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Biophysicist in Profile



Ishita Mukerji

Ishita Mukerji, currently Associate Professor at Wesleyan University in Connecticut, can't remember when science, especially physics, hasn't been a part of her life.

Born in Tuscaloosa, Alabama, in 1961, Mukerji grew up with a physicist father, Ambuj, who was a physics professor at University of Alabama at Tuscaloosa. "I was always interested in science," Mukerji explains, giving credit to her father's profession as her real entry point into the field. Her mother, Snigdha, was a stay-at-home mom who imbued Mukerji with a love of culture. When Mukerji was six, the family moved to the New York City suburbs. While her father conducted research and taught physics at Lehman College, Ishita's mother got involved in organizing cultural performances and often invited professional dancers, actors and musicians to visit their home.

Surrounded by artistic people, Mukerji enjoyed dancing and singing but quickly learned her talents lay in the scientific field rather than in the

artistic arena. She remembers spending time listening to her father have indepth scientific conversations and longing to participate.

"By the time I was a sophomore in high school," she explains, "I knew I wanted to pursue science." After graduating from high school, Mukerji attended Bryn Mawr College, a women's liberal arts school in Pennsylvania, where she enrolled as a chemistry major, As a sophomore she started her first research project under the eye of her mentor Charles Swindell. Her senior year she did a joint research project with Swindell and Gerry Richmond. Richmond remembers that "Ishita was dedicated to doing good science, in both her class work and in her laboratory work," adding that Ishita was always there to help other students. Her research during that time revolved around synthetic organic chemistry but, as she got closer to graduating, her interests shifted to physical organic chemistry. Mukerji learned early on, however, to create balance in her life. "Ishita had a healthy perspective on her science, taking it seriously enough to do a good job but not obsessed with it to the detriment of her personal life," says Richmond.

After graduation, Mukerji began working at AT&T Bell Laboratories as a research technician. While there, her research interests became more defined and focused on biophysics rather then chemistry. After two years, she chose to go back to school for her PhD and moved to the University of California at Berkeley. Her research group focused on photosynthesis, particularly energy transfer in the light harvesting complexes of Photosystem I and the structure of oxygen evolving complex in Photosystem II. Ken Sauer, a former

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advisor of Ishita and now Professor Emeritus at Berkeley, remembers that "she provided the momentum and the dedication to see each project to a meaningful conclusion." She also had good interaction with other students.

May/June 2006 Newsletter

"In addition to being a good scientist, Ishita has great interpersonal skills," says James Cole, who was a student with Mukerji at Berkeley. Cole, now a professor at the University of Connecticut, adds that, "she has real poise and grace,

ing on two research projects: DNA structure and DNA-protein interactions, and fiber formation and aggregation of proteins. Both projects rely on spectroscopy to ascertain answers to fundamental research questions. She notes that her

lab will use

whatever tech-

nique is neces-

sary to answer

While at Princeton Mukerji was shocked to discover the academic community had a more conservative notion on gender roles.

and the knack of making people comfortable around her."

Staying true to her philosophy to "learn as many different things as possible," Ishita moved cross country to Princeton University for her postdoctoral fellowship, joining Thomas Spiro's lab, which was using UV Raman Spectroscopy, a technique that interested her and continues to hold her interest today. While at Princeton Mukerji was shocked to discover the academic community had a more conservative notion on gender roles.While her research advisor was supportive, it became apparent that the doors of opportunity were not always open. In response to this "awakening," Ishita focused on proving that her scientific skills were solid. According to Spiro, "She was warm and cooperative, and set a good example with her hard work." Her projects focused on hemoglobin and provided a fresh insight into the paradigm of allostery.

In 1994, Mukerji started as an assistant professor at Wesleyan University. "Wesleyan University is an ideal situation for me," she explains, "because it allows me to interact with students in a close and personal way." In 2001 she became an Associate Professor of Molecular Biology and Biochemistry at Wesleyan, a position she holds today. She is also currently chair of the Molecular Biology and Biochemistry co-director department and of Wesleyan's Molecular Biophysics program. Mukerji's lab is currently workthe questions being asked. She is proud of what her lab has accomplished, noting that, "we've been able to take our main research technique and apply it to a bunch of different problems. We've been successful in getting new information and doing things other folks have not done before."

In 1995 Mukerji was awarded the National Science Foundation Career Development Award. The award came early in her career and helped her get her foot in the door. In 2001, Mukerji was honored with the Donaghue Investigator Award. "The recognition by my peers and colleagues that my science was worthy of these awards was really gratifying," she says. "I'm sure I danced around my office when I heard about them."

The Donaghue Investigator Award,

given only to Professors at Connecticut institutions, focuses on the practical benefits of scientific knowledge, which gave Mukerji the idea of

starting a website. Using her research on sickle cells, she started a website about the disease to inform the public about the science behind it. Mukerji adds that "we also wanted to ensure that people with scientific backgrounds could find relevant information as well, so the site is constructed in layers." Mukerji puts a lot of energy into making sure lay people understand what is scientifically occurring around them. It was this thought that lead her to design a course at Wesleyan for non-science majors. The course revolves around the biological processes mediated by light. Topics include rainbows and the colors in the sunset.

Mukerji, like many other biophysicists, found an intellectual home in the Biophysical Society. She has attended Society meetings since she was a student. "It provides a great venue for people to come and talk about their work and meet others working in similar areas," she reflects. "I can't tell you how many collaborations I've developed from going to meetings." She has remained active in the Society, participating in a panel for the Minority Affairs Committee (MAC) at the 2006 annual meeting in Salt Lake City, and now serving as MAC chair. She has also served as the chair for the Committee on Professional Opportunities for Women. Mukerji, a mother of two, fought for childcare at annual meetings. Her fight proved to be successful, as childcare was provided at the 2005 and 2006 meetings. "Since most women scientists (~75%) are married to other scientists, offering childcare at the meeting was the most obvious way to facilitate attendance of people with younger children." She adds that childcare is not just

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> a women's issue, but a general issue that needs to be addressed. Mukerji respects the leadership in the Society. "It is run by forward thinking people," she states, "who are concerned about young scientists and making sure the field advances."

> Mukerji often takes her two children, ages 5 and 9 to the Wesleyan Women's basketball games. Her husband Chris, who works in the admissions office

Biophysical Society

have made all the difference in your situation. Second, dismissing your concerns probably went a long way towards making you feel like you were making a mountain out of a molehill, even though you weren't. How can we expect young people to recognize, report, and avoid sexual harassment when we send them conflicting messages about what harassment is, and how it should be handled?

Yet there is also one stellar example of our species in this picture: YOU. You did exactly what you should have done in this situation. You first approached the harasser, and asked him to stop. When he did not, you reported the situation to your advisor. When no action was taken, you reported the situation to another faculty member in your department. That no action was taken is no reflection on you or the seriousness of this situation; instead, it indicates there is a flaw in how some people in your department view and/or handle sexual harassment. Hopefully, this is a local problem, because the next step you must take is to report this harassment to your department chair, or, if you suspect the chair's response will be similar to the one you received from your advisor, directly to your university office for sexual harassment. You can do all this quietly, posing hypothetical questions initially if you wish, but do not stop until you find someone in a position of authority who will listen to you and respond appropriately, as per the guidelines described in your university's policy on sexual harassment (most of these are available online).

Finally, your department chair must ultimately be made aware that an incident of sexual harassment was not handled appropriately by the faculty of your department. This notification can be made by you, or by the office that handles sexual harassment reports, but it must occur. Hopefully, bringing the mishandling of your situation to the chair's attention will result in the proper handling of any subsequent harassment incidents. And that would be a very nice legacy to leave for the students preparing to start their graduate studies, in your lab and others.

Profile (Continued from page 3.)

at Wesleyan, is the assistant coach of the team. Mukerji is the team's faculty mentor, which works out well because the kids enjoy attending the games. Mukerji also enjoys recreational activities such as camping and hiking. While she was not terribly athletic as a child, she now runs to stay in shape. She also has an interest in the environment intrigued by experiments that can be carried out in the field. Hiking and camping, which she does in her free time, is an extremely attractive way to further her scientific knowledge.

"I cannot imagine not being a scientist," she states firmly. "I would have gravitated to something that would have been there," referring to the field of science. One thing is certain: Mukerji no longer has to prove her scientific skills. They speak for themselves.

Public Affairs (Continued from page 8.)

Proteins and Molecular Tags, issued in early January. The Office of Science plans to issue a new solicitation in the coming months for one or more centers for bioenergy research. Centers focused on systems biology research into carbon sequestration and bioremediation are also being considered for future years.

Begun in 2000, the Office of Science's GTL program supports advanced research in systems biology aimed at harnessing the powers of the microbial world to produce abundant and clean energy, absorb carbon dioxide, and transform radioactively contaminated waste.

Roundup

Capitol Hill: Congressman *Sherwood Boehlert* (R-NY), chairman of the House Science committee since 2001, announced his retirement from Congress. He has been a member of Congress for 21 years. Under term-limit rules set by the House Republicans, Boehlert would have had to step down from his post as Chair of the Science Committee at the end of 2006.

The next chairman will be selected in January 2007. Likely successors, if Republicans retain the majority in the November elections, are Congressman Ralph Hall (R-TX), Dana Rohrabacher (R-CA) and Vern Ehlers (R-MI). If Democrats regain control of the chamber, Ranking Member Bart Gordon (D-TN) will most likely become the chairman.

The Science Committee oversees the National Science Foundation, NASA, and the Department of Energy.

OMB: If confirmed by the Senate, *Rob Portman* will become the new Director of the Office of Management and Budget. Portman has been serving as the U.S. trade representative, a position he took following his resignation from the House in 2005. The Ohioan takes over the budget job from *Josh Bolten*, who was recently named the new White House chief of staff. The staff change at the top of the Budget Office mid budget cycle leads to Portman defending and pushing for a budget that he did not create.

NIH: The Public Access Working Group, an advisory panel to NIH responsible for the implementation of the 2005 public access policy, is calling for all articles based on NIH-sponsored research to be made available via PubMed Central within six months of publication. Currently, the NIH asks principal investigators to voluntarily post such articles on PubMed Central within a year of publication. NIH Director *Elias Zerhouni* will make the final decision. The Biophysical Society currently provides free access to all edited papers after twelve months. Unedited accepted papers are freely accessible upon acceptance.