

EMORYPROFILE PARASKEVI GIANNAKAKOU

NO TRANSLATION
needed

BY ERIC RANGUS

A common pharmacore for epothilone and taxanes.
"p53 is associated with cellular microtubules and is transported to the nucleus by dynein."

The titles of the above articles give nothing away regarding their content. In fact, their very intimidating vocabulary would frighten away many readers—except for maybe a cancer researcher, who would quickly scour the pieces for the latest information on commonalities between taxanes (a family of effective chemotherapy drugs that unfortunately can lose effectiveness when patients become resistant) and epothilones, a newer, more versatile type of chemotherapy drug (the first article).

Or how p53, a tumor-suppressor protein that becomes inactive in many cancers, moves from a cell's cytoplasm to its nucleus along microtubules—which form a cell's skeleton, basically—using a protein called dynein, and how cancer cells can disrupt this sensitive process by damaging the microtubules (the second article).

Perhaps the best way to decipher these pieces is to ask the primary author of each, Paraskevi Giannakakou of the Winship Cancer Institute.

"p53 is inactive in almost 50 percent of tumors in the clinic," said Giannakakou, assistant professor of hematology/oncology and pharmacology in the Winship Cancer Institute. The article on p53 was published in last October's *Nature Cell Biology*, one month before Giannakakou came to Emory. At the time, she was finishing a postdoctoral fellowship at the National Cancer Institute (NCI) in Bethesda, Md.

"When it is inactive, there is no tumor suppression, and the tumor can go on," she continued. "p53, to be active, has to go from the cytoplasm to the nucleus, where it binds DNA and activates genes leading to growth arrest and apoptosis. If it is mutating, it can go to the nucleus, but it cannot bind DNA."

Researchers, however, had never known how p53 traveled from a cell's cytoplasm to its nucleus—until Giannakakou found out.

"I investigated the potential interaction with the microtubule cytoskeleton because I thought maybe microtubules would be the tracks on which p53 traffics to translocate to the nucleus," she said. Which is exactly the case.

The finding is significant because anti-cancer agents attack microtubule networks in the process of killing cancer cells.

Giannakakou joined the Winship Cancer Institute last November after finishing her NCI fellowship. She earned her PhD jointly from NCI and the University of Athens in her native Greece, which is where she received her bachelor's degree in pharmacology.

"I always wanted to do cancer research," said Giannakakou, who goes by "Evi" to her friends and co-workers. She speaks English fluently but retains a distinctive Greek accent.

"In particular I was interested in the development of drug resistance in cancer. We know, for example, that very often patients respond to cancer chemotherapy, and later on they fail because they have become resistant to the chemotherapy agents. So one way to make cancer chemotherapy more effective is to understand the mechanism in which drug resistance arises and try to find the ways to overcome [it]."

Just 33, quite young for a top-level cancer researcher, Giannakakou has progressed rapidly in her field and is a leading authority in the molecular investigation of drug resistance to cancer. Giannakakou knew early in her career that, to make an impact, she might have to move away from home.

"When I started my Ph.D in Greece [in 1993], after the first year I realized I hadn't had the opportunity to be exposed to cutting-edge molecular biology techniques," Giannakakou said.

"So I looked at [other] labs in Europe and the U.S. that were dealing with drug resistance in cancer. I did some research, pulled some names and wrote letters. I came to the U.S. for some interviews, and NCI was the most appealing."

In many ways, a move to Emory following her postdoc was ideal. Giannakakou is a translational researcher, a type of study that seeks to apply new scientific understanding directly to clinical care. It is one of Winship's guiding philosophies and a type of research strongly supported by its director, Jonathon Simons.

"Jonathon wanted to make [Winship] a translational cancer research center, and that was a big attraction for me," Giannakakou said. "The environment here is becoming more and more exciting, with a lot of new recruiting. That will make this environment very intellectually stimulating."

The fact that Emory had offered Giannakakou's husband,

Dimitris Papanicolau, an assistant professorship in endocrinology played a role in Giannakakou's move to Atlanta, as well. The two met in Bethesda in 1995 when Papanicolau, another Greek native, was a fellow at the International Institute of Child and Human Development. They married in 1999.

Upon first looking at Emory Giannakakou contacted associate professor Margaret Offermann, who suggested she send her vitae to Simons. An interview followed, and Simons—who was impressed with Giannakakou's work—invited her to give a presentation at Winship where she met some of the faculty. Soon she was offered her professorship.

"It was amazing, because I had not heard of the Winship Cancer Institute before, and I don't think the positions were advertised extensively," Giannakakou said.

She now runs a lab that has swelled to six researchers over

the summer. This fall, after summer interns depart, it will drop back down to about four.

"I never intended to stay [in this country]," Giannakakou said. "I wanted to come, do the work for my thesis, then go back. But I love research so much, and when I saw the kind of research I could do here, it was impossible for me to go back."

Giannakakou has traveled the world attending conferences (upcoming journeys include trips to France, Switzerland and Poland) and she speaks four languages: French and Italian, in addition to English and her native Greek. But in her line of work, knowing English is essential since all of the jargon is English-based, she said.

"English is the universal language," Giannakakou said. "Any researcher in any given country needs to know English in order to keep up with the literature and publish."

"It's an easy language to learn," she continued. "Compared to Greek, at least."



Ann Borden

The Winship Cancer Institute's Paraskevi Giannakakou, is a leading authority in the molecular investigation of the body's resistance to cancer drugs. The type of cutting-edge research she can perform in the U.S. drew her away from her native Greece.

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