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David Burgess

David Burgess is of Cherokee descent and was raised in his early years in Santa Fe, New Mexico. His father came from Oklahoma where his grandmother (David's great grandmother) was a medicine woman. Burgess' mother, who is of English descent, stayed at home raising David and his brother and sister. When Burgess was 12, the family moved to Santa Rosa, north of San Francisco, where his father, a math and science teacher, became a junior high school principal serving mostly Chicano students.

Burgess believes that he became a scientist in part due to the legacy of his great grandmother. He attended California State Polytechnic University thinking that he wanted to go to dental school, but two events changed his mind. The first was visiting an orthodontist doing surgery, which he did not enjoy; the second was being placed in the class of a gifted freshman biology teacher, who facilitated Burgess' involvement in undergraduate research. Burgess remembers his undergraduate "cell biology" course with fondness, but looking back now at his old notes he realizes that what he really learned there was classic cytology. In fact, at around the time that he entered graduate school, the journal *Experimental Cytology* changed its name to *The Journal of Cell Biology*. A cell biologist at Cal Poly, Ron Ritschard, pushed Burgess to attend graduate school and "infused into him the pure enjoyment of doing science."

In graduate school at the University of California, Davis, Burgess focused on developmental cell biology with particular interest in morphogenesis and microfilaments and the role they played in epithelial sheet folding, coinciding with early study of the cytoskeleton, which has been the center piece of Burgess' scientific work throughout his career. In 1974, while finishing graduate school, Burgess took the cell motility workshop at Friday Harbor Laboratories, which, as he recalls, "was put on by scientists interested in getting more graduate students and postdocs to work on the cytoskeleton." Tom Pollard, Ray Stevens, John Solaro, and Tom Schroeder, with whom Burgess later took a postdoc, ran the course. Pollard says of Burgess, "I have always admired David's enthusiasm for research and his dedication to the scientific community – including teaching and academic leadership." Some of Burgess' classmates from that summer are also prominent in the field, including Zach Cande, Leah Haimo, Lans Taylor, and John Condeelis. Burgess has continued his summer work at Woods Hole, both as an investigator and as an instructor in the physiology course.

Another cytoskeleton colleague, Win Sale of Emory University says, "Burgess has been one of the pioneers in determining the role of the cytoskeleton and molecular motors in epithelial cell membrane transport. In particular, he and his colleagues recognized that directed movement of certain membranes involves multiple classes of molecular motors often anchored to the same membrane cargo. Burgess has developed an appealing model that movement involves a sequential use of each motor for targeted transport of membranes in the polarized cells. This important model, further defining the requirement to understand how molecular motors are targeted to specific membranes and, once properly anchored, how motor activity is regulated."

As an NIH post-doctoral fellow at the Friday Harbor Laboratory at the University of Washington, Burgess worked with Tom Schroeder, who had discovered the contractile ring of dividing cells, and Ray Rappaport, another highly-regarded cell biologist investigating cytokinesis. This work led to Burgess' recruitment to the faculty of Dartmouth College in 1976. As one of the first hires of Biology Chairman Bob Allan, an early leader in the field of cell motility, Burgess enjoyed Dartmouth. Burgess' first doctoral student was Paul Matsudaira. The two began to focus on dissecting actin-binding proteins in the brush border microvillus, which led to the discovery of Myosin I and villin. Burgess gives Matsudaira, now at the Whitehead Institute at MIT, a great deal of credit for his "seminal work in the field." The two worked in friendly competition with the labs of Mark Mooseker and Klaus Weber. Burgess explains, "this was a very exciting time for the study of actin binding proteins and the brush border cytoskeleton in the polarized intestinal epithelial cell." It also led to his current work on molecular motors and their involvement in membrane trafficking.

Matsudaira says of his former mentor: "at Dartmouth, Dave steered me to the topic of the brush border and gave me the freedom to go at it. As a graduate student, Dave taught me the high degree of professionalism that we should apply to research and especially to teaching. He was a very good lecturer and mentor of students."

In 1982, Burgess and his wife, Rita Hogan, moved to the University of Miami Medical School, where he had much more time for research. His work focused on the regulation of the differentiation of intestinal epithelial cells and on the regulation of Myosin II and tropomyosin in nonmuscle cells. The regulation of differentiation of intestinal stem cells is critical to the understanding of colonic polyps and tumors.

Burgess left Miami to chair the Biological Sciences Department at the University of Pittsburgh. It was in Pennsylvania that Burgess became increasingly interested in policy matters, especially in science education and training and work force diversity. In Pittsburgh, Burgess received two Howard Hughes

Medical Institute grants for undergraduate and precollege science education initiatives which supported major efforts to increase opportunities in science education for minorities.

Burgess was pleased to accept an appointment at Boston College that afforded him the opportunity to work with students and conduct research. "One of the things that attracted me to Boston College is that it's a Jesuit university that has a commitment to its mission of serving others. It is both a first-rate university, and a human university." He has been very pleased by how well he has been accepted by all sectors, "from the law school to the English department." Happily, the opportunity to maintain his laboratory was part of the bargain, allowing Burgess a mix of administrative duties and science.

His lab is still in Pittsburgh and is completing the move to a brand new building at BC this Spring. His scientific work continues to focus on cell movement. "I think the study of cell movement has been a major part of cell biology since the founding of the field," says Burgess. He is increasingly interested in the regulation of motors, including unconventional myosins and the microtubule motor dynein and how they are turned on and off and how they become associated with membranes in cells. Burgess hopes that this work on the basic cell biology of epithelial cells may provide important insights into malabsorption diseases. In recent years, Burgess' lab has returned to the project he started as a postdoc, the study of cytokinesis, focusing on the division of daughter cells after mitosis. In recent years Burgess has contributed to the study of how regulators of mitosis affect the timing of cytokinesis by regulating contractile ring myosin.

As Provost, Burgess is involved in a broad range of issues at the college. He explains, "the theme of my career has been to establish my own credibility as a scientist first, so that I may have the opportunity to serve on panels such as the NIH Cell Biology Study Section such that my voice might be heard more loudly when I speak about minority issues," adding that he has "always played a role in trying to work towards increasing the opportunities for minority students to pursue science." Indeed, Burgess has taken on a national role by serving on the NIH Advisory Council to the Office of Research on Minority Health, and this year, as President of the Society for Advancement of Chicanos and Native Americans in Science (SACNAS). In his advisory capacity to the NIH, Burgess hopes to work toward "improving the health status, medical care and delivery as well as training opportunities for an increasingly diverse population," but tempers his ambition by trying to be "realistic" with regard to minorities entering science, especially in light of recent blows to affirmative action. "I am concerned that the efforts of several states in opposition to affirmative action, whose successes have been documented to significantly increase the pool of under-represented minorities earning science baccalaureates, has now put the future of diversity in the scientific workforce in jeopardy." In his policy writing on issues of minorities in science, he cites the statistic that only about 3% of doctorates in the sciences are awarded to under-represented minorities. Burgess sees a role in minorities issues for people from many sectors, including colleges, universities and scientific societies such as the ASCB and SACNAS. Burgess states his goal as simply "changing the face of who gets to do science," to more closely reflect the occurrence of disease mortality and morbidity, noting the "huge cost to society of ignoring this problem." He is hopeful that a more diverse population of scientists will increase the likelihood that diseases that disproportionately impact minority populations will be more seriously examined.

Burgess laments the retirement from Congress of Representative Louis Stokes (D-OH), a champion of minority issues. He is hopeful, however, that the proposed new graduate program at the NIH will attract a significant number of minority students to science. He is encouraged by the commitment to issues of diversity by NIH Director Harold Varmus and the institute directors.

Burgess also believes that the number of students receiving doctorates should be seriously analyzed. He believes that the recent survey of the ASCB membership conducted by the Education Committee suggests we may have trained too many people for the opportunities that are currently available.

Burgess has been a loyal member of the ASCB since he finished graduate school in 1975, and has remained involved ever since. His service has included membership on the Minorities Affairs Committee, whose meetings he still attends. Burgess was an active member of the Congressional Liaison Committee's Pennsylvania Project when he lived in Pittsburgh, and continues his CLC involvement from his new home in Boston.

Burgess and Hogan live in Newton, Massachusetts, and have four sons: Trevor, 26, Shaun, 20, Matthew, 10 and William, 9. Hogan is a former corporate banker. This spring, Burgess will coach William's youth soccer team. The family spends most of its free time doing activities with their children, and have become fans of Boston College hockey, basketball and football. They also enjoy the beach, camping and skiing.