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Arthur Lander

Arthur Lander grew up in Brooklyn, New York, the son of two attorneys. Lander and his older brother Eric—the Whitehead Institute geneticist—lost their father to Multiple Sclerosis when Arthur was 10. In spite of this, Lander remembers his childhood as “pretty normal” except that he and Eric had to pitch in with much of the housework and home repairs. In fact, from the age of 13 Arthur did all of the family’s cooking, his enjoyment of which is still in evidence in his popular course “Science in the Kitchen,” at the University of California, Irvine.

Even as a young child, Arthur Lander loved the biology of life. He proudly recalls growing four string bean plants in his tiny Brooklyn backyard. Academically, Arthur enjoyed “doing his own thing”. As a teenager in the 1970s, he indulged this tendency at the new experimental public school, John Dewey High School, on Coney Island. There were no entrance exams; teachers recommended potential students by attesting that the student was “independent minded”, a standard that Arthur met and exceeded. Students created their own curriculum, which allowed them to learn at their own pace, absent the competitiveness faced by most high school students. There were no grades, extramural sports or proms. Out of Arthur’s graduating class also came Spike Lee, the movie director, and Ray Suarez, the former National Public Radio commentator.

One of Lander’s first exposures to serious science was a National Science Foundation–sponsored high school summer course in biochemistry. When he began looking at options for college, Lander was drawn to Yale not only because of its strong reputation in science, but also for its reputation in music and theater, in which he participated avidly. As a college student, Lander’s science education—much more structured than he had been used to in high school—was supplemented with an equal emphasis on songs and shows. Although his career as an actor was cut short when directors refused to cast his strong Brooklyn accent (since shed), Lander responded by writing, directing and producing two musicals. He also spent afternoons and school breaks working in the lab of Yale immunologist Byron Waksman, purifying a novel cytokine and studying its effects on lymphocyte activation.

Lander admits that he made time for a growing number of extracurricular pursuits by “going to class less and less.” He recalls that the only time he attended his 8:00 a.m. physical chemistry class was to take the final exam. Despite such truancy, Lander excelled at his studies and graduated with honors, continuing in the Medical Scientist Training (M.D., Ph.D.) Program at the University of California, San Francisco. Although he knew little about the West Coast when he arrived, he was immediately seduced by the environment, both scientific—it was a time of exciting growth at UCSF—and cultural—for example, he honed his musical skills by studying jazz theory.

At UCSF, Lander worked with Lou Reichardt, a partnership Lander greatly enjoyed, in part because of the considerable freedom he was given to develop his own ideas. Lander also benefited because Reichardt’s avid mountain climbing career gave Lander opportunities to speak in Reichardt’s place at seminars and symposia. Lander developed an early reputation in extracellular matrix research, identifying laminins as promoters of neuronal growth. Among his findings in this period was that laminin worked together with heparan sulfate proteoglycans. Since that time, Lander has been fascinated by the extraordinary structures of extracellular matrix molecules, and has sought to understand why evolution has had to employ such odd molecules for so many diverse purposes.

Although Lander enjoyed his medical training, it only strengthened his interest in basic research. He did a brief postdoc at Columbia, then took a faculty position jointly in the Department of Brain and Cognitive Sciences and the Department of Biology at MIT. At MIT, Lander continued his research on laminins and proteoglycans, both fields that were not very visible in the late 1980s. Lander credits support from the NSF and the David and Lucile Packard Foundation with helping him build his research program in the early years of his laboratory.

Lander also credits his years at MIT with showing him a rigorous, disciplined approach to science, much of which was driven home by his participation in graduate teaching. At the same time, Lander began to see parallels between his interests in science and in music and the arts. He sees science as a search for beauty, not just information, and finds that aesthetic principles sometime influence his research directions. He explains that just as a jazz musician seeks to create excitement in a “straight ahead” tune by introducing non- standard harmonies and rhythms—an action known as “going outside”—Lander seeks ways to occasionally “go outside” in science. As examples he cites his forays into protein–carbohydrate interactions, the teleology of “co-receptors” and recent work on the formation of developmental gradients.

Lander met his wife, Anne Calof, when they were both graduate students at UCSF. When Lander took the position at MIT, Calof also took a Boston-area postdoc, at Tufts Medical School. When Calof was offered a faculty position at the University of Iowa, Lander was immersed in his research at MIT, so the couple decided to manage the separation by getting married—as Lander says, “we decided to get married right

before we split up." After spending over three years commuting between Boston and Iowa City, the couple was reunited at the University of California, Irvine in 1995, where Calof (also an ASCB member) is now an Associate Professor in the Department of Anatomy and Neurobiology. Since then, Lander has been promoted to Chair of the Department of Developmental and Cellular Biology at UCI.

In February 2000, Calof gave birth to the couple's first child, Isabel. Tragically, after only one month, the baby died of complications from Cornelia de Lange syndrome, a rare developmental disorder that affects the growth of both the body and the brain. Isabel's brief life inspired the couple's interest in clinical science. Although only two research groups in the world focus on finding the cause of this disorder, a candidate locus has recently been identified, and Calof and Lander hope to help out in pursuing this or other leads. Calof published an essay last year in *Current Biology* called "Long Odds", a poignant, retrospective look at how the disease affected her and her family.

Lander's commitment to cell biology is evidenced by his role on the Graduate Education Subcommittee of the ASCB Education Committee for the past six years. Education Committee Chair Frank Solomon, who recruited Lander to the Committee, says that Lander helped organize the ASCB Career Survey and made important contributions to the design of that survey and to the interpretation of its results. Solomon regards Lander as a "wonderful mentor and teacher" and someone whose science is "interesting and innovative, both technically and intellectually."

As Lander sees it, the major challenges now facing cell biologists lie not so much in the ability to gather data but in the ability to provide quantitative frameworks for understanding and predicting the behaviors of complex systems, such as signaling networks, gene regulation networks and macromolecular assemblies. He believes that the need to develop more quantitative, system-oriented approaches is forcing cell biologists to seek the aid of computer scientists, physicists and engineers—a very literal example of "going outside." An additional challenge for Lander is the desire, made more urgent by his daughter's death, to see that his research is not only rigorous and aesthetically pleasing but that it also tangibly helps people.