

William H. Riker University Award for Excellence in Graduate Teaching: Robert A. Bambara, Ph.D.

Dr. David Guzick, M.D., Ph.D.

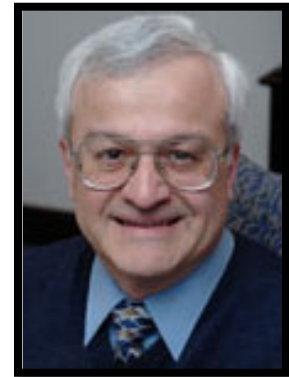
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A major mission at SMD is graduate education. While we have 400 medical students, we have 560 graduate students, of whom 440 are doctoral candidates in 14 different PhD programs. Indeed, graduate students are the heart and soul of our research--they do much of the technical work in our laboratories and clinical research settings; and more important, they are at the core of the intellectual exchange of ideas that generates novel science.

Indeed, a truly great scientific career is measured not only by the direct impact of the scientist's original work, but by the impact on the field of his or her progeny--students mentored by the scientist who go on to make substantial contributions themselves.

From this perspective, while we often celebrate the scientific achievements of our faculty, we don't celebrate their achievements as mentors to graduate students often enough. It is, therefore, truly wonderful to share with you our excitement for Bob Bambara, Ph.D., Professor and Chair of the Department of Biochemistry and Biophysics, who was honored at the University's May 19 Commencement Exercises with the William H. Riker University Award for Excellence in Graduate Teaching. This is the first Riker award to go to a faculty member at the medical school. This is no surprise, since we don't teach many formal courses. The Riker Award is also for mentoring students who go on to have successful careers, however. In fact, Bob's students are professors at the University of California, Indiana, Kentucky, Leiden, North Carolina, and Virginia. Two are Professors at the Univ. of Rochester, and two are Deans! Others head large biochemistry programs in biotech, and one is vice president of a major company.

William H. Riker, Ph.D., was Chair of the Department of Political Science from 1962-1977. He founded the now-mainstream field of positive political theory, which introduced the tools of game theory, and the axiomatic method of social choice theory to political science, which have proved crucial to predictive tests for political theory. But as Bruce Bueno de Mesquita and Kenneth Shepsle have written in their Memoir for the National Academy of Sciences, even more than his original scholarly work, Dr. Riker was devoted to his graduate students: "He remained in touch with virtually every Ph.D. student with whom he had worked. He traveled the world to assist his students in building programs wherever they were. On his seventieth birthday, the political science department at



Robert A. Bambara,
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Biophysics

Rochester threw a party and two-thirds of the students who had ever received a Ph.D. from the department came to participate in the celebration. Bill Riker inspired such devotion because he himself was so devoted."

This two-way devotion between student and mentor applies equally to Bob Bambara and his students, making it especially fitting that he receive the Riker Award for Excellence in Graduate Teaching.

This past year, among many publications on Bob's C.V., was a paper in *J. Biol. Chem* (281, 26051-26061) entitled "Reconstituted Okazaki Fragment Processing Indicates Two Pathways of Primer Removal." In this work, Marie Rossi, who is finishing her PhD in Bob's lab, used pure proteins to reconstitute the reactions that take place while eukaryotic DNA is being replicated. Surprisingly, they show that the replication process involves two separate enzyme pathways and more proteins than previously thought. These results may be relevant to cancer therapy that targets DNA replication proteins.

Marie summarizes the experience of working with Bob this way: "Like a father teaching his child how to ride a bicycle, Bob has been a scientific father mentoring his students. *The first stage - training wheels, three wheels for balance:* In joining the lab, I worked with a postdoc, and with Bob's leadership, together we determined the direction of my research project and together designed experiments. *The second stage - father holding the seat and handlebars:* As I spent more time in the lab, I began to have more independence, designing some experiments myself and presenting my work through poster sessions, while Bob guided the focus of my research. *The third stage - letting go and riding by yourself:* After a few years in the lab, Bob has the confidence and trust in me to let me ride by myself, designing my own experiments, pursuing my own questions, and giving me the opportunity to represent the lab through talks at conferences and meetings. Even with this independence, I know that he is there watching over me like the proud father watching his child ride down the street."

I know that when Bob reads the above paragraph, it will warm his heart, because when I asked him about his philosophy of mentoring graduate students, he responded that he tries to model his mentoring style on that of his own mentor, Robert Lehman, Ph.D. (discoverer of DNA ligase and previous Chair of Biochemistry at Stanford), in whose lab Bob was the Jane Coffin Childs post-doctoral fellow. Bob described Dr. Lehman as a "fatherly advisor." What does he mean by this? "Bob took care of me in all dimensions--he gave me good ideas, helped me find a job, called to offer me positions on high-level national committees, and would call NIH, if needed, to discuss study section reviews of my grant applications. He was always there for me, long after I left Stanford for Rochester."

Marie will be leaving this fall for a postdoctoral position with Dr. Vilhelm Bohr (son and grandson of the great physicists); and based on the many letters of support from previous graduate students, she will always be able to depend on Bob's sage counsel after she leaves his laboratory. For example, our own Jennifer Anolik, MD, PhD, (Assistant Professor of Medicine) writes that "throughout my graduate work, Bob was exemplary as a meticulous experimentalist, creative thinker, and relentless hard worker. It was during these years that I really learned how to think as a scientist...Even once I was no longer officially his 'student,' I have continued to

benefit from his mentorship, including my successful K08 application and my R01." Or as another example from someone a little farther away from Rochester, Gregg Siegal, PhD (Associate Professor of Biochemistry at the University of Leiden) writes that "Bob has a very special attitude towards the members of his group. He literally looks on us as his scientific children, having often told me that I was Bob Lehman's grandchild!" Like any good parent, Bob continuously frets over the well being of his scientific children after they have left his group and is always in touch with his sage advice."

This idea of a scientific family was captured during Bob's acceptance speech: "Why have my graduate students been successful? My partner in life, Gail Marriott, speaks of our family at home and our family at work. I am proud that my family is here, Becky and Brad, Kevin and Steve, and one person who you might know from the winning U of R basketball team: Julie Marriott. What about the family at work? We do everything together. An example is that in 1997 we had a lab volleyball team. My father, who was on the 1932 Chicago championship high school volleyball team called our team the worst he had ever seen. We lost every regular season game. Richard Feynman, the Nobel prize winning physicist said: 'There is nothing so satisfying as succeeding at something that you are no good at.' We were not taken seriously in the playoffs. We won game after game, seemingly unnoticed, and suddenly the trophy was in our hands. Dr. Feynman was so right! The family at work does everything together. We write our grant applications; and if they are not funded, we plot the tactics for revision. We write scientific papers; and if they are not accepted, we argue with the reviewers. This may seem like Tom Sawyer talking his friends into whitewashing the fence for him, but you can judge. When they leave the protection of the ivy walls of the University of Rochester, and encounter the real world, they are ready."

Two additional quotes from current graduate students testify to this rich environment that Bob creates for scientific and personal mentorship. "He motivates the people in his lab by expressing his trust in their abilities. He is one the kindest people I've ever known and he takes an interest in my life outside the lab. A highlight of the year for myself as well as my wife and young children is the Holiday party that he hosts at his home, which always includes a demonstration of his model trains. It's hard to tell the kids from the adults once the trains start moving." (Patrick Brandt) "Even as department chair, Bob still finds time every day to stop in the lab and see how things are running. His passion for our work is unmatched by anyone else I've known. And it's contagious. Bob never has to push us to work harder; we're here because we want to be." (Jason Pike)

Robert Anthony Bambara grew up in Chicago wanting to be an astronomer. As a high school student, he joined the Adler Planetarium, which had special programs for students interested in astronomy--they made their own telescope mirrors, visited University and government laboratories, participated in seminar series, etc. Bob entered college as an Astronomy major at Northwestern University, which he viewed as a "coastal University." For financial reasons, he commuted to Northwestern from home, with sleeping bags and pillows in the back seat, but also with an inflatable raft and beach gear for the beach on the coast of Lake Michigan.

On a fateful day during his college career, the Chair of Astronomy called Bob to her office and told him that his math skills may not be good enough to be a successful astronomer, that the field

had few jobs, that most astronomers were switching to the new field of computer science, and that based on his interests, he should consider chemistry. Bob was able to make contact with Paul Loach, Ph.D., a photobiologist who studied light absorption by chlorophyll. Here was a way, he thought, of going into Chemistry and still study light. (After all, he was really an astronomer at heart!) As an undergraduate, he published two papers with Dr. Loach and finished college in 1970. At that time, if you didn't want to go to Vietnam after college, medical school was the only way to defer being drafted. So Bob applied for the M.D.-Ph.D. program at Northwestern and was accepted, but he didn't really want to go to medical school--"I was an astronomer." As fate would have it, his lottery number for the draft was 241, which freed him to go to graduate school without having to go to medical school.

So Bob made his first sojourn to Upstate New York where he began graduate work in Biochemistry at Cornell. As a graduate student, he initially rotated in a laboratory that studied light absorption, but Bob gradually found himself becoming more interested in DNA biochemistry. He worked in the laboratory of Ray Wu, Ph.D., who was one of the first to develop technology for DNA sequence analysis. As a graduate student, Bob completed one of the first DNA sequences reported in the literature. This sequence, part of a bacteriophage, was 18 nucleotides long and it took him 3.5 years to complete. (Now, by comparison, recent automated technologies can sequence 100 million nucleotides per day, 1000s of nucleotides per second.) Bob's DNA sequence methodology was based on DNA polymerase, so it was natural that he applied to Arthur Kornberg's Department at Stanford for a post-doctoral position. It was here that he met his mentor and scientific father, Dr. Lehman. Bob was then recruited to Rochester after two years as a post-doc with Drs. Lehman and Kornberg. He drove to Rochester from Stanford, and was introduced to a Rochester snowstorm during the last 40 miles. Having slept at the Thruway stop, Bob arrived in Rochester wondering what he had done in moving from Palo Alto! He began work on January 1, 1977 and, fortunately for us, didn't look back. The rest is history.

Meliora,

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