

## Quote Sheet

### ***Bayer Facts of Science Education XIV: Female and Minority Chemists and Chemical Engineers Speak about Diversity and Underrepresentation in STEM***

#### **Diversity and Underrepresentation in STEM**

“There has been a suppression of women and minority groups and some resistance to change. But, I believe we’ve seen some progress, and it’s a matter of time that more change will come about.” —a mid-career American Indian male chemistry professor

“The data show that we’re going in the wrong direction. We are importing more and more scientists from overseas.” —a mid-career American Indian female chemistry professor

“People from different backgrounds enhance the productivity of the team by bringing different viewpoints and experiences.” —a mid-career Asian female chemist

“Women and minorities are typically categorized into labor categories. Science and math careers are viewed only for the wealthy.” —a mid-career African-American male chemistry professor

#### **Value of Science and Importance of Science Literacy**

“Everyone needs a solid understanding of basic science to make educated decisions and to have an opinion on what is happening in the world today.” —a mid-career Caucasian female chemist

“Knowing science sharpens your skills in all areas. It leads to an appreciation for the arts, politics, and your ability to debate the issues.” —a mid-career African-American male chemistry professor

“Many people don’t view scientists in a positive way. They think scientists are weird geeks and have a negative view of what scientists and chemists do.” —an early-career African-American female chemist

“Science and math haven’t been emphasized as part of our mainstream culture. It’s not cool to be a scientist.” —a mid-career African-American male chemistry professor

#### **Causes of Underrepresentation: Societal vs. Economic vs. Family/Cultural Factors**

“A definite bias existed in my neighborhood growing up. I was asked ‘why not do something with your hands? Blacks don’t do chemistry. Why you?’” —a mid-career African-American male chemistry professor

“Our society prescribes to this stereotypical behavior: only girls can play with dolls and only boys can play with Legos.” —a mid-career Caucasian female scientist

“People have more confidence in people who look like themselves.” —a mid-career American Indian female chemistry professor

“Many underprivileged students are forced to quit school in order to get a job and help support their family.” —a late-career Asian female chemistry professor

“I was told at one point that I was a token and that I would never make it. I knew I’d have to work extra hard to be three times as good to be respected. I wasn’t sure I could work hard enough.” —a mid-career Caucasian female scientist

“Brain power is not enough in this field. You have to be well prepared and in survivor mode. There is a lot of racism and discrimination. It’s important to build a rock solid support system inside and outside of the scientific community.” —an early-career African-American female chemist

#### **Childhood Experiences**

“Our schools are not adequately addressing science literacy and building the confidence of our young women and minorities. Many are not prepared to take on higher degrees.” —an early-career African-American female chemist

“There is a lack of encouragement in elementary school. You are seeing more of a focus now in middle school. The younger you get girls and minorities to see it’s okay to like science or math, the more likely they are to pursue it.” —a mid-career Caucasian female scientist

“Teachers shy away from science in elementary school. They usually only focus on reading and math.” —a mid-career Caucasian female scientist

“The effectiveness of schools really depends on the district. It depends on how much money the school has to pay their teachers and to provide hands-on experiences.” —an early-career Hispanic female chemist

“I always wanted to know how things worked. My parents did not believe in stereotypes and always encouraged my interests. They would buy me science kits and take me to science camps and other activities.” —a mid-career Caucasian female scientist

#### **STEM Education Barriers, Discouragement**

“My career choice was continuously challenged. People in my community could not understand why I would waste money on a Ph.D. instead of getting a job.” —a mid-career African-American male chemistry professor

“It’s harder for poorer minorities to get a good education. Typically only the elite white can afford to go to private schools.” —a mid-career American Indian female chemical engineer

“How effective a school is in science education really depends on the teachers. Not all teachers have appropriate backgrounds in science.” —a mid-career African-American male chemistry professor

“Poorer districts usually don’t offer lab experiments due to lack of funding and liability issues.” —a mid-career African-American male chemistry professor

“I think the lack of emphasis on science and math in the curriculum is particularly hard on minorities because they don’t have the exposure or are not being challenged at home.” —a mid-career African-American male chemistry professor

“There were certain communication barriers I had to overcome in graduate school. The expectation was that I wouldn’t do well and that I needed to be three times as good as everyone else. I had a lot of self-doubt. In order to build my confidence I had to build social relationships and gain the trust of my peers. Many women and minorities don’t survive because of the social aspect.” —an early-career African-American female chemist

“Money was an issue but it was available. You just had to know where to look.” —an early-career Hispanic female chemist

“Many minorities don’t know how to get scholarships. I learned about them in my high school career center and through the American Chemical Society in college.” —an early-career Hispanic female chemist

### **Positive, Motivational Forces**

“I have very specific memories of teachers in 4th grade and 10th grade who were especially supportive and provided extra work to challenge me.” —a mid-career American Indian male chemistry professor

“Even though I was interested in chemistry in high school, I started as a political science major in college. I discovered I loved chemistry while doing research. My chemistry professor gave me confidence and encouragement when I felt I didn’t have enough nerve to go on.” —a mid-career American Indian female chemical engineer

“Because my parents required that I had to do something academic and get paid, I spent many summers in a pre-science program working in a lab. We lived in a college town that was very active in science and intent on increasing minority programs.” —an early-career African-American female chemist

“I remember during my summer internships in college being told to introduce myself as a chemist not a student. This really gave me self-esteem.” —an early-career African-American female chemist

“I knew that I needed to set my goals high and achieve them. I made my own way. I sought scholarships and worked extra jobs to finance my education.” —an early-career Hispanic female chemist

### **Workplace Challenges**

“My organization lacks sensitivity to minorities. They don’t understand how diversity can make them a better organization and they don’t understand how to encourage it. The American Chemical Society has really helped support underrepresented minorities. They gave me the opportunity to be a leader that my organization never will.” —a mid-career American Indian female chemical engineer

“Everyone needs an incentive to stay in their career path. Unfortunately women and minorities only progress to a certain point in STEM careers. There is still a glass ceiling for us.” —a late-career Asian female chemistry professor

“Entrance positions are not a problem. But after the first 10 years of your career, women and minorities start losing ground with their peers. Small disadvantages and biases accumulate over time.” —a mid-career American Indian female chemistry professor

“We still have to overcome bias. We work extra hard to show knowledge and not be overlooked or be perceived as not worthy. There is a different type of managerial speak. We have a Hispanic leadership team at my organization to help new hires.” —an early-career Hispanic female chemist

### **The Road to Success**

“Mentoring is so important. You need to build friendly relationships and maintain those associations throughout your career.” —a mid-career Asian female chemist

“I feel very good about my life’s work. I’m giving back to the community, contributing to the future and making a better life for all.” —a mid-career American Indian male chemistry professor

### **Recommendations for Encouraging and Nurturing Girls and Minorities in STEM**

“Parents need to challenge their children to their talent and give them experiences.” —a mid-career African-American male chemistry professor

“Industry needs to play a heavy lever in defining what they want. They need to mandate that new hires be more prepared.” —an early-career African-American female chemist

“It’s not enough to teach science by reading from textbooks. The love and wonder of science need to be taught in creative ways.” —a mid-career Native American female chemical engineer

“Schools need to give equal opportunity to everyone and help students without a good background.” —a mid-career Caucasian female scientist

“Until we change our attitude, improvement is a mute point. We need to start early on in society and change the overall image of women and minorities and their career paths.” —a late-career Hispanic male chemist

“We need to generate the same sense of urgency to improve our country’s science literacy as there was in the 1960’s during the Sputnik era to help with our current generation of problems. We need to lay out a challenge for this country.” —a mid-career African-American male chemistry professor