



THE FACULTY OF MEDICINE
Harvard University

Frederick Pei Li



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Professor Frederick Pei Li, whose foundational studies set a new paradigm for our understanding of the genetic origins of human cancers, died on June 12, 2015 at the age of 75. Throughout a distinguished career spanning five decades at the National Institutes of Health, the Dana-Farber Cancer Institute, the Harvard T.H. Chan School of Public Health and the Harvard Medical School, he was an international thought leader in cancer genetics who founded programs that catalyzed research in population science and health services research related to human cancers. He mentored a luminous generation of world leaders in cancer

epidemiology and genetics, survivorship, outcomes research, and cancer focused behavioral sciences. His unassuming demeanor belied the profound impact of his research, programmatic innovations and mentoring on cancer science, prevention, and care.

Born in Canton, China in 1940, Fred Li migrated to White Plains, NY in 1947. With support from his mother, he left high school at the age of 16, entering New York University, where he majored in physics. After receiving his MD from the University of Rochester, and a Master of Arts in Demography from Georgetown University, he joined the Epidemiology Branch of the National Cancer Institute in 1967.

In 1969, Dr. Li and his NCI colleague Dr. Joseph Fraumeni made a paradigm-changing contribution to our recognition of the importance of heritable genetic alterations as the underlying cause of cancers. At a time when most of the cancer research world was focused on the development of better chemotherapies and the lifestyle and environmental origins of cancer, Li and Fraumeni sought to understand why certain families experienced higher than normal cancer risks. Using then nascent tools of cancer epidemiology, they focused on families afflicted by an especially high multi-generational risk of contracting not just one, but also multiple forms of cancer, including cancer types uncommon in the general population. Their rigorous work clearly demonstrated that cancer in these families resulted from an inherited predisposition, anticipating the molecular revolution in cancer biology. This cancer predisposition syndrome is now

*In tribute to their dedicated efforts to science and medicine, deceased members of the Harvard Faculty of Medicine (those at the rank of full or emeritus professor) receive a review of their life and contributions with a complete reflection, a **Memorial Minute**.*

known as Li-Fraumeni Syndrome (LFS). In collaboration with Drs. Stephen Friend, David Malkin and colleagues, they later demonstrated that LFS families had in common mutations inactivating a critical tumor suppressor gene, *TP53*. This ground-breaking work established the centrality of altered genes to the pathogenesis of cancer and was recognized by their receipt of the Charles S. Mott General Motors Prize in 1995.

While Fred was best known for this seminal demonstration of the role of inherited mutations in cancer risk, his impact was much broader. After moving to Boston to serve at the NCI Epidemiology Branch's Boston Field Hospital, he was simultaneously appointed associate physician at the New England Medical Center, and fellow at the Peter Bent Brigham Hospital. He joined the faculty of the Harvard School of Public Health and Dana Farber in 1981 as the head of DFCI's Division of Cancer Epidemiology and Prevention. In 1998, he became the Vice Chair for Population Sciences in the Department of Medical Oncology. In these roles, Fred transformed the application of population sciences to cancer research at HSPH, HMS and DFCI. A true visionary, he recognized before almost anyone else the importance of studying, understanding, and supporting cancer survivors burdened by long term late effects of their strenuous therapies. By fostering the development of pioneering survivorship and cancer predisposition clinics, as well as initiatives in health services and behavioral science research, he built a multidimensional program in population sciences. These established Harvard as a leading center in cancer epidemiology, genetics, outcomes research, the application of behavioral sciences to cancer, and community outreach innovations in cancer prevention and early detection.

Dr. Li was named Professor of Clinical Cancer Epidemiology at the Harvard T.H. Chan School of Public Health, Professor of Medicine at Harvard Medical School, and the Harry and Elsa Jiler American Cancer Society Clinical Research Professor, one of the most eminent professorships awarded by the American Cancer Society. He served on the NCI's National Cancer Advisory Board during the Clinton Administration, and on the editorial boards of eminent professional publications such as *Cancer Research*, *The Journal of Clinical Oncology*, and *the American Journal of Medical Genetics*. He was awarded Richard and Hinda Rosenthal Award from the American Association for Cancer Research (AACR), the American Cancer Society (ACS) Medal of Honor in Clinical Research, and the Award for Research Excellence in Cancer Epidemiology and Prevention from the AACR and the ACS. Dr. Li served as founding Editor-in-Chief of one of the leading academic journals in his field, *Cancer Epidemiology Biomarkers, and Prevention (CEBP)*. His important contributions to CEBP were recognized by the creation of the Frederick P. Li Impact Award, awarded annually to an article published in CEBP that has had a major impact in the field of cancer genetics, epidemiology, and prevention. He served as a member of the Board of Directors of the AACR from and was elected a Fellow of the AACR Academy.

No recitation of Fred Li's research contributions, professional leadership, and many accolades does justice to the fullness of his legacy. Fred was a deeply caring and compassionate individual who founded and operated a free clinic in Chinatown in Boston for many years, often providing physician care

himself at no charge to patients. He was an extraordinary teacher, mentor, and inspiring role model. The novel programs he founded were used by him as the milieu in which to nurture a generation of brilliant junior faculty, many of them women, to become academic and professional leaders in their own disciplines.

Almost before anyone else, Fred was interested in the long-term outcomes in childhood cancer survivors. He was prescient in understanding not only that studying survivors would lead to insights into genetic etiology (as in the second cancer predisposition in retinoblastoma), but also that it was our responsibility to assure expert and compassionate care for those we cure. His publications in the mid-1970's set the stage for childhood cancer survivorship research, outlining not only the many issues faced by survivors but also establishing research methods for investigators studying those outcomes over the decades to come. He was among the first to detail the risks of secondary cancers in childhood cancer survivors (*Cancer* 35:1230-1235, 1975), as well as the medical and social outcomes in survivors using case tracing and questionnaires (*Annals of Internal Medicine*, 84:5, 1976) and to recognize the importance of family studies and understanding the health of the progeny of survivors (*Lancet*, 2:707-715, 1974). "He suggested to me that the Dana-Farber needed a childhood cancer survivorship program, and that I should start it by seeing all the retinoblastoma survivors. I took his advice.", recalled Professor Lisa Diller. She and Dana Farber became pioneers in the field.

Dr. Li was an innovator who valued cross-disciplinary thinking well before this concept became a common theme in population research. He built a Division of Population Science at the Dana-Farber that purposefully brought together scientists who worked across the translational continuum. The division provided a forum for those focused on genetics and cancer care to interact with investigators focused on prevention and early detection, connections that catalyzed innovation. He cultivated an atmosphere that inspired his faculty "look outside the lamp post light"—beyond the obvious, to new connections and opportunities.

Fred was proud of bringing a strong preventive orientation to Dana-Farber. He supported his faculty working in this space without fail. The ultimate mentor, he made connections, provided opportunities, and collaborated in ways that expanded our thinking. At the time that Dr. Li recruited her to DFCI, Dr. Karen Emmons' research had focused on behavioral interventions to reduce cancer risk factors, including smoking cessation. Dr. Li was an investigator on the Childhood Cancer Survivor's Study and noticed that the tobacco use rates among this cohort of survivors was only slightly less than that among the general population. Professor Emmons recalled that "Fred encouraged me to explore this observation and supported me in developing a line of research that doubled smoking cessation rates among cancer survivors. Were it not for his observations and willingness to help me make the necessary connections, I would not have pursued this line of work and the development of effective approaches to smoking cessation for survivors would have continued to lag."

In addition to being highly supportive of faculty working outside of traditional areas oncology research,

Fred was also highly supportive of the many women in his Division, whose careers he helped to launch. In fact, several of the first women at DFCI who became tenured professors at Harvard did so under Dr Li's leadership. These faculty members also went on to significant leadership roles with his support and guidance.

Fred Li was deeply devoted to his wife, Dr. Elaine Shiang, his children, Andrew, Margaret, and Irene and his grandchildren. He fully understood the challenges of balancing family life with the extraordinary demands of a career of a physician-scientist. He applied this understanding to his mentees by supporting their development as spouses, partners, and parents, not just rising academic leaders. Professor Emmons commented on just what this approach meant to his faculty: "Above all, Dr. Li supported his faculty in all of their professional and personal pursuits. He knew our families and inquired about them. He shared stories of his own family and the importance of priorities. In an extremely stressful environment, he made having a full and balanced life normative, which was a gift." His personal qualities of kindness, modesty, respect for others, intellectual rigor, integrity, and optimism are legacies that endure, embodied in the form of the personal qualities and contributions being made by those he trained and inspired.

On June 12, 2015, Harvard, Fred's beloved family, his many friends, colleagues and mentees, and everyone whose cancers are now being prevented or detected at earlier curable stages lost someone to whom we all owe an enormous debt. Fred Li was an enormous force in advocating for the importance of the rigorous study of the causes, risks, and prevention of human cancers, from inherited susceptibility to late effects of cancer therapies, and for mitigating the very human cost of cancer across this spectrum. His is a profound legacy that continues to endure.

Respectfully submitted,

Edward J. Benz Jr., MD, *co-chair*

Stuart H. Orkin, MD *co-chair*

Lisa R. Diller, MD

Karen M. Emmons, PhD

Judy E. Garber, MD, MPH

Timothy E. Rebbeck, PhD