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Biophysicist in Profile

Ana Maria Gomez

For Ana Maria Gomez, Director of Research at U-637 INSERM, France, becoming a research scientist was a dream-come-true. Born in Toledo, Spain, she was an inquisitive child who needed to know how to fix things that did not work. Attracted to biology and chemistry and educated in a Catholic school, she wanted to use her abilities for the welfare of people—but not as a physician. By age 13, she decided to pursue pharmacology.

She also liked electricity and helped her dad do electrical repairs. Her play included opening batteries (hidden from her parents) and creating chemical reactions. “Early in my life I wanted to do research,” she says, “but at the same time I heard everywhere that it was something very difficult and somehow I thought that it was more of a dream.”

Her parents supported her dream as she studied pharmacology at the Universidad Complutense de Madrid. Her PhD advisor, *Carmen Delgado*, who remains as a tenured scientist in the Department of Pharmacology at UCM’s School of Medicine, offered work with electrophysiology in cardiac hypertrophy. She was excited by the project, as the heart had been her predilection organ in physiology and pharmacology. Delgado recalls, “These were years of hard work mixed with fun and amusement. Ana is a very intelligent person who dedicated herself passionately to scientific research while maintaining her willingness to help others.”

In Delgado’s lab, Gomez learned patch-clamp and membrane electrophysiology. “I liked what I saw the first time I laid eyes on the setup with all those electrical cables.”

During three months spent in a French laboratory with which Delgado collaborated on a human cardiac hypertrophy project, Gomez saw something else she liked: her future husband, *Jean-Pierre Benitah*, who was also working on his PhD.

Gomez and Benitah decided to do their postdocs in the USA. They chose Baltimore, where they could work in separate labs strong in their interest areas, he at the Johns Hopkins University and she at the University of Maryland in the lab of *Jon Lederer*, who is still there, now as Director of the Biotechnology Institute. Gomez was interested in Lederer’s work on transient inward current, a proarrhythmogenic current dependent on intracellular calcium. His own interest was not in pathology or hypertrophy, but she accepted, thinking that she could apply what she learned to hypertrophy when she returned to Europe. Yet Lederer did allow her to do this work in his lab. They identified a defect in excitation-contraction coupling in heart failure, and the results of calcium

sparks in cardiac hypertrophy and heart failure were published in *Science*.

Working in an American lab was difficult at first, because her English language skills were not strong. She enjoyed the melting pot of cultures, though, with lab colleagues from the USA, China, India, Puerto Rico, Japan, and the United Kingdom. Outside the lab, she had to learn how to be safe in a city where crime was high. She did adapt and enjoyed her work, friends and visiting Baltimore and other East Coast tourist sites. "I was a bit sad to leave, because I was very much enjoying the American life and the scientific life in the lab."

With her goal of returning to Europe, Gomez tried for a position at CNRS (National Center for Scientific Research) that she was told would be difficult for a foreigner to attain, as the jobs were decided by an external committee in a national contest in Paris once each year. She won her dream researcher position on her first try and accepting an offer she couldn't refuse, she and her husband moved to Montpellier in southern France.

Gomez set up a lab unique in France for cardiac myocytes, with a confocal microscope synchronized with patch-clamp equipment. She also installed a chamber to record intracellular calcium signaling in the whole living heart, utilizing two-photon microscopy - the first to use this approach to study pathological hearts.

Last year she was awarded a Director of Research position at Inserm, the French counterpart of the US-based National Institutes of Health, again on her first try. She says that collaboration with other scientists across the world using complementary techniques to analyze the same problem helps her avoid becoming narrow-minded in the biophysics field, while also allowing her to enjoy and be enriched by traveling and encountering new cultures. Travel is a rare pleasure, because she doesn't get out of the lab much, but not only because science is a very self-involving job. "Most of us do not consider science a job; it is more of a passion."

Laetitia Pereira, currently doing a postdoc in pharmacology in Donald Bers' lab at the University of California, Davis, School of Medicine, credits Gomez with influencing her career in biophysics. She notes, "Her forthcoming and patient advice on both professional and personal matters was invaluable in guiding me through my PhD."

Once interested mainly in finding out what was different in cardiac disease, Gomez is now more interested in the involved mechanisms. She works in three main project areas: the physiologic and pathologic function of a recently discovered protein, Epac; cardiovascular complications of type-2 diabetes, and determining the mechanisms of sudden death in children and young adults from a rare disease due to mutations in the calcium release channel. She collaborates with a cardiologist with family members with this disease, the first of whom died at age fourteen while playing soccer.

Gomez reminds beginning scientists that progress is sometimes slow, but good work always pays. When success does come, she cautions, "Keep your feet on earth: do not think of yourself as too important, but respect other scientists and learn from them. Sometimes it is easy to be blinded by the glory and forget that we all work for the advancement of science, and so we serve the community."



Gomez and her two-year-old son in the Pyrenees.