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Biophysicist in Profile



Linda Kenney

Science is all about collaboration, tenacity, and serendipity, as Linda Kenney's career can attest to. Born in Cherokee, Iowa, Kenney was not particularly interested in science as a child. Her father, James, was a stock and commodities broker; her mother, Ruth, was a PE teacher. Although a good student, Kenney was more interested in nonscience subjects—sports, particularly softball, and ballet—while young. In seventh grade a biology teacher opened her eyes to the intricacy of science, but her interest in science did not develop until she enrolled at the University of Iowa as biology major, with plans to attend medical school. The sudden death of her father forced Kenney to be independent, relying on a number of different waitress jobs to pay for school. Her tendency to question authority, a trait not valued by her managers, gave Kenney the "opportunity" to work for many different restaurants.

One day, while perusing the employment section of the *Daily Iowan*, she came across an advertisement for a student assistant in a lab working on ion transport in turtle colon. Her curiosity piqued, she contacted the professor who had placed the ad. He met with her but decided that her lack of experience didn't qualify her for his job but did recom-

mend her to a co-worker, who put her to work in a physiology lab.

"It was really when I started working in the lab that I got enthusiastic about a scientific career," Kenney says. She excelled at her lab work as she continued working on her degree. As she approached graduation she decided to study for her PhD at the University of Pennsylvania in the lab of *Jack Kaplan*, a professor of physiology. "It was a fun place to be," raves Kenney of the department. She remembers attending seminars where faculty would constantly interrupt speakers with questions. "I've never been anywhere that was as lively as that was." It was an invigorating intellectual environment, and Kaplan became her PhD mentor. "He taught me to be critical of my own work and other work that I was exposed to," explains Kenney. Her PhD research was on the reaction mechanism of Na,K-ATPase from human red blood cells. It was an exciting time in the field of biophysics: the genes had been sequenced and if an expres-

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sion system could be developed, the effect of mutations on function could be studied.

Moving to Yale on a postdoctoral fellowship, Kenney tried to develop an expression system to study the Na,K-ATPase. Unfortunately she was a decade early. "The molecular biology tools that were needed for success of this project really developed in the next few years," she says. "I made a decision at that time that I should change fields. I went to a bacterial genetics lab at Princeton, and I found the perfect problem to study." That problem was signal transduction and gene regulation in *E. coli* in response to osmotic stress.

At Princeton she worked with *Tom*

Silhavy, whom she calls the "God of Bacterial Genetics." Silhavy, a geneticist, had a different way of looking at problems and taught Kenney how to look at systems through a different perspective.

Combining different disciplines, Kenney quickly learned, enhanced experiments.

Silhavy was skilled at this. "He had an elegant way of making things seem simple." Combining different disciplines, Kenney quickly learned, enhanced experiments. "If you're exposed to different fields, then you can approach a problem from whatever perspective you need in order to address the next question," states Kenney.

Near the end of her postdoc, Oregon Health Sciences University, a small medical school in Portland, offered Linda a job, and she took the opportunity with open arms. "Having the freedom and room to establish my research program was really beneficial," she remembers. While there, she was given the opportunity to work with high school students who came to study in her lab. Kenney enjoyed the chance to positively influence their decisions about a future in science. She taught them the basic skills they would need to succeed, such as focusing, paying attention to details, and working together to obtain results.

This ability to work with others is truly one of the characteristics that sets Kenney apart. She thrives on her ability to network with other scientists in a slew of different fields. According to friend and tennis opponent *Joe Falke*, at the University of Colorado, "In addition to her skills as an individual scientist, Linda succeeds in networking with other scientists better than anyone else I know. This innate ability to network, which arises from Linda's outgoing personality and her genuine interest in other people, is a real strength of her personality."

Unfortunately, since the medical school was separated from the rest of the University, opportunities for Kenney to

work with scientists in different disciplines were limited. This motivated her to move to the University of Illinois at Chicago, where she remains today.

Currently, Linda is working on the EnvZ/OmpR two-component system that regulates outer-membrane proteins in the University of Illinois's Department of Microbiology and Immunology. Specifically, she is taking the basic knowledge about how OmpR works and applying it to new models, including *Salmonella* pathogenesis. "What stands out is her desire to understand her system in detail not only in vitro, but also in vivo," says *David DeRosier*, a colleague currently at Brandeis. "That is, whereas one may find interactions or reactions in vitro, one does still not know how these play out inside the cell."

Kenney's research bridges this gap as well as the gap between biophysics and genetics. "The biophysics-genetics mix is not common, nor easy to master, but her efforts at this have given her an important and unsurpassed dual per-



Linda Kenney teaching a course as a visiting ASM Professor in Santiago, Chile.

This innate ability to network, which arises from Linda's outgoing personality and her genuine interest in other people, is a real strength of her personality.

spective," says *Ryland Young*, a professor at Texas A&M University and often tennis opponent. "Many of the signal transduction systems that are really worth pursuing were defined by bacterial genetics and physiology, and her willingness to dive into this very difficult field has really set her apart from the general run of biophysicists."

This is also one of many reasons why Kenney's influence in the Biophysical Society is important. She attended her first Biophysical Society (BPS) meeting in 1983, and, although it was a memorable experience, due in part to the weather and a distracted slide projectionist, she has remained a loyal Society member. "There are terrific colleagues that I've met there year after year," she explains. "It's a great place to go to get applications of methods that could be useful to the system I'm working on." She currently serves on the Public Affairs and Minority Affairs committees and was elected to the Society's Executive Board. She takes pride in the

reputation of the Biophysical Society with respect to women. "The Biophysical Society has been receptive to women early on with CPOW and offering daycare at the annual meeting. Women are elected to the Council and to the Presidency, so they are active members of the Society." One of her favorite aspects of the annual meeting is that students, not necessarily the big names in the field, can participate as speakers. This option would not be available in a larger society. Since students are

the future of the field, giving them this experience and hearing their ideas is crucial. In addition to the Biophysical Society, she is also active in the American Society for Microbiology. For the past eight years, she and Young have coordinated the Hatch Echols tennis

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mittee has recommended that the University increase interdisciplinary collaboration among its independent science departments. Suggestions to do so include creating a department of chemical and physical biology and setting up interdepartmental committees that would have the authority to recommend faculty appointments. The committee also recommends creating an interdisciplinary research center, while also maintaining strong support for the traditional disciplines. The committee is collecting comments on its recommendations and will issue a final report in December.

Round-up:

FDA: The Food and Drug Administration (FDA) announced plans to maintain a waiver program that allows experts with industry ties to serve on advisory panels. To address concerns about such experts having conflicts-of interest, the agency plans to review the waiver-granting policy and make the process more transparent to the public. This announcement comes as both the House and Senate are both considering legislation that would make it harder for the FDA to use experts with industry ties.

Woodrow Wilson Center: The Woodrow Wilson Center has produced a report entitled, *Nanotechnology: A Research Strategy for Addressing Risk*. The report calls for \$1 billion to be invested over the next two years to create an overarching strategy and research priorities to ensure the safety of nanotech products and applications. The report calls for the agencies responsible for health and the environment to take the lead: EPA, NIST, NIH and OSHA. Andrew Maynard of Lux Research authored the report.

NSF: NSF has released a report entitled *Federal Funds for Research and Development: Fiscal Years 2003-2005*. The report provides details on federal R&D spending across agencies as well as federal spending obligations to universities. The report is available at

www.nsf.gov/statistics/nsf06313/.

NCI: In August, President Bush announced the appointment of *John E. Niederhuber*, M.D. as the 13th Director of the National Cancer Institute (NCI). The position does not require Senate confirmation. Niederhuber has been acting director of NCI since June. Prior to being named acting director, Niederhuber served as NCI's Chief Operating Officer and Deputy Director for Translational and Clinical Sciences since September 2005. Before joining the NCI in a full-time capacity, Niederhuber was a Professor of Surgery and Oncology at the University of Wisconsin School of Medicine and Director of the University of Wisconsin Comprehensive Cancer Center. Earlier in his career, Niederhuber chaired the Department of Surgery

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tournament at the annual Molecular Genetics of Bacteria and Phage Meeting.

Kenney is involved in the BPS Public Affairs Committee in part because of her concern about the impact that current funding will have on science and how it is conducted. "Our best discoveries have been when people didn't set out to make that discovery. They worked on a system and followed their interest and there were spin offs in ways they couldn't have predicted," Kenney says, noting this serendipity method is changing. "I think we are undergoing some profound changes because the funding situation has made it more difficult. It's going to change our whole medical school/university system," Kenney predicts. Scientists were once supported by their university salary, but now are being asked to bring in their salary from grants, which adds tremendous stress. In addition, "we're under pressure from NIH to do more translational research,"

she explains, which she predicts will result in a change in topics that are researched.

Kenney remains active outside of science, a trait inherited from her mother. As a graduate student and postdoc, she played softball on both department and city teams. She can often be spotted in airports, tennis racquet in hand, ready to get in a few games whenever possible. Kenney has two stepchildren, Rachel and Joanna, as well as three grandchildren. She enjoys art and music and believes that had she not chosen science, she would have chosen a career in one of those genres. "Science, music, and art are all related," she says. Through her musician brother, Jerry, she sees the similarities firsthand. She relates to his playing a saxophone solo because he is putting himself out there in a similar way she does when talking to the scientific community about her research. Science, music and art require the confidence to expose oneself to criticism.

Like many, Linda hopes to impact the career choices of future scientists in a positive way. "My favorite time is when I'm working with a postdoc and we're discussing a result and we come up with a new way of thinking about the results," Kenney admits. "My door

"The biophysics-genetics mix is not common, nor easy to master, but her efforts at this have given her an important and unsurpassed

is always open," she says. "I am always available to talk about experiments." She also values the time with her colleagues, an ability that has enabled her to bridge the gap between genetics and biophysics. "Science is a way of looking at the world, or coming to ways of understanding our world," says Kenney. It's a lifestyle she has totally embraced.