



David M. Livingston



David M. Livingston, a towering figure in cancer research, died unexpectedly on October 17, 2021, at the age of 80. His legacy is etched in the fabric of modern cancer science, not only for his landmark discoveries but also for his deep dedication to mentorship, his ability to foster collaboration, and his unwavering commitment to scientific integrity and rigor.

Born in Cambridge, Massachusetts, and raised in Salem, David's early life and education reflected both his intellectual precocity and resilience in the face of antisemitism. His journey in medicine began with an undergraduate degree from Harvard in 1961, followed by an MD from Tufts in 1965, where he graduated at the top of his class. David's medical training continued at Peter Bent Brigham Hospital and later, at the NIH, where he worked with luminaries such as Dr. Phil Leder and Dr. George Todaro. These experiences catalyzed his commitment to addressing important scientific questions with rigor and fearlessness.

David's scientific contributions were profound. His research on the retinoblastoma protein (pRB) revealed its critical role in cell-cycle regulation, linking it to tumor suppression mechanisms. His

laboratory's work laid the groundwork for understanding the role of the BRCA1 and BRCA2 genes in DNA repair, illuminating pathways that have been vital in understanding breast cancer pathogenesis and advancing therapeutic approaches. Also, his contributions to cloning EP300 and EP400 and his insights into DNA tumor viruses reshaped cancer biology. He was renowned for his keen scientific intuition, the robustness of his findings, and his unflagging enthusiasm for new discoveries.

At Harvard Medical School (HMS), David was a key figure, shaping the institution's scientific and educational landscape. As the Emil Frei III Professor of Medicine and Genetics and as Deputy Director of the Dana-Farber/Harvard Cancer Center (DF/HCC), he led transformative efforts that positioned Harvard as a leading center for cancer research. His role extended to developing and overseeing research initiatives

*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**.*

that connected multiple affiliated institutions, a formidable task that required both vision and diplomacy. His leadership was instrumental in fostering a collaborative environment among Harvard's research entities, culminating in the establishment of the DF/HCC consortium — an endeavor that unified Harvard's diverse cancer research initiatives under one collaborative umbrella. He played a pivotal role in establishing the DF/HCC-MIT Bridge Project, which facilitates the application of technology and engineering approaches to the study and treatment of cancer by supporting grants jointly proposed by MIT and Harvard faculty. These accomplishments reflected David's rare ability to bridge institutional divides and his recognition that such unity would enhance both the depth and scope of cancer research across Harvard.

In 1992, David Livingston, in conjunction with Thomas M. Roberts, forged a collaboration between DFCI and Sandoz (now Novartis) to uncover new cancer therapeutic targets and to enhance scientific understanding of the company's drug-discovery efforts. The original agreement provided basic and translational research funding for about 20 Dana-Farber laboratories, multiple postdoctoral fellowships, and support for HMS graduate programs in the life sciences. Following the merger of Sandoz with Ciba-Geigy that resulted in the formation of Novartis in 1996, the collaboration deepened to include closer integration of DFCI investigators into Novartis drug-discovery programs. At its peak, more than half of all Novartis oncology preclinical efforts were linked to DFCI laboratories. For example, DFCI investigators Thomas Roberts, Charles Stiles, and Brian Druker (now at Oregon Health and Sciences University) played pivotal roles in the development of imatinib mesylate (Gleevec) for chronic myeloid leukemia (CML). This was a breakthrough, targeted therapeutic that inhibited a tyrosine kinase involved in the formation of the fusion protein BCR-ABL, effectively shutting down replication of cancer cells. To date, the DFCI-Novartis Drug Discovery & Translational Research Program has provided more than \$160 million in cancer research funding and supported more than 750 research projects.

A testament to his collaborative spirit, David initiated an annual retreat in 1988, gathering scientific competitors at his country home in Colrain, Massachusetts to share unpublished data and discuss ideas openly. This annual event became a cherished tradition, fostering camaraderie and trust among leading cancer researchers. David's legacy of collaboration extended beyond his personal relationships. He served for many years on the Damon-Runyon Cancer Research Board of Trustees, as scientific chair of the Pezcoller Symposium Scientific Advisory Board, and as a trusted advisor to the NCI under then NCI director Richard Klausner.

Beyond administration, David was a beloved educator and mentor at HMS. His mentorship went beyond the boundaries of the laboratory; he was devoted to nurturing his trainees' intellectual and professional growth and emphasizing the importance of scientific rigor and integrity. His students recall him as a supportive, if demanding, mentor who took a deep interest in their success, shaping the careers of nearly 200 fellows and students, many of whom went on to become leaders in academia and industry. David's office was always open to his trainees, and he encouraged them with his daily inquiry, "What's new and different?" — a prompt that invited open discussion of ideas and fueled a dynamic, curious atmosphere within his lab.

His contributions to cancer research were recognized through numerous accolades, including his election to the National Academy of Sciences, the National Academy of Medicine, and the American Academy of Arts and Sciences. Yet, David's greatest joy came not from his accolades but from the success of those he mentored, including 2019 Nobel laureate William G. Kaelin Jr.

David's life was enriched by his passions outside the lab. He was a lover of good (and not so good) jokes, an accomplished chef and gourmand, a skilled linguist, and an avid supporter of Boston sports. Most of all, he was a devoted husband, father, and grandfather, whose legacy will live on in the lives of those he touched — both in science and beyond. His contributions to cancer research and mentorship will continue to impact the field for generations to come.

Respectfully submitted,

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