



IN MEMORIAM

John Gaetano Forte
Professor of Molecular and Cell Biology
UC Berkeley
1934-2012

John Forte, a pioneer in studying the acid-secreting gastric parietal cell, mentor to scores of aspiring scientists and physicians, teacher to thousands of biology and physiology students, and devoted husband, father, and grandfather, died November 19, 2012, after a long battle with leukemia. John was a Professor of Cell and Developmental Biology in the Department of Molecular and Cell Biology at the University of California, Berkeley. He is survived by his loving wife of 51 years, Trudy, who was also his colleague and collaborator at UC Berkeley; his daughters, Michele Ramos (Marcelio), Susan McElhany (Clay); son John (Nicole), and grandchildren, Marcel, Gaetano, Giovanna, Fiona, Peter, Rafael, and Stuart.

John was a world-renowned investigator of gastric physiology and teacher of physiology for undergraduate, graduate and postdoctoral students over the course of a 47-year career at Berkeley. John had important and wide-ranging impacts in both his research and teaching. He was the antithesis to Leo Durocher's "good guys finish last," and was a great example of a good guy actually finishing first, as illustrated when someone who knew John in graduate school was overheard muttering after visiting John, "Wow, we never thought that he would amount to anything because he was too nice."

John was born and spent his childhood in Philadelphia, PA, and attended Valley Forge Military Academy for high school. He completed the A.B. degree from Johns Hopkins University in 1956. He was an outstanding student and athlete, playing football and serving as captain of the fencing team at Hopkins.

John earned the Ph.D. degree in 1961 from the University of Pennsylvania, where he studied the metabolic requirements for acid secretion by the parietal cell of the frog stomach with Professor R.E. Davies. He also met Trudy, the love of his life. They moved to Berkeley in 1965, and he joined the Department of Physiology and Anatomy, rising through the ranks to full professor in 1974. He also served as chair of the Department of Physiology and Anatomy from 1972 to 1978.

One of John's most important scientific contributions was his identification of a unique potassium-activated ATPase (H,K-ATPase) in the membranes of parietal cells of the stomach. It is the pump that is responsible for generating the highly acidic stomach secretions. He and his collaborators then used clever biochemical assays to define how this unique ATPase of the parietal cell operated as a K⁺-activated ATPase quite similarly to the Na,K-ATPase and Ca-ATPase found in other membranes of most cells in the body. These and later studies led to our present treatments for ulcers and acid reflux disease. John's work is testimony to the success of the pursuit of basic physiology and cell biology in providing insights that have major ramifications for health care.

Another groundbreaking area was his (and Trudy's) use of electron microscopy to study acid secretion. Clever developmental studies on frog stomachs showed that cytosolic, membrane-bound vesicles (tubulovesicles) in parietal cells were the location of the acid pumps. Time-course studies on piglet stomachs showed that activation of the acid secretory apparatus involved massive fusion of H,K-ATPase-localized tubulovesicles with the apical membrane, and return to resting conditions involved retraction of the apical membrane combined with endocytic reformation of tubulovesicles inside the cells. These findings were codified in John's membrane recycling hypothesis for parietal cell secretion that was published in the journal *Gastroenterology* in 1977, presciently ushering in a cell biological approach to studying parietal cell physiology.

John received nearly all of the major awards in the field of gastrointestinal physiology. Among them are a Guggenheim Fellowship, Honorary Membership in the British Society of Gastroenterology, the William Beaumont Prize from the American Gastroenterology Association, the Distinguished Achievement Award from the American Gastroenterology Association, the Horace Davenport Distinguished Lecturer from the American Physiological Society, the Sheikh Hamdan Award for Excellence in Medical Sciences and a National Merit Award from the National Institutes of Health (NIH). The NIH funded John's research continuously for a remarkable 45 years. John also provided important service to the field as an editor of several books, an editorial board member of several journals, a grant reviewer for NIH, and as an organizer of many international meetings.

John was a dedicated teacher of undergraduate students. He wrote highly innovative and effective syllabi to accompany all of his lectures in Human Physiology. He also generated and perfected exercises for the undergraduate student laboratories. In his later years John was a popular lecturer in the 600-student Biology 1A course. He was fond of his videos used for teaching, with soundtracks, including one of macrophages killing bacteria to the sounds of the BeeGee's "Stayin' Alive." John received numerous awards for his teaching and mentoring at Berkeley.

John was a highly effective research mentor for postdoctoral, graduate, and undergraduate students. He was smart, rigorous, innovative, insightful, and great at seeing the big picture. He was also patient, supportive, warm, loyal, generous, optimistic, and a great listener, a terrific combination of mentoring qualities that was also always extended to other young scientists in the field.

His mentoring was enhanced by his obvious joy in working in the laboratory himself (a real lab rat), ranging from biochemistry to microscopy. It was common that all of these approaches would operate simultaneously in his lab, and the breadth and depth of his understanding of it all was remarkable, like a maestro conducting an orchestra to his favorite opera. He was always excited to generate new methods and apparatus and to perform experiments. Lab meetings were held at a pizza joint with pitchers of beer and were book-ended by discussions of experimental results during the walk to and from the restaurant. Even during his last days in the hospital, John was still discussing his latest ideas about the model he, Jim Crothers and Bob Macey have developed to describe the integrated activities of ion channels and pumps in parietal cells in the gastric glands of the intact stomach.

John was a big man who filled the room physically and spiritually. Perhaps that is why we will feel his absence all the more acutely. Yet for all of his physical presence, most will always remember him for a feeling of welcome that was apparent from the first introduction. His smile and his laugh could fill the room. He lectured with the fervor of a fiery preacher, grabbing your collars and showing you what really excited him. One of his most endearing qualities was that he loved talking, discussing, and arguing about the parietal cell with friends, resulting in many, many conversations that always included a great deal of laughter and good feelings. For decades, John actively led the academic discourse on parietal cell biology and was the social and intellectual force behind the yearly gathering of the Parietal Cell Club at the American Physiological Society. John always ensured that new and young investigators were encouraged to enter and expand the conversations. After these gatherings of the parietal cell cognoscenti, John spearheaded a continuation of these discussions at a bar or restaurant. At scientific meetings all over the world, John and his friends were almost always the last to straggle out.

As is likely evident, John was a kind and generous man who had many friends. John and Trudy loved to travel abroad, often with their three children in tow, exploring new places and reacquainting themselves with those whom they had previously visited. They were also wonderful hosts. Many students, colleagues, and friends visited their charming home in Berkeley over the years. John and Trudy's Sea Ranch home on the northern California coast was another delightful gathering place. When John took his friends out to hunt wild

mushrooms at Sea Ranch, they quickly learned that science was not his only keen interest. John was also a devoted and active member of the St. Mary Magdalen Parish in Berkeley. A supporter of local performing arts, he enjoyed lending his baritone voice to the UC Berkeley Monks Faculty Choir and church choir. He expressed other creative talents through carvings and furniture woodworking, performing home repairs for his children and attending to the extensive “garden” in the fields of his Sea Ranch home.

What a privilege and luxury it was to have John as a colleague and friend! Those of us whose lives were enriched by him will always fondly remember all of our interactions with him, and we, and the field, will sorely miss him.

Terry Machen
Curtis Okamoto
Catherine Chew
Jim Goldenring