

George L. Drusano, MD

RECIPIENT OF THE 2012 MAXWELL FINLAND AWARD FOR SCIENTIFIC ACHIEVEMENT

For his groundbreaking work in anti-infective pharmacology and antimicrobial resistance, Dr. George L. Drusano, MD is the recipient of the 2012 Maxwell Finland Award for Scientific Achievement.

In the words of Dr. Paul G. Ambrose, President of the Institute for Clinical Pharmacodynamics, George Drusano is a distinguished scholar and scientist who “helped redefine infectious disease chemotherapy as we know it today.”

As with many pioneering scientists throughout history, Dr. Ambrose says, Dr. Drusano, “despite skepticism from some notable contemporaries, has succeeded in pushing back the darkness with the light of knowledge. I feel much the same way I imagine Sir Isaac Newton did when he said ‘If I saw further than others, it is because I was standing on the shoulders of giants.’ George L. Drusano, MD, is such a giant and as deserving as anyone I can think of for the 2012 Maxwell Finland Award.”

George Drusano was born in Baltimore in 1949 and grew up there. “My childhood was more than a bit unusual,” says Drusano, who wryly describes himself as “the world’s only Italian Catholic only child!”

His mother stayed at home to raise him. His father worked for the City of Baltimore as a municipal explosives expert. This also was a bit unusual, Drusano says, “in that Dad had an eighth-grade education but the job required calculations employing solid trigonometry, which he taught himself.” In his later years, Drusano’s father was Senior City Street Inspector for Baltimore.

“Although undereducated,” Dr. Drusano says, “both my parents were highly insistent that I obtain an excellent edu-

cation. To that end, Dad started volunteering at the local Jesuit high school, Loyola High School, so that I could attend there. This was necessary because of the tuition, which was \$400 per year in 1963 and well beyond the family’s means. I received a marvelous education there. Later, I applied to and was accepted at both Johns Hopkins University and Boston College. I shocked everyone by attending BC, as I felt that my personal growth necessitated my going out of Baltimore.”

In 1971, Dr. Drusano received a bachelor of science degree from Boston College. “While at BC, I was a physics major,” he recalls. “Strangely, I put this down to Walt Disney. As a child, I loved the science aspects of things on ‘The Wonderful World of Disney’ and can still remember watching the great explanation of nuclear chain reaction: a whole room of ping pong balls set on mouse traps and then throwing in a neutron—another ping pong ball—and watching the fun begin.”

In the same vein, he says, “I actually read the comic book *Donald Duck in Mathemagic Land*, which should explain a lot of things to my colleagues.” He graduated from Boston College as Scholar of the College of Arts and Sciences for Physics, but, he says, “I looked at my future field—theoretical high energy particle mechanics—and realized that it was a lot like singing opera: There are tens of thousands of people who do it extraordinarily well, but about four actually make a living at it.” He adds, “Hence, on to medical school!”

In 1975, Dr. Drusano received a medical degree from the University of Maryland. While in medical school, he says, “my future life was hijacked by two individuals. From the first time I met Dr. Theodore E. Woodward, Chairman of

Medicine and a founding member of the Infectious Diseases Society of America, I knew he was a great role model. In my sophomore year, Dr. Richard Hornick became my Physical Diagnosis instructor. From then on, I knew I was bound for a career in infectious diseases.”

Also around this time, Dr. Drusano says his “mathematical bent” also came into focus. “A classmate of mine and I became fascinated by the chemotherapy problem of treating endocarditis, which prompted a mathematical model for drug penetration into vegetations with a link model for organism death, all roundly ignored. However, my foot was now on my future path.”

After a chief residency position at the University of Maryland Hospital and then serving as a Professor of Medicine there, he took a professorial job in 1992 at the Albany Medical Center Hospital. Today he is director of clinical pharmacology and associate director of the Clinical Research Institute at Albany Medical College. He is a fellow of both the Infectious Diseases Society of America and the American Academy of Microbiology.

In 1991 Dr. Drusano received the Rhone-Poulenc Award at the International Congress of Chemotherapy for his innovative research with fluoroquinolones. And in 1998 he was awarded the American Society of Health System Pharmacy Research and Education Foundation Drug Therapy Research Award for outstanding contributions to the scientific pharmaceutical literature.

Over the years, he has served on the program committee of the Interscience Conference on Antimicrobial Agents and Chemotherapy and as the pharmacology editor for the journal *Antimicrobial Agents and Chemotherapy*. In 2000–2002 he was president of the International Society for Anti-Infective Pharmacology.



Dr. John S. Bradley, Division of Infectious Diseases, University of California, San Diego, says, “Not only is Dr. Drusano an accomplished clinician, but he has the gift of being able to see patients exposed to microbes as more than just single patients, or a cohort of patients in aggregate, but to see them in terms of statistical populations with respect to the ways in which pathogens ‘see’ antimicrobials at the site of infection, and how they respond to such exposure. He adds that Dr. Drusano “mathematically has been able to describe these exposures as virtually no one has ever done before, and correlates them with responses to therapies given a distribution of pathogen susceptibilities from patient isolates, which he has

also viewed as mathematical populations.”

His “career-long drive is to harness the power of statistical analyses and modeling for the benefit of entire populations of patients, as well as each single patient, and he has contributed immensely to patient care in ways that we cannot even now fully appreciate,” Dr. Bradley says.

Another colleague, Dr. William A. Craig, University of Wisconsin School of Medicine and Public Health enu-

merates Dr. Drusano's salient contributions to the field of antimicrobial pharmacology. He says that Dr. Drusano was the first scientist to (1) introduce major statistical models for analyzing pharmacologic data; (2) apply Monte Carlo simulation—which expands the variation observed in relatively small patient populations to the variation that would be observed in larger populations—for identifying effective doses and clinical breakpoints and; (3) examine and validate the ability of certain pharmacokinetic/pharmacodynamic magnitudes to select and suppress resistant strains of bacteria.

Dr. Robert C. Moellering, Jr., the Shields Warren-Mallinckrodt Professor of Medical Research at Harvard Medical School, and the 2006 Maxwell Finland Award awardee, says that Dr. Drusano “is one of the brightest individuals I know. He has an encyclopedic knowledge of medicine and science which he has applied very effectively to create important new knowledge. Along with Bill Craig, he has essentially taken the formerly staid and narrowly focused science of pharmacology and converted it into a dynamic discipline now assuming increasing importance in drug development and therapeutic applications.”

Dr. Drusano's insightful and innovative work, Dr. Moellering says, “represents classical ‘bench-to-bedside’ research which has had a major impact on the way we presently dose antibiotics in the clinical setting. It has taken pharmacology from a largely empiric process 20 years ago to a discipline which allows us to predict with considerable certainty which doses and dosing regimens are likely to provide optimal benefit and minimal toxicity to patients.”

It is clear, he says, “that George Drusano has made major contributions to and has literally revolutionized the field of pharmacology.”

Currently, Dr. Drusano says, “my family life is settled. Marianne, my PLSS (Poor Long-Suffering Spouse) and I have been married for 38 continuous years—as she always reminds me, eight of the happiest years of her life, but she will not tell me which eight!”

The Drusanos have three children: George Jr., known as “Chip,” Michael, and Stephen. Michael has just finished his residency in Family Medicine and is in practice in Florida. Steve works at an ad agency in New York City. Chip, Dr. Drusano says, “is our special needs child, with severe Asperger's Syndrome. He is Marianne's success story, as he was supposed to be institutionalized when young, an outcome she simply refused to accept. She has worked tirelessly for the last 33 years with Chip. He is currently living independently and is engaged in a culinary program—with about eight credits to go—and makes the world's best baklava!”

When at home, Drusano likes to read “trashy adventure novels, listen to classical music, watch bad adventure films and comedies, and play with our Schnauzer, Otto.” In the future, he says, “I really foresee a retirement where we move to a city with good universities, Boston comes to mind, where I can audit all the courses I didn't take the first time around, such as music appreciation, art appreciation, second level western civilization, astronomy, etcetera, and be the oldster at the back of the classroom giving *agita* to at least one tenured full professor per semester.”

When George Drusano is asked what drives him to wake up every morning and continue his pioneering work, he says, “Remember ‘The A Team’ on TV? When a similar question was asked of Colonel Hannibal Smith—the leader of the A Team—he said ‘I do it for the jazz.’ Other than my family, I have discovered nothing in life that compares with the feeling of finding something that you know will translate into life saving therapies for seriously infected patients. I really get ‘jazzed’.”