



Biophysical Society

9650 Rockville Pike
Bethesda, Maryland 20814-3998
Tel: 301-634-7114; Fax: 301-634-7133
E-mail: society@biophysics.org
<http://www.biophysics.org/>

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Biophysicist in Profile



Carmen Mannella

Carmen Mannella believes that the next decade will be a defining one in scientific and philosophical ways. "We're approaching the point where we can start to effect changes in the species by genetic manipulation," he says, "but just because scientists might have the ability to effect changes doesn't mean we're the ones who should decide which types of changes might be considered."

"The fact that we're making rapid progress is good," Carmen explains, but he would like people to take the time to integrate what everything means and try to understand the bigger picture. "To some extent I would like to be able to say slow down, but you can't. Progress is what it is. Things are moving fast and you just have to work harder to keep up."

And work hard he does. Mannella is currently Division Director of Molecular Medicine at Wadsworth Center in Albany, New York, professor at the School of Public Health at SUNY Albany, and an adjunct professor at Rensselaer Polytechnic Institute.

Mannella was born in Buffalo, New York, on June 15, 1947, to Patrick and Nicolina, neither of whom were scientists. Patrick was a factory worker, and

Nicolina a homemaker with a love of music and cooking. Mannella's three brothers and one sister did not pursue science, but he cannot remember a time when he was not "fascinated by how things work." In addition to his regular course work, Mannella participated on the debate team in high school, where he learned the value of intellectual combat and the importance of communication, a skill he feels is essential in the scientific field.

After high school, Mannella attended Canisius College, where he studied physics as well as the classics. During the summer between his junior and senior year, he participated in an NSF-funded internship that focused on membrane biophysics. The experience, he says, "opened a new world to me because I had never thought of anything bigger than an atom. Now all of a sudden you had all these complicated molecules forming higher order structures that had predictable physical properties. All of a sudden I was a biophysicist."

After graduating with a BS in physics, Mannella earned a PhD in biophysics at the University of Pennsylvania Johnson Foundation. There he worked in the lab of Walter Bonner, a plant bioenergeticist who also became his mentor. The Johnson Foundation had an intense productive atmosphere where the scientists con-

"Progress is what it is. Things are moving fast and you just have to work harder to keep up."

ducted research in controversial aspects of mitochondrial bioenergetics. Mannella worked with then-postdocs Roland Douce and Alan Lambowitz on the structural aspects of mitochondria. "If you can isolate the mitochondria,"

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Mannella explains, "you can you take them apart in a controlled way and understand the compartmentalization of the enzymes, the mechanical properties of the membranes, and what you can learn by how changes in shape can be affecting the metabolic activity." Mitochondria continue to be his main focus of research to this day.

As his research progressed, Mannella was awarded a National Cancer Institute Postdoctoral Fellowship at Roswell Park Cancer Institute. While there, he worked closely with Don Parsons on X-ray scattering from membranes. After two years, he left the Roswell Park lab and joined Lambowitz at St. Louis University Medical School as a postdoc and Research Assistant Professor in the Edward A. Doisy Department of Biochemistry. Lambowitz, currently Director of the Institute for Cellular and Molecular Biology at the University of Texas at Austin, explains that "Carmen did seminal work on RNA splicing and mitochondrial DNA rearrangements, which were key to the success of the lab."

While at St. Louis University, Parsons moved his lab to the Wadsworth Center in Albany, New York, and invited Manella to join him. Mannella accepted the invitation and joined The Wadsworth Center, which is an arm of the New York State Health Department. He enjoys the lively environment at Wadsworth, which mixes public health issues with lab work, focusing on basic fundamental biological and biophysical phenomena. There, Mannella also met colleague Kathleen Kinnally, currently a Professor of Basic Sciences at NYU. Kinnally credits Mannella with bringing

"long-term contributions to the development of new imaging techniques," contributions that are well recognized.

"If you can isolate the mitochondria, you can you take them apart in a controlled way and understand the compartmentalization of the enzymes, the mechanical properties of the membranes, and what you can learn by how changes in shape can be affecting the

She adds that it is his personality, however, that makes him a good director. "His honesty and integrity make you trust him as a man. His intelligence, focus and vision make you trust his judgment. Thus, he has been very successful as a mentor and as a manager," she explains.

Mannella's enthusiasm for science is contagious. He is amazed by the details of cellular structure never before seen, images that modern technology has allowed. "What we're seeing now is revolutionizing how we think of the cell," Carmen states. Currently he is working on applications of cryo electron tomography of frozen hydrated specimens. "I think electron microscopy is at the stage now where the founders wanted it to be fifty or sixty years ago," he states. He also thinks that as science is moving at incredibly high speeds and the technical aspects become increasingly complex, keeping track of everything is nearly impossible. He admits that keeping up with the literature in his own field is sometimes difficult.

He imparts his love of research to others through his teaching and mentoring as well. Friend and colleague Henry

Tedeschi, currently Professor Emeritus in Biological Sciences at SUNY Albany, notes that Man-nella "influences students and fellow researchers with novel ideas and challenges." Tedeschi adds that Man-nella "taught the use of logical approaches in science without preconceived notions

and communicated a strict sense of ethics." Mannella admits to using Walter Bonner as a guide for his teaching style, trying to be fair and understanding. Lambowitz notes that Mannella has succeeded in that, "Carmen is exceptionally fair, and has exceptionally good common sense." Lambowitz adds that not only are Mannella's scientific skills valuable to his students, but "his learn-by-doing philosophy for teaching gives them independence."

In 1989, Mannella organized a summer internship program in biophysics. "It's something I wanted to do because I know it can have an impact on career decisions," he explains. Students from all over the country take part in the program, which continues today under the

He warns that these talks need to be done responsibly if scientists want to continue to have the freedom to study without constraints put on them by the government.

leadership of Randy Morse, faculty member, and Caitlin Reid, Assistant Chair of the Graduate Program in Biomedical Sciences at SUNY, Albany.

Mannella has been a member of the Biophysical Society since 1983. He

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How to Advance In a Leadership Position (Continued from page 12.)

your expectations so that the workers are 100% sure about what is expected. This clear communication is critical to successfully leading your group. If someone is not meeting expectations, let them know immediately. Be sure to send them the message in a way that allows them to change their behavior in a positive way. The success of your leadership depends on how well you motivate the people around you. To do this, you need to learn how to recognize the personalities and abilities of your group. Ultimately you need to empower people so they can pursue the vision you have inspired in them.

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credits the Annual Meeting as his entry into the Society. "The annual meetings of the Society were the one place where the different aspects of biophysics would come together every year," he says, "I couldn't think of not going to the meeting." Mannella has served as treasurer of the Bioenergetics Subgroup and then as subgroup Chair. He is co-chairing a symposium on the outer mitochondrial membrane at the 2007 Annual Meeting in Baltimore.

Mannella is married to Linda, an interior designer, whose input he credits with providing him with research ideas. They have two children, Marc, a teacher, and Susan, who is currently pursuing her degree. In addition to science, Mannella has a deep interest in philosophy. "Science addresses reality in a way that you absolutely have to use in order to understand physical reality," he explains, "while philosophy is dealing with things in a way that you can't touch or in a way that you can't dissect through approaches to understanding." He is also a history buff, especially the

history of science. Outreach at Wadsworth Center keeps Carman busy as well. He organizes lectures on science given to the general public to help them understand today's research.

Mannella has created his own style of teaching and his own system of beliefs about where science should lead us. "I've turned a PhD in biophysics into a career that really spans many different aspects of biomedical research and public health service."

As for the future, Mannella forecasts that "we're going to be able to really understand how the molecular machinery of the cell operates," and that serious discussions about genetic engineering of the species will become more prevalent. He warns that these talks need to be done responsibly, and that scientists ought not say things publicly for their shock value. "We are part of the ongoing discourse about stem cells and genetic engineering, but we need to learn to listen better to the opinions from other sectors of society. The failure of initiatives for improved science funding may reflect a lack of trust in scientists that only we can restore."

Public Affairs

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Department regarding deemed exports. The policy was purported to try to control access of foreign students and scientists to sensitive technologies, but would have forced universities and research institutions to obtain licenses for thousands of students and researchers working on campus.



Member in the News

Ariele Warshel of the University of South Carolina and member since 1982 received the 2006 President's Award in Computational Biology of The International Society of Quantum Biology and Pharmacology. The award is presented every two years to an individual who has made a significant contribution to the field of computational chemistry and biology.



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Anyone interested in receiving support from this fellowship program must also submit an application to attend the Gordon Conference of interest.

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For more information, please visit our web site (www.grc.org) or email Holly Tobin (htobin@grc.org).

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