

CANCER

Winning the war

An insider's guide to the politics and personalities of America's war on cancer

By Adrian Woolfson

On 26 December 1971, President Richard Nixon authorized a preemptive strike against a military stockpile in North Vietnam, comprising a 5-day bombing campaign known as Operation Proud Deep Alpha. Only 3 days earlier, he had announced the initiation of another type of war. The conflict this time was not against a foreign ideology or nation but rather against the corrupt and malign processes of human biology that transform healthy cells into unwelcome pathological strangers bent on undermining our existence—an initiative that came to be known as the war on cancer. In this engaging, provocative, and deeply personal book, Vincent and Elizabeth DeVita-Raeburn provide a unique and compelling insider's guide into the personalities, organizations, and key protagonists that provided the backdrop and impetus for this unprecedented campaign.

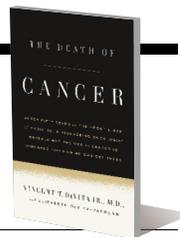
Vincent DeVita is well positioned to tell the story of the war on cancer, having served as director of the National Cancer Institute (NCI), physician-in-chief at Memorial Sloan Kettering, and director of the Yale Cancer Center. As a physician, he has devoted his life to caring for cancer patients. As a clinical researcher, he helped develop the concept of combination chemotherapy, which transformed the treatment of human cancers and led to a cure for Hodgkin's lymphoma and diffuse large B-cell lymphoma. He has also experienced malignancy first hand, having been diagnosed with prostate cancer in 2009.

The book, cowritten with his daughter, Elizabeth, provides a detailed account of the pioneering days of chemotherapy at NCI, including some insightful and, at times, remarkably unflattering accounts of some of the major players in early cancer research. It also includes stories of DeVita's relentless and thoughtful attempts to identify appropriate experimental therapies for his friends, family, and patients, as well as an assorted collection of irreverent and humorous anecdotes.

The Death of Cancer presents a candid and disarming critique of the ways in which medicine, and specifically oncology, is regulated

The Death of Cancer

Vincent T. DeVita and Elizabeth DeVita-Raeburn
Sarah Crichton Books, 2015.
324 pp.



in the United States. DeVita believes that, in some instances, burdensome restrictions and red tape have delayed the timely delivery of potentially efficacious, but not yet approved, medicines to those in desperate need. In his view, the current approval process has also led to an overreliance on randomized clinical trials that may be unnecessary when an experimental agent has already demonstrated overwhelming evidence of efficacy. The insistence on using survival endpoints in studies on patients with advanced disease may also, he maintains, result in efficacy signals being overlooked.

The book contrasts the bureaucracy associated with contemporary clinical trials with the “war room” days of early chemotherapy, when clinical study protocols could be adjusted in real time according to emerging data. DeVita justifies the need for more flexibility on the basis that individuals facing imminent death have an entirely different relationship to risk. Such individuals, he ar-

gues, are more likely to be amenable to the possibility of significant toxicities if there is a potential for prolonged survival.

We are currently in the process of navigating a remarkable new era in which the targeted small molecules and engineered biologics that have enhanced, and in some instances superseded, conventional chemotherapy are being eclipsed by the remarkable results achieved with immunotherapy. Therapeutic advances in the form of checkpoint inhibitors, immune agonists, vaccines, and cellular therapies such as chimeric antibody receptor T and NK cells, have been accompanied by next-generation genome-sequencing technologies and biomarker platforms that offer the promise of personalized medicine.

Given the dramatic pace of new discoveries in cancer medicine and the extraordinary results achieved with immunotherapeutic agents, the authors are correct when they assert that we don't need to identify the magic bullet to cure cancer immediately. We simply need to develop treatments, combinations, and schedules capable of keeping patients alive long enough to benefit from the next generation of breakthrough agents.

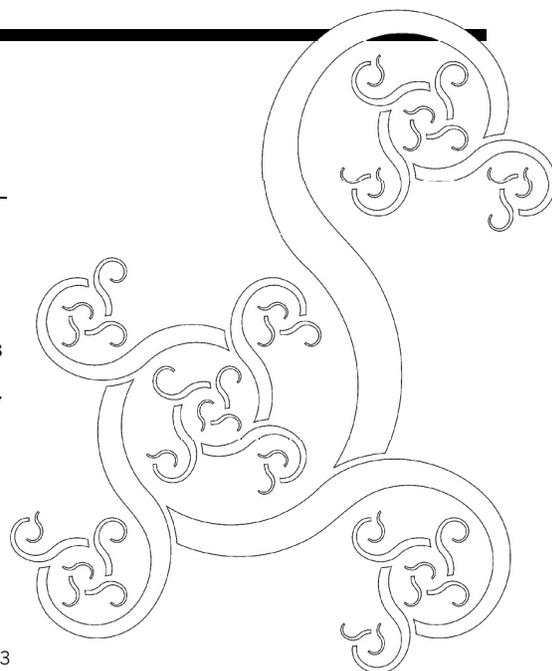
DeVita's infectious enthusiasm and unshakeable belief that cancer will soon become a thing of the past provides both an inspiration and a glimpse into the future when, like many infectious diseases before them, common cancers are likely to be trivialized. However, the achievement of this goal, he argues, is likely to depend on the development of a more flexible and innovative technical and regulatory framework for clinical trials that facilitates the rapid and adaptive targeting of multiple cancer nodes simultaneously.

MATHEMATICS

Patterns of the Universe

A Coloring Adventure in Math and Beauty
Alex Bellos and Edmund Harriss
The Experiment, 2015. 144 pp.

Coloring books, once relegated to the 12-and-under set, have enjoyed a recent surge in popularity among adults. Joining the growing market of coloring products for grown-ups, *Patterns of the Universe* presents 65 striking black-and-white illustrations designed to introduce doodlers to a range of challenging mathematical principles. From the geometry of crystals, to the undulating waves created by a Fourier transform, to the intricate design of the Mandelbrot set, the elegant patterns are accompanied by brief, accessible explanations of the underlying mathematics.



10.1126/science.aad3526

10.1126/science.aad9853

PHOTO: TK

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