

NCW 2007: The Many Faces of Chemistry

Career Profile: Biomedical Engineer

by Mae Jemison

Describe your present position.

I am the founder of BioSentient Corp., a medical devices company. We develop equipment that can be worn to wirelessly monitor the involuntary nervous system. I also founded an international science program called "The Earth We Share" under the non-profit Dorothy Jemison Foundation for Excellence. It's not my day job, it's my "for love of" job. In addition, my work on behalf of science literacy extends to having served as national spokesperson for Bayer Corporation's company-wide *Making Science Make Sense* program for the last 12 years. Finally, I sit on several corporate boards and chair a few Texas statewide technology groups.

Did you get to your present position because of your background in chemistry and area of specialization or did life experience(s) take you there?

My present work results from a confluence of events. My background in chemistry and engineering was important, but my experiences built on one another. It's the sum total that gets you there, not usually one or the other. I started college wanting to design artificial organs. In college I was told to go to the chemical engineering department; it was before biomedical engineering was a set field. Then I went to medical school to get the medical perspective. When I went overseas to work as a doctor in Sierra Leone and Liberia, I thought that it was just going to be a sideline in my career, but it turned out to be one of the more important things for later being chosen as an astronaut. I had to rely on myself 24 hours a day, 7 days a week, 365 days a year. That was very important to the astronaut program to have people who had "operational experience", to make decisions in real time and to rely on themselves. You'd be surprised where your path takes you and the things that become valuable.

As an astronaut, chemical engineering was incredibly important. Rocket fuels are made out of chemicals. Things we're concerned about in space flight, such as how do you protect people, how do you make materials that protect the shuttle and its equipment, are part of chemistry.

In what areas of chemistry did you specialize?

I'm a chemical engineer. I also went to medical school. And again, it was because I wanted to do biomedical engineering at a time when the field wasn't very well defined.

Do you use chemistry on a daily basis? Describe what you do on a day-to-day basis.

Chemistry is not just "I'm pouring stuff together in a test tube". It's understanding and analyzing the interaction of one substance with another one; a substance can be an actual material. My day-to-day work ranges from designing protocols to test the electronically-based equipment that we use, to designing clothing that carries the monitoring equipment so that people can wear it, like underwear, under a football uniform. It includes putting together a curriculum for our international science camp



Mae C. Jemison, the first African-American female U.S. astronaut.

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that requires me to draw on both chemistry and life sciences. I use chemistry on a day-to-day basis because I cook and make coffee—that's the important chemistry!

Describe the personal skills that have played an essential role in your present position.

Personal skills are things like "stick-to-it-iveness", but also knowing when to let things go. That's a hard lesson to learn. Also important are being open minded, being willing to explore the world from various facets, and realizing, as a friend told me, if you're bored it's your own fault, because the world is endlessly fascinating. Every subject that we encounter, every person that we encounter, has something of interest to us, something we can learn.

What advice do you have for those who wish to pursue this or some other nontraditional career path?

My advice to anyone is to do something that engages you and is fun. It doesn't mean "ha-ha", but that I can be fully engaged and pay attention to it. Don't be afraid to change. Folks often want you to do things they're comfortable with, so they can more easily define you. They want you to be a chemical engineer who does "x, y, and z". But if I had stayed a chemical engineer and did "x, y, and z" I never would have been in biomedical engineering. If others hadn't, it may not have developed as a field. The idea that you have to do something that's just along the beaten path is something you have to get out of your mind.

How and where can readers learn more about this type of career?

For information about the astronaut program, <http://nasa.gov> is a wonderful place to go. I wrote a book for 16-year-olds called *Find Where the Wind Goes: Moments from My Life*. It's about growing up and having interest in different things and perseverance. I talk about being an adult, but from the perspective of a 16-year-old.

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Biomedical Engineer, continued

Are there other thoughts or lessons learned that you would like to share with our readers?

People live up or down to your expectations. If we expect wonderful things from students and work with them, then

they're going to try their darnedest. If you truly expect wonderful things from yourself, you'll get there. A sense of humor is the best thing you can have. I know everyone says that because it's true. If you can't occasionally laugh at situations you find yourself in, then life might be awfully dreary and awfully tough.

Mae Jemison is the founder of BioSentient Corp., Houston, TX, and a former NASA astronaut; info@biosentient.com.

Related Resources

1. Jemison, Mae. *Find Where the Wind Goes: Moments from My Life*; Scholastic Press: New York, 2001.
2. Kelter, Paul B.; Snyder, William E.; Buchar, Constance S. Using NASA and the Space Program to Help High School and College Students Learn Chemistry. Parts I & II. *J. Chem. Educ.* 1987, 64, 60; 1987, 64, 228.

Editor's Notes

Unlike the other Career Profiles in this issue, Mae Jemison's is the result of an telephone interview, subsequently transcribed by JCE staff.

Additional information about Mae Jemison appears in the News from Online feature column that appears on pp1592–1594.