

Lee Witters, M.D.: Stories of science

By Jennifer Durgin

Once upon a time, somewhere on the banks of the Nile . . ." begins DMS biochemist Lee Witters, M.D. He's just delivered a one-hour overview of diabetes to an undergraduate endocrinology class and has now instructed the students to put down their pens and pencils and simply listen to a story. He explains that he's been coached by his wife, a professional storyteller, as to how all stories should begin ("Once upon a time . . .") and end.

For the next 40 minutes, Witters tells a tale about the history of diabetes, from early Egyptian and Greek descriptions of the disease to the discovery of insulin at the University of Toronto in the 1920s. He shows the class historical photographs and centuries-old scientific papers, as well as a clip from a Canadian film about the discovery of insulin. And he weaves in interesting, human details—the kind that make scientific discoveries fascinating but that often get lost in a sterile, factual recounting.

All eyes are fixed on Witters. The students aren't doodling, filling in crossword puzzles, or completing homework for other classes the way they sometimes do during lectures. Although Witters runs a few minutes over the scheduled end of the period, the students remain riveted in their seats. There isn't even the usual rustle of papers and book bags. Finally, Witters wraps up the tale. With the discovery of insulin, he concludes, "a diabetic could live happily ever after."

Witters, the Eugene W. Leonard 1921 Professor of Medicine and of Biochemistry at Dartmouth Medical School, never expected to devote so much time to teaching undergraduates—or to be so good at it. (He teaches three undergraduate courses and also lectures in a few Medical School courses.) He spent much of his career as a bench researcher and clinician, earning a reputation as a leader in his field at Harvard from 1973 to 1984 and at Dartmouth since 1984. But teaching has "really changed me over the last 10 years," says Witters. "It's become what I do." And by all accounts he does it well. He's received numerous teaching awards at the College and DMS, including Faculty Advisor of the Year, Teacher of the Year in the Basic Sciences, Professor of the Year, and Profiles in Excellence Teaching Award.

"Lee is a natural teacher," says Christina Ullrich, M.D., a 1994 Dartmouth College graduate who worked in Witters's lab for two years before going on to Harvard Medical School. Ullrich is now a fellow in pediatric hematology-oncology and in pediatric palliative care at Children's Hospital of Boston. She says Witters made "enzymatic pathways or hormonal feedback loops . . . not just abstractions but phenomena that were relevant to our everyday lives."

And "he has so much patience," says another former student, Hiram Shaish, a DC '05 who plans to attend medical school. Shaish re-

calls Witters repeating concepts over and over in class, and at office hours never admonishing students, "Didn't you come to class?"

As head of the College's Nathan Smith Premedical Society, Witters enjoys mentoring as well as teaching. He has helped many undergraduates figure out whether to pursue a career in medicine. "We had more than a few 'sorting out Patrick's life' chats," says Patrick Ward, a DC '05 who is finishing a year-long research fellowship at Cambridge University in England. Next fall, Ward will begin an M.D.-Ph.D. program at the University of Pennsylvania. He has a special

appreciation for how devoted Witters is to his students. Ward not only took Witters's courses but also worked in his lab for three years.

"Working in Lee's lab gave me

the chance to really see how much time he puts into revising his courses each year, which is on the order of weeks and months per class—before [they] even begin," says Ward. "Add on top of that the countless office hours that Lee makes available during term-time to his undergraduate students, [and] it is a true wonder how he ever gets anything else done, let alone put in the time necessary to run a lab, fulfill his Medical School teaching duties, run the premed society, start a human biology program, and do half a dozen other things."

Ward, a long-distance runner, was initially drawn to Witters's lab because it focuses on the biological basis of endurance at the cellular level. The lab studies the enzyme AMP-activated protein kinase (AMPK), which regulates cell metabolism and energy levels and plays an important role in cancer, appetite control, and type II diabetes. (For more on AMPK and Witters's research, see page 6 of the Winter 2005 issue of DARTMOUTH MEDICINE.)

Witters's lab was one of the first to focus on AMPK, says Laurie Goodyear, Ph.D., an investigator at the Joslin Diabetes Center in Boston, but worldwide research on the enzyme has "just taken off in the last five years or so." Goodyear, who collaborates with Witters on AMPK, describes him as "a really good scientist and thinker . . . laid back but intense." And, she adds affectionately, "a character."

Witters sports a wiry ponytail, dresses casually, and has a keen sense of humor. He and his wife live in a log-cabin home on 100 acres in Norwich, Vt. It's known as the "Witters homestead" to the dozens of students who come out there for barbeques, to walk the trails, or to play with the dogs, chickens, and horses.

Given Witters's appearance and close-to-nature lifestyle, perhaps it's not surprising that he graduated during the turbulent 1960s from Oberlin College, an institution known for liberalism and activism. "Other than my marriage and my children," says Witters, attending Oberlin was "the most important thing that ever happened to me."

At Oberlin, he found a diversity and "ways of thinking about

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things” that were “quite different from the fairly conservative, Caucasian, Christian, Protestant, Republican town [in northeastern Ohio] that I grew up in,” he says. “It was a pretty incredible time to be going to college. We had lots of activist people come through campus.” Martin Luther King, Jr., visited three times and was the keynote speaker at Witters’s graduation in 1965.

Every year, on Martin Luther King Day, Witters invites a small group of students to listen with him to a recording of that speech. Titled “Remaining Awake Through a Great Revolution,” it was a call to stand up against injustice. In the speech, King describes how depressed he was by a recent trip to India. “How can one avoid being depressed when he sees with his own eyes evidences of millions of people gone to bed hungred at night?” King asks, using a Biblical term for hungry. “How can one avoid being depressed when he sees with his own eyes millions of people sleeping on the sidewalks at night? . . . Can we in America stand idly by and not be concerned?” Of food surpluses in the U.S., King says, “I know where we can store that food free of charge . . . in the wrinkled stomachs of the millions of God’s children in Asia and Africa, in South America, and in our own nation who go to bed hungred at night.”

Though Witters never became a frontline social activist, Oberlin and King’s words have shaped his worldview and many of his life choices. For example, Witters opposed the Vietnam War. So after he earned his M.D. from the University of Rochester in 1969, knowing he would face the draft upon completing his residency at Beth Israel Hospital in Boston, Witters applied for a three-year fellowship at the National Heart and Lung Institute in Bethesda, Md. But he wasn’t “just avoiding Vietnam,” he insists. “I was very committed to an academic career and a research career.” So committed that he had spent every spare moment during medical school doing research in an endocrinology lab. He even wrote a thesis on measuring testosterone and anabolic steroids in urine.

After Bethesda, Witters became a research fellow at Harvard in 1973 and by 1982 was an associate professor of medicine. He eventually found his way to Dartmouth by way, one might say, of Scotland.

In the early 1980s, Witters spent a year as an honorary fellow at the University of Dundee, working on early AMPK studies. He not only enjoyed the research, but he and his family found they preferred the rural life of Scotland to the suburban life of Massachusetts’s South Shore. He’d grown weary of the long commute to Boston that stole family time. “My kids were starting to grow up outside of me, and I



If he’s not at a lab bench or a classroom lectern, Lee Witters’s favorite place to be is somewhere on the 100-acre farm that he shares with his wife and assorted animals.

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didn’t particularly like that,” says Witters. In Scotland, “I sort of recaptured my family.” The year abroad also helped cure Witters of what he calls “a serious case of Harvarditis.” In Scotland, “I realized one could have life outside of Harvard and Boston . . . in a small, nonurban area.” So a couple of years later, when Dartmouth was recruiting a chief of endocrinology and metabolism, Witters applied.

Still, it was a difficult decision to leave Boston. “I had to satisfy myself that professionally I would be happy, and I really wasn’t sure,” he admits. “What convinced me is I saw a strong core of endocrinologists here. . . . I felt I would have a home” at Dartmouth.

In the 22 years since that decision, Witters hasn’t looked back once. He has continued to produce research published in prominent scientific journals while also discovering his love for teaching. And he has returned to the issues that inspired him at Oberlin. He designed a course called the Biology and Politics of Starvation, which intertwines the physiologic processes of hunger, satiety, malnutrition, and starvation with the sociologic and political realities that result in millions of people starving around the world.

“My contribution to social equity and justice can be by being a teacher,” Witters says he realized, by acquainting “students with the power of concern at every level.” And Witters truly means every level—from the most rigorous scientific research to world politics. “Compassion begins with competence,” Christina Ullrich remembers him telling her once. A physician’s compassion “must be predicated on complete competence in medical practice in order to truly serve,” she says. That idea “has inspired me during long hours studying in medical school and later during long nights on call in the hospital.”

Yet even Witters, who has helped launch the careers of so many young scientists and physicians, sometimes worries that he should be doing more to better the world. A few years ago, he attended a talk at Dartmouth by Paul Farmer, M.D., Ph.D., a Harvard physician famous for his tireless work on world-health issues. Witters recalls that he couldn’t help thinking, “Why am I not doing this?”

“I couldn’t do what you do,” Witters told Farmer after the talk. And Farmer replied, “I couldn’t do what *you* do. We both need to be doing what we’re doing.”

Witters truly loves what he does. “Finally, through trial and error, and a bunch of serendipitous events,” he says, “I got to a happy place.” So like all his stories, this one, too, ends happily ever after. ■