go to college. Because of their sacrifices, I am where I am today as the first woman from Nevada and the first Latina in American history ever elected to the United States Senate. But it’s not just about being the first, it’s about setting an example of what we can all achieve. My message to young men and women is that if I can do it, they can do it too. From a young age, my grandparents instilled in me the importance of fighting for what is right. If you have a passion and believe in something, you should use that to motivate them to make a change and get involved. Today, as we see too many of our nation’s leaders stay silent as the worth, intelligence and dignity of immigrants, women and minorities are questioned, young people of all backgrounds need to realize their voices matter and that they too can make a difference.

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CCM: When my grandfather came to America from Chihuahua, Mexico, he likely could have never dreamed that his granddaughter would be serving in the United States Senate. Yet it is because of my grandparents’ and parents’ hard work and perseverance that my sister and I were able to be the first in the family to go to college. Because of their sacrifices, I am where I am today as the first woman from Nevada and the first Latina in American history ever elected to the United States Senate.

But it’s not just about being the first, it’s about setting an example of what we can all achieve. My message to young men and women is that if I can do it, they can do it too. From a young age, my grandparents instilled in me the importance of fighting for what is right. If you have a passion and believe in something, you should use that to motivate them to make a change and get involved. Today, as we see too many of our nation’s leaders stay silent as the worth, intelligence and dignity of immigrants, women and minorities are questioned, young people of all backgrounds need to realize their voices matter and that they too can make a difference.

AWIS: What role should men play as allies to help correct equity issues that impeded women from achieving their full potential?
CCM: Our commitment to diversity as a nation is critical in business, government and education and should be a bipartisan priority. Can you imagine what we could do if we came together to provide more women the resources they need to get a higher education, start businesses and get the workforce training programs they need? Whether it’s through mentorships, peer-to-peer relationships, or advocating for legislation and policy, men can be allies to help bring women together to ensure we all have the tools and skills needed to succeed in achieving our full potential.

AWIS: What career hardships do you believe you have encountered or seen because of your gender?
CCM: When my grandfather came to America from Chihuahua, Mexico, he likely could have never dreamed that his granddaughter would be serving in the United States Senate. Yet it is because of my grandparents’ and parents’ hard work and perseverance that my sister and I were able to be the first in the family to go to college. Because of their sacrifices, I am where I am today as the first woman from Nevada and the first Latina in American history ever elected to the United States Senate.
AWIS: Why does this moment in history hold such great promise for gender equity, specifically, for gender equity in STEM fields?  
CCM: As the Senator for a state with a booming tech and science industry, I have seen firsthand the opportunities that STEM fields can provide for students and workers. In the past few years, a lot of progress has been made in ensuring that we are fostering the talents of young girls in science and technology and reminding them that there is no limit to their potential.

I co-sponsored the Code Like a Girl Act, which will create grant programs to encourage young girls to pursue computer science. More and more women and girls are realizing that they can succeed in these male-dominated industries. There are more women undergraduates on college campuses across the country, there are a record number of women running for political office and more women small businesses owners than ever before. This is the start of a future where we are no longer celebrating “firsts;” but instead, celebrating that faces in Congress, in research laboratories, and in boardrooms are finally becoming as diverse as America itself.

Born and raised in Las Vegas, Catherine Cortez Masto has spent her career fighting for Nevada’s working families. She served two terms as Attorney General of Nevada and, in November 2016, became the first Latina and the first woman from Nevada ever elected to the United States Senate.

Senator Cortez Masto remains a strong advocate for women and children and sits on the Committee on Commerce, Science, and Transportation. She co-sponsored the Code Like a Girl Act, which would create two National Science Foundation (NSF) grant programs to encourage young girls to pursue computer science, among other legislation that upholds gender equity in STEM.

Senator Cortez Masto earned a Bachelor of Science in Business Administration in Finance from the University of Nevada, Reno in 1986, and a J.D. from Gonzaga University School of Law in 1990. She currently resides in Las Vegas with her husband Paul.
The struggle for the inclusion of women in science extends beyond ensuring women’s ability to have successful careers in STEM. It extends beyond ensuring women’s inclusion as subjects in clinical trials to validate that medical treatments work for us, too. It extends all the way to the inclusion of female animal models and even female cells in basic scientific research.

Much of the progress we’ve made on these fronts has occurred in the past few decades. It wasn’t until 1991 that the first woman was appointed as director of the National Institutes of Health (NIH). It wasn’t until 1993 that the NIH Revitalization Act mandated the inclusion of women and minorities in NIH-funded clinical trials. And it was only two years ago that NIH implemented a policy stating that sex as a biological variable should be factored into research and reporting in vertebrate animal and human studies.

As sex differences research spreads and burgeons across many disease areas, it becomes increasingly clear that differences between women and men most likely play a role in the etiology, diagnosis, management, and care of all diseases that affect both sexes.

Take Alzheimer’s disease for example. We are just beginning to see the tangible effects that differences between women and men have on the disease. In recognition of the need to further elucidate these differences, the Society for Women’s Health Research (SWHR) formed a network of expert Alzheimer’s researchers and clinicians to explore, understand, and leverage the scientific basis of the roles that sex and gender play in Alzheimer’s to inform prevention and treatment and provide guidance for research, clinical trials, and policy.

Most recently, the network members and I published a review article in the journal *Alzheimer’s & Dementia: The Journal of the Alzheimer’s Association* that summarizes what we know — and what we don’t know — about sex and gender differences in Alzheimer’s and makes recommendations for future research priorities in the field (Nebel, Aggarwal et al. 2018). These recommendations include more research on:

- Risk factors that affect only one sex, like menopause and pregnancy disorders
- Sex differences in risk factors that affect both women and men, like cardiovascular disease, diabetes, sleep disorders, depression, and genetics
- Sex and gender differences in racial and ethnic groups
- Gender differences in caregiving and how the burden of caregiving increases Alzheimer’s risk
- Differences between women and men in the detection, diagnosis, progression, management, and treatment of Alzheimer’s
- Differences between women and men in response to current Alzheimer’s therapeutics and those in development

Researching sex differences in Alzheimer’s and then applying what we learn to clinical practice helps not only women but men as well.

Women and men can have different risk factors because of differences in their biology or gender roles in society. Understanding which factors increase Alzheimer’s risk for women and increase risk for men, and then taking steps to modify those risk factors, is critical for prevention and early intervention strategies.
Consider Alzheimer’s risk factors. Women and men can have different risk factors because of differences in their biology or gender roles in society. Understanding which factors increase Alzheimer’s risk for women and increase risk for men, and then taking steps to modify those risk factors, is critical for prevention and early intervention strategies.

For example, some risk factors only affect women. It is well known that early surgical removal of a woman’s ovaries (before natural menopause) is associated with increased dementia risk, but using estrogen therapy after surgery until age 50, the average age of natural menopause, helps mitigate that risk. In addition, a few recent studies have implicated pregnancy in Alzheimer’s. Some studies suggested being pregnant or having a certain number of children decreases risk for Alzheimer’s (Fox 2018, Gilsanz, Corrada et al. 2018), while another study showed the opposite (Jang, Bae et al. 2018). More research is needed to better understand this association and possible underlying mechanisms as to how pregnancy is influencing a woman’s Alzheimer’s risk.

Other risk factors like depression and sleep apnea affect both women and men. However, depression is more common in women and sleep apnea is more common in men. Low education is also an Alzheimer’s risk factor for both sexes, but until relatively recently, women had fewer educational opportunities than men in the United States, putting them at increased risk. Recognizing these sex differences can help form a more personalized approach to mitigating some of the disease risk.

How we diagnose Alzheimer’s represents another opportunity to apply what we know about sex differences into clinical practice. Alzheimer’s is usually diagnosed with verbal memory tests, like remembering lists of words. Women have a lifelong advantage in verbal memory compared to men, and they are even able to sustain their verbal memory into mild stages of disease. However, this can mask the underlying disease and women may not get diagnosed until they are in a much more advanced stage of Alzheimer’s, thereby limiting opportunities for interventions and treatments.

Currently, age and education are adjusted for when using verbal memory tests to diagnose Alzheimer’s, but, despite...
Top 10 Most Popular Science Websites

According to The Trendrr, here are the top 10 Science websites dedicated to providing information of science related to any given Science subject. Be it Astronomy, Nuclear Science, Zoology, Botany, Anatomy, Mathematics, Statistics, Algebra, Bio Metrics, Physics, Chemistry, Computer/Binary science, and Artificial Intelligence, etc.

1. **How stuff works: www.howstuffworks.com**
   This Science website covers a wide range of topics for example Animals, Health, Culture, Information Technology, Artificial Intelligence, Life style, Science in general, Adventure, and different category quizzes. Its regular visitor traffic is around 19,500,000.

2. **NASA: www.nasa.gov**
   NASA needs no introduction as we all know. It is the second most popular and wonderful website that provides awesome and interesting information especially about space science. Its estimated visitor traffic is 12,000,000. It covers Aeronautics, Space science, Journey to Mars, International space stations, Education, History, Earth, and other technical and useful topics to be discussed about.

3. **Discovery Communications: www.discoverycommunications.com**
   Discovery communication and its channel need no introduction. The regular visitor traffic of Discovery Communication is 6,500,000. Discovery Communication covers the interesting and adventurous reports and its videos plus full episodes of the topic we missed or want to see again. In that way it provides us a kind of ‘Live transmission’ feel. This website is simply wonderful and loved among its visitors.

4. **Live Science: www.livescience.com**
   Live Science is also one of the most visited science websites. Its estimated regular traffic of regular visitors is 5,250,000. Live Science is an interesting, useful and wonderful science website because it constantly improves and serves its visitors the required and timely information of any topic. Lives Science covers a wide variety of interesting topics such as Health, Culture, Animals, Planet Earth, Solar System, Nuclear Science, Strange News, Information Technology, History, and Space.
5. **Science Daily: www.sciencedaily.com**  
This website estimated user base and visitors are 5,000,000. Science Daily covers about the topic and useful information related to Health, Environment, Society, Technical, and other news.

6. **Science Direct: www.sciencedirect.com**  
Science Direct directly tells you to search and explore information related to Medical Research, Technical, and Scientific. It openly lets you open access content of books, chapters, and Journals. Its estimated visitors and user base in numbers is 3,900,000.

7. **Space: www.space.com**  
This website’s regular visitors are 3,500,000. It covers a wide range of topics for example Science & Astronomy, Space flight, Search for life, sky watching and other useful news from across the globe. Science Direct website is its closest competitor.

8. **Scientific American: www.scientificamerican.com**  
The estimated regular visitor of this science website is 3,300,000. Scientific American is ranked at the number 8 among other science websites on the basis of its popularity, content, and visitors.

9. **Nature.com: www.nature.com**  
This website is interesting and provides the useful information about physical sciences, health sciences, earth and environmental sciences, biological sciences, and other wonderfull unknown facts. Its estimated visitors are 3,100,000.

10. **Popular Science: www.popularscience.com**  
This Science website is one among other interesting and wonderful websites in this category. Its estimated regular visitors are 2,800,000. It lets you get to know the interesting and unknown before facts.

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**Martina Koeva, PhD**  
Senior Research Scientist  
EnBiotix, Inc.  
AWIS Professional Member since 2015

**AWIS: Tell us about where you work and your professional career in biology/bioinformatics research.**  
MK: I have been a Senior Research Scientist at EnBiotix, Inc (Cambridge MA), a product focused anti-infectives company for approximately three-and-a-half years. My work at EnBiotix primarily focused on early discovery and pre-clinical development, where I made critical contributions to the advancement of EnBiotix’s Anti-Persisters and Systems Biology platforms, successfully combining computational and experimental efforts. Previously, I was a joint postdoctoral associate in the laboratories of Dr. Susan Lindquist at the Whitehead Institute for Biomedical Research and Dr. Ernest Fraenkel at MIT for approximately five years in a highly collaborative and translationally-oriented environment working on discovery stage research, again combining computational and experimental efforts. Before coming to Boston for my postdoctoral appointment, I was a California Institute for Regenerative Medicine Scholar at the University of California, Santa Cruz, where I received my PhD in Bioinformatics. My undergraduate degree is in Mathematical and Computational Science with a focus on Biology from Stanford University.

**AWIS: What do you consider your most important career achievements, milestones and accomplishments?**  
MK: At EnBiotix, one important achievement has included the award and completion of the highly competitive (3% success rate) Gates Foundation Grand Challenge Explorations Phase I grant focused on the generation and visualization of novel network models highlighting host-microbe interactions relevant to environmental enteric dysfunction in children. Additionally, last year I was a lead author on an Antimicrobial Agents and Chemotherapy publication demonstrating the efficacy of EnBiotix’s lead combination, EBX-001 against *P. aeruginosa* using an anti-persister strategy for the treatment of chronic *P. aeruginosa* infections.

My postdoctoral accomplishments have included the acquisition of molecular and cellular biology skills to complement my computational expertise. This accomplishment manifested itself in the successful development, execution of a global phenotypic screen for novel modulators of Heat-Shock Factor 1 (HSF1), and the discovery of hidden network nodes using computational network methods linking genetic modulators of the heat-shock response. I was also an effective collaborator contributing computational biology expertise on several projects leading to six publications.

Of course, I also consider the completion of my PhD as an important milestone, along with the award of a California Institute for Regenerative Medicine fellowship, which allowed me to focus for the latter part of my PhD on the development of methods for integration of stem cell gene expression data.

“I’ve encouraged young women to go into STEM careers, but also during networking and mentoring opportunities have provided feedback and encouragement to women already in STEM careers to seize opportunities they were interested in and to pursue their goals and dreams.”

“Stereoisomer Showdown: Martina Koeva” continues on page 52 >
Revati Wani, PhD  
Senior Scientist  
Pfizer, Bioprocess R&D

AWIS Professional Member since 2015

AWIS: Tell us about where you work and your professional career in biology/bioinformatics research.
RW: I began my career in cancer research as a graduate student at Wake Forest School of Medicine trying to understand how and if direct protein cysteine oxidation can impact function(s) of a major signaling hub Akt, that is often found hyper activated in a wide range of solid and circulating tumors. This question was a small part of a much larger question that attempted to illuminate oxidation as a new regulatory process for signaling networks. Despite being as prevalent as phosphorylation in cells, oxidation of signaling proteins is largely unknown to the cancer research community.

This mechanism offers a different lever to disrupt the cancer network but I didn’t fully realize its potential until I transitioned to the oncology drug discovery group at Pfizer. Not only do redox modifications impact structure & function of cancer biomarkers in the cells directly but they also influence pharmacology of the anti-cancer drugs directed against them. Experiencing the direct application of my “basic” research in the cancer drug discovery environment of biopharma has been the most exhilarating experience of my journey in cancer research.

AWIS: What do you consider your most important career achievements, milestones and accomplishments?
RW: Achievements have meant different things at different stages in my career. As a graduate student, having discovered the only known regulatory mechanism separating the three isoforms of a major cancer biomarker despite 40,000 prior research articles on Akt kinase felt like a profound accomplishment. Surprisingly it continues to remain the only such mechanism of isoform selectivity.

When I transitioned to the biopharma world of discovery, accomplishment meant impacting pipeline through clinically-relevant research. I was able to discover a mechanism of drug resistance in breast cancer cells through targeted metabolomics that allowed me to propose a rational drug combination to overcome the resistance. I experienced the power

References
1. Left panel: Fig 8 from thesis titled ‘Molecular and Functional Regulation of Akt2 by oxidation’ by Revati Wani submitted in 2011

“Stereoisomer Showdown: Revati Wani” continues on page 53 >
Ready to Achieve STEM Equity in Georgia

Atlanta and many other cities in Georgia boast some of the nation’s leading medical and scientific institutions, biotechnology companies, research centers, colleges and universities. Recognizing the need for a local resource supporting these individuals, the AWIS Georgia Chapter was established to provide networking opportunities, community engagement, leadership training and data-driven solutions for advancing equality of women in all STEM disciplines.

AWIS Georgia operates under a tripartite mission that specifically includes:
1. outreach: to recruit future generations of women into the STEM fields, as well as educate everyone regarding the biases that exist for these women in their places of work;
2. professional development: to build leadership skills, interdisciplinary collaborations, and career advancement strategies; and
3. support services: which, for example, assist women who aim to re-enter the workforce after an extended leave of absence (e.g. due to maternity, illness and other reasons).

“In order to create systemic change and achieve STEM equity, we strive to provide multiple engagement opportunities for our new and existing members,” said Kathryn Oliver, PhD, AWIS Georgia Chapter President.

This vision aligns with that of AWIS National, particularly “to promote equal opportunity for women to enter the scientific professions and achieve their career goals,” as well as “to raise the status of women in science, and women generally.”

Oliver stated, “We are simply an extension of the National office, serving as a liaison in our local region. Our goal is to provide the resources required to engender and support a community of invested, passionate individuals who become advocates for equality of all women in STEM throughout Georgia and beyond.”

Kathryn Oliver completed her BS (2009; Zoology) and M.S. (2011; Microbiology & Molecular Genetics) at Auburn University, followed by PhD (2016; Genetics, Genomics, & Bioinformatics) from the University of Alabama at Birmingham (UAB). Dr. Oliver joined the Emory University Center for Cystic Fibrosis and Airways Disease Research (CF-AIR) in 2017 to study the impact of ribosome velocity with regard to protein folding, maturation, and activity. She was awarded fellowships from the Cystic Fibrosis Foundation and Burroughs Wellcome Fund for this work and, in collaboration with investigators from Georgia Tech, also contributes to studies concerning nanoparticle-based gene delivery to airway basal (progenitor) cells. Most recently, Dr. Oliver received the Junior Investigator Best Abstract in Basic Science award at the 31st Annual North American CF Conference, which was competitively awarded from 150 international submissions.

Helen Siaw, B.S. Graduate Research Assistant, Department of Chemistry, Emory University, Social Media Chair, AWIS Georgia Chapter
**Top leadership commitment from partners**
The Georgia Chapter is actively working to grow the number of its stakeholders through formal partnership with AWIS. To do so, AWIS Georgia offers several different combinations of incentives depending on the level of enrollment:
1. recognition by the organization’s logo placed on all official communications and media outlets;
2. opportunity to post advertisements and job openings on the chapter’s website and social media platforms; as well as disseminate these announcements through email listervs;
3. invitation to speak and/or set up booth(s) at AWIS Georgia events;
4. involvement in the selection of scholarship recipients as well as presentation of award certificates; and
5. complimentary AWIS National and AWIS Georgia Chapter membership for up to 5 company employees.

“Organizations that partner with AWIS should understand that they are formally committing to STEM equity,” said Dr. Oliver. “This requires top leadership at each institution to evaluate whether they are providing women with equal pay, promotion opportunities, parental leave, and all other applicable gender disparities. If not, new policies should be executed immediately to rectify any disproportion between men and women, as recently illustrated by Salesforce’s CEO, Marc Benioff, who spent $3 million to close their pay gap. With multiple allies taking action to achieve equality for women, in addition to AWIS’s efforts at local, regional, and national levels, the cumulative effect will be systemic change across all employment sectors.”

AWIS Georgia is comprised of 30 chapter affiliates and more than 100 collegiate representatives through an institutional partnership with Emory University. Current membership encompasses several STEM disciplines including biological sciences (biology, biochemistry, chemistry, neuroscience, genetics, microbiology, toxicology), social sciences (humanities, sociology, psychology, public health), engineering (electrical, environmental), medicine (oncology, radiology, emergency, pediatrics, infectious disease), research (basic science, clinical), physics (applied, theoretical), mathematics (applied, computer science), scientific writing and science policy. Chapter members also represent numerous academic institutions – Emory University (Atlanta), Clark-Atlanta University (Atlanta), Georgia Southern University (Savannah), University of Georgia (Athens), Georgia College and State University (Milledgeville), and Georgia State University (Atlanta) – as well as industry (Argos USA, Visuray LLC, The Grant Science Lab) and non-profit organizations (Georgia Research Alliance, Understanding Interventions).

Since launching the AWIS Georgia Chapter in the spring of 2018, its board members have much to celebrate, but also more work to do. Dr. Oliver noted, “Every Board member went above and beyond to perform all that was required to form the chapter, and they are the reason that we currently stand where we do today. Because of their efforts and those of the national office, we will impact thousands if not millions of women in STEM across Georgia. You are only as good as your team, and our officers certainly deserve all the credit.”

**Ready for 2019**
With the initiation and onboarding process completed, the Georgia Chapter’s Board plans are underway for 2019 and consist of activities such as career panels, coffee hours, professional development and leadership workshops, research seminars, and K-12 outreach days. Additional events will include partnering with the AWIS Emory affiliate group to host a booth at the Atlanta Science Festival, creating a ‘Moms Club’ to aid mothers re-entering the workforce, and instituting an annual Women’s Conference to celebrate and acknowledge the achievements of STEM women in Georgia.

**Best practices from the Georgia Chapter**
1. Begin with an affiliate group to increase membership, stakeholders, and network connections, then utilize that platform to springboard into a citywide or statewide chapter.
2. Obtain a vested interest in the success of the chapter by garnering support from a large, local institution.
3. Assemble a team of energetic, task-oriented go-getters to serve on the executive board.
4. Reach out for corporate sponsorships through previously existing connections with current members.
5. Host informal meet-and-greets in the beginning to establish common ground and provide networking opportunities for individuals looking for interdisciplinary collaborations.
6. Throughout every step of the process, build authentic relationships.

Dr. Kathryn Oliver received the Junior Investigator Best Abstract in Basic Science award at the 31st Annual North American CF Conference.
Established in 1995, the New Jersey Central chapter (AWIS-CJC) empowers and promotes women scientists through programs that facilitate career development, education, networking, leadership and entrepreneurial opportunities. AWIS-CJC spearheads programs to re-engage New Jersey women in STEM in entrepreneurial ventures. Key initiatives include Entrepreneurial & Innovation challenges and MedHealth challenge.

The New Jersey Institute of Technology’s (NJIT) I-Corps site and AWIS-CJC recently received joint funding through the supplemental program for providing entrepreneurial alternatives for New Jersey women with life sciences PhDs from the National Science Foundation (NSF). Co-directors of the New Jersey Innovation Acceleration Center at NJIT, Judith Sheft and Michael Ehrlich, along with Kamana Misra from AWIS-CJC are jointly managing the I-Corps supplemental program.

“We have a key interest in developing sustainable ecosystems for efficient re-engagement of women in STEM and I believe, embracing entrepreneurship is an enormous opportunity for this workforce to re-stimulate the job market,” said Kamana Misra, PhD, President for AWIS-CJC and entrepreneur with AWIS National’s STEM to Market accelerator program.

The pilot cohort is currently in session at the New Jersey Center for Innovation Acceleration at NJIT. Selected STEM ventures with female leads receive specialized training and mini grants of up to $2,000. “We are happy to include this cohort of women STEM entrepreneurs to our summer accelerator,” said Michael Ehrlich from the NJIT School of Management. “In addition to introducing the principles of the Lean Startup methodology, the teams also make connections with experienced entrepreneurs and investors that can lead to potential follow-on support or collaboration.”

Judith Sheft from NJIT and Reema Puri from Nevakar are key advisory members associated with the entrepreneurial challenge for the New Jersey women in STEM initiative.

“We are always supportive of developing a sustainable ecosystem to train scientists in New Jersey to undertake entrepreneurship ventures,” said Judith Sheft, Associate Vice President Technology and Enterprise Development at New Jersey Innovation Institute at NJIT. “I see great potential and value in providing entrepreneurship training to women in STEM.”

“We want to help women get to the next level by taking that technology, building an entrepreneurial spirit around it and getting the critical funding,” said Reema Puri, Vice President, HR, Nevakar and key advisory member.

The group, in addition to instructional curriculum, gets to interact with key STEM stakeholders in New Jersey.

The companies and founders participating in the current cohort include:
- Bright Brainer Virtual Rehabilitation System: Namrata Grampurohit, PhD
- ContraRx: Kamana Misra, PhD
- In Vitro Diagnostics Solutions: Amy Bendel, PhD
- Learnroll Immerse: Sushmita Chatterjee

“We have a key interest in developing sustainable ecosystems for efficient re-engagement of women in STEM and I believe, embracing entrepreneurship is an enormous opportunity for this workforce to re-stimulate the job market,” said Kamana Misra, PhD, President for AWIS-CJC and entrepreneur with AWIS National STEM to Market (S2M) accelerator program.
Münster University is one of the winners of the Ideas Competition in “International Research Marketing” run by the German Research Foundation (DFG). The “WiRe” concept – “Women in Research” – of Münster University’s International Office found favour with the international jury. The German Federal Ministry of Education and Research is providing the University with prize money of 100,000 euros with which to put the project into practice.

WiRe is a network involving funding and assistance specifically for women. The project tackles a worldwide problem: women constitute a minority in academic management positions, especially in the so-called MINT subjects (Mathematics, IT, Natural Sciences and Technology). Financial assistance for women researchers after they have received their doctoral degree, for example, will enable them to spend up to six months at Münster with their family or partner.

One of the aims of the WiRe concept is to raise the international profile of both Münster University and Germany as a family-friendly location. The partners in this cooperation include the University’s Equal Opportunity Office and the Association for Women in Science (AWIS).
Gender equity champions cheered as U.S. Senators Chris Coons (D-Del.), Lisa Murkowski (R-Alaska), Kamala Harris (D-Calif.), and 44 other Senators introduced the Hidden Figures Congressional Gold Medal Act in August. AWIS endorsed the bill honoring four African American female mathematicians that significantly contributed to the United States’ victory in the Space Race. Katherine Johnson, Dorothy Vaughan, Mary Jackson, and Dr. Christine Darden would receive the highest award the United States can bestow to a civilian: the Congressional Gold Medal.

The lives and careers of Katherine Johnson, Dorothy Vaughan, Mary Jackson, and Christine Darden were featured in the book *Hidden Figures: The American Dream and the Untold Story of the Black Women Mathematicians Who Helped Win the Space Race*, by Margot Lee Shetterly. That book was adapted into the 2016 film *Hidden Figures*.

The credit and recognition to these four brave and courageous STEM professionals who paved the way for women, especially women of color, is long overdue, and AWIS applauds this bipartisan effort to acknowledge these Hidden Figures. AWIS research shows a strong correlation between women with role models and women with leadership goals to help drive excellence in STEM by achieving equity and full participation of women in all disciplines and across all employment sectors.

**Congressional Gold Medal Awardees**

**Katherine Johnson** calculated trajectories for multiple NASA space missions including the first human spaceflight by an American, Alan Shepard’s Freedom 7 mission. She also calculated trajectories for John Glenn’s Friendship 7 mission to orbit the earth. During her time at NASA, she became the first woman recognized as an author of a report from the Flight Research Division.

**Dorothy Vaughan** led the West Area Computing unit for nine years, as the first African American supervisor at National Advisory Committee for Aeronautics (NACA), which later became NASA. She later became an expert programmer in FORTRAN as a part of NASA’s Analysis and Computation Division.

AWIS Supports Senate Push to Honor African American Mathematical Pioneers
Dr. Christine Darden became an engineer at NASA 16 years after Mary Jackson. She worked to revolutionize aeronautic design, wrote over 50 articles on aeronautics design, and became the first African-American person of any gender to be promoted into the Senior Executive Service at Langley.

Mary Jackson petitioned the City of Hampton to allow her to take graduate-level courses in math and physics at night at the all-white Hampton High School to become an engineer at NASA. She was the first female African-American engineer at the agency. Later in her career, she worked to improve the prospects of NASA’s female mathematicians, engineers, and scientists as Langley’s Federal Women’s Program Manager.
Virtual Visiting Scholars
Research STEM Gender Equity
Two Researchers to Fuel Investigations for ARC Network

AWIS announces Cara Margherio, PhD, and Ethel Mickey, PhD, as Virtual Visiting Scholars for the ADVANCE Resource Coordination (ARC) Network. As the new AWIS initiative dedicated to promoting gender equity within STEM and postsecondary higher education, the ARC Network will host Virtual Visiting Scholars to synthesize existing gender equity research and datasets to produce different methods and interventions.

“By bringing Drs. Margherio and Mickey onboard, we maximize this exciting opportunity to revitalize their efforts to achieve gender equity within STEM,” said Rochelle L. Williams, PhD, Project Director and Co-Principal Investigator for the ARC Network. “Coupling their efforts to conduct a comprehensive sweep of the research landscape with the community aspect of the ARC Network empowers us to tip the scale in favor of women who are systemically overlooked for tenure-track positions, awards and recognitions in university settings.”

Funded by the National Science Foundation in 2017 under award number HRD-1740860, the ARC Network strives to achieve STEM equity in academia by 2025. Incorporating an intersectional, intentional and inclusive lens, the STEM equity brain trust convenes diverse audiences as a community to collaborate, share, and implement the best practices and tools shown to effect change. As part of this initiative, Virtual Visiting Scholars’ work determines the overall effectiveness and applicability of interventions and grants institutions, organizations, and disciplines’ access to research. Visit www.EquityInSTEM.org for more information.
Dr. Cara Margherio
As Assistant Director of the University of Washington Center for Evaluation & Research for STEM Equity, Dr. Cara Margherio manages the evaluation of NSF- and NIH-funded projects, primarily working with national professional development programs for early-career academics belonging to groups underrepresented in STEM. Grounded in critical race and feminist theories, her research interests include community cultural wealth, counterspaces, intersectionality, and institutional change. Dr. Margherio holds a PhD and MA in Sociology from the University of Washington and a BPhil in Sociology and BS in Psychology from the University of Pittsburgh.

Centering Women Faculty of Color in a Meta-Synthesis of Research on Mentoring
Dr. Margherio will research how women faculty of color remain not only underrepresented but also understudied at every level of the professoriate. Mentoring is one area of research in which the experiences of women faculty of color are often subsumed within the larger category of women faculty. Her research will synthesize the features that emerge as most salient to address the mentoring needs of women faculty of color mentoring. Ultimately, she will illustrate how shifting the focus changes our understanding of what needs are met by mentoring and what is necessary for mentoring to be beneficial.

Dr. Ethel Mickey
A sociologist studying gender, work and organizations, STEM, and social networks, Dr. Ethel Mickey is a Visiting Lecturer in the Department of Sociology at Wellesley College, where she teaches courses on gender, technology and society, and the sociology of education. Her doctoral research draws on a qualitative case study of a high-tech firm in the United States to explore gendered practices, experiences and outcomes of professional networking. Her dissertation reveals the exclusionary nature of networking and how networking can reinforce intersecting institutional inequalities in one of the country’s leading industries. Dr. Mickey received the Northeastern University Dissertation Completion Fellowship to support this research. In 2018, Dr. Mickey received the Best Student Paper Award from the American Sociological Association section on Communication, Information Technologies, and Media Sociology for her paper titled, “Doing Gender, Doing Networks: Exploring Individual Networking Strategies in High-Tech.” Her work has also appeared in the Journal of Contemporary Ethnography; Aggression and Violent Behavior; and Feminist Formations (forthcoming). In addition to her doctoral work, Dr. Mickey has collaborated on research on second-wave feminist campus activism around sexual harassment.

Implications for Career Success Resulting from STEM Faculty Networks
Faculty networks shape academic career success by providing collaboration opportunities, access to material resources, and access to implicit informal knowledge. Despite the theorized benefits of social networks, there is ever-increasing evidence that women’s marginalization and exclusion from networks may, in part, contribute to their underrepresentation in STEM. Dr. Mickey will research the gender differences in faculty network characteristics and how gender differences in faculty networks contribute to and explain gendered variations in faculty career outcomes, including productivity, retention, and advancement. •
their leadership capacities through Homeward Bound, a year-long transformational leadership program that culminates in a voyage to Antarctica (for methodological details and participant demographics, see Nash, Davies, & Moore, 2017; for an overview of the leadership program, see Nash & Moore, 2018a, 2018b). In the survey, we asked questions about women’s perceptions of leadership like ‘How do you personally define leadership?’, and ‘What is your leadership style?’ We used content analysis to determine how the leadership descriptions provided by the women aligned with the nine FRLM factors. We also used Pearson’s chi-square test to see if there was any association between FRLM factors and how participants defined leadership and their own leadership styles.

Despite the identification of some patterns in how survey participants grouped factors, our results do not reveal strong and uniform relationships among the factors identified by women in STEMM as important to leadership (see Nash, Davies, & Moore, 2017). The most frequently described factor in our survey was idealised influence as a behaviour, a transformational leadership factor. This was closely followed by inspirational motivation and idealised influence as an attribute. Although women typically referred to transformational leadership factors in their leadership definitions, it is not possible to identify one or two definitions of leadership that are ‘typical’ to women in STEMM.

Similarly, when explored how women’s descriptions of their own leadership styles related to the nine FRLM factors, we found that their leadership style descriptions often included multiple factors. Despite some relationships between factors, overall, the results do not show significant trends in how women in STEMM pair leadership factors within their descriptions of their leadership style. This is important because these findings challenge popular conceptions of a distinct female style of leadership.

What does this mean?

Our research shows that women in STEMM value and perform selected transformational leadership factors more so than transactional leadership factors. However, tellingly, while the participants in our study identify inspirational motivation (a transformational leadership factor) as an important leadership trait, few women indicated that they actually practiced this traditionally ‘masculine’ trait. In contrast, many more women in the study were engaged in idealized influence (a transformational leadership factor) as a behaviour as members of collaborative teams, a stereotypically female leadership behaviour.

A critical point for women, then, is that organisational contexts and/or leadership expectations are gendered and recognising gendered variations in organisational contexts may be key to enabling women to be effective leaders (Yoder, 2001). Yet, women in STEMM are often oblivious to the gendered nature of their organisations, rendering change unlikely (Nash and Moore, 2018). Further research is needed about how women lead, why they lead in particular ways and the effectiveness of different leadership styles in STEMM contexts.

Meredith Nash is Senior Lecturer in Sociology and Deputy Director of the Institute for the Study of Social Change at the University of Tasmania. Her research examines gendered inequalities in everyday life.

Robyn Moore is a researcher in the School of Social Sciences at the University of Tasmania. She uses an intersectional lens to examine inequality, focusing on gender and race.

References
Another mechanism by which psychological stress may impact cancer progression is through inflammation. Chronic stress sets the stage for inflammation in the body. This has been shown to help tumors build their own blood supply. (Tumors, like all other cells, need blood vessels and nutrients to live and grow. Many tumors develop mutations that promote more blood vessel growth). The same inflammation also makes it more likely that a tumor will extend through neighboring tissue to invade other organs, the lymphatic system, or blood vessels.

It appears that the same pathway affects cancer recovery when chronic stress promotes inflammation and leads to long-term fatigue. Fatigued cancer survivors show higher levels of inflammation than non-fatigued survivors.

In the future, psychological scientists hope to aid in cancer treatment using the knowledge they have gained about the fight-or-flight and stress responses in the body. In particular, they hope that the understanding of immune function will help with cancer immunotherapies, which ‘program’ a patient’s immune system to eliminate cancerous cells.

Reference

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“Where Psychological Science and Cancer Research Unite” continued from page 11

Katrina Piatek-Jimenez, PhD is a professor in the Mathematics Department at Central Michigan University. She earned her PhD in Mathematics/Mathematics Education from the University of Arizona. Her research focuses on gender equity in mathematics education, stereotypes of mathematicians, and motivation in STEM careers.

Jennifer Cribbs, PhD is an assistant professor in the School of Teaching, Learning and Educational Sciences at Oklahoma State University. She earned her PhD in Mathematics Education from Clemson University. Prior to that, she worked as an applications engineer for a glass and ceramic manufacturer. Currently, her research focus is on mathematics identity and student persistence in STEM.

References
patients each meet with the entire care team on the same day to develop a personalized treatment plan. This approach shortens the time it takes to get their care plan in place and started by almost 30 percent.

Similarly, I feel my success in the field did not happen without the help of the many talented people I’ve worked with over the years. Oncology research has changed dramatically — from being an individual doing research on a specific topic to team science. Through collaboration, we are making huge leaps in the amount of information we have and how we integrate that information into clinical care. With the huge data sets now available we can investigate different scenarios.

A team effort by a wide range of specialists is required to take advantage of this large collection of disparate information. More than ever, in order to move cancer care forward, we have to be prepared to work as a team and seek out the expertise of those with whom we normally might not work.

I don’t think my college chemistry professor would understand. But it’s not him I’m thinking about.

Kelly K. Hunt, MD is a Hamill Foundation Distinguished Professor of Surgery in Honor of Dr. Richard G. Martin, Sr. Chair, Department of Breast Surgical Oncology, The University of Texas MD Anderson Cancer Center.

AWIS: What would you describe as an amazing opportunity in your work in biology/bioinformatics research?

MK: As a computational biology collaborator on a number of projects during my postdoc, I contributed to a growing body of work showing the important role that HSF1, the master regulator of the heat-shock response in mammalian cells, plays in the initiation and maintenance of tumorigenesis. Indeed, HSF1 drives a transcriptional program that is quite distinct from heat shock to support highly malignant human cancers. Much of the work that I contributed to as either a collaborator or as a lead scientist focused on the characterization of this transcriptional program, its potential use for diagnostic purposes, as well as its targeting via either chemical or genetic means for therapeutic purposes. I consider my contribution to this body of work as an amazing opportunity and am thankful to my postdoctoral advisors for giving me this chance.

AWIS: How are you helping women in STEM achieve their full potential?

MK: I've encouraged young women to go into STEM careers, but also during networking and mentoring opportunities have provided feedback and encouragement to women already in STEM careers to seize opportunities they were interested in and to pursue their goals and dreams.

AWIS: What are some of the challenges you face in your STEM career and how did you address them?

MK: One challenge I can think of has been the tremendous speed of technological development. When I was starting out in college, microarrays were just emerging as a high-throughput technology for assessing the global transcriptional state of cells and tissues. Throughout my postdoc, sequencing technologies and their applications (RNA-Seq, ChIP-Seq, etc.) to bulk tissue were most common, but more recently single-cell sequencing has been gaining prominence quickly. Different computational methods for extracting biological knowledge from data generated using these technologies have quickly followed but keeping abreast of all new analysis techniques can be daunting. I love learning though, so I’ve addressed this by keeping up with the literature and learning new method applications, where relevant, on my own.

AWIS: Can you name a person who has had a tremendous impact on your STEM career?

MK: I would love to name many people that have had a tremendous impact on my STEM career but will mention at least a few here: Dr. Susan Lindquist (one of my postdoctoral advisors), Dr. Diane Joseph-McCarthy (VP of Translational Science and my direct manager at EnBiotix), and my parents. Susan gave me the opportunity to work on really exciting science during my postdoctoral years, taking a chance on a computational scientist to pursue a difficult experimental project. She was a demanding mentor and my skill set grew tremendously during my postdoctoral years. Diane has been a fantastic mentor at EnBiotix and has given me the opportunity not only to grow my computational and experimental skills, but to acquire more project management experience and to take on broader responsibilities, which I have valued immensely. Of course, my parents – Dr. Stefka Koeva and Dr. Iordan Koev, have been instrumental with their support and belief in me from a young age and I have much gratitude for their encouraging me to pursue my interest in math, biology, and their combined power.

Martina Koeva, PhD is a Senior Research Scientist at EnBiotix, Inc. She is a dynamic and motivated industry researcher with demonstrated expertise in systems biology, infectious disease, oncology, and project management, committed to the development of new medicines. Dr. Koeva received her doctorate in Bioinformatics at the University of California, Santa Cruz, and BS in Mathematical and Computational Science at Stanford University.
of organization-wide collaborations, cutting edge technology and team work in a profound way that added to the sense of accomplishment. Being able to independently establish those collaborations and drive science was very meaningful.

Through guidance and support from few colleagues and persistent effort I was able to quickly learn the work processes, design my own research projects and build my own teams in the process. I addressed a key manufacturing challenge by developing an improved process for a late stage biologic that reduced manufacturing time and amounts to a few million dollars cost saving. With no prior operational know-how or chemical engineering background being able to impact a multi-million-dollar late stage therapeutic would be a true milestone in my journey so far.

AWIS: What would you describe as an amazing opportunity in your work in cancer research?
RW: I am grateful to be a part of research community that strives so passionately to win the ‘war against cancer’ each day. Being part of a large biopharma allows myself and the drug discovery community at large to stay at the top of innovative technologies and positions them to embrace those advancements rapidly for bringing better therapies to address unmet clinical needs in patients. The opportunity to impact lives of patients even in the smallest possible way is very meaningful.

What makes the journey equally rewarding is being able to serve as a conduit to pass forward the learnings through mentoring colleagues especially younger women and motivating them to stay on the path of discovering transformative therapies by pursuing advanced education. The opportunity to be a part of their scientific journey and hopefully influencing their career paths is truly amazing!

AWIS: How are you helping women in STEM achieve their full potential?
RW: Over the years I have had the privilege of getting to know numerous bright young women through several outreach programs, science fairs and other professional networking events who have been interested in pursuing scientific careers. I have been able to recruit and mentor several such bright minds to various internship and scientific training positions.

Being able to encourage and train women scientists to think outside of the box, to innovate, to guide them toward career development, to motivate them to actively participate at conferences, to help them develop professional networks and hopefully influence them to stay on long term scientific careers makes my journey as a research scientist more meaningful. Is especially more rewarding to watch them pursue those careers outside of work and reach out for strategic and scientific guidance as they advance along those paths.

AWIS: What are some of the challenges you face in your STEM career and how did you address them?
RW: I have had the opportunity to experience both academic and biopharmaceutical work environments in my professional career so far. Within biopharma I have had a chance to work in both early stage, preclinical small molecule cancer drug discovery and late stage, large molecule drug development space. All scientific environments have been vastly different in terms of routine workflows, deliverables, logistics and financial cost of operations. Most challenges have been unique to the individual work environments. For instance, the biggest challenge in any biopharma is the volatility, the uncertainty around the fate of targets/projects driven by evolving clinical and business needs.

Fear of unknown and navigating the constant new can be hard. Being flexible and willing to learn about newer targets and adapting to the evolving portfolio has actually helped me not just navigate those challenges and grow as a scientist but allowed me to develop a broader appreciation for complexities involved in bringing anti-cancer therapies to the clinic. In the process it helped me expand my professional network and introduced me to some terrific minds that have influenced my scientific journey.

Another area of challenge is inadequate representation of women in senior positions. This is definitely a more pervasive issue for women in most areas of STEM. I have created training opportunities for several young and aspiring women scientists to hopefully infuse the joy of learning in their work and motivating them toward pursuing additional degrees, networking & not giving up. I actively mentor several women scientists both at and outside of work to help them build collaborations, introduce them to other scientists and hopefully help them expand their professional network in the process. But more honest effort is needed by all women and men in STEM especially those in positions of authority to address this issue.

AWIS: Can you name a person who has had a tremendous impact on your STEM career?
RW: I have had the rare pleasure of meeting some of the greatest scientists in the field and every interaction taught me something about science, life and on occasions about myself. Empathy, willingness to mentor and accessibility to other aspiring researchers in the field are more valuable than just being great individual innovators in those STEM areas.

Try to create opportunities for yourself and other fellow scientists instead of asking or waiting for them to come your way. Of the advice I have received, the one I personally follow the most is to try to create opportunities for yourself and other fellow scientists instead of asking or waiting for them to come your way. Of the advice I have received, the one I personally follow the most is to try to create opportunities for yourself and other fellow scientists instead of asking or waiting for them to come your way. Of the advice I have received, the one I personally follow the most is to try to create opportunities for yourself and other fellow scientists instead of asking or waiting for them to come your way.

Working together gives me the feeling of being part of a larger scientific community with a common mission and has enriched my journey in science.

Revati Wani, PhD is a senior scientist at Pfizer Bioprocess R&D, Biotherapeutics Pharmaceutical Sciences. She is a cysteine chemical biologist who discovered isoform specificity of Akt2 through direct post-translational oxidation of a unique linker region cysteine 124 that ablates Akt2 kinase function. She has applied her redox expertise to both cancer biomarker discovery to enable preclinical small molecule pharmacology and culture process development of late stage biologics. Dr. Wani earned her doctorate from Molecular Medicine and Translational Science program at Wake Forest School of Medicine, MS in Biochemistry at University of Pune, India and BS from Fergusson College, India.
the well-known female advantage in verbal memory, sex is not taken into account in these tests. This can lead to false positive diagnoses for men who may be cognitively normal and false negative diagnoses for women who may have mild cognitive impairment. A new study recently showed that when sex-specific cutoffs were used in verbal memory tests, women and men are more accurately diagnosed and the diagnosis correlates better with their brain pathology (Maki, Sundermann et al. 2018). If this finding can be replicated and expanded in additional studies, it may suggest that different verbal memory cutoff scores are needed for women and men when diagnosing Alzheimer’s in the clinic.

Alzheimer’s clinical trials should also account for differences between women and men in their design and analysis. For example, biomarkers like amyloid-beta and tau are used to help stage the progression of Alzheimer’s. However, little is known about sex differences in these biomarkers. Studies show that women with the same amount of Alzheimer’s pathology as men show more severe clinical symptoms of the disease, but we do not yet understand why. As Alzheimer’s clinical trials move toward early intervention and prevention, it is important to consider the differences between women and men in trial design and recruitment. It’s also important to look at sex differences during data analysis, which may help identify different Alzheimer’s subtypes, opening up new potential therapeutic avenues.

Making progress in the Alzheimer’s research areas outlined as high priority in SWHR’s review — as well as advancing sex and gender differences research across all areas of health and disease — will require interdisciplinary, cross-institutional approaches with strong support across public and private sectors.

Moving the field forward in these areas also requires innovative leaders in the scientific community who will challenge the long-standing notions that using only one sex in research is adequate. Looking at sex and gender differences is critical to improving health outcomes for both women and men.

At the SWHR, we aim to ensure that differences between women and men are investigated in research and that established differences are considered in clinical trials and clinical practice. We also advocate for policies that help expand the field of sex-based biology and the inclusion of women in research.

Visit the SWHR’s website for more information on our science, policy, and communication activities and the importance of considering differences between women and men in your research. 

Dr. Rebecca Nebel is the Director of Scientific Programs at the Society for Women’s Health Research, where provides strategic leadership and vision for SWHR’s scientific initiatives designed to improve research, diagnosis, treatment, and access to quality care for women. She currently oversees a vast portfolio of programs including activities in endometriosis, migraine, sleep, Alzheimer’s disease, and urology. Dr. Nebel received her PhD in biomedical sciences from Albert Einstein College of Medicine and her BS in biological sciences from Binghampton University.

References


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What is your favorite word?
Purposeful

How do you define it?
I define purposeful as doing everything with intention. I look at my life both personally and professionally with intention. I’m a strong believer that if you define your life goals — whether it’s personal or professional — with purpose and passion, you will always aim for goals that are fulfilling and rich. The world is a platform with abundance of opportunities that need help, and resolution, thus aiming to be purposeful on how I can help in the world is a win win. World wins and so does one’s heart.

Has your word influenced you during your career, or is it a word that you have chosen retrospectively?
As I mentioned above, being purposeful in my own world and platform has allowed me to think beyond boundaries and gain traction over time to know that I can help influence and bring positive impact to my work space.

How has AWIS had an impact on your career journey?
I started early with AWIS when I was still at an entry level at work. I participated in various roles with the East Bay chapter and that helped me become an AWIS national representative. My participation was the conduit to meet other like-minded women in STEM whom I learned from and soon developed lifetime friendships.

What are you currently reading?
Art of Possibility! It’s a great read. It’s essentially how I think daily about life and work — anything is possible. You just have to be focused and disciplined to aspire and reach your goals.

Tawni Koutchesfahani is an accomplished operations leader in the biotech, and medical device sector. Currently, Tawni serves as the Senior Director, Contract Manufacturing of Drug Product at Catalyst Biosciences. Prior to joining Catalyst Biosciences, Tawni was the Director of Manufacturing Strategy at Relypsy, as well as the Director of Supply Chain. Prior to joining Relypsy, Tawni was a key manufacturing leader within the Baxalta (spin-off as a public company from Baxter) manufacturing network for its BioScience division as well as Baxter’s BioSurgery division since 2009. Tawni earned an M.S. in Chemical Engineering from the University of California, Berkeley, and a B.S. in Chemical Engineering from the University of California, Santa Barbara.
Thinking about your next move?

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