

Joanne Stubbe

An Interview by Mindy Levine

When Joanne Stubbe, Novartis Professor of Chemistry and Biology at MIT, received a phone call late one night in September, she did not expect to hear John Holdren, President Barack Obama's science and technology advisor, on the line. Nor did she anticipate that he was calling to inform her that she had won the National Medal of Science, the highest domestic scientific honor. "It came as a complete surprise," Professor Stubbe said. "I had no idea."

Professor Stubbe, together with the 8 other National Medal winners, received her award from President Obama in a ceremony on October 7, 2009. One of the best parts of receiving the award, explained Professor Stubbe, was that "my family finally figured out that what I do is important." Nine of her family members were in Washington to witness the ceremony, characterized by Professor Stubbe as "pretty inspiring" and "very emotional."

Impact on Career

Despite the importance of the award, Professor Stubbe does not anticipate that it will significantly impact her career. "Awards can sometimes give you visibility so you can attract better people," said Professor Stubbe. However, at a high-profile institution like MIT, such added visibility may be less important.

"In the long run, is the award the key thing?" Professor Stubbe asked rhetorically. "Not really. The key thing is solving the problems."

Research Activities

Professor Stubbe's research focuses on mechanistic investigations of biochemical pathways involved in nucleotide metabolism. This research has led to a number of successful applications, including the mechanism-based anti-cancer drug Gemcitabine, which is patented and distributed by Eli Lilly and Company. "The evidence is really strong that Gemcitabine works like other mechanism-based inhibitors we have studied in detail with an unusual twist due to the second fluorine," said Professor Stubbe. "Why it works on cancer cells specifically is related to complex metabolism, and is something no one could have predicted *a priori*."

Professor Stubbe said that there are relatively few scientists interested in detailed enzymatic mechanisms today. "People today think they can look at a protein crystal structure and know how things work - and they don't have a clue. This is what we are up against."

Nonetheless, people can still be successful in this research area as long as they are willing to continually learn new things, which is good advice for all chemists in today's rapidly changing world, Professor Stubbe said. Mechanistic biochemical research remains an active and exciting research area, she said, because "there are a lot of problems left to solve."

Importance of Teaching

Despite such impressive research achievements, Professor Stubbe stated categorically, "I think my most important contributions have not been to research but to teaching." She said teaching can have a tremendous impact. For example, if there are 25 students in a class, and 5 of those students are inspired, each one can go on to make a major contribution to his or her field.

Recently Professor Stubbe gave a seminar at the University of South Carolina. While at the university, one of the faculty members approached her and said that her class was the best class he had ever taken. "I may not even remember a particular student," Professor Stubbe said, "but I think I am impacting the people who go into science."

Gender Issues

"I don't want to discuss this issue," Professor Stubbe said when the question of gender issues in chemistry was first raised, "even though I think it is a very important one." Nonetheless, as the first woman to be tenured in the MIT chemistry department, she is perhaps in a unique position to comment on the question. Professor Stubbe has spent a lot of time helping young faculty members, both men and women, adjust to life at MIT.

Professor Stubbe explained that there used to be discrimination against female academics of all disciplines, in areas such as compensation and the tenure process. There has been tremendous progress in reducing such discrimination over the years, said Professor Stubbe, so that "women coming in the present generation may not even realize how much energy went into changing the culture."

Advice about Academia

Professor Stubbe explained some advantages to choosing a career in academia. "A big plus for academics is that you can work on something that you are really passionate about," said Professor Stubbe. "For example, I have been fortunate my whole life to be paid to do my hobby."

Professor Stubbe cautioned new faculty members against spending excessive energy worrying about tenure decisions and departmental politics. "Spend more time doing good science," she said, and hopefully the good science will be recognized appropriately. Moreover, in Professor Stubbe's opinion, the six-year period before tenure is really too short to make a substantial contribution, especially in the biological sciences.

Reflections on MIT

When asked to reflect on her career at MIT, Professor Stubbe said, "My career wouldn't be what it is at all without being at MIT. Being here has allowed me to set up outstanding collaborations, which has enabled me to do science that I otherwise couldn't have done. At MIT, there are so many people interested in science that if you use your energy wisely you can do just about anything. Being at MIT has allowed me the privilege of working with the best graduate students in the country."

Professor Stubbe concluded, "It is a tough place, but a very special place."