



Continuing the Family Business

As the youngest child in her family living in Uzbekistan, **Barno Sultanova** grew up hearing about chemistry from her father, brother, and sister, all of whom were chemists. The family also lived in the apartment block that belonged to the Institute of Cellulose Chemistry and Technology of the Academy of Sciences, where her neighbors would discuss their research within earshot of the young girl.

Seeing Beyond the Unpleasant

It was no surprise, therefore, that Barno felt inspired and encouraged to enter the “family business,” deciding to study organic and polymer chemistry. Specifically, her interests led her to study a substance called bacterial cellulose and the ways in which it can be used as a dressing for wounds. Cellulose is found abundantly in nature, particularly in plants. Bacteria, when they collect together, also produce cellulose to make what is known as a “biofilm.” When protected by their biofilm, bacteria become much more resilient to attack from disinfectants and antibiotics than individual bacteria existing alone.

Barno was interested in the idea that certain properties of bacterial cellulose make it a desirable wound covering. Bacterial cellulose allows oxygen and moisture to reach the damaged area and can also be made to contain antibiotics to help in the healing. Barno’s research is exploring the different properties of cellulose produced by strains of the *Acetobacter xylinum* bacterium and is trying to identify which forms work best for different types of wounds. Although she agrees that using bacterial products on wounds might be unpleasant to think about, she says the wound covering works well, and she hopes her final product will have “many medical and technical uses.”

On to Germany

When Barno started to study polymer chemistry, she realized that a wealth of new discoveries came from Germany. “Looking back in history, many discoveries in chemistry were due to German scientists—and so to study in Germany was my dream,” she says. Barno attended Tashkent State Pedagogical University in Uzbekistan’s capital of Tashkent. After completing her studies there in 1999, she joined the A.S. Sadykov Institute of Bioorganic Chemistry of the Academy of Sciences, also in Tashkent. At that time, she familiarized herself with the literature on bacterial cellulose, and in 2004 was awarded a fellowship to study at Hamburg University in Germany.

In 2006, after returning to Uzbekistan and receiving support from her government, she was excited to learn of the UNESCO-L’Oréal Fellowship she was to receive toward her doctoral studies. With this funding, Barno was able to return to Friedrich-Schiller University where she is currently working toward completing her Ph.D. by mid 2009.

Proud Role Model

Barno has made time along the way to raise two children, a son and a daughter, with the support of an “understanding man as my husband.” Barno says she is especially proud to be a role model for her children. “This summer when I was on holiday at home, I asked my son what he wanted to be when he grew up. He wasn’t entirely sure, but he said he liked mathematics and physics, and respects chemistry because of me,” she says. “This made me very happy.”

Perfecting Her Delivery

Barno has not been easily deterred by challenges in her life. In 2004, she decided she needed to improve her English. She sought and won a scholarship to study at the Central Institute of English and Foreign Languages in Hyderabad, India. Recently, in April 2008, Barno made her first trip to the United States to attend the American Chemical Society national meeting and to deliver an oral presentation there. “From the beginning, Barno worked very hard to perfect her delivery in English, and overcome many organizational and financial problems to attend,” says Dieter Klemm, her professor at the Friedrich-Schiller University. “It was her first presentation at a large meeting, and she did really well.”

Barno advises young women in science to try to seek a balance between work and family life, but to know that “you can achieve anything if you just have a dream.” Life can be difficult at times, especially for women who are expected to be many things to many people, she says, but “we just have to try to find our own form of internal motivation and overcome these difficulties.”



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