

## Report on the Women in Physiology Symposium in IUPS 2009

Junko Kimura · Yuichi Suzuki · Kazue Mizumura · Chika Katagiri ·  
Kazumi Azuma · Li-ying Hao · Kamalesh K. Gulia · Susan Wray ·  
Sanae M. M. Iguchi-Ariga · Kim E. Barrett

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**Abstract** A symposium entitled “Women in Physiology” was held on 30 July 2009 during IUPS in Kyoto. Seven female researchers from five countries presented their views. This article includes the summary of each speaker’s talk. Figures are not included here because they have been uploaded to the web site of Women Physiologists of Japan (WPJ) (<http://square.umin.ac.jp/wpj/>) with the permission of each speaker. Please visit this internet site, download the files freely, and use them for presentations.

**Keywords** IUPS · Women scientists · WPJ · Gender equality

At the Women in Physiology Symposium during IUPS 2009 in Kyoto, seven female researchers from five

countries presented. They are all scientists themselves, working in national or industrial research institutions or universities. The symposium was well attended, although more than 90% of the audience was women. After the symposium, a group called Women Physiologists of Japan (WPJ) held a social, which was even better attended and included children and many men. The contents of each speaker’s talks have been uploaded to the web site of WPJ (<http://square.umin.ac.jp/wpj/>) [1] with the permission of each speaker. Please download the files freely and use them for presentations. WPJ members would be happy if the files were used for activities promoting female researchers. The following is a summary of each speaker’s talk. The order of the speakers is not the same as the symposium but has been modified to summarise the situation in Japan first.

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J. Kimura (✉)  
Department of Pharmacology, Fukushima Medical University,  
Fukushima, Japan  
e-mail: jkimura@fmu.ac.jp

Y. Suzuki (✉)  
Laboratory of Physiology, School of Food and Nutritional  
Sciences, University of Shizuoka, Shizuoka, Japan  
e-mail: yuichi@smail.u-shizuoka-ken.ac.jp

K. Mizumura  
Research Institute of Environment and Medicine,  
Nagoya University, Nagoya, Japan

C. Katagiri · K. Azuma  
Shiseido Research Center, Yokohama, Japan

L. Hao  
Department of Pharmaceutical Toxicology, School of  
Pharmaceutical Sciences, China Medical University,  
Shenyang, China

K. K. Gulia  
National Brain Research Centre, Gurgaon, Haryana, India

*Present Address:*  
K. K. Gulia  
Sree Chitra Tirunal Institute of Medical Sciences and  
Technology, Comprehensive Center for Sleep Disorders,  
Biomedical Technology Wing, Thiruvananthapuram,  
Kerala, India

S. Wray  
Physiology Department, School of Biomedical Sciences,  
University of Liverpool, Liverpool, UK

S. M. M. Iguchi-Ariga  
Graduate School of Agriculture/Life Science,  
Hokkaido University, Sapporo, Japan

K. E. Barrett  
Department of Medicine and Office of Graduate Studies,  
University of California, San Diego, CA, USA

Figures are not included here because they have been uploaded to the above-mentioned web site.

### Network of woman physiologists in Japan

by **Kazue Mizumura** (Professor, Chairperson of the Committee for Gender Equality, Physiological Society of Japan, former representative of the Women Physiologists of Japan) (see “Network of woman physiologists in Japan—it is an experience!” at <http://square.umin.ac.jp/wpj/>).

Why is a network of women necessary? For one, the absolute number of woman researchers is low in Japan, ca. 13% in the Physiological Society of Japan (PSJ) and 11.7% in our university. This low percentage of women leads to woman researchers being isolated in work or academia (often there is only one woman researcher in the lab, with female faculty being even more uncommon), having no role models or no women nearby to consult with. Another reason for networking is that woman researchers are often isolated from information about grants, positions, etc. Their time after work is occupied by keeping house or child-care, the areas in which women are expected to take more responsibility in Japan. Many Japanese men go out for a drink after work to relax and to enjoy conversation with their bosses or colleagues. This is called “nominication.” “Nomu” means “to drink” in Japanese. Men can obtain a wide range of information during this nominication. However, opportunities to attend these activities are limited for women with children. Another reason for the information divide is that the position of women on average is low and therefore women have limited opportunities to receive information through official channels. The realization of this led three Japanese woman physiologists, Drs. Michiko Hamba, Yoshiko Sugawara, and Kayoko Onodera, to set up a network of women in PSJ, called Women in Physiology of Japan (WPJ) in 1995. The purposes of WPJ are (1) to cultivate mutual friendship among women physiologists to improve the research environment and to develop physiology and (2) to construct a network for discussion and exchange of information. These purposes were clearly stated in the first issue of the group’s newsletter. I myself once served as a representative of WPJ, and Dr. Junko Kimura, one of the chairpersons of this symposium, is the present representative.

WPJ has various activities, such as newsletter (NL) publication (two issues/year), organization of members’ gatherings, keeping the internet web site, and organizing workshops. Our NL, started in 1995, has played an important role in uniting and improving the communications of the members. The first issue consisted of only 4 pages but the latest issue contains 15 pages. The number of

WPJ members was originally about 20, but is now almost 80, which is approximately 20% of the current female members of PSJ. NL also includes a column called “Journey in Research,” an essay by a senior member on her personal research history, career, and people who have influenced her the most. The essay introduces a role model for young physiologists, while at the same time being a precious record of the life of a woman physiologist. “Letters from WPJ Members” deal with topics in daily life, but sometimes contains important proposals to be discussed and solved. The “Featured Articles” discuss problems of term-limited positions, keeping one’s maiden name after marriage, research environment issues, and information on skill-up courses. Opinions of male researchers are also included. The percentage of members who contribute to the newsletter is quite high, and it creates a strong feeling of identification as a member of WPJ.

WPJ holds an all-member get-together once a year, with a scientific lecture delivered by a member followed by food and drink services. These get-togethers also provide opportunities to know senior woman researchers and to become acquainted with the role models. We have also had speakers from outside WPJ. One was Ryoko Akamatsu, a former Minister of Education, Culture, Sports, Science, and Technology, who spoke of the need for more women in decision-making process in politics and in the management of universities.

The WPJ homepage (<http://square.umin.ac.jp/wpj/>) has a link to that of the PSJ. More than 12,000 people have already visited this page.

The characteristics of WPJ activities can be summarized in two ways. The first is the use of e-mail as a communication tool, which allows only one annual meeting to be sufficient for maintaining good communication. This helps to make the membership fee quite cheap. The second is to nominate many members for secretarial offices. This improves awareness and gives WPJ members a sense of belonging, which helps keep the members active.

WPJ has its own funding sources. Contributions have been made by spontaneous donations on occasions such as retirement. The fund has been used to support the above-mentioned WPJ activities.

As a result of WPJ activities, it has become fun for me and for other WPJ members to participate in the meetings of PSJ! Before WPJ, I knew only a few woman physiologists, but I now know the majority of WPJ members, and I can get many kinds of information and help when I see WPJ members.

In 2002, the Committee for Gender Equality was established in PSJ following a proposal of WPJ. The Japan Inter-Society Liaison Association Committee for Promoting Equal Participation of Men and Women in Science and Engineering, also established in 2002, conducted large-scale

questionnaire surveys and made proposals, some of which were reflected in policies of the present Government of Japan. However, despite many efforts, the progress of gender equality in science in Japan is still slow. We hope our network will help promote the progress.

Through the activities of WPJ, we have learned the necessity and the effectiveness of networking with women. We hope our experience will help promote networks of women in other countries.

### Promotion of gender equality and work/life balance at Shiseido

by **Chika Katagiri**, PhD, and **Kazumi Azuma**, PhD (see “Promotion of gender equality and work/life balance at Shiseido” at <http://square.umin.ac.jp/wpj/>).

According to the “Report on Scientific and Technological Studies in FY2008” by the Ministry of Internal Affairs and Communications, female scientists account for only 13.0% of all scientists in Japan. In Lithuania, nearly half or 49.3% of researchers are female; in the United States this figure is 34.3%, in France it is 27.7%, and in the UK 26.0%. The ratio of female scientists in Japan is significantly less than for other major developed countries.

In Japan, organizational and cultural issues sometimes begin with a preconception that women are “not suitable” for scientific studies. Reasons why a woman might not continue a career include childbirth and childcare, caring for an elderly parent, or the job transfer of a spouse. In particular, in light of the reality that young researchers are most often employed for fixed terms, during which they are expected to produce favorable results, a woman facing childbirth or experiencing other personal circumstances often has no choice but to abandon her work altogether during such times. In short, female researchers in Japan often cannot continue their careers for reasons entirely unrelated to their abilities, which results in a conspicuously low number of female researchers. Diversity in nationality, gender, age, etc., is not only beneficial, but essential and the fields of science and technology are of course no exception. To conclude, it seems accurate to state that there is not a sufficient number of female researchers in Japan and also that the reasons why women often cannot continue their research careers have nothing to do with their abilities. Therefore, action in response to such issues is called for.

#### Efforts relating to gender equality at Shiseido

Shiseido was established in 1872 and will soon celebrate its 137th anniversary. Its primary business is the manufacturing and selling of cosmetics, toiletries, foods, and pharmaceutical products. Because the core business of

Shiseido is cosmetics, 90% of its customers and 70% of its employees are women.

Shiseido’s corporate ideals are embodied in what is called the “Shiseido Way,” established in 1997. The item “With Our Employees” states that “The diversity and creativity of our employees makes them our most valuable corporate asset. We strive to promote their professional development and we evaluate them fairly.” The expressions “diversity and creativity of our employees” and “we evaluate them fairly” show that gender equality is a basic principle of Shiseido’s management.

Shiseido has promoted gender equality for many years and has been recognized by the Minister of Health, Labor and Welfare as an exemplary company in this regard. According to research by the Japanese government and by various public service corporations, the more women there are in management and the smaller the difference in length of service between men and women employees, the higher a company’s profitability. Since 2007, Shiseido has been tackling these issues aggressively through its Gender Equality Action Plan 15 (covering fiscal years 2007–2009.). The plan comprises 15 activities organized into five priority objectives: cultivating Shiseido’s corporate culture, developing and promoting female leaders, reviewing how employees work, helping employees balance work and childcare, and making social contributions that aid the next generation.

According to a Shiseido case study, work place equality has significantly improved in response to these action plans that assist employees. Here we show the trend and current status of the percentage of female researchers at the Shiseido research center. At Shiseido, the percentage of female scientists is about 40%, which is higher than the national average. However, the percentage of women in managerial positions at Shiseido Research Center is only 9.2%. The percentage of females in leadership position still remains low. Efforts made by the company to ensure equal employment opportunities for men and women have made significant progress in some aspects, although there are still many areas for improvement in terms of opportunities for men and women. Today, among the younger generation of employees at Shiseido, the ratio of men to women is about equal. What is important is to create situations in which women are in a position to participate in discussion on the company’s future policies.

#### Virtuous circle of work/life balance

We also recently introduced efforts to improve work/life balance—a way of working efficiently so employees are able to enhance and balance other aspects of life outside of work. Realizing a work/life balance is something that concerns all employees, regardless of gender or age and

marital or parental status. The present system and support for balancing work and childcare is, however, most likely to be of use to female employees with young children. In order to realize a work/life balance, shortened working hours, flexible administration regarding time, and improvements in labor productivity are necessary. At Shiseido, we believe further that a work/life balance leads to a “virtuous circle”: more diverse ways of working create time for personal life; outside of work, employees enhance their experiences with their families, in their communities, and in other areas of life; and those experiences can be put to use at work increasing creativity and productivity, which leads to more personal time and this “virtuous circle.”

The Shiseido Female Researcher Science Grant (<http://www.shiseido.co.jp/doctor/grants/science.htm>) is a grant to support the research activities of female researchers outside of Shiseido and is given as part of corporate social responsibility activities. The formal objective of the grant program is to encourage the development of female researchers who can play leading roles by assisting talented female researchers in their research activities. It is applicable to the field of “general natural sciences” so as to encompass as many female researchers as possible. The grant can be used for research expenses, but also for hiring research assistants. We want the grants to be a stepping stone to help women overcome those barriers. As the grant program itself continues over the years, we hope it may also serve to create a network among female researchers—women who can lead in their fields and who can serve as role models for the future. Let’s participate in this female network.

### Women scientists in China

by **Li-ying Hao** M.D., Ph.D., Professor (see “Growing up together with the children: women scientists in China” at <http://square.umin.ac.jp/wpj/>).

Based on the data provided by the Gender, Institutions, and Development (GID) Database, we see that the situation of Chinese women is much better than before. For example, the literacy ratio (f/m) has reached 0.91, and the percentage of women in parliament has increased to 20.3%. Of course, compared to countries with well-developed gender equality, there are still big differences. For example, in Sweden, the percentage of women in parliament is as high as 45.3%. A survey of China shows that women represent 45.4% of the workforce and that the percentage of women in governmental affair offices has reached 39.0%. It is also reported that women constitute more than one-third of the total scientists in China. In some research fields such as information technology and life sciences, the number of women scientists is even closer to 50%.

Not so long ago China was a semi-feudal country, and Chinese women were neither allowed to go to school nor to go out for work. But a big change happened 60 years ago, when people began to say “women can hold up half of the sky.” Gender equality was initiated as a basic state policy in China to promote equality between men and women. From this perspective, gender equality in China was launched not only by women but also by men. There is a women’s federation, the All-China Women’s Federation. It has branches in every province, every city, and every community. The chairpersons of the federation have been the senior female politicians in the government. The current chairwoman of the federation is Ms. Zhi-li Chen who is also a scientist in the field of ferroelectric materials.

In China Medical University, 66% of the total staff are women. Except for the affiliated hospitals where many nurses work, the main campus staff is 44% female, and female professors represent 43% of the total number of professors. Furthermore, based on the data for 2006, 44% of the projects supported by the China Natural Sciences Foundation have female leaders, and 55% of the total financial support is obtained by the female leaders. September 9 is China National Teacher’s day; we have an excellent teacher award every year to celebrate this day. Last year 38 teachers were awarded of whom 16 were women. March 8 is International Women’s Day. To celebrate this special day for women, we will award excellent women who have done a good job in their working positions. At the same time, in an award called “Award for Five-Good Family”, we also award women of our university staff who did good jobs with their families. Very interestingly, people who are excellent at helping match-making will be recognized with awards for excellent matchmaker. Officially women have a half-day holiday, and they usually go shopping or attend other entertaining activities to celebrate their own festival.

Women take more responsibilities in caring for family and educating children. It is not easy for woman scientists to achieve balance and fulfill roles in both work and family. Therefore, we usually have to make much more of an effort to achieve success. The most difficult time is the period after a baby is born. Being positive will help to pass the hard time. Being honest and modest to admit that we can not handle all of these things by ourselves will make it easier to ask for help. Grandparents are big helping hands in China, and fathers are also well-involved in the children’s parenting. I did a simple survey to see who collects kids from kindergarten after work. The data show that mothers, fathers, and grandparents each contribute one-third. This makes it easier for women to continue their career as their children grow up. A career mother benefits her children because she is knowledgeable, experienced, and refreshed by new knowledge. Raising children costs

time and energy, but we ourselves grow in the mean time. Children inspire us and enrich our lives. We become more optimistic, braver, stronger, and more efficient.

At present the main problem is that the proportion of women is significantly lower among high level scientists. It is said that the Chinese government is seeking intellectuals, ethnic minorities, and women to balance the workforce. Therefore, the situation of women will hopefully become better. Women scientists are serious, attentive, meticulous, persistent, cooperative and creative; and they are invaluable intellectual resources in scientific research. Women deserve equal appreciation and praise. Gender equality does not mean competition between men and women. Men and women should work together in harmony. This is good for not only women but also for men and children.

### **An Indian woman scientist's perspective on gender equality**

by **Kamalesh K Gulia**, Ph.D. (see "An Indian woman scientist's perspective on gender equality: fight or flight!" at <http://square.umin.ac.jp/wpj/>).

The Indian woman of the 21st century is evolving into a strong, innovative, revolutionary, multifaceted icon, to take up demanding research and to contribute in equal measure to the science frontiers and the home front. Till the 19th century, women had no access to institutions of higher learning, which prevented them from participation in the scientific revolution. One of the exceptions in the 12th century was Lilavati, daughter of a great Indian mathematician, Bhaskaracharya, who attained deep knowledge in algebra. In the history of the past 3,000 years, a few women emerged as natural philosophers. The beginning of the liberation of women was only after the introduction of modern education and the thrust for their literacy.

In modern times, women have free access to higher learning in all areas without any gender discrimination; however, subtle biases begin to surface at the time of placement. The women, who face breaks in their careers due to various social constraints, have to undergo relatively harder experiences in life to match global competition in research careers. The glass ceiling, which may appear at a higher level for women in other fields, becomes more evident for these scientists. Any delay adversely affects their career prospects due to age restrictions, lack of power, and institutional pressure to enhance scientific productivity. In this constant struggle for excellence they are least recommended for awards. The postdoctoral-to-principal investigator transition is the leakiest pipe where women scientists are most likely to quit. The trials and tribulations are compounded by having to prove credibility and

capability over and over again. A low representation of women in policy-making makes the ground rougher. Men generally misjudge women's genuine need for flexibility and independence in work even while taking care of home and hearth. Employment opportunities and career growth for women in national laboratories and good universities are limited. Undoubtedly, the research is more demanding than teaching alone. It is rare to find women at the level of heads of institutions, in scientific bodies, and meritorious research awards lists. If policy makers are not alert and realistic in their approach, the challenge of attracting and retaining good woman scientists will even become greater when other lucrative sectors are pulling them out of science with the attractions of high salaries for less demanding work.

With strong determination, a few women have efficiently shaped their struggle into a success story. Although better opportunities in science began in the early 20th century, the only women who could fully enjoy these privileges were those who had facilities, including full-time domestic help to make marriage, motherhood, and a career possible, and who did not have the burden of being the chief breadwinner, as research is a relatively low-paying field. Each successful woman scientist, like a superwoman, has created her own support system. A good woman scientist has to prove to be exceptional and display an extraordinary drive unlike her male counterpart.

With the objective of strengthening the role of women in the development process and promoting their representation in scientific and technological leaderships, The Third World Organization for Women in Science (TWOWS) was founded in 1993. TWOWS works to highlight and reward role models. The Department of Science and Technology, Government of India, initiated a Women Scientist Scheme in 2003 that is emerging as a catalytic force for bringing these highly qualified potential woman scientists back into mainstream active research. Recently, a National Task Force on Women in Science has been constituted to look into relevant issues and to bring about significant progress at the grass-roots level for female empowerment. It is emphasized here that, although most successful women scientists have created their own niche by working extraordinarily hard, in order to facilitate more women in this career and to sustain them in science, a financially viable national program is warranted with built-in support systems such as flex-time, maternity benefits, and creche facilities attached to the workplace.

Not that the problems will ever come to an end for women, but the marvel lies in her subtle innate ability to work hard, her gentle ways to steady progress, coupled with a firm determination to beat all possible challenges. The current era can be called a Golden Age in the history of India, as today, women of substance are not only leading the nation but are also making significant contributions in



all sectors ranging from the corporate sector to politics, from academics to research, overcoming all adversities.

### UK and personal perspective on gender equality and physiology

by **Susan Wray**, Professor (see “We do it our way—UK and personal perspective on gender equality and physiology” at <http://square.umin.ac.jp/wpj/>).

In this brief and personally biased overview, I will highlight the good, the bad, and the ugly about gender equality issues and how they might affect women in physiology in the UK. I will focus on the following:

- How good/bad is it?
- What are the issues?
- What can we do?

I will present some data and snapshots of UK institutions, grant awarders, editorial boards, and societies. As it is then readily apparent that there are questions we should be asking concerning female presence (or rather the lack of it), I will then raise what the issues may be. This will cover aspects such as women knowing what they want; the choice issue; how science is done; the workplace, families and support; and what are stereotypes, assumptions, and prejudices that surround such issues. As much of this has been said before, my treatment will be brief and given to generate discussion. I will then cover what I think can be done to have a positive impact on women in physiology. This will include evaluating and celebrating successes, mentor schemes, creating new ways of doing things, the power of persistence, and the long-term view.

### Integrated master plan for the support of female researchers at Hokkaido University

by **Sanae Maria Margherita Iguchi-Arigo**, Ph.D., Professor, (see “Sustainable should be female researchers’ careers: integrated master plan for the support of female researchers at Hokkaido University” at <http://square.umin.ac.jp/wpj/>).

A big tide of promotion for female researchers began in 2006, called the First Year or “Dawn” of Promotion for Female Researchers in Japan. Japan’s 3rd Science and Technology Basic Plan has set the target of increasing the ratio of female researchers to 25% by fiscal year 2010. Several funds and grants have started related to female researchers’ promotion, including the fund for model programs to support female scientists. Hokkaido University, one of the first 10 recipient institutions of the fund, has been driving forward various supporting activities. The

Support Office for Female Researchers in Hokkaido University (FResHU) has been established within the framework of Hokkaido University’s policy of gender equality promotion and has been functioning in a policy-making role and as a one-stop contact point for female researchers in need. Hokkaido University has committed itself to a “Triple Twenties Policy”: by 2020, 20% of all staff in teaching and research positions should be women. To achieve this goal, the University has devised a “positive action scheme,” which will be discussed as well as other issues for female researchers’ careers.

### Barriers to gender equality in US biomedical science

by **Kim Elaine Barrett**, Ph.D., Dean (“Barriers to gender equality in U.S. biomedical science: the slow drip of the leaky pipeline” at <http://square.umin.ac.jp/wpj/>).

Women are substantially underrepresented among biomedical faculty in the U.S., particularly at senior levels. However, women have reached—or in some cases, exceeded—parity in both graduate and clinical biomedical training programs. Thus, the lack of female academic leaders can no longer be attributed to a lack of women entering the field, but rather, disproportionate attrition—the so-called leaky pipeline. Factors suggested to contribute include family responsibilities and other work-life conflicts that disproportionately affect women, the challenges of managing dual-career lifestyles, systematic inequities in pay and conditions of employment on the basis of gender, conscious and unconscious biases that reduce female hiring, a hostile climate, underrepresentation of women in leadership and decision-making positions, and likely others. However, many U.S. educational institutions as well as businesses are realizing that they cannot be competitive without tapping fully into the scientific talent pool. My presentation discusses evidence for inequity and bias in the involvement of women in U.S. science, based on national data as well as studies that have been conducted at my own institution and what might be done to correct the situation. While gains have been made, the leaky pipeline has persisted for more than 30 years and the scientific enterprise will be the poorer if solutions are not identified.

Some progress is apparent in the representation of women at all steps of the academic ladder. For example, the U.S. National Institutes of Health, the major funder of biomedical research, reports that around 37% of its awards went to women in 2007, up from less than 30% in 1998. Likewise, there have been steady gains in the proportion of assistant, associate, and full professors in U.S. medical schools who are women, as well as the proportion of chairs and deans. Likewise, the U.S. National Science Foundation reported that around 27% of full professors in the life

sciences were women in 2006, up from less than 10% in 1979. However, some caveats must be expressed about these data. First, women faculty in medical schools may be disproportionately represented in so-called soft-money positions rather than being on the tenure track. Second, over time, small differences in treatment at the time of hiring with respect to salary or other resources tend to accumulate to represent substantial inequities. Further, in that the average time that elapses between award of the Ph.D. and promotion to full professor is around 15 years, the data on trends in female Ph.D. recipients would suggest that by now around 40% of life sciences full professors should be women, which has not occurred. Obviously, women are being lost from the academic career path or are never even choosing to enter it.

In recognition of these issues, the U.S. National Academy of Sciences (NAS) recently commissioned a report to assess the current status of women in science and engineering fields at major U.S. research universities. Some of the findings, while reflecting only a snapshot in time, were disturbing. First, a very considerable proportion of newly minted female Ph.D.'s do not even apply for faculty positions at research-intensive universities. This was particularly true in the disciplines of biology and chemistry. One strategy proposed to correct this is to increase the number of women serving on faculty search committees, particularly as the chair. Second, of faculty proposed for tenure, women represented a lower proportion than in the tenure-track faculty pool as a whole. Female full professors, moreover, were paid 8% less on average than their male counterparts in the same discipline. On a more positive note, women were more successful in gaining tenure than men, although they spent a longer time as assistant professors before being promoted.

Implicit and explicit bias also remains an issue when women are seeking careers in academic research, as well as the resources they need to conduct their research. A number of studies, such as that of Weneras and World [*Nature* 387: 341 (1997)] have shown that women needed to have significantly more publications to be judged as productive as men applying for postdoctoral fellowship funding. There have also been a number of high profile detractors from the role that can be played by women. An example is found in former Harvard President Larry Summers (now an economic advisor to President Obama) who opined that women were inherently less suited to highly technical pursuits. Stephen Pinker and Peter Lawrence have likewise written that inherent sex differences exist in scientific ability. Nevertheless, it is my belief as well as my experience over the course of my career that such biases are diminishing. Further attention to these biases, and methods to circumvent them (such as anonymous review of grant proposals and faculty candidates) may be helpful in this regard.

At my own institution, the University of California, San Diego, only just over 20% of our faculty are women, placing us lowest for this measure among the ten-campus University of California system. Further, two salary equity studies have shown that women were receiving substantially less compensation than their male counterparts after correcting for experience. In response to these findings, our search practices and oversight of appointments and starting salaries have been substantially overhauled. We have also provided all faculty with the right for a “calibration” review both as an associate and full professor, allowing cumulative disadvantages to be righted. Measures of contributions to all of the University’s missions, including teaching and clinical activities, have also been developed. Finally, high level administrators with an “equity portfolio” have been appointed both on the main campus and at the medical school, sustaining attention on these issues.

In a general sense, we can identify several recommendations for action if we wish our research workforce to be reflective of the diversity of our student bodies. First, we must make sure in all of our institutions that conditions are equitable for existing faculty. Second, greater outreach is needed to convince young women of the attractiveness of a faculty career, particularly its opportunities for flexibility. The tenure and promotion process also needs to be transparent, and progress towards greater inclusiveness should be measured and publicized. All institutions would also do well to implement measures to improve work-life balance, which increasingly benefits male faculty as well. Finally, none of these changes is possible without securing a strong personal commitment from senior leadership of one’s institution. I am pleased to say that this is now clearly evident at my own and should pay dividends going forward.

### Postscript

During the symposium, Professor Denis Noble, President of IUPS (2009–), presented two slides including one with ICSU (International Council of Science) Statute 5: “In pursuing its objectives in respect of the rights and responsibilities of scientists, ICSU, as an international non-governmental body shall observe and actively uphold the principle of the universality of science. This principle entails freedom of association and expression, access to data and information, and freedom of communication and movement in connection with international scientific activities without any discrimination on the basis of such factors as citizenship, religion, creed, political stance, ethnic origin, race, color, language, age or sex.” (See also the longer ICSU Statement on the Conduct of Science <http://www.icsu.org>). Professor Noble assured the meeting

that IUPS adheres to ICSU and fully supports this principle.

In his other slide, Prof. Noble indicated that 8 out of 16 reigning monarchs were women over the period 592–770 in Japan, referring to work by Tonomura [2]. Why did female rule end? The explanation given in Tonomura is that after 770, women abandoned living separately in their own residences to become “wives” in a more modern sense. Before that, “marriages” were what some call “visitation marriages” with the woman having independent control of when her “husband” could visit. Thus, there was a time in history when gender equality was natural. This must have been true not only in Japan but also many other places in the world. We learned from the symposium that gender inequality is a world-wide phenomenon now. However, we also learned of the successful experiences of Shiseido

and China in increasing the number of women scientists. Furthermore, various trials have begun to promote women scientists in different countries. The audience must have felt a hope for the future of gender equality among physiologists.

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