



Nancy DAVIDSON

Photo courtesy of Fred Hutchinson Cancer Center



The Ludwig Board Member on being prepared to say “yes,” good mentors and lessons in life and leadership that shaped her career and fueled her success as a breast cancer clinician, researcher and leader.

When Ludwig Board Member Nancy Davidson opened her first laboratory at Johns Hopkins University in 1987, she set her sights on exploring apoptosis, or programmed cell death, and its potential induction as a treatment for breast cancer.

Her lab—in a converted supermarket in East Baltimore where the future Co-directors of Ludwig Johns Hopkins, Bert Vogelstein and Ken Kinzler, were at the time transforming our understanding of cancer genetics—achieved notable successes. It showed, for example, that withdrawing estrogen could induce apoptosis in certain breast cancer cells.

But then Davidson attended a talk by Stephen Baylin, who is today a Ludwig professor at Johns Hopkins and a visiting professor at the Ludwig Oxford Branch, and was then helping to pioneer the study of cancer epigenetics in that same converted supermarket. Listening to Baylin speak, it occurred to her that the epigenetic gene silencing he described might account for the loss of estrogen receptor expression in some breast cancers, and she asked him if he'd be interested in testing that hypothesis. In a series of studies conducted over the next few years, the pair would go on to show that this is indeed the case.

Those studies set Davidson down a three-decade path of discovery that has illuminated the role of epigenetics in breast cancer. Now the Executive Vice President of Clinical Affairs and Director of the Clinical Research Division at the Fred Hutchinson Cancer Center and Chief of the Division of Medical Oncology at the University of Washington, Davidson has sought to apply those findings to the treatment of the disease, evaluating epigenetic modifiers as therapeutic agents in clinical trials. In addition, her collaborative

clinical studies on the use of endocrine therapy for the treatment of hormone-responsive breast cancer in premenopausal women have helped to alter medical practice, as have her collaborations exploring the combination of chemotherapy and targeted therapy for HER2-positive breast cancers. Davidson has also co-led clinical studies that have illuminated the role of obesity and race in therapeutic outcomes in early stages of the disease.

Beyond her work as a scientist and clinician—with more than 400 papers to her name—Davidson is a prominent leader in her profession. She is one of only seven people, and two women, to have been elected president of both the American Association for Cancer Research (AACR) and the American Society of Clinical Oncology (ASCO).

FINDING A PASSION

Davidson was born in Colorado, moved to Maryland with her geologist parents when she was a teenager and attended Wellesley College, in Massachusetts. Majoring in biology in college, Davidson took a part time job at a lab focused on liver cancer research. It was there that she met her future husband Thomas Kensler, working with him on his research exploring the mechanism of a carcinogen in liver cancer. The experience piqued her interest in biology and the possibility of a science-related career.

After her first year at Harvard Medical School,

Davidson accepted a job offer to work in a breast cancer research laboratory at the National Cancer Institute (NCI) headed by the prominent physician-researcher Marc Lippman. "I thought, 'Wow, this is what I want to do,'" Davidson recalls. "I can see where this is going to take me. I see the lab, I see the clinic, I see how they're connected. That's where I want to be." After earning her MD, Davidson completed an internship in internal medicine at the University of Pennsylvania, where she met an up-and-coming oncologist named John Glick, who would become a lifelong mentor. She then transferred for her residency to Johns Hopkins University.

Davidson next took a fellowship at the National Cancer Institute in nearby Bethesda to continue her work with Lippman. Her work there led to a job offer from Martin Abeloff at Johns Hopkins, where she opened her first laboratory and rose to become a tenured professor, director of the breast cancer program at the Johns Hopkins Oncology Center and holder of the Breast Cancer Research Chair at the university's School of Medicine.

That was when Davidson became intrigued by the idea of using hormone therapies to treat premenopausal women with early hormone-responsive breast cancer. "The dogma at the time was that young women need chemotherapy, period," explains Davidson. "We came to realize that this might not apply to all young women with breast cancer." About a year after the birth of her second child, Davidson got approval in 1988 for a major clinical trial to test that proposition. "We reported the results at ASCO the year my second child graduated from high school—17 years after the trial's conception."

The results showed that adding tamoxifen to chemotherapy after surgery dramatically extended time to relapse and disease-free survival, changing how breast cancer is treated in a large subset of premenopausal patients. Based on this study and others,



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Nancy Davidson introduces Washington Governor Jay Inslee, right, during a signing ceremony at the Fred Hutchinson Cancer Research Center for a new state law raising the age at which someone can buy tobacco or vaping products to 21.

Davidson would quite literally help rewrite the ASCO treatment guidelines for such cases.

As her research proceeded apace, Davidson also became increasingly involved in ASCO. “I had received one of my first grants from them, so I was very, very loyal to the society,” says Davidson. She eventually joined the Board of the organization, encouraged by her mentor, Glick. “He called me up and wouldn’t get off the phone until I said yes, I would run. And I won.” This subsequently led to her election to serve as ASCO president. After her tenure as ASCO president, Davidson accepted a job as director of the University of Pittsburgh’s Hillman Cancer Center in 2009 and then, in 2016, moved to the prestigious Fred Hutchinson Cancer Center in Seattle, Washington, directing its Clinical Research

Division and serving as head of medical oncology at the University of Washington. In 2015, she became president-elect of the AACR, completing her term in 2018.

INGREDIENTS OF SUCCESS

Davidson’s passion for her work has sustained her through the ups and many downs of scientific research—and she urges young researchers to make sure they love what they choose to study. But taking the helm did not always come naturally to Davidson. Her NCI mentor Lippman, she recalls, gave her some advice that helped her cultivate the confidence required for leadership. “He said, ‘You’re quiet, reserved, you always sit in the back of the seminar room. Why don’t you move a little farther forward?’ And then

he said, 'You ought to try to ask a question after every seminar.' It was very good advice."

Such mentors, Davidson notes, have played a critical role in advancing her career. Some, like Baylin, helped shape her scientific focus, while others, like Abeloff, guided her clinical career; others, like Glick, pushed her to seize opportunities, or advised her on administration and leadership. "There were no women mentors," she observes. "All white men. And when our trainees hear that, they're like, 'What? How can that be?' But that was the fact of the matter then. I think the good news is, if people are worried that their mentors have to look just like them, I'm here to say they don't." They may simply share your interests, she says.

But mentors can only help those who are willing to help themselves. "Saying yes is extremely important," Davidson says. "You have to be in a position to get the invitations to lead, but then you have to be prepared to accept them. I tell people to seize the day!"

It also helps, she stresses, to know when to pivot and switch paths—in your research as much as your career. When the results of a roughly decade-long effort to use autologous bone marrow transplantation to treat advanced breast cancer came up negative in 2000, for example, Davidson promptly dropped the project, shutting it down within a week. "You have to know when to hold and when to fold," she says.

Finally, Davidson says, having a happy personal life has been a top priority of hers and one she recommends to others. She did not, for example, delay having children. Fortunately, her boss at Johns Hopkins was understanding and gave her all the time she needed for maternity and infant care. But she was lucky. "There were no duty hour restrictions when I was a resident," she says. "There certainly are now. There was no maternity leave. There is now. There's a

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lot more attention to parental leave. Those things have changed and all for the better.”

Institutional support for childcare could certainly improve further, Davidson says. But such measures would have to be instituted equitably. There are multiple paths to having a family, including adoption, and many people with jobs are also caring for elderly parents and need just as much support. Further, legal requirements may vary from place to place for global organizations like Ludwig Cancer Research.

She and Kensler, for their part, were mutually supportive, taking turns tending to their children and their careers—and even collaborating on a few studies over the years. When he was off in China conducting research on liver cancer and its prevention, as he sometimes was for months at a time, Davidson took care of the kids. Later, they prioritized her career, after she took the job at Pittsburgh and became president of ASCO. A shared passion for cancer research also enriched their relationship.

“When I think about the best decisions I made in my life, the first was my husband, the second was having kids, and the third was my career,” she says. “I think those are things that people need to keep in mind.”