Revealing Nature's Pharmacopeia

By her own admission, **Farzana Shaheen** comes from a society with strong customs and limitations for women, where a woman's success in science "requires much effort, hard work and dedication." But Farzana has not let that deter her. Born in Rawalpindi, Pakistan, Farzana has pursued a single direction in her career with the precision of an archer's arrow. She is a "crazy and great scientist, who is determined about her work, sometimes spending long hours in the lab to complete her experiments," says Sohail Gagai, a guardian who has helped support her in her studies, living in Karachi, Pakistan. "She is not afraid of any obstacle in life, and she seems to love what she does," he adds.

Growing up in Pakistan, Farzana earned undergraduate and graduate degrees at the Quaid-i-Azam University, in the capital city of Islamabad. She then pursued her Ph.D. in natural product chemistry at the University of Karachi under the supervision of M. Iqbal Choudhary, graduating in March 2000. According to Farzana, Choudhary, along with other professors, was a great support to her as she tried to make a name for herself in such a male-dominated field.

Plant Medicine

Farzana's research has sought to root out compounds in nature that may be used to treat human diseases. While working on her doctoral degree, Farzana identified potent substances from traditional medicinal plants that could potentially prevent convulsions in epilepsy. "So far, only preventive medicines exist for epilepsy, but none of them cures the underlying disorder and the disease prevails for the entire life of the patient," she says. According to Farzana, the available antiepileptic drugs are also associated with severe side effects when used over the long term. She hopes that the compounds she has identified may provide an alternative treatment option for these patients.

After graduating with her Ph.D. in 2001, Farzana was appointed as an assistant professor of organic chemistry at the H.E.J. Research Institute. The UNESCO-L'Oréal Fellowship she received allowed her to travel to the United Kingdom in 2005 to work with Arasu Ganesan at the University of Southampton. This was her first experience working abroad. "There I worked on many small projects and learned synthetic organic chemistry," she says. During that time, Farzana was also able to synthesize some of the antiepileptic products that she had identified during her doctoral research, moving her research forward significantly.

Working with Peace of Mind

As it has a habit of doing, family life intervened at the time Farzana was about to travel abroad. She gave birth to her first child right before leaving for the University of Southampton. She credits her understanding husband Zahuri Abdul Rauf, who "allowed me to work there with peace of mind," for helping her with this task. Now she continues to balance her career and family life, with her son, who is now four years old, as well as a one-year-old daughter.

Combine and Conquer

Recently, Farzana won a Fulbright Scholarship for 2008-2009 to work with Kit S. Lam at the University of California, Davis. Working with one of the foremost experts in the field, Farzana is learning advanced combinatorial chemistry, which describes the process of bringing together the active parts of different molecules to come up with the best and most effective combination. She is using these powerful and novel techniques to build a collection of agents that can be tested for possible use in treating a wide variety of diseases.

To date, Farzana has one US patent, for a synthetic antiepileptic compound, and 35 publications in international journals under her belt. She also supervises six graduate-level students at the H.E.J. Research Institute of Chemistry in Pakistan. Currently, Farzana is applying combinatorial chemistry techniques to identify molecules that can potentially stop cancer in its tracks.

She plans to return home to Pakistan soon to apply what she has learned. According to Farzana, it is important to love what you do and think positively. "You can get your inspiration from thinking about the things you are doing for this world, and the benefits that may come from your research and discoveries."

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