

[<< back](#) 

1997

Graciela Candelas

Graciela Candelas has an international perspective on life and work. She has homes in both Puerto Rico and Woods Hole, Massachusetts, and collaborates with scientists not only in the U.S., but also in Europe and India.

Candelas was born in Puerto Rico, but her family lived in New York during her early childhood while her father earned his Ph.D. at New York University. During her time in New York, Candelas went to PS 1 in Long Island City. She returned to Puerto Rico when she was four and has spent most of her life there, but she travels throughout the world each year.

Candelas describes her childhood as "wonderful." Her father, Teobaldo Casinova, was a statistical psychologist who encouraged each of his three daughters to pursue science. He assured his children that they would "get the humanities at home" and that they should all concentrate on science education in school. Candelas and both her sisters did just that. Candelas and her sister Ileana both teach and conduct research at the University of Puerto Rico, Graciela in Biology and Ileana in Organic Chemistry. Graciela, who is the eldest of the three sisters, claims she became a scientist "by tradition because science was a big part of my childhood."

Completing her secondary education at a private girls' school in San Juan, Candelas then went to the University of Puerto Rico for her undergraduate degree. Following college, she moved to North Carolina with her husband, Gustavo Candelas, who was a visiting professor at Duke University. Candelas began her masters in biology at Duke University in 1957. By the time she finished her degree, she had three children, Gustavo, Carmen, and Teresa. In 1964 she decided to complete her Ph.D. at the University of Miami because it was close to home. They gave her credit for the courses she took at Duke and she primarily wrote her thesis there, on protein synthesis in sea urchin eggs.

After completing her Masters degree, Candelas went back to Puerto Rico in 1959 where her husband had just been appointed chairman of the biology department, at the University of Puerto Rico. She took this opportunity to "pioneer" cell biology in her country: "I formed the first course in Cell Biology at the university, and I brought the first ultracentrifuge to the island," she recalls.

Candelas claims that her island laboratory is "the most beautiful in the world. It is also a fully equipped state of the art facility." The lab is concerned with gene research, fingerprinting, monoclonal antibodies, and histology. The lab was originally funded through the NIH Research Centers for Minority Institutions Program. Candelas' early work looked at protein synthesis in sea urchins and epidermal mitosis, but her focus has since shifted to another model system. "I decided I needed my own model systems and began to look at organisms that produced proteins in large amounts," she explains. This work led her to look at spiders that have several sets of glands, each of which produce fibroins. While others in the field are interested in the nature of the fibers that the spiders produce, one of which is one of the strongest of natural fibers, Candelas is exploring one pair of glands as a model system with synthesis of a large sequentory protein. She explains that her lab conducts time sequence studies by "confining the spiders in a limited space and depriving them of food, which depresses the fibroin synthesis of the glands to base levels. If the glands are subsequently depleted of their stored silks, within 90 minutes the glands generate dramatic levels of fibroin." During these experiments, the glands produce protein in huge amounts, allowing Candelas and her colleagues to easily monitor the progress through time course studies. Karen Sprague of the University of Oregon, whose work is related to that of Candelas, calls research in the Puerto Rico lab "fascinating," and notes that the mechanism the spiders use to produce RNA is interesting and important.

At 74 years old, Candelas continues to teach, perform research, and guide her students. She is extremely proud of the quality of students at the University of Puerto Rico: "I have mentored a tremendous number of students over the years and they are very good." Among them is her own daughter Teresa, who is an Assistant Professor of Biological Science and works with Candelas in her lab as a fellow teacher and researcher. Candelas says she and her daughter have a very good relationship and that they enjoy working together. Her other daughter, Carmen, is the academic coordinator at a school for special children. Candelas loves teaching and continues to teach an undergraduate course every other semester. In addition to her graduate students, she has ten undergraduates working in her lab, all of whom she hopes to inspire to go into science.

Conchita Zuazaga, Director of the Neurobiology Institute in San Juan, and a former student of Candelas, describes Candelas as a "mentor and outstanding teacher." She says that Candelas "was my teacher in the freshman Biology course I took 37 years ago, and has served as my role model ever since. She is still teaching with the same enthusiasm and devotion she showed many years ago." Candelas strongly identifies with her role as academic mentor, to the point that she encourages her own students to follow her academic footsteps.

Candelas has been an active member of the ASCB for many years. "I go back to the days of Dan Mazia who was an adopted mentor." Mazia, who recently died, encouraged Candelas to get involved with the Society. In 1975 the ASCB Annual Meeting was held in San Juan, and she was asked by then-President George Pappas to chair the Local Arrangements Committee. With no shortage of modesty, Candelas says, "people will tell you it was the best meeting ever. According to Nancy Bucher, there were no letters of complaints afterwards." She goes on to recall the meeting where "the annual reception was held at one of the military forts built before the Pilgrims came to the U.S. It was illuminated for the occasion, and we had a local orchestra playing native music. We had young scientists meeting the members at the airport to bring them to the hotel. The only problem was that people were distracted by the beach." Candelas continues to be active in the ASCB by bringing at least three and sometimes as many as eleven students to the Annual Meeting each year.

Candelas still collaborates with scientists working with spiders, bringing her to exotic places such as Crete, France, and India. She also owns a house in Woods Hole, where she still goes every summer. "My son, Gustavo, who has a graphic design business in Arlington, Massachusetts, uses the house on weekends when I am not there." After "falling in love with the MBL" and making many friends in Woods Hole, she decided to go back each year to use the top quality laboratory facility, keep up with the research, and maintain relationships with her colleagues. "It's a fabulous place," she explains "there are lectures, people work all hours of the day, and there are parties all the time."

Outside work, Candelas continues her father's artistic tradition. She and her husband collect prints from artists all over the world. She goes frequently to the theater in New York City, attending both dramas and musicals. Candelas has also devoted significant time to cultivating local art. She is president of the San Juan Art Students League. She enjoys playing the piano, and her favorite pastime is snorkeling among the coral reefs. Notwithstanding her frequent travel, Candelas is always happy to return to her native San Juan.