
1973—2023
50
Years of Discoveries
NFCR™
National Foundation
for Cancer Research
We Make Cures Possible

OUR COMMITMENT

Together, we make cures possible.

AS WE CELEBRATE THE PAST, WE ARE PREPARED for the future. NFCR's first 50 years focused on research to learn about the disease of cancer. Over that time, we have made many significant breakthrough discoveries in the fight against cancer — and the researchers we have funded have saved lives as a result of these discoveries. The next 50 years will take those breakthroughs and expand on them as we work to make cures possible.

The view ahead is bright and full of hope. It is one where cancer will be a disease that has been cured. In this future, NFCR will have an expanded community of supporters as we build a movement to enable all people to be part of the cure. Our current donor base has been (and will continue to be) invaluable in helping us accomplish our mission. However, to find cures to all cancer, we need to expand our base — and the amount of resources we dedicate to research.

Right now, we have momentum with the support of a donor base and research community that is motivated to make a difference. But to accomplish our goal of curing cancer, we need more funding, and we need the sheer number of people who believe in and support the mission of NFCR to expand exponentially. We will get there, but only with your help.

We're all part of the cure in our own ways. Some of us give financially. Some volunteer. Some provide care. Some give education about prevention and how to navigate a cancer diagnosis. Whatever your part, join forces with NFCR to make cures possible.

Cures won't just happen. Together, we can create a world without cancer.

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Give. Volunteer. Support.

Contents

ABOVE: In 1983, after the 2nd Gordon Conference on Oxygen Radicals, a small NFCR workshop was held at Montecito, California, with Szent-Györgyi, Salisbury, and a handful of colleagues.
ABOVE RIGHT: NFCR researchers of free radicals, Drs. Lester Packer, Bruce Ames, Helmut Sies, and Martyn Smith, together at UC Berkeley in 1984.
RIGHT: Appreciation letter from Dr. Szent-Györgyi to Franklin Salisbury, Sr. for his initial gift.

LABORATORY OF THE
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ALBERT SZENT-GYORGYI, M. D., PH. D.
TEL.: FALMOUTH 548-3705
AREA CODE: 617

May 28, 1971

Mr. Franklin C. Salisbury
919 Eighteenth Street, N W
Washington, D.C. 20006

Dear Mr. Salisbury:

I am deeply touched by your great generosity and compassion. I have worked very hard all my life with the aim to conquer this terrible disease, and now I see my way clear through to an understanding and cure. I will do my best to spend every penny most carefully to the greatest advantage. What I want to add is that such a donation means much more than its dollar equivalent. It is a great encouragement which, sometimes, is badly needed.

Yours very truly,

Albert Szent-Gyorgyi
M.D.,Ph.D.

AS-G:fb

Creating a World Without Cancer

IN THE LAST 50 YEARS, NFCR HAS played a significant role in advancing the fight against cancer through our research programs. Many would still say that cancer can't be cured. Simply put, they are wrong. Cancer is a genetic disease that can (and will) be managed and cured. Through the work of NFCR — along with our community of researchers, donors and supporters, cancer patients and survivors, who serve as our inspiration and motivation, we will advance our mission and make cures possible.

The first 50 years of NFCR have resulted in many research breakthroughs, which have helped pave the way for progress in new detection, diagnosis, treatment and prevention methods. Through the pages of this magazine, we share the stories of NFCR from our early days to today. Along this journey, we feature some significant moments in our evolution as a cancer research nonprofit. We also highlight and honor some of the most influential scientists and breakthrough discoveries that advanced cancer research.

NFCR is unique in many ways, but the most essential aspect of this organization is the community we have helped build. From the core team at NFCR to our partner organizations such as AIM-HI Accelerator Fund (AIM-HI), Global Coalition for Adaptive Research (GCAR) and Asian Fund for Cancer Research (AFCR), to the researchers we support globally, to our 5.3 Million donors who help make everything we do possible, to the cancer patients and survivors who motivate us every day to advance the NFCR mission of finding cures for cancer, our community is very strong and unified.

This year, at the historic moment of our 50th anniversary, we launched a new brand with a new tagline: "We Make Cures Possible." Our brand evolution signifies our continued commitment to, and focus on, finding cures for all cancers by working with all stakeholders in cancer care. Together, we can make cures possible.

Please read the stories in this magazine. Learn about what drives our team, scientists and supporters — inspired by our successes to date and the women and men from our research and support community who have made a difference.

We are all part of the cure. I invite you to find your part and join forces with NFCR. Together, we will go further and help the world live without cancer.

Sincerely,

Sujuan

Sujuan Ba, Ph.D.
PRESIDENT AND CEO, NFCR

Meeting of NFCR scientists with NFCR leadership and donors in Boston, 2023.

Committed to a Cure

THE REMARKABLE 50-YEAR JOURNEY OF THE NATIONAL FOUNDATION FOR CANCER RESEARCH

FOR THE PAST 50 YEARS, the National Foundation for Cancer Research has provided vital funding to make game-changing discoveries in cancer treatments, detection, prevention and, ultimately, a cure. NFCR has distinguished itself in the cancer research sector by emphasizing wholistic, long-term, transformative research often overlooked by other major funding sources — research that aims to cure all types of cancer.

NFCR's unwavering commitment to this vision has yielded remarkable achievements and catalyzed groundbreaking discoveries that have transformed cancer treatment paradigms. Notable accomplishments include:

- **Identifying Oncogenes and Tumor Suppressors:** NFCR-funded researchers played a pivotal role in identifying key oncogenes and tumor suppressor genes that govern cancer development. These discoveries laid the foundation for targeted therapies and personalized medicine approaches.

- **Angiogenesis and Tumor Microenvironment:** For more than 30 years, NFCR has supported researchers in identifying and unraveling the mechanisms behind tumor angiogenesis. NFCR-supported scientists have increased the understanding of the extracellular matrix, immune cells, and vasculature that form the tumor microenvironment contributing to the progression of cancers, leading to the development of FDA-approved treatments.

- **Genomic and Proteomic Research:** Early on, NFCR recognized the transformative potential of genomics and proteomics in cancer research. The foundation's support enabled scientists to delve deep into the genetic and proteomic landscape of cancer, uncovering novel therapeutic targets.

- **Global Initiatives on Improving Clinical Trials:** With an unwavering commitment to its global impact principle, NFCR facilitated partnerships with international research institutions, fostering a collaborative, worldwide approach to paradigm-shifting clinical trials that are accelerating life-saving cancer drug advancements.

Public awareness of NFCR's commitment to basic cancer research in 1984.

ALL THESE BREAKTHROUGHS HAPPENED WITH the help of more than 5.3 million individual donations. Together, those donations provided NFCR with $410 million to fund cancer research, prevention and public education.

And so, as NFCR celebrates its 50th anniversary, it seems only appropriate to recognize that it all began with one such donation.

That pivotal day happened in 1972, when Franklin C. Salisbury, a Washington DC attorney, sent a letter with a $25 donation to Dr. Albert Szent-Györgyi, a Nobel laureate and pioneering biochemist, who wanted to answer the call to arms President Richard Nixon had issued with the "War on Cancer."

Salisbury sent his donation after reading an

article in the *Evening Star* in which Szent-Györgyi aired his frustration with the hurdles he faced to get government funding. Szent-Györgyi, the Nobel laureate who with Hans Krebs discovered how cells metabolize oxygen to create energy, maintained it was pointless to describe what research he was going to do in grant applications, "when the whole point of basic research was to venture out into the unknown."

To Salisbury's surprise, Szent-Györgyi responded: "I am deeply touched by your great generosity and compassion. … I will do my best to spend every penny most carefully to the greatest advantage. What I want to add is that a donation means much more than its dollar equivalent. It is a great encouragement which, sometimes, is badly needed."

Szent-Györgyi's response intrigued Salisbury and his wife, Tamara, who had been a program officer at the Office of Naval Research. As a corporate attorney and businessperson, Salisbury was accustomed to dealing with large figures. The gratitude of a Nobel laureate for his $25 donation struck him as odd. Something must be terribly wrong with the "War on Cancer" for such an eminent scientist to have to go begging.

The idea of helping Szent-Györgyi find a cure for cancer motivated Franklin and Tamara Salisbury who worked together with Szent-Györgyi to establish the National Foundation for Cancer Research as a 501(c)(3) nonprofit, which would mobilize a grassroots "War on Cancer" and raise money to support research for a cure.

During its first decade, NFCR supported Szent-Györgyi and his network of scientists who used electron spin resonance (ESR) to detect free radicals in structural proteins and studied the affinity of tumor cells for certain kinds of free radicals. Szent-Györgyi came very close to fitting together pieces of important biochemical puzzles, opening new research perspectives on the processes involved in cancer.

In a few years, the public's response to NFCR's direct-mail solicitations helped NFCR raise enough money to support not just Szent-Györgyi's research, but research by other scientists working to cure cancer.

From the start, it was clear that NFCR would distinguish itself with its unique approach that encouraged iconoclastic researchers such as Szent-Györgyi, who had trouble getting funding for "blue sky" ideas. NFCR's vision then and now was to foster a collaborative and interdisciplinary approach to cancer research. Unlike traditional funding agencies, NFCR focused on providing scientists with long-term support and the freedom to explore novel ideas and uncharted territories. This unique approach fueled groundbreaking discoveries and catalyzed progress in the field of oncology.

The three cofounders of NFCR, Dr. Szent-Györgyi, Franklin Salisbury Sr. and Tamara Salisbury.

"The whole point of basic research was to venture out into the unknown."

Dr. Albert Szent-Györgyi

A good example is Dr. Harold F. Dvorak, a researcher at Beth Israel Deaconess Medical Center and Harvard Medical School who had discovered a molecule but could get no funding to study it. In 1980, Salisbury called Dvorak and offered to support his pioneering research. He accepted the funding and went on to establish that his molecule, now called vascular endothelial growth factor (VEGF), is a protein primarily responsible for blood vessel formation in tumors. Dvorak's breakthrough discovery was critical to the development of anti-angiogenesis therapies which inhibit the growth of blood vessels that fuel tumor progression. His research laid the groundwork for the development of life-saving drugs like Avastin, forever transforming the landscape of cancer treatment — and moving that much closer to a cure.

Evolution and Expanding Impact

THROUGHOUT THE 1980S AND 1990S, NFCR continued funding pioneering researchers, contributing to significant advances in genomics, immunotherapy and targeted therapies. The foundation's dedication to investing in the best minds earned it a reputation as a driving force behind scientific progress.

Then, in 1997, on the eve of NFCR's 25th anniversary, Salisbury passed away. The Board of Directors elected his son, Franklin C. Salisbury Jr., who had joined NFCR in 1993, to be the new CEO. Over the next 22 years, he would carry on NFCR's mission, while expanding its vision for funding high-risk and high-impact cancer research.

Key to Franklin Jr.'s vision was how he worked with the scientists NFCR supports. Building on the model established by his parents, NFCR continued providing innovative scientists what Donald Engelman, Dean of Molecular Biophysics and Biochemistry at Yale, called "adventure funding."

An example of that adventure funding was Dr. Danny Welch, who is renowned for his exploration of the genetic underpinnings of metastasis, the primary cause of cancer-associated deaths. Dr. Welch's research has been instrumental in identifying metastasis suppressor genes and deciphering their mechanisms, paving the way for potential therapeutic interventions.

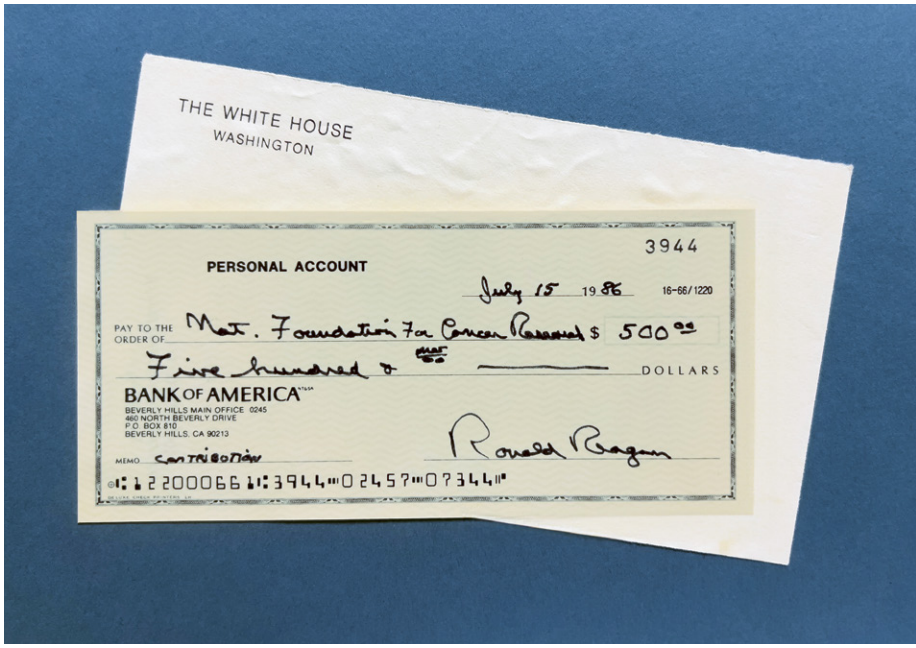
Recognizing that "medical research could be a bridge to globalization," Franklin Salisbury, Jr. worked with scientists in NFCR's orbit to establish a network of research centers at universities and research hospitals around the world.

One of the research centers was at the University of Oxford where NFCR had been supporting Graham Richards' research on computational drug design since 1982. With the expansion of global research, Salisbury Jr. worked with Prof. Richards to establish the NFCR Centre for Computational Drug Design in 2001. The Centre was a virtual consortium that included researchers from several European countries. The first research program launched was a Screensaver LifeSaver Project which used the idle time of over 3.5 million internet-connected personal computers to computationally screen a large database of molecular structures.

From 2001 to 2007, more than 3.5 billion drug-like molecules were screened against 12 cancer targets, which yielded tens of thousands of lead compounds that were analyzed by science project leaders and used to identify new anti-drug candidates. "This technology gave individuals a chance to use their idle computer time to assist in the discovery of new drugs to combat cancer," Salisbury Jr. said.

"That is a very powerful way of uniting the public support globally."

NFCR also embraced investment in early detection, diagnosis and cancer prevention, paving the way for personalized cancer treatments tailored to individual patients.



1986 donation from President Ronald Reagan (top). Scientists at the NFCR Annual Scientific Meeting in Woods Hole, Massachusetts (bottom).

Iconoclastic Science Moves into a New Era

AT THE SAME TIME THAT SALISBURY JR. WAS making his mark on NFCR, another powerful player was shaping the organization's direction—future CEO, Dr. Sujuan Ba. A trained research scientist with experience in the biopharmaceutical sector, Ba recognized early on that NFCR needed to expand its focus into translational efforts, building international collaborations and entrepreneurial oncology ventures.

Since 1999, Ba has moved NFCR in that direction in positions ranging from chief science officer, chief operating officer, president and finally being named CEO in 2019. She has developed innovative scientific platforms for global collaboration that have rapidly broken down barriers slowing cancer research and accelerated the development of next-generation treatments.

Her leadership has been recognized outside NFCR as well. She was named one of the "Top 300 Women Leaders in Global Health" in 2015 by the Graduate Institute of International and Development Studies' Global Health Programme and has received many other awards for her leadership role of advocating cancer research and global collaboration.

But while she steered NFCR in new directions, Ba never lost sight of the organization's original vision.

"We always try to identify the unmet need. We are always at the forefront. As an organization, we have an obligation, responsibility and mission to research those areas that for-profit organizations will not dare go," Ba said. "NFCR has always gone against the grain to look at cancer as a disease that can be healed. We're not just trying to cure a specific type of cancer like many organizations and research groups, but rather all cancer."

Another example of Ba's collaborative approach is the GBM AGILE (Adaptive Global Innovative Learning Environment) Knowledge Network, a think tank that revolutionized the fight against GBM, a brain cancer that is regarded as incurable and universally fatal. President Joe Biden's son, Beau, died of GBM, as did Senator John McCain.

Ba knew a barrier to GBM cancer research was that it kills 98% of patients in less than three years. Yet, traditional drug trials take 5-7 years to produce results and cannot be modified once they begin. A paradigm-shifting approach was desperately needed.

"The current clinical trial simply wasn't working for GBM patients," Ba said. "It was a broken system, and we had to pilot a paradigm for change. We had to find a revolutionary system that actually could make the clinical trial much more effective for patients."

GBM AGILE did just that with adaptive trials that incorporate the latest information. Harnessing an international team of more than 150 oncologists, statisticians, pathologists, neurosurgeons, imagers and patient advocacy leaderships, GBM AGILE captured traditional Phase II and Phase III clinical trials in a seamless process, which led to greater efficacy, lower costs and more rapid delivery of effective therapies to patients. The fast-tracked approach is now FDA-approved and led to drug trials that take much less time — and promises to advance development of more cancer drugs worldwide.

But GBM was just the start of the collaborative, iconoclastic approach Ba and other leading cancer researchers brought to NFCR. Next was the AIM-HI Accelerator Fund, which works to evaluate and fund the oncology startups that develop innovative first-in-class and best-in-class experimental cancer drugs and diagnostics. So far, AIM-HI has helped to launch 15 oncology companies.

"The whole philosophy is about empowering scientists to do the best science and give them the tools and funding critically needed to do that," Ba said. "That's what we've always been about. Let's do research — and research will find a cure. That has been the philosophy for 50 years. But now we've evolved and expanded systematically into the entrepreneurial aspect of bringing the discoveries out of laboratories and advancing drug development."

"We're not just trying to cure a specific type of cancer like many organizations and research groups, but rather all cancer."

Dr. Sujuan Ba

NFCR leadership and scientists with international collaborators at the 2005 Biofunding Summit.

Although she is immensely grateful for the many small donations NFCR has received over the past 50 years, Ba recognizes that the organization needs to attract larger donors. She's confident that NFCR's new entrepreneurial approach to finding cures will do just that.

"Now, we not only help scientists make discoveries, but we are also taking those discoveries all the way through the pipeline," she said. "In this way, we can actually demonstrate how many discoveries our scientists made and how many of them are being pushed into commercialization, how many go through preclinical studies, how many get into Phase I or Phase II, how many get to the patient side. This is the quantifiable impact our supporters want to see—and deserve to see."

A Vision for the Future

AS THE FIGHT AGAINST CANCER CONTINUES to evolve, so does the National Foundation for Cancer Research — adapting to emerging scientific trends and transformative technologies and incorporating state-of-the-art methodologies into its grant programs.

NFCR has also diversified its fundraising efforts, through innovative campaigns and strategic partnerships with various organizations. This expanded financial support has further amplified NFCR's ability to fund groundbreaking research projects and attract top-tier scientists. The foundation also has established educational programs and scholarships to nurture young talent and inspire the brightest minds to devote their careers to cancer research.

Since 1973, NFCR has raised more than $410 million, making possible scientific breakthroughs that give patients hope for a cure. The first 50 years of the National Foundation for Cancer Research is a testament to the power of vision, determination and collaboration in the pursuit of a cure, as well as the power of grassroots support from ordinary citizens.

From its humble origins starting with a $25 donation to being a major cancer-related charity, NFCR has impacted millions of lives. Driven by a steadfast commitment to innovation and global impact, NFCR continues to spearhead groundbreaking research that will shape the future of cancer care and ultimately lead to a cancer-free world.

As NFCR moves forward, one thing remains certain: The unyielding spirit of its mission will inspire future generations.

Franklin Salisbury Jr., Dr. Sujuan Ba and Charlie Weatherspoon, co-founders of the AIM-HI Accelerator Fund (top). A screenshot of the Screensaver LifeSaver Project (bottom).

"We have never wavered from our original vision. We've made 50 years of progress, and now we need people to help us fund the breakthroughs of the next 50 years," Ba said. "Today, we have the infrastructure, the network, the power and the knowledge needed. We're moving full steam ahead, seeding new ideas and exploring new frontiers for future discoveries, all while pushing those discoveries into clinical trials. With the help of our donors, we'll continue to drive the science that makes cures possible."

RESEARCHERS:
DR. ALBERT SZENT-GYÖRGYI
DR. HELMUT SIES
DR. LESTER PACKER
DR. BRUCE AMES
DR. MARTYN SMITH
DR. TREVOR SLATER

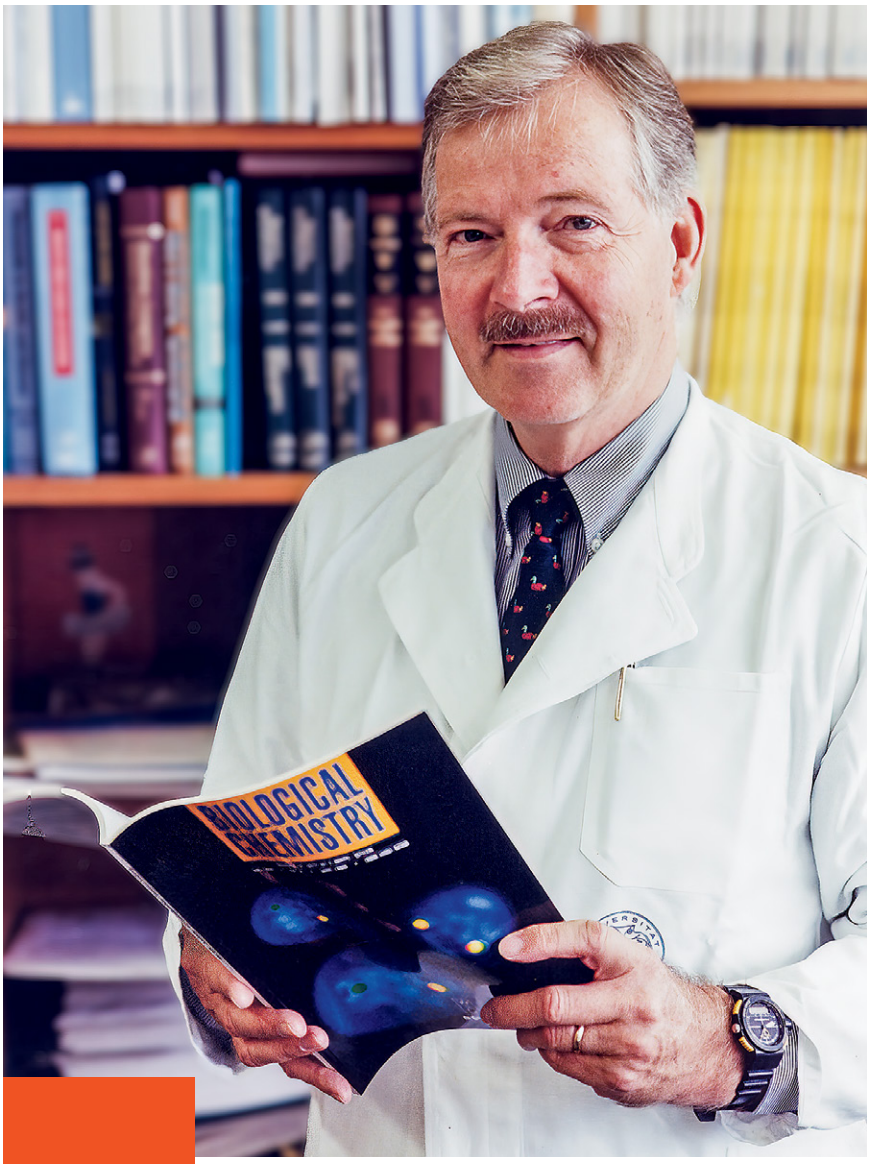
Free Radicals & Antioxidants

THE STUDY OF REDOX REACTIONS IN CANCER RESEARCH GAINED MOMENTUM in the 1960s and 1970s with Dr. Albert Szent-Györgyi's work on the role of electron transfer reactions in biological systems. Dr. Szent-Györgyi's research, leading to the creation of the NFCR in 1973, paved the way for Dr. Helmut Sies to further expand our knowledge of redox reactions during the 1980s. With the support of NFCR, Dr. Sies became instrumental in understanding the role of oxidative stress in cancer development and progression. Amidst the growing recognition of the importance of redox reactions in cancer, Dr. Trevor Slater's research emerged, shedding light on the intricate balance between oxidants and antioxidants.

NFCR not only supported individual scientists in the field of free radicals and antioxidants, but also fostered collaboration through sponsorship of symposia such as The Oxygen, Radicals, and Cancer Workshop. The workshop coordinators, Dr. Lester Packer, Dr. Bruce Ames and Dr. Martyn Smith, started the Oxygen Club of California, an organization for collaboration on oxidant-related research. It is this spirit of collaboration that has accelerated progress for the past 50 years and continues to offer new possibilities for innovative cancer therapies and improved patient outcomes.

BREAKTHROUGH

Dr. Albert Szent-Györgyi, co-founder of the NFCR, laid the foundation for understanding the critical role of electron transfer reactions in biological systems. His identification of vitamin C's role as an antioxidant, and its potential in combating oxidative stress, was pivotal. He elucidated cellular respiration mechanisms and their connection to cancer, enhancing our understanding of metabolism's impact on the disease. His work laid crucial foundations for exploring therapeutic avenues and fostering innovative approaches in cancer treatment and prevention.

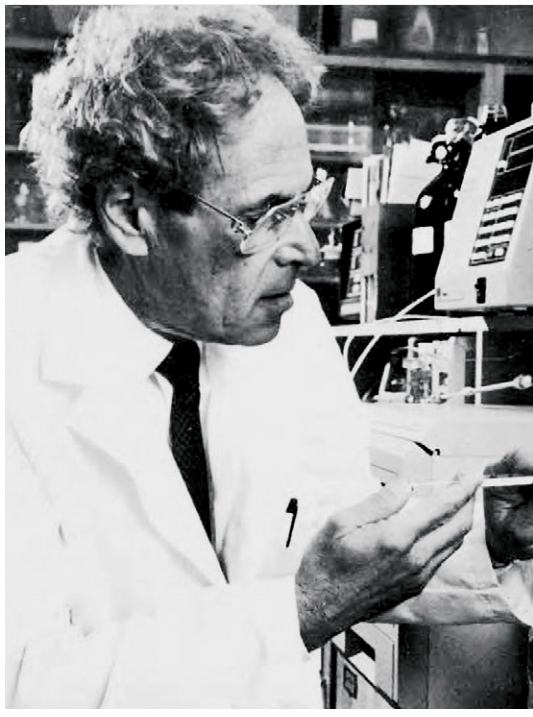


BREAKTHROUGH

DR. HELMUT SIES is renowned for his pioneering work in understanding the critical role of antioxidants and oxidative stress in cellular health. His groundbreaking studies identified key mechanisms by which cells combat oxidative damage, a process implicated in various diseases including cancer. Among his notable discoveries is the role of lycopene, a compound found in tomatoes, in protecting cells from damage. His research has significantly advanced our understanding of cellular defense mechanisms and has profound implications for aging, cancer, cardiovascular diseases and other health conditions.

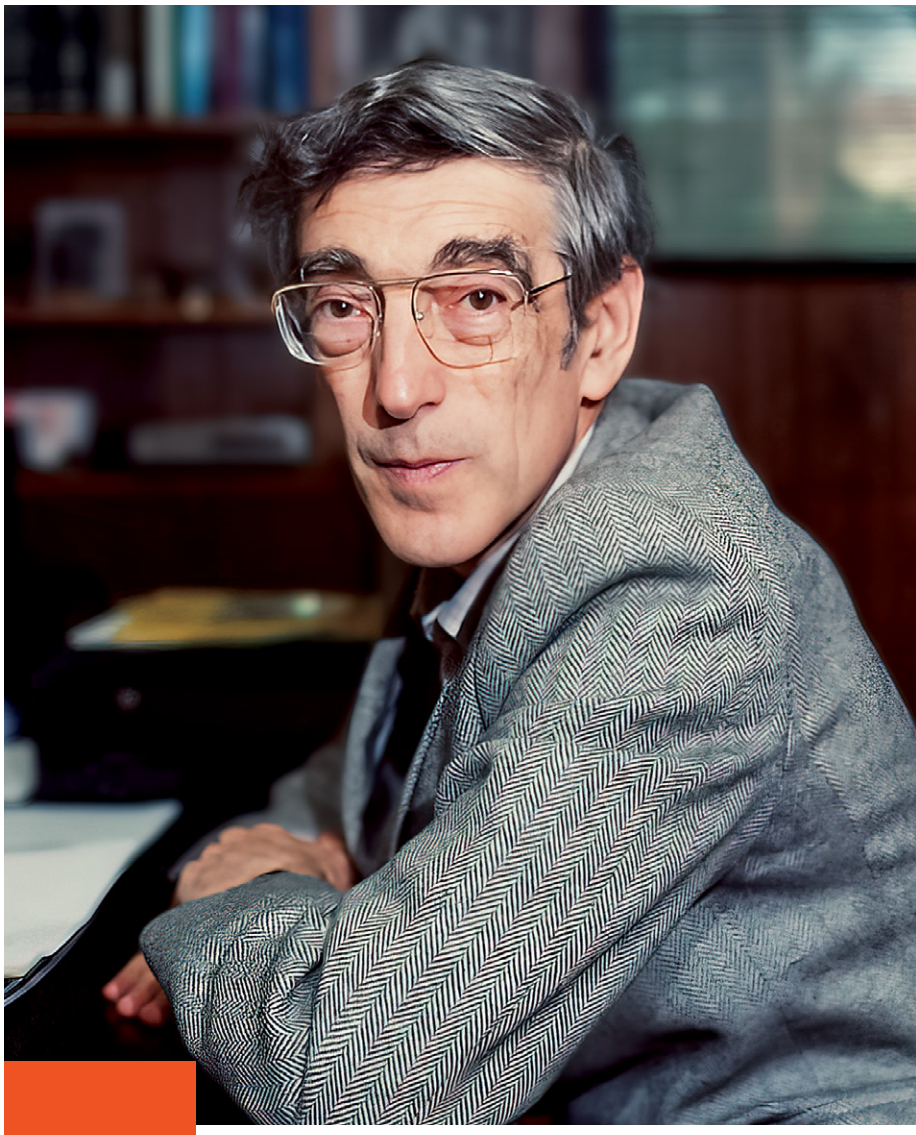
BREAKTHROUGH

Dr. Lester Packer is a world-renowned expert on antioxidants and their role in disease prevention and treatment. His research has provided insight into how oxidative stress contributes to cancer development and progression. He was one of the first scientists to demonstrate that antioxidants could protect cells from damage, thereby preventing cancerous changes. Dr. Packer's discoveries have influenced the development of treatments centered around antioxidant supplementation, contributing to the survival and quality of life of countless patients.



BREAKTHROUGH

Dr. Martyn Smith is recognized for his contributions to understanding the relationship between exposure and disease. Dr. Smith's investigations into the impact of chemical exposures on DNA mutations have unveiled critical insights, establishing links between exposure to specific chemicals and subsequent cancer risk. Dr. Smith's research has informed policy decisions and public health strategies for agencies such as the World Health Organization and the U.S. Environmental Protection Agency.

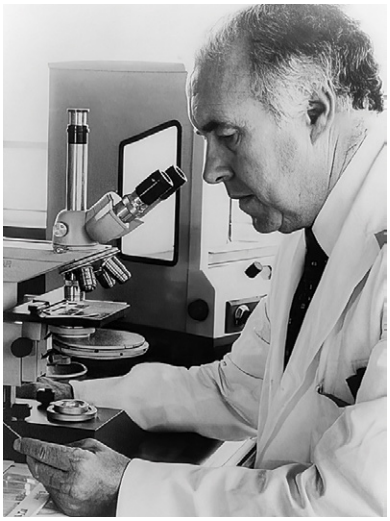


BREAKTHROUGH

DR. BRUCE AMES is a renowned biochemist and molecular biologist, celebrated for his contributions to genetics cancer research. Dr. Ames developed the Ames Test, a widely adopted method assessing mutagenic potential, shedding light on carcinogenic properties of chemical compounds. Dr. Ames' work laid the foundation for understanding the role of genetic damage in cancer, shaping risk assessment, and informing public health policies regarding chemical exposure. His impact resonates through safer chemicals and advanced strategies in cancer research and prevention.

BREAKTHROUGH

Dr. Trevor Slater has greatly advanced our understanding of free radicals' role in cancer pathogenesis. His trailblazing studies have elucidated the molecular damage caused by these reactive species in cancer cells, thereby paving the way for innovative therapeutic approaches. Dr. Slater's research on antioxidant therapy has offered critical insights for cancer treatment, enhancing the overall prognosis and patient care in this domain.



NFCR DONOR STORY

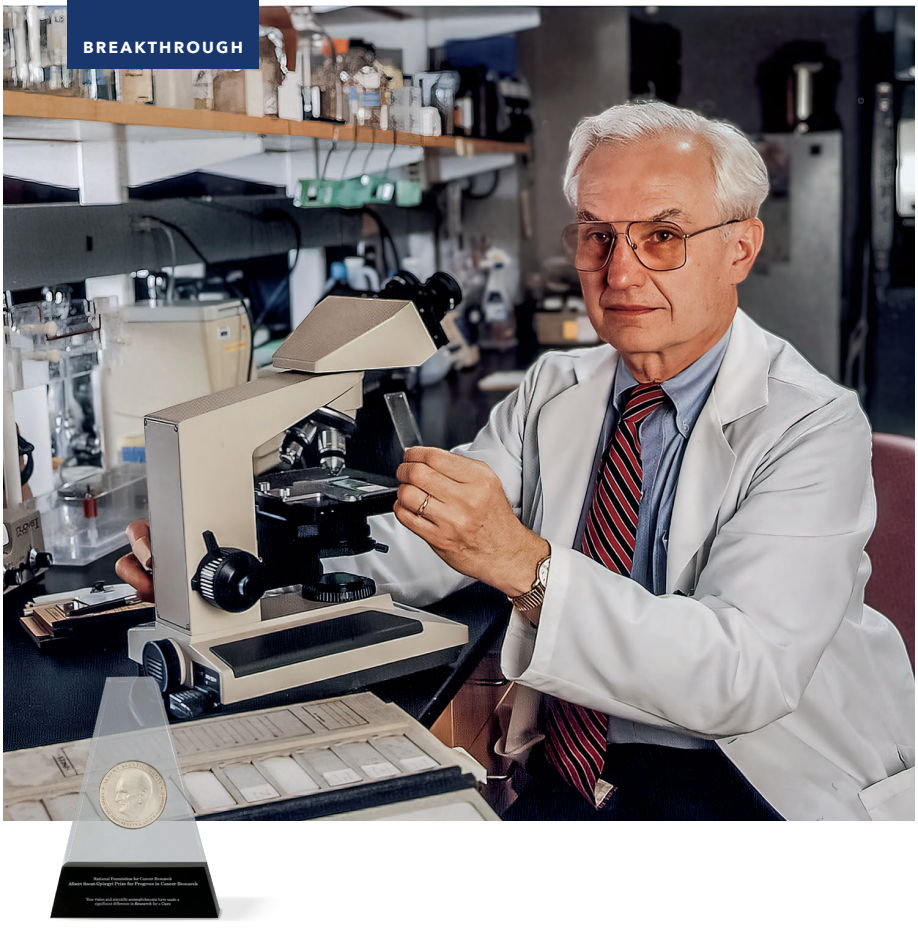
In the mid-1970s, retired high school biology teacher from Brooklyn, NY, **Anthony (Tony) Pratt** wanted to do something about the metastatic breast cancer that took his mother's life. He read an article about Nobel laureate Albert Szent-Györgyi's goal to eradicate cancer. He wrote to Dr. Szent-Györgyi expressing his desire to support the pioneer's basic research. A grateful letter from Dr. Szent-Györgyi suggested Tony send any contributions to the National Foundation for Cancer Research. And Tony and his wife Marjorie made the first of their monthly donations to NFCR which continue to this day.

SCIENTISTS:
DR. HAROLD F. DVORAK
DR. RAKESH K. JAIN
DR. ISAAC P. WITZ
DR. BEATRICE MINTZ

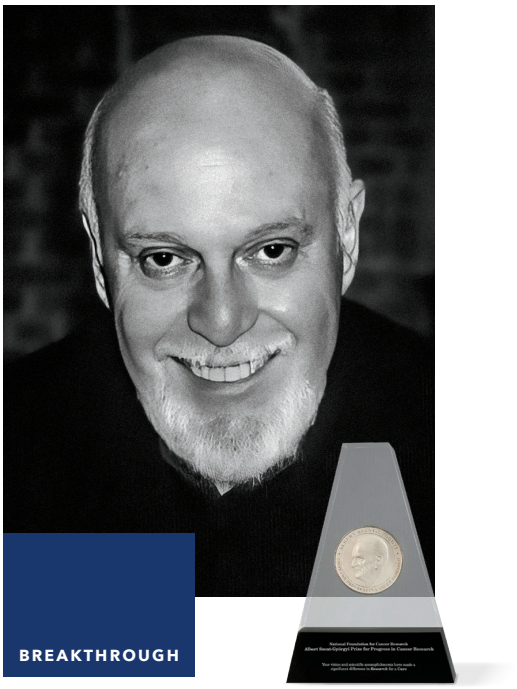
Tumor Microenvironment & Angiogenesis

THROUGH ITS UNWAVERING SUPPORT AND RECOGNITION OF PIONEERING scientists, NFCR continues to drive innovation and knowledge in the fields of tumor microenvironment (TME) and angiogenesis research, paving the way for transformative breakthroughs in cancer treatment and patient care. Dr. Harold F. Dvorak, supported by NFCR, discovered tumor cells' secretion of vascular endothelial growth factor (VEGF), pioneering angiogenesis research. His findings led to anti-angiogenic treatments like Avastin. Dr. Isaac P. Witz demonstrated communication between tumor cells and microenvironment's importance, challenging the cancer cell-centric view and advancing immunotherapy understanding. Dr. Beatrice Mintz's groundbreaking work established cancer as a developmental aberration. She demonstrated the significance of microenvironments in stem cell behavior, with tumor stem cells normalizing in healthy environments. Dr. Rakesh K. Jain introduced the concept of 'normalizing' abnormal tumor vessels through anti-angiogenic approaches, enhancing drug delivery and efficacy. His work significantly influences immunotherapy combinations and broadens perspectives on cancer treatment and other diseases, reshaping therapeutic strategies based on TME interactions.

BREAKTHROUGH



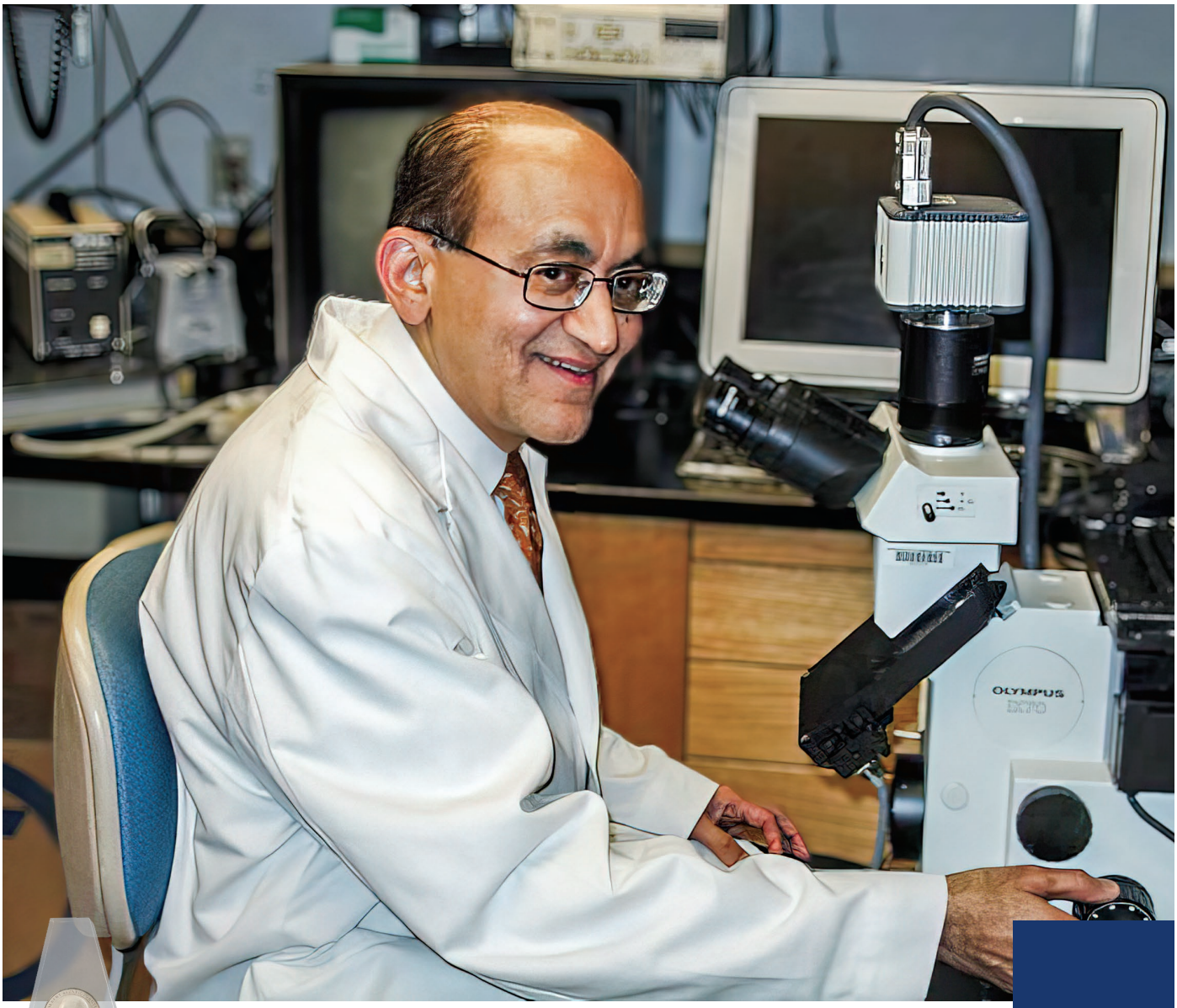
Dr. Harold F. Dvorak is best known for his contributions to the field of tumor biology, revolutionizing our understanding of the tumor microenvironment by discovering vascular endothelial growth factor (VEGF). This pivotal discovery elucidated the mechanisms behind tumor-induced angiogenesis, the process by which tumors form new blood vessels to fuel their growth. VEGF has since become a central target in anti-angiogenic cancer therapies. Dr. Dvorak's groundbreaking work has not only deepened our knowledge of tumor biology, but also paved the way for the development of novel therapeutic strategies aimed at curbing tumor vascularization – proving invaluable in the ongoing fight against cancer. NFCR honored Dr. Dvorak with the inaugural Szent-Györgyi Prize for Progress in Cancer Research in 2006.



Dr. Isaac P. Witz's illustrious career spans more than 50 years of breakthrough observations on the critical importance of tumor microenvironment in the biology of the cancer cell, its growth and advancement to metastasis. For paving the foundation of the TME, NFCR honored Dr. Witz with the 2023 Szent-Györgyi Prize. His seminal work demonstrated that humoral immune components localized in the tumor microenvironment can impact tumor biological functions and growth. His discoveries paved the foundation for certain aspects of contemporary immunotherapy, ultimately benefiting cancer patients and advancing scientific steps toward finding cures for cancer.

BREAKTHROUGH

DR. BEATRICE MINTZ achieved remarkable breakthroughs spanning developmental genetics, gene-transfer technology, embryology, epigenetics and tumor microenvironment. Notably, Dr. Mintz pioneered the first chimeric mice by combining early, genetically distinct mouse embryos, allowing her to further illuminate how local cellular environments guide behavior. She ingeniously demonstrated that transferring early carcinoma stem cells to a fitting normal environment stabilizes their development. In 2011, NFCR honored Dr. Mintz with the Szent-Györgyi Prize.



BREAKTHROUGH

DR. RAKESH K. JAIN is known for his pioneering work in overcoming barriers in the tumor microenvironment (TME). With NFCR support, Dr. Jain's studies have shed light on how blood vessels, lymphatic vasculature, fibroblasts, extracellular matrix and immune cells in tumors create a hostile environment that fuels tumor progression. Dr. Jain's anti-angiogenic approach normalizes abnormal tumor vessels for better delivery and efficacy of anti-cancer medicines. Dr. Jain's contributions have not only enhanced our comprehension of cancer progression, but also influenced therapeutic strategies to target these interactions. Dr. Jain was honored by NFCR with the 2022 Szent-Györgyi Prize.

NFCR DONOR STORY

Arnold and Helen Klein are immigrants from Slovakia who faced incredible economic and physical challenges when they first arrived in the U.S. After years of hard work, Arnold became a successful entrepreneur and has been free of Chronic Myelogenous Leukemia (CML) for 20 years. The Kleins have been generous supporters of NFCR since 2010, funding research projects and saving lives. They have established the **Arnold and Helen Klein Fund for Cancer Research**, which will have a long-lasting impact on NFCR's scientific program.

RESEARCHERS:
DR. I. BERNARD WEINSTEIN
DR. WEBSTER CAVENEE
DR. PETER K. VOGT
DR. CARLO M. CROCE
DR. LEO SACHS
DR. ESTHER H. CHANG

Oncogenes & Tumor Suppressor Genes

NFCR HONORS AND SUPPORTS OUTSTANDING RESEARCHERS WHO HAVE played a pivotal role in advancing groundbreaking research on oncogenes and tumor suppressor genes. Dr. Webster Cavenee stands out among visionary researchers, as his work provided the first indisputable evidence of tumor suppressor genes, revolutionizing the field and fundamentally changing our comprehension of cancer initiation and progression. Dr. I. Bernard Weinstein made important strides in unveiling "oncogene addiction," revealing cancers' dependence on specific signaling pathways, which allowed vulnerabilities to be targeted by therapeutic agents. Dr. Peter K. Vogt's research led to the discovery of the first retroviral oncogene, SRC, and in avian retroviruses — MYC, JUN and PI3K — providing crucial evidence of the cellular origin of oncogenes. Dr. Carlo Croce's groundbreaking work identifying key oncogenes and tumor suppressor genes through chromosomal translocations and regulation by microRNA has led to novel insights into cancer pathways and new therapeutic approaches. Dr. Leo Sachs made numerous significant contributions, including identifying chromosomes that control tumor suppression and discovering apoptosis as a major mechanism by which WT-p53 suppresses malignancy. Dr. Esther H. Chang developed a nanoscale delivery system to target tumors and deliver tumor suppressor gene, p53.

BREAKTHROUGH

Dr. I. Bernard Weinstein is a distinguished figure in the realm of cancer research and oncology, recognized for his studies on the molecular mechanisms of cancer development and progression. A central theme of his research was understanding how DNA repair, mutation and genomic instability contribute to cancer onset. Dr. Weinstein hypothesized that these mutations within an oncogene drive the cell toward malignancy and alter the cell-signaling pathways in a way that makes the cancer cell dependent on the oncogene for its survival. Dr. Weinstein's work has provided critical insights into genetic alterations in cancer, leading to the identification of potential therapeutic targets.

BREAKTHROUGH

DR. WEBSTER CAVENEE is a preeminent figure in cancer genetics research, renowned for his groundbreaking work on the genetic basis of tumorigenesis, oncogenic cell signaling and his use of genetic approaches to cancer identification. Dr. Cavenee identified genetic mutations involved in cancer, with a particular emphasis on brain tumors, such as glioblastoma multiforme. This pivotal work not only provided key insights into the genetic mechanisms that drive tumor progression, but also offered potential therapeutic avenues for targeting these genetic anomalies.

BREAKTHROUGH

Dr. Peter K. Vogt gained significant recognition for his groundbreaking research, which played a pivotal role in uncovering the mysteries of oncogenes. His genetic investigations were instrumental in pinpointing the initial oncogene, SRC, and in revealing that retroviral oncogenes originate from the cell's genome. Notably, his work extended to identifying other crucial retroviral oncogenes like MYC, JUN and PI3K, all of which hold substantial significance in human cancer. Presently, PI3-kinase stands out as a highly promising focal point in the realm of cancer treatment.

BREAKTHROUGH

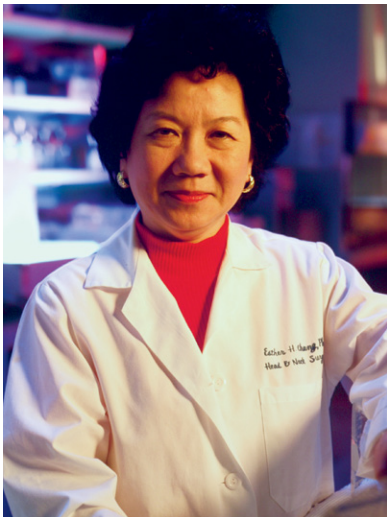
Renowned for his investigations into cancer pathogenesis, **Dr. Carlo M. Croce** has illuminated the genetic underpinnings of cancer onset. His research has established links between various cancers and genetic factors, underscoring the role of chromosomal abnormalities in initiating and advancing cancer. Dr. Croce's work encompasses gene studies, including ALL1, LZTS1, and the pivotal discovery and sequencing of BCL2, which is associated with lymphomas. Moreover, his research unveiled the role of microRNA in cancer pathogenesis. Dr. Croce's work has deepened our comprehension of cancer's genetic composition, enabling new approaches to diagnosis, prognosis, and treatment. For his contributions, NFCR honored him with the 2008 Szent-Györgyi Prize.

BREAKTHROUGH

DR. LEO SACHS was a renowned molecular biologist whose pioneering work laid the foundation for advances in the fields of hematology and cancer research. His investigations into the differentiation and growth of hematopoietic cells enhanced the understanding of how blood cells develop from stem cells. The identification of colony stimulating factors (CSFs) and maturation factors could boost the production of infection-fighting white blood cells in cancer patients undergoing chemotherapy or radiation. His research on the tumor suppressor gene WT-p53 and its role in inducing apoptosis (programmed cell death) in leukemia cells has provided insights into suppressing malignancy and offers potential therapeutic strategies.

BREAKTHROUGH

Dr. Esther H. Chang and her team developed a groundbreaking nanoscale drug delivery system to target primary and metastatic tumor cells directly, significantly heightening tumor sensitivity to chemotherapy and radiation across a spectrum of cancer types, including head and neck, prostate, pancreatic, breast cancer and melanoma. Recently, her team successfully delivered the p53 gene to sensitize ovarian tumors to chemotherapy. Her target delivery nano-cancer treatment minimizes toxicity to healthy cells, resulting in minimal side effects and remarkable therapeutic outcomes.



NFCR DONOR STORY

Since 2005, former Home Depot CEO **Frank Blake** has supported NFCR through monthly donations with **200-plus gifts**. In a recent presentation to nonprofit professionals, Frank was asked to explain his personal theory on generosity. He humbly replied, "Expressing generosity, expressing kindness, living in an 'other-focused' way is one of the most important journeys you take in life." His deep passion for cancer research stems from the loss of several siblings and other family members to cancer. Through his decades of support to NFCR, his action encourages others to embark on their own journey of generosity to support NFCR with the confidence that they, too, can **make cures possible.**

RESEARCHERS:
DR. SUSAN BAND HORWITZ
DR. KATHRYN HORWITZ
DR. YUNG-CHI CHENG
DR. ALEX MATTER
DR. DENNIS A. CARSON
DR. ZHEN-YI WANG & DR. ZHU CHEN
DR. DOUG LOWY & DR. JOHN SCHILLER
DR. ALAN SARTORELLI
DR. MICHAEL B. SPORN
DR. CURT I. CIVIN

Transformative Therapies Development

NFCR PROVIDES SUPPORT AND RECOGNIZES NUMEROUS SCIENTISTS MAKING life-changing contributions to cancer therapies. Dr. Kathryn Horwitz's research on hormone-based therapies has improved breast cancer treatment. Dr. Susan Band Horwitz's groundbreaking discovery around Taxol resistance has transformed cancer care. Dr. Alex Matter's development of the first drug specifically targeting molecular lesion in cancer, Gleevec, ushered in a new era of precision medicine. The collaborative efforts of Dr. Zhen-Yi Wang and Dr. Zhu Chen transformed the once fatal disease, acute promyelocytic leukemia (APL), into a highly treatable one by integrating traditional Chinese and Western medicine. Dr. Yung-Chi Cheng's innovative research on traditional Chinese medicine in anticancer drug development has left a lasting impact. Dr. Dennis A. Carson uncovered the common deletion of a purine metabolism enzyme and the p16 tumor suppressor gene in multiple cancers to develop cladribine, a first-line treatment for hairy cell leukemia (HCL). Dr. Alan Sartorelli was one of the first scientists to recognize the importance of personalized treatment approaches based on a patient's genetic makeup. Dr. Doug Lowy and Dr. John Schiller developed vaccines for the human papillomavirus (HPV). Dr. Michael Sporn pioneered the field of chemoprevention with the development of novel treatments. Dr. Curt Civin's discoveries enabled stem cell transplantation, improving survival for leukemia patients. These collective efforts have profoundly impacted cancer patients by providing more effective and targeted treatment options, enhancing prognosis — and offering hope for a better quality of life.

BREAKTHROUGH

Dr. Susan Band Horwitz's research into the mechanism of action of paclitaxel (Taxol), a prominent chemotherapeutic derived from the yew tree, has impacted the creation of novel anticancer treatments. Paclitaxel is now a cornerstone in managing diverse cancers, including breast, ovarian and lung. Despite the effectiveness of Taxol therapy for many patients, drug resistance poses a clinical challenge. Dr. Horwitz's research could guide doctors in predicting patient responses. Dr. Horwitz's contributions have enriched our knowledge of cancer cell proliferation, offering patients expanded avenues for effective therapies. NFCR honored Susan Band Horwitz with the 2020 Szent-Györgyi Prize.

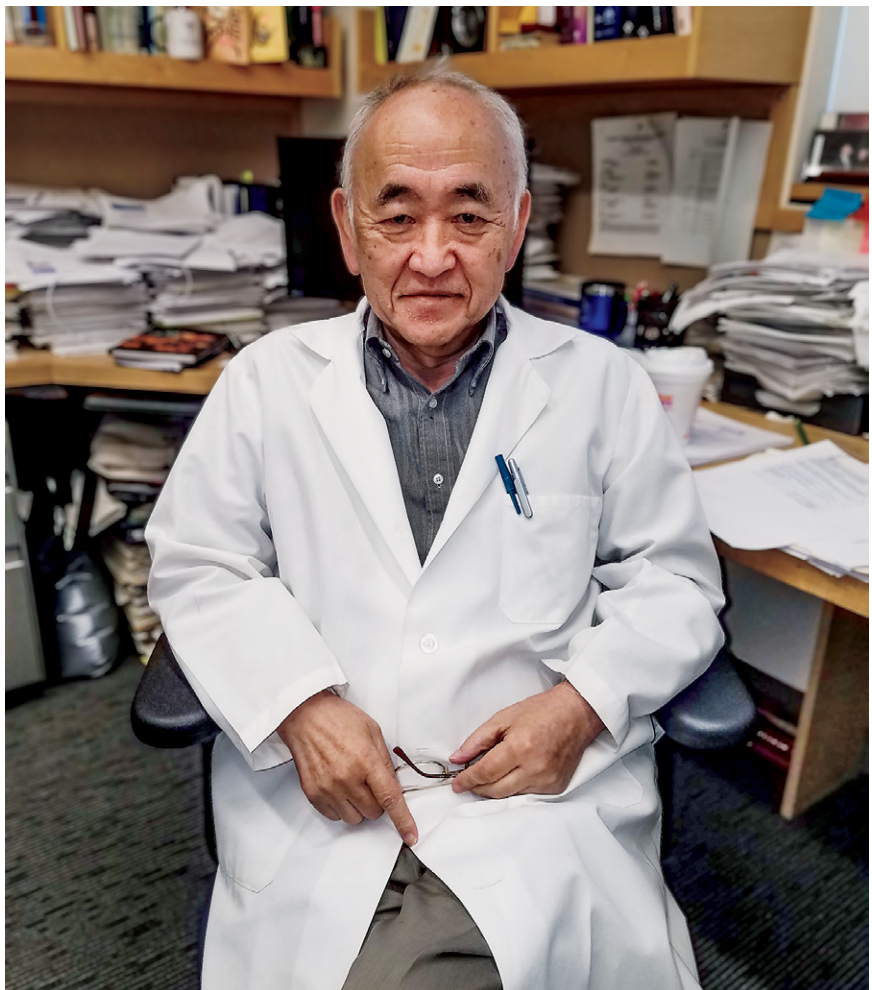
ALBERT EINSTEIN COLLEGE OF MEDICINE

BREAKTHROUGH

Dr. Kathryn Horwitz is a distinguished researcher in the field of endocrinology, with a focus on the role of steroid hormones such as progesterone in the development and progression of breast cancer. Dr. Horwitz's research delves into the molecular mechanisms through which hormones impact tumor growth, metastasis and treatment response. Her investigations led to crucial insights into hormone resistance in breast cancer and have paved the way for the development of novel therapeutic strategies. Dr. Horwitz's influence is evident in improved patient outcomes and the broader understanding of hormonal influences in cancer progression and treatment.

BREAKTHROUGH

DR. YUNG-CHI CHENG has consistently pushed the boundaries of antiviral and anticancer agents. Renowned for groundbreaking contributions to cancer and hepatitis B drug development, his research explores traditional Chinese medicine's potential anticancer properties, including a botanical drug that enhances immunotherapy and chemotherapy. Combined with a frontline drug, it is treating liver cancer patients in a global clinical trial. This holistic approach, melding modern and traditional methodologies, underscores Dr. Cheng's commitment to finding diverse solutions to complex medical challenges. Dr. Cheng's contributions have elevated our grasp of potential therapeutic strategies in the battle against cancer.



BREAKTHROUGH

Dr. Michael B. Sporn was a pioneer in the realm of cancer research, particularly as a trailblazer in the emerging field developing novel chemopreventive drug agents, a concept in its infancy at the time. This work included the synthesis of hundreds of naturally occurring molecules known as triterpenoids, possessing remarkable preventive properties, from anti-inflammatory and anti-proliferative to pro-apoptotic and cytoprotective. Triterpenoids hold immense potential in combatting various cancers, including breast, lung and pancreatic malignancies.

BREAKTHROUGH

DR. ALEX MATTER is a visionary scientist celebrated for his work in precision medicine. Dr. Matter's development of Gleevec, the first drug specifically targeting molecular lesion in cancer, revolutionized cancer treatment by demonstrating the potential of targeting specific genetic abnormalities. Gleevec's success paved the way for targeted therapies, altering cancer care and inspiring the pursuit of tailored treatments for various malignancies. Dr. Matter's legacy resonates through improved patient outcomes and personalized oncology approaches. NFCR honored Dr. Matter with the 2013 Szent-Györgyi Prize.

BREAKTHROUGH

Dr. Dennis A. Carson is best known for his research in the development of new therapeutics for cancer and autoimmune diseases. He has helped create several novel anticancer drugs, including cladribine, a first-line treatment for hairy cell leukemia. Dr. Carson's impactful work has enriched our understanding of cancer biology, offering potential avenues for more effective treatments and improved patient outcomes.

BREAKTHROUGH

In 2012, NFCR awarded the Albert Szent-Györgyi Prize to **DR. ZHEN-YI WANG** and **DR. ZHU CHEN** for their groundbreaking contributions to cancer research, particularly in treatment of acute promyelocytic leukemia (APL). Their innovative therapeutic approach combined traditional Chinese medicine with Western medicine, significantly improving treatment outcomes. This method dramatically increased the five-year disease-free survival rate and set a new standard of care for APL. Their collaborative efforts showcased the potential of tailored therapies, offering new hope and insights into managing challenging cancer subtypes.

BREAKTHROUGH

NFCR honored **Dr. Doug Lowy** and **Dr. John Schiller** with the 2018 Szent-Györgyi Prize for their groundbreaking work in developing the HPV vaccine – the first FDA-approved cancer vaccine. The vaccine's efficacy against HPV-driven cancers, especially cervical cancer, has been instrumental in public health. Dr. Lowy unraveled viral oncology mechanisms, and Dr. Schiller deepened our comprehension of viral-associated cancers. Their combined efforts have saved lives and inspired innovative approaches to combat and prevent HPV-related malignancies.

Dr. Schiller (Left) and Dr. Lowy (right)

BREAKTHROUGH

DR. CURT CIVIN pioneered bone marrow stem cell transplantation, significantly improving leukemia patient survival rates. His 1984 discovery of CD34, a vital marker for hematopoietic stem cells, revolutionized treatment by enabling stem cell transplantation. Dr. Civin's latest breakthrough offers hope for acute myeloid leukemia (AML) patients. He has identified artemisinins, used against malaria, as effective agents against AML cells. ART-838, a specific artemisinin compound, shows remarkable promise, complementing existing drugs and sparing normal bone marrow cells.

BREAKTHROUGH

Dr. Alan Sartorelli has made a lasting mark on cancer research through his contributions to the development of chemotherapeutic agents. As a trailblazer who grasped the significance of tailoring drugs to specific tumors, Dr. Sartorelli's research has been pivotal in shaping the present-day personalized approach to cancer treatment, which hinges on the unique genetic makeup of each patient. His innovative approaches have paved the way for more effective therapies and improved patient outcomes, leaving a legacy in the field of cancer research and treatment.

NFCR DONOR STORY

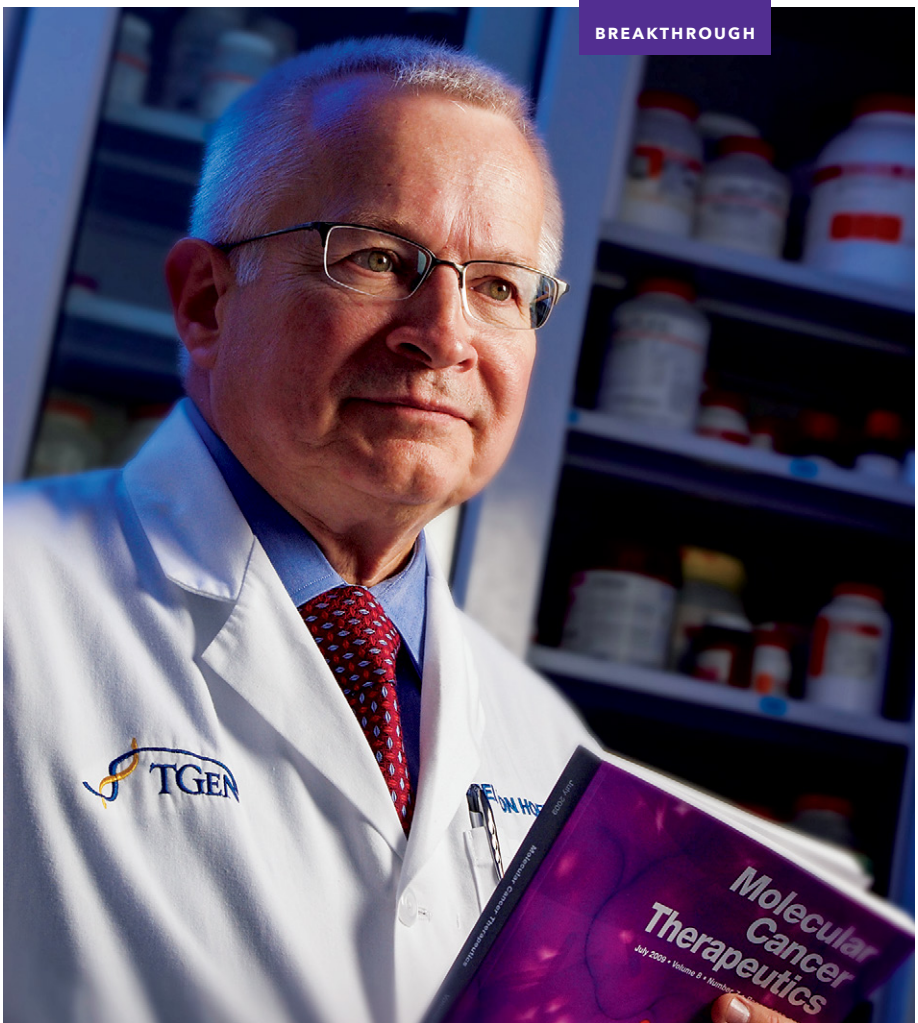
Jim Nickelsporn, a compassionate attorney in Maryland, near NFCR's headquarters, has always supported people in their time of need. Sadly, he lost his father to kidney cancer, and his mother survived colon cancer. The cancer prevalence in his family convinced Jim and his sister to begin their checkups every three years. For 20 years, Jim has given to NFCR to support high-risk/high-reward research. Jim tells NFCR, "Research must take risks, and I know that one day, a cure will be found. I support NFCR to carry out the searches for the cure." His commitment includes numerous gifts through the NFCR honor and memorial program. Commitment to cancer research, compassion for those in need, and a healthy lifestyle is Jim Nickelsporn's equation for living well.

RESEARCHERS:
DR. DANIEL VON HOFF
DR. ALANNA SCHEPARTZ
DR. MICHAEL HALL
DR. JAMES P. BASILION
DR. RALPH WEISSLEDER
DR. ALICE T. SHAW

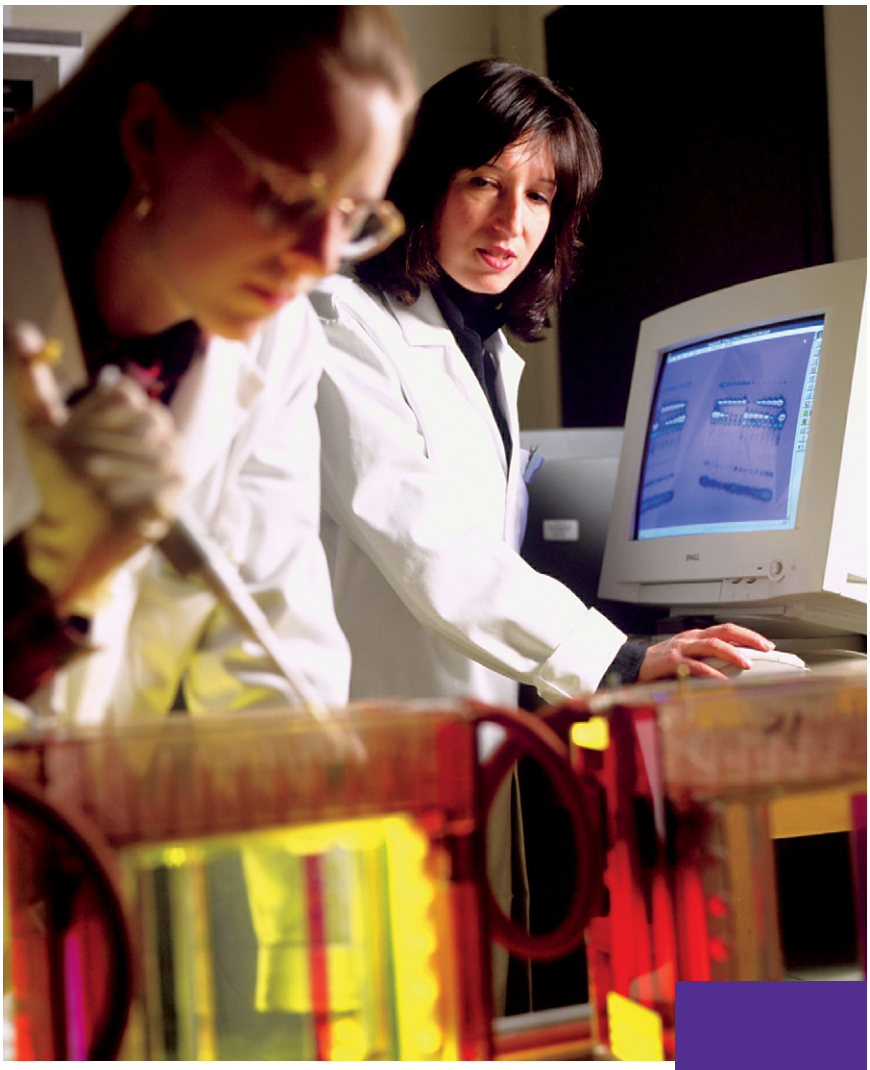
Targeted Therapies & Molecular Imaging

NFCR'S LONG-TERM SUPPORT HAS FOSTERED BREAKTHROUGHS IN targeted therapies and molecular imaging for cancer diagnosis and treatment. Dr. Dan Von Hoff received his first grant from NFCR, which led to chemotherapy for pancreatic cancer, gemcitabine. He is now focused on monoclonal antibodies targeting stellate cells for pancreatic cancer treatment. Dr. Alanna Schepartz's beta-peptide inhibitors represent a highly effective and specific new generation of anticancer drugs, targeting protein-protein interactions in various cancers. With the discovery of TOR pathway, Dr. Michael Hall elucidated its crucial role of cell growth and metabolism, leading the way to development of mTOR inhibitors. Combining detection and treatment techniques, Dr. James P. Basilion's team developed a process called photodynamic therapy to treat metastatic cancer with applied light. Dr. Ralph Weissleder's work on high-resolution molecular imaging and nanomaterials shows promising results in early cancer detection. Dr. Alice Shaw's innovative treatments for drug-resistant lung cancer led to global registration studies for crizotinib and ceritinib, resulting in FDA approval — significantly improving outcomes for ALK+ lung cancer patients.

BREAKTHROUGH



Dr. Daniel Von Hoff is a renowned figure in the field of oncology, having significantly impacted the treatment and understanding of various cancers. Dr. Von Hoff has been involved in the development of numerous anticancer agents, which have become part of standard treatments. Throughout his career, Dr. Von Hoff has been involved in over 200 clinical trials, contributing to the development of several drugs, including gemcitabine, mitoxantrone, fludarabine, paclitaxel, docetaxel, irinotecan and more. Currently serving in prestigious positions and leading research programs, Dr. Von Hoff continues to make significant contributions in the fight against cancer.



BREAKTHROUGH

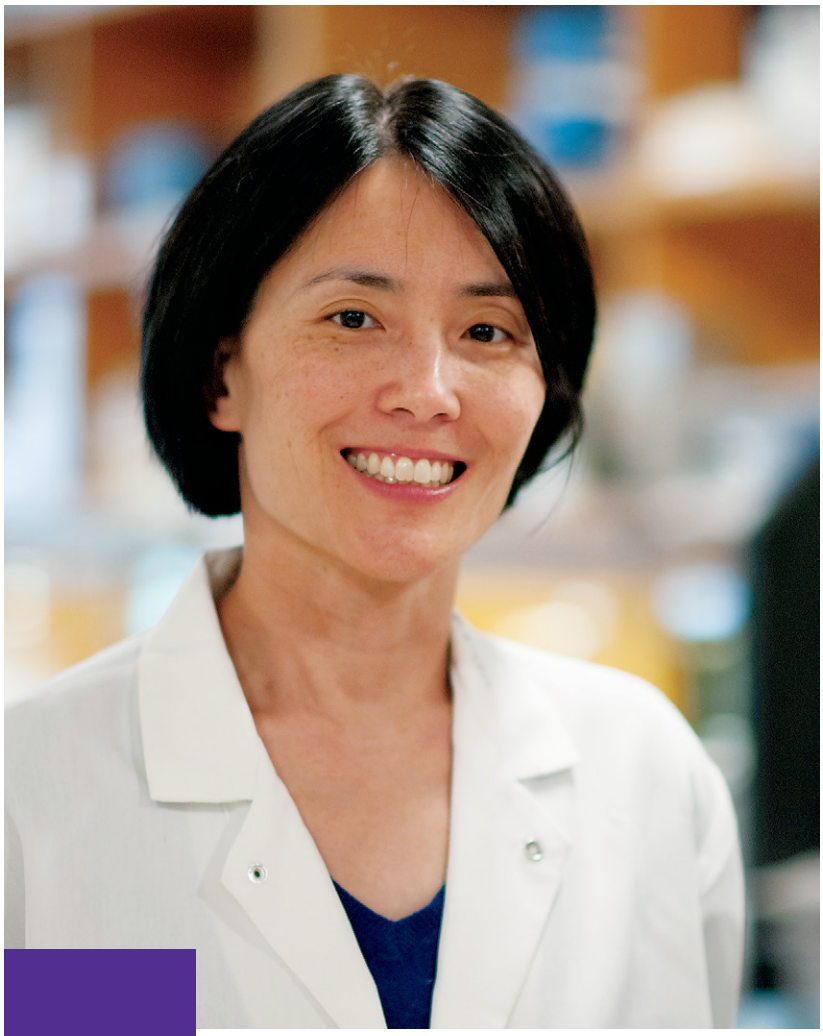
DR. ALANNA SCHEPARTZ pioneered beta-peptide inhibitors, addressing a major drug discovery hurdle: blocking "protein-protein interactions" for cancer cells. Unlike small molecule inhibitors, these beta-peptide inhibitors are structurally similar to their target proteins, allowing for targeted and effective binding for enhanced inhibition. Using this technology, Schepartz's lab crafted beta-peptide inhibitors of epidermal growth factor receptors (EGFR), an important protein that is often mutated in non-small cell lung cancer. With the added stability of beta-peptides in the body, this novel drug class has the potential to create a completely new technology platform for more effective and long-lasting anticancer drugs.

BREAKTHROUGH

Dr. Michael Hall discovered one of the most important cell targets in oncology and NFCR honored him with the 2015 Szent-Györgyi Prize. With the discovery of the target of rapamycin or TOR, a conserved protein kinase, and the role of TOR in controlling cell metabolism and growth, Dr. Hall led the way in developing mTOR inhibitors for cancer treatment. Dr. Hall's insights into mTORC1 signaling pathways have spurred the development of targeted therapies, offering new avenues for cancer intervention. His exceptional contributions continue to shape the landscape of cancer research and therapeutic strategies.

BREAKTHROUGH

Dr. James P. Basilion devised a game-changing theranostic tool capable of binding to prostate-specific membrane antigen (PSMA) in prostate and triple-negative breast cancers. It enhances patient outcomes by enabling simultaneous imaging of multiple molecular markers, making it easier to identify cancer at an early stage, significantly improving survival odds. In addition, this technology can help surgeons determine tumor margins during surgery. Dr. Basilion's new technique promises to facilitate molecular imaging of gliomas and has the potential to serve as a molecular targeting agent to deliver therapeutics.



BREAKTHROUGH

DR. ALICE T. SHAW was the lead investigator in the global registration studies for two drugs (first-generation crizotinib and second-generation ceritinib), which led to FDA approval for advanced ALK+ lung cancer. She was the lead investigator of the international phase 1 and 2 trials of third-generation lorlatinib. Her team also led the first-in-man trial of combining lorlatinib with an inhibitor of an ALK-independent pathway to combat the urgent need to develop on-target and off-target mechanisms of resistance.

BREAKTHROUGH

Dr. Ralph Weissleder is an esteemed biotechnology researcher renowned for contributions to imaging and next-generation diagnostics. His focus spans novel molecular imaging, early disease detection tools, and advanced nanomaterials for early treatment. His work bridges cell biology and human biology, utilizing imaging and minimally invasive interventions. Due to the strong translational nature of his research, his developments have propelled advanced clinical trials and led to commercialized technologies.

NFCR DONOR STORY

Bethesda, Maryland's **Alice-Anne Birch** and a dozen of her friends founded the Daffodils & Diamonds Luncheon Group to honor loved ones who have succumbed to cancer. Working with NFCR since 2005, this group of accomplished women and their annual luncheon have raised more than $1.4 million to support our scientists to develop new treatments specifically for breast, ovarian and lung cancers. The luncheon hosts more than 300 like-minded individuals, who have been inspired by hearing from NFCR-supported researchers and entrepreneurs and helped launch several high-risk/high-impact projects.

RESEARCHERS:
DR. WAYNE MARASCO
DR. JAMES ALLISON
DR. MARK M. DAVIS & DR. TAK W. MAK
DR. FREDERICK W. ALT
DR. STEVEN A. ROSENBERG
DR. LAURENCE COOPER
DR. CÉSAR MILSTEIN

Immunology & Immunotherapy

NFCR SUPPORTS SCIENTISTS WHOSE RESEARCH PAVES THE WAY FOR groundbreaking therapies and the vital role the immune system plays in cancer progression. Dr. James Allison's pioneering work on immune checkpoint blockades created a transformative shift in melanoma treatment, prolonging patient survival. Drs. Mark M. Davis and Tak W. Mak's seminal discoveries on the T-cell receptor (TCR) structure, led to life-saving CAR T-cell therapies for blood cancer. Dr. Steven A. Rosenberg's pioneering work in immunotherapy revolutionized cancer treatment by harnessing the power of the human immune system, and developing one of the first effective immunotherapies for advanced cancer patients, particularly in metastatic melanoma. Dr. Laurence Cooper's immunotherapy involving CD19-specific T-cells and other adoptive T-cell therapies propelled pediatric and adult leukemia and lymphoma treatment. Dr. César Milstein, who pioneered mAb production technology using hybridomas, led development of therapies using monoclonal antibodies as anticancer drugs. Dr. Wayne Marasco made significant strides, building upon previous discoveries to effectively combat renal cell carcinoma. Dr. Frederick W. Alt's pivotal findings of somatic recombination and gene amplifications have elucidated the understanding of programmed genetic recombination and hypermutation processes required for antibody repertoires of B lymphocytes. These collective achievements hold immense promise in revolutionizing cancer care, instilling hope and improved outcomes for patients.

BREAKTHROUGH

Dr. Steven A. Rosenberg has pioneered immunotherapies and gene treatments. His clinical trial studies on interleukin 2 (IL-2) culminated in the FDA's first-ever approval of a cancer immunotherapy. Beyond cytokine therapy, he ventured into engineered immune system approaches, from checkpoint inhibition to adoptive cell transfer therapies. These ground-breaking efforts have catalyzed therapeutic advances, leading to vital treatments such as Proleukin, Yervoy and Yescarta, which revolutionized cancer treatment paradigms. For these life-saving contributions, NFCR honored him with the 2019 Szent-Györgyi Prize.

BREAKTHROUGH

Backed by NFCR since 1994, **Dr. Wayne Marasco** has made significant strides in immunotherapy and monoclonal antibodies. His innovation targets clear cell renal cell carcinoma, a prevalent kidney cancer. He is combining CAR T therapy with checkpoint blockade inhibitors or antibodies to stimulate the immune system, boosting CAR T's cancer cell-killing efficacy. Dr. Marasco's findings demonstrate enhanced anti-tumor immunity leading to cancer cell death and may serve as a platform for solid tumor treatment.

BREAKTHROUGH

DR. JAMES ALLISON revolutionized cancer research by pioneering immunotherapy. His groundbreaking work on immune checkpoints, particularly CTLA-4 and PD-1 pathways, has transformed cancer treatment. Dr. Allison's discoveries have led to unprecedented breakthroughs in cancer therapeutics, unleashing the body's immune system to target and combat cancer cells. NFCR honored him with the 2014 Szent-Györgyi Prize. His innovative contributions earned him the Nobel Prize in Physiology or Medicine in 2018 and continue to reshape oncology, offering new hope and improved outcomes for countless patients.

BREAKTHROUGH

Dr. Frederick W. Alt won the 2015 Szent-Györgyi Prize for his work in understanding DNA repair mechanisms and genetic instability, which has illuminated cancer development and treatment resistance. His discovery of gene amplification in chemotherapy-resistant cancer cells shattered the belief in the stability of the human genome. Specifically, his research on the mechanism and control of genomic rearrangement processes, including programmed genetic recombination and hypermutation processes elucidated the generation of antigen receptor diversity in the immune system.

BREAKTHROUGH

Nobel laureate **DR. CÉSAR MILSTEIN** revolutionized monoclonal antibodies production through the hybridoma technique. His genetic engineering work extended antibody applications and created artificial antibodies to treat diseases like cancer. Dr. Milstein's development of the hybridoma technique enabled the production of highly specific monoclonal antibodies with significant applications in medicine. By exploring hybridomas, he unveiled insights into immune responses and somatic mutations, underpinning immunotherapy and precision medicine. Dr. Milstein's work reshaped cancer treatment, driving advancements in targeted therapies.

MRC LABORATORY OF MOLECULAR BIOLOGY

BREAKTHROUGH

Dr. Laurence Cooper is a distinguished oncology researcher renowned for his pioneering work in cellular therapies for cancer, particularly in the development of adoptive T-cell therapies, including chimeric antigen receptor (CAR) T-cells. His research focuses on re-engineering patients' immune cells to combat cancer, with remarkable success in hematological malignancies. Dr. Cooper's innovative approach, integrating genetic engineering and immunology, tailors therapies to individual pediatric and adult patients, significantly advancing the promise of cell therapies for widespread clinical use and improving cancer patient outcomes.

Dr. Mak (Left) and Dr. Davis (right)

BREAKTHROUGH

NFCR honored **DR. MARK M. DAVIS** and **DR. TAK W. MAK** with the 2021 Szent-Györgyi Prize for human gene and cloning findings that decoded the structure of T-cell receptors (TCRs) and elucidated the intricate mechanisms of T-cell recognition of foreign agents. Their research led to the development of techniques for labeling T lymphocytes based on their recognized molecules. This breakthrough underpins cancer vaccine development and forms the basis for FDA-approved CAR T-cell therapies for blood cancers.

RESEARCHERS:
DR. BERT VOGELSTEIN &
DR. KENNETH KINZLER
DR. JACQUELINE BARTON
DR. WAUN KI HONG
DR. WEI ZHANG
DR. ROBERT C. BAST

Genomic Research & Biomarkers

THE HISTORY OF GENOMIC AND BIOMARKER RESEARCH IS ONE OF INNOvation, with NFCR-supported scientists playing a crucial role in groundbreaking achievements. Dr. Bert Vogelstein's pioneering work in cancer genomics unveiled mutations and genomic alterations driving cancer development. He and Dr. Kenneth Kinzler identified APC as a tumor suppressor gene with a potential primary role in initiating colorectal cancer, providing a possible pathway to disrupt the cancer development through effective targeted therapy. Dr. Jaqueline Barton's focus on DNA repair mechanisms not only led to a clearer understanding of the first molecular steps in cancerous transformation, but also advanced diagnostics and treatment. Dr. Waun Ki Hong emphasized personalized treatments by targeting specific biomarkers, optimizing therapy outcomes and reducing side effects. Dr. Wei Zhang's work integrated genomics and biomarker analysis to elucidate the role of mutations in cancer progression and treatment. Dr. Robert C. Bast identified the CA 125 biomarker, the first useful method for monitoring the course of patients with ovarian cancer, impacting the care of thousands of women worldwide. This transformative research has provided crucial insights into cancer's genomic basis, enabling new targeted therapies and personalized medicine for patients worldwide.

Dr. Vogelstein (left) and Dr. Kinzler (right).

KEITH WELLER, JOHN HOPKINS MEDICINE

BREAKTHROUGH

Dr. Bert Vogelstein's pioneering work provided the first conclusive evidence for genetic alterations in colorectal tumors, fundamentally transforming our understanding of tumorigenesis. The characterization of the p53 tumor suppressor gene is now known to be mutated in a vast majority of human cancers, and Dr. Vogelstein is one of the field's most cited scientists. **Dr. Kenneth Kinzler**, working with Dr. Vogelstein, identified the tumor suppressor gene APC, playing a potentially primary role in the initiation of colon cancer. Together, these findings of TP53 and APC have opened the door to disrupting the development of cancer and create effective targeted therapy to these defective genes.

BREAKTHROUGH

DR. JACQUELINE BARTON is recognized for her groundbreaking work in DNA electrochemistry. Dr. Barton's investigations into DNA's conductivity and interactions with small molecules have deepened our understanding of DNA damage and repair processes. Dr. Barton's research sheds light on how faulty DNA repair mechanisms can lead to cancer development. Her insights have implications for cancer treatment and the design of novel therapeutic strategies, positioning her as a trailblazer in advancing our grasp of cancer biology.

BREAKTHROUGH

Dr. Waun Ki Hong, a pioneer in the field of oncology, is recognized for his innovative work in cancer prevention and treatment. Known for his leadership in chemoprevention, Dr. Hong has laid the foundation for numerous successful trials. His insights into the molecular mechanisms of targeted therapies have elevated treatment precision, improving patient outcomes by targeting specific biomarkers. In translating laboratory findings to clinical practice, Dr. Hong positively impacted the lives of countless cancer patients.

BREAKTHROUGH

Dr. Robert C. Bast has made profound strides in the realm of oncology. He is best known for his work on the CA-125 antigen, a key biomarker for ovarian cancer detection. Dr. Bast's research has greatly improved the early detection and treatment of ovarian cancer, leading to enhanced patient outcomes. As a distinguished professor and researcher at MD Anderson Cancer Center, his leadership has fortified the bridge between laboratory discoveries and clinical applications, ensuring that research benefits patients directly.

BREAKTHROUGH

DR. WEI ZHANG stands as a distinguished luminary in cancer research, renowned for his impact on cancer genomics and personalized medicine. His investigations center on the molecular and genomic characterization of specific cancer types, striving to unveil therapeutic targets and biomarkers. He has identified genes and factors that may be associated with lower survival rates among African American lung and uterine cancer patients in comparison to their Caucasian American counterparts. Dr. Zhang has significantly advanced our comprehension of cancer's intricate molecular foundations, allowing for individualized treatment approaches and empowering direct patient care across diverse patient populations.

NFCR DONOR STORY

In 2006, **Ken and Marianne Bouldin** established the **Hope Fund for Sarcoma Research** in partnership with NFCR after their daughter was diagnosed with an aggressive sarcoma subtype: malignant peripheral nerve sheath tumor (MPNST). Only minimally sensitive to chemotherapy and radiation, MPNST patients typically face a five-year overall survival range of just 30% to 50%. Thanks to the Hope Fund, NFCR scientists developed the first clinically annotated database and microarray of MPNST tissue to identify molecular biomarkers including one that is a prognostic indicator and a potential new target — one step closer to a cure.

RESEARCHERS:
DR. DANNY WELCH
DR. RONALD DEPINHO
DR. DANIEL A. HABER
DR. PAUL FISHER
DR. GARTH L. NICOLSON

Metastasis

NFCR EXTENDS ITS UNWAVERING SUPPORT AND HONORS TO SCIENTISTS at the forefront of metastasis research. Dr. Danny Welch leads this research with a two-pronged strategy which could inspire new therapies preventing metastasis and detecting high-risk patients early. Dr. Ronald DePinho's research helped form the basic understanding of cancer cell development. He has convincingly established that telomere dysfunction, combined with an impaired DNA damage response and the continual renewal of epithelium by aging or disease processes, converge to form the common carcinomas and their metastases. With NFCR funding since 2000, Dr. Daniel A. Haber developed the CTC-iChip, capturing circulating tumor cells for real-time insights, genetic testing and personalized treatment decisions. Dr. Paul Fisher's immune-theranostic approach to fighting metastatic tumors targets cancer cells without harming healthy ones, holding the potential to reshape cancer treatment. Known for his work establishing the fluid-mosaic model of the cell membrane, Dr. Garth L. Nicolson also characterized heparanases significance as biomarkers for tumor metastasis. By delving into the complex mechanisms underlying metastasis, NFCR and these visionary scientists aim to revolutionize the way we approach cancer treatment, making significant strides toward improved patient outcomes, enhanced quality of life, and ultimately, a world free from the burden of metastatic cancer.

BREAKTHROUGH

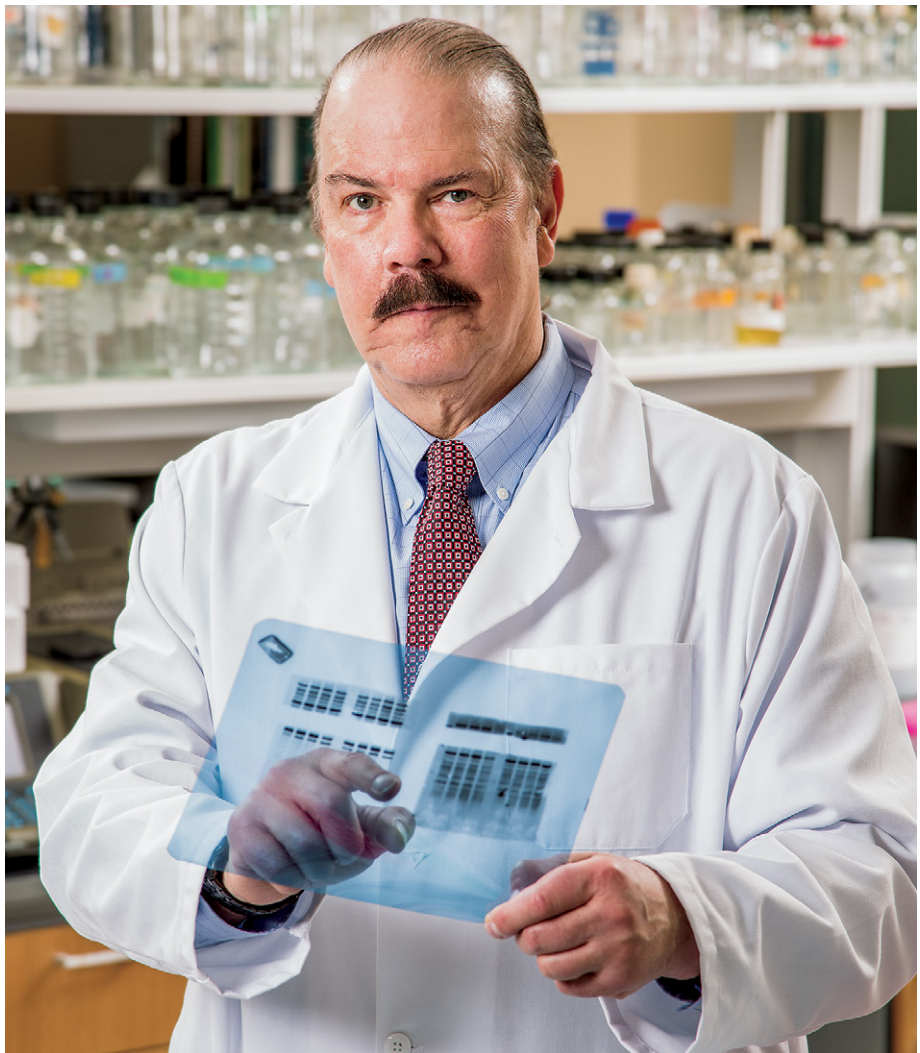
Dr. Danny Welch is renowned for his two-pronged strategy to combat the lethal spread of cancer, which accounts for 90 percent of cancer-related deaths. His research unveiled metastasis suppressor genes such as KISS1, BRMS1 and ITIH5, essential in combatting cancer's spread, and how DNA variabilities in mitochondria relates to racial susceptibilities to specific cancers and their metastatic potential. Dr. Welch's approach offers hope for targeted therapeutic interventions and opens new avenues in cancer treatment.

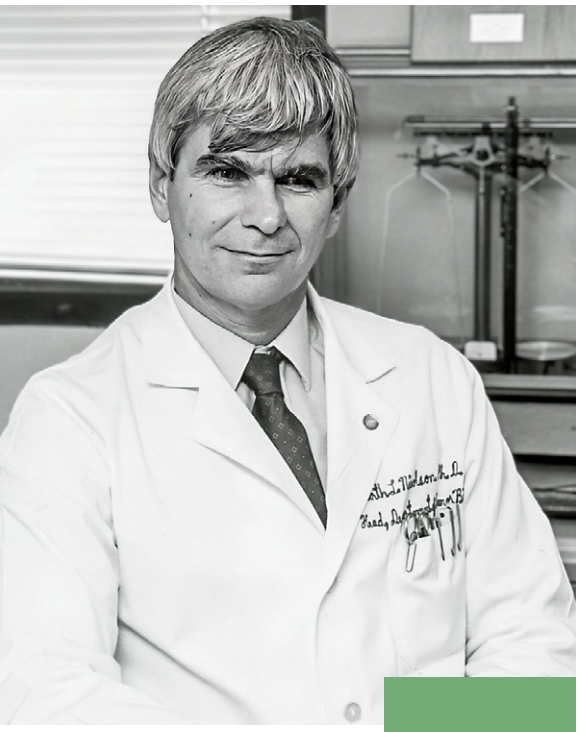
BREAKTHROUGH

Dr. Ronald DePinho is best known for his work on telomerase and telomere dysfunction as it relates to cancer and aging. In collaboration with Nobel laureate Dr. Carol Greider, Dr. DePinho generated the first telomerase knockout mice. His research on cancer cells includes the recognition of the mechanism of tumor suppression by p53. For his work, NFCR honored him with the 2009 Szent-Györgyi Prize. His current work studying the signaling molecule, STAT3, has an integral role including proliferation, survival, angiogenesis, metastasis, invasion and immune escape, which influences tumorigenesis and suppression of the immune system. Using computer-based drug screening of thousands of compounds from chemical libraries, Dr. DePinho has identified inhibitors of STAT3 in complex tumor models of various cancers.

BREAKTHROUGH

Known for his work on the molecular and genetic mechanisms that contribute to cancer development and progression, **DR. PAUL FISHER** has delved into understanding the genes that play a crucial role in cancer cell survival, with the hope of developing targeted therapies. With NFCR funding, Dr. Fisher genetically engineered a tumor suppressor to produce a fluorescent signal, aiding in tumor diagnosis and monitoring. He incorporated this immuno-theranostic into an "adoptive cell therapy" that reduced prostate tumors in mice. His therapy utilizes modified immune T-cells to deliver anticancer genes and an immune enhancer gene, effectively targeting and destroying cancer cells.



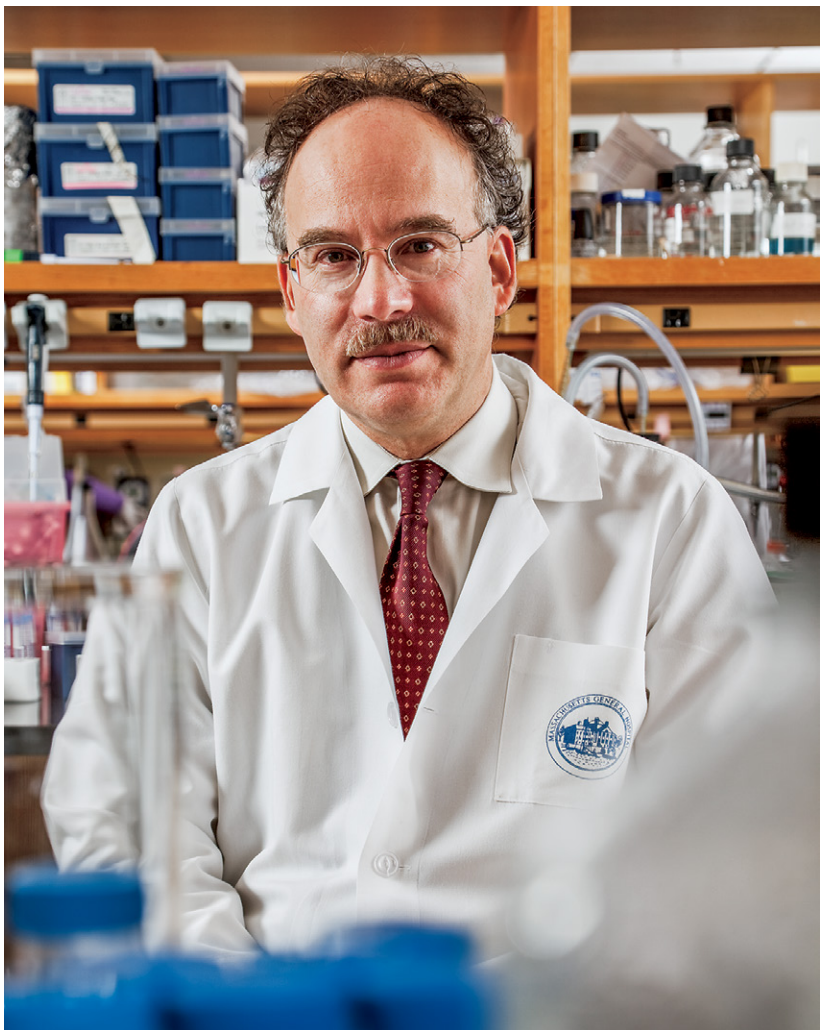


BREAKTHROUGH

Dr. Garth L. Nicolson, best known for advancing the understanding of cellular membranes and establishing the fluid-mosaic model of the cell membrane, expanded his research into cancer metastasis. In collaboration with Dr. Motowo Nakajima, Dr. Nicolson also characterized heparanases in their significance as biomarkers for tumor metastasis. In doing so, they made the first connection between metastasis and heparanase. In melanoma cells, Drs. Nicolson and Nakajima revealed the importance of heparan sulfate proteoglycan degradation as a crucial event during tumor cell invasion.

BREAKTHROUGH

DR. DANIEL A. HABER focuses on understanding the genetic abnormalities of cancer – from inherited mutations and predispositions to mutations that are acquired by tumors themselves. Dr. Haber has made groundbreaking discoveries related to circulating tumor cells (CTCs). These cells break away from primary tumors and are responsible for metastasis. His research has opened new avenues for early cancer detection and understanding drug resistance, with significant implications for the diagnosis, treatment and management of cancer.



NFCR DONOR STORY

Lucy Stanovick, a college professor and mother of two, was diagnosed with Stage IV metastatic breast cancer in 2008 at age 42. But she quickly turned her passion for fighting her disease into something bigger — the **Lucy Fund for Metastatic Breast Cancer Research at NFCR**. The Lucy Fund supports NFCR scientists focused on metastatic cancer research. A year after her diagnosis, Lucy also created the annual "Party 4 Life," a festival with her friends, family and community to raise even more funds. Though Lucy attended her last "Party" in 2012, she'll be remembered for her charismatic personality, love for her family, friends and students. Her family continues her legacy to raise awareness and funds for metastatic cancer research.

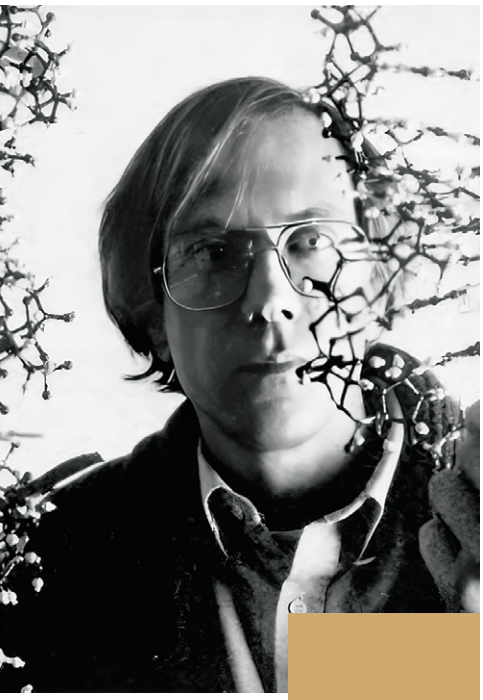
RESEARCHERS:
DR. PETER DERVAN
DR. THOMAS CECH
DR. DAVID PRESCOTT
DR. THOMAS STEITZ
DR. TERENCE RABBITTS
DR. MARY-CLAIRE KING
DR. RONALD G. CRYSTAL
DR. PAUL SCHIMMEL
DR. XIANG-LEI YANG

Genetics

NFCR HAS STEADFASTLY SUPPORTED CANCER GENETICS RESEARCH AND honors scientists who have been instrumental in unraveling cancer's genetic basis. Dr. Thomas Cech, a Nobel laureate for his discovery of ribozymes, revolutionized the understanding of RNA gene regulation. Another Nobel laureate, Dr. Thomas Steitz, uncovered the structure and function of the ribosome and provided insights into potential targets for cancer therapies. Dr. David Prescott advanced DNA replication research. Dr. Terence Rabbitts contributed to understanding chromosomal translocation's role in tumor formation. Dr. Mary-Claire King identified the first gene associated with hereditary breast and ovarian cancer, BRCA1, representing a fundamental step in the understanding of cancer and changing the face of cancer prevention, screening, diagnosis and treatment. Dr. Paul Schimmel advanced our understanding of the important role that aaRS enzymes play in defining the genetic code. The collaborative research of Dr. Schimmel and Dr. Xiang-Lei Yang unveiled critical insights into tRNA synthetases, revealing their unexpected roles in tumor development and presenting novel therapeutic avenues. Dr. Peter Dervan revolutionized gene regulation by developing sequence-specific DNA-binding polyamides, offering potential in cancer therapy by disrupting gene expression. Dr. Ronald G. Crystal developed groundbreaking strategies and technologies and laid the foundation for gene therapy. These outstanding scientists have been pivotal in genetics research, promising targeted therapies and more effective prevention, detection and cancer treatments.

BREAKTHROUGH

Dr. Peter Dervan, a trailblazing bioorganic chemist, is celebrated for pioneering sequence-specific DNA-binding molecules, particularly polyamides. His groundbreaking research illuminates gene regulation mechanisms by precision-targeting specific DNA sequences, offering exciting prospects for innovative therapeutic interventions, notably in cancer treatment. Dr. Dervan's work not only enhances our grasp of DNA structure and gene function, but also holds potential for disrupting gene expression in cancer cells through precise molecular binding, a promising avenue for advancing cancer therapies.

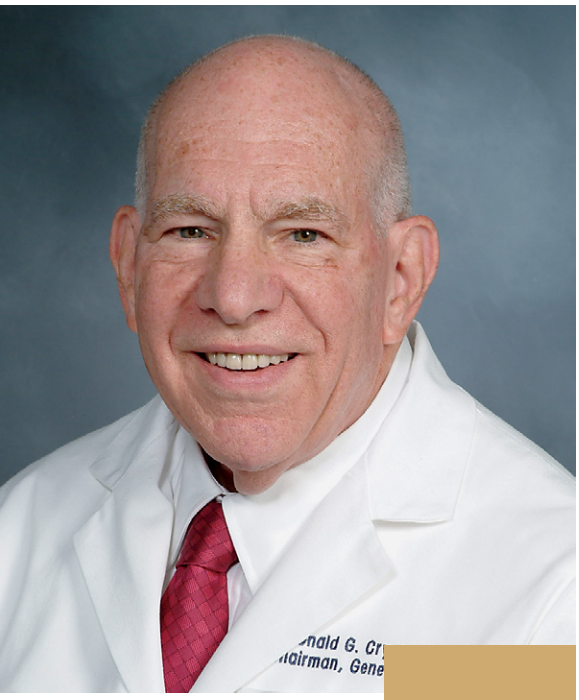


BREAKTHROUGH

Dr. Thomas Cech has revolutionized cancer research and RNA biology. His groundbreaking revelation that RNA, long considered solely a genetic messenger, can possess catalytic abilities, unveiled a novel class of biomolecules termed ribozymes. This revelation has redefined our comprehension of biological catalysts and genetic regulation mechanisms. His Nobel-winning breakthrough holds profound relevance in cancer, where aberrant RNA processing can fuel malignancies. Dr. Cech's pioneering insights propel advancements in cutting-edge cancer diagnostics and therapies, charting a course toward improved patient outcomes.

BREAKTHROUGH

DR. DAVID PRESCOTT'S contributions have illuminated the critical roles of telomeres and telomerase in cancer, reshaping our comprehension of these structures. His research unveiled their significance in upholding chromosomal stability, while their aberrations fuel unbridled cell proliferation – a hallmark of cancer. Dr. Prescott's groundbreaking work laid the foundation for telomere biology within the cancer framework, galvanizing the pursuit of inventive therapeutic avenues. Consequently, his research bears far-reaching implications, enhancing cancer diagnosis and treatment approaches, thereby enhancing the well-being of cancer patients worldwide.



BREAKTHROUGH

Dr. Ronald G. Crystal's pioneering use of a modified adenovirus as a delivery vehicle for new therapies marked a watershed moment in gene therapy, sparking numerous therapeutic strategies and vaccines. Using recombinant proteins and antibodies, his team transformed brain cells into antibody-producing cells – particularly potent against glioblastoma, an aggressive and incurable brain cancer. His strategies and technology for effective gene delivery to the central nervous system promises to revolutionize cancer treatment and impact central nervous system disorders.

BREAKTHROUGH

Distinguished molecular biologist **DR. TERENCE RABBITTS** is celebrated for pioneering research into cancer's genetic origins. His work centers on oncogenes and their involvement in leukemia, with a standout focus on elucidating chromosomal translocations' role in cancer onset. These findings have not only enriched diagnostics, but also propelled targeted therapeutic approaches. Dr. Rabbitts' influential contributions have profoundly shaped cancer genetics, unveiling invaluable insights into the intricate molecular pathways underlying tumorigenesis.

PATRICIA KUHARIC, WEILL CORNELL MEDICINE

BREAKTHROUGH

Dr. Thomas Steitz, a 2009 Nobel laureate in Chemistry, reshaped our understanding of the ribosome's structure and function – a pivotal hub for cellular protein synthesis. His groundbreaking insights resonate profoundly in cancer research, offering avenues for novel therapies. By comprehending protein synthesis mechanisms, tailored drugs can disrupt cancer cells' protein production. Dr. Steitz's transformative findings have propelled progress in both cancer treatment and comprehension, thus imparting a tangible positive impact on the lives of countless cancer patients.

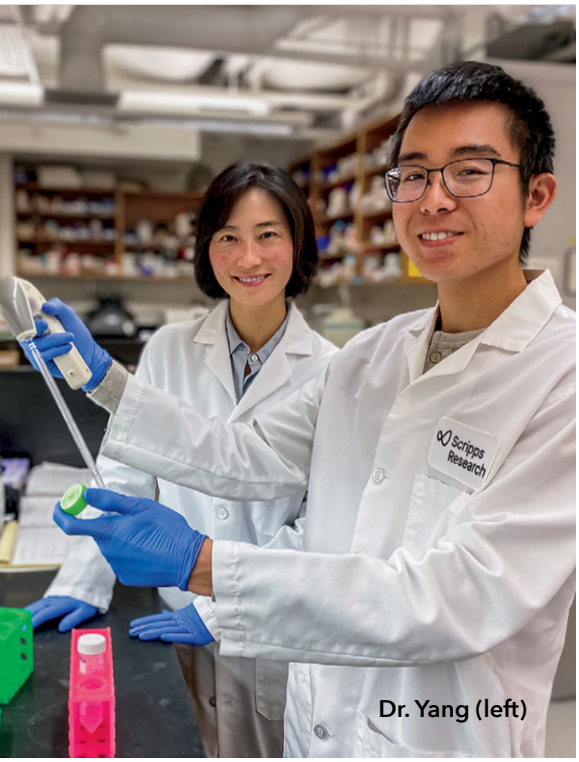
MICHAEL MARSLAND, YALE UNIVERSITY

BREAKTHROUGH

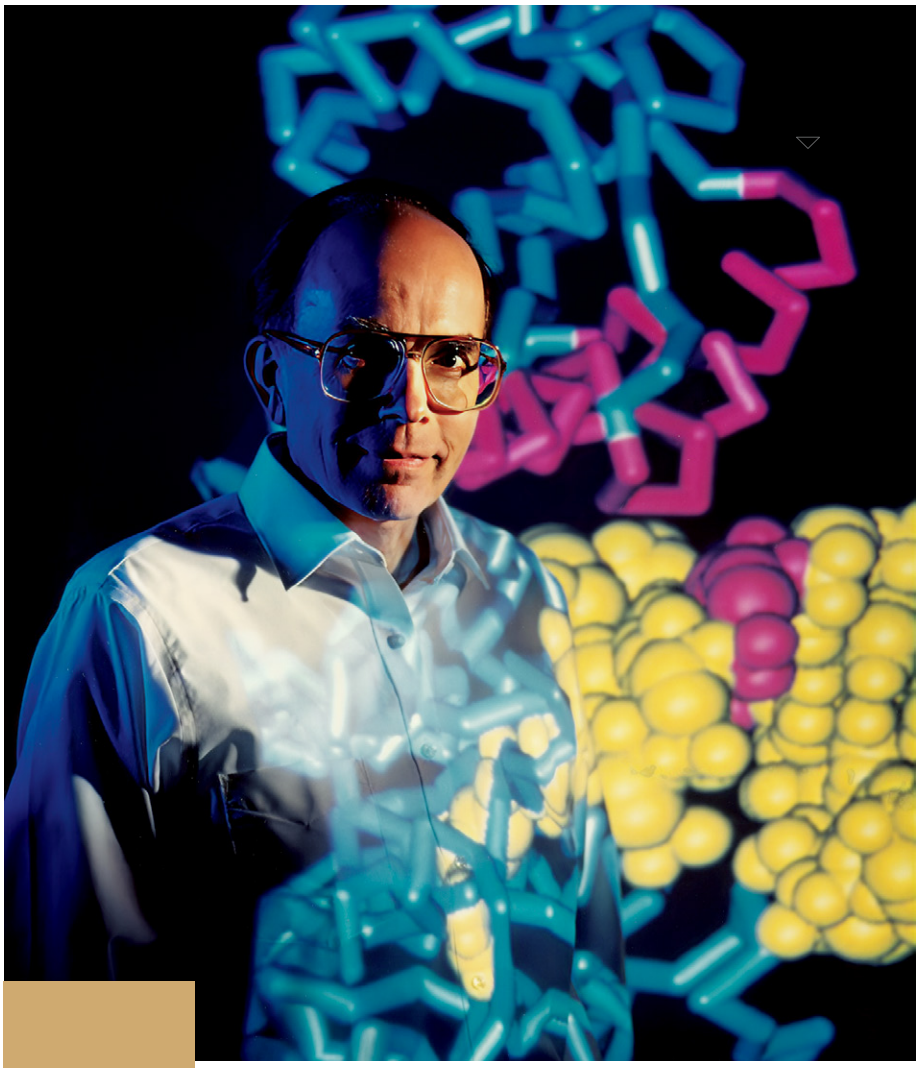
DR. MARY-CLAIRE KING has left an enduring impact on cancer research through her transformative contributions. Best known for identifying the BRCA1 gene associated with hereditary breast and ovarian cancers, her work revolutionized our understanding of cancer susceptibility. Dr. King's discoveries catalyzed genetic testing and personalized risk assessment, guiding preventive strategies and informing treatment decisions. Her legacy extends to broader applications of genetics in oncology and paves the way for innovative approaches to cancer prevention and care. NFCR honored Dr. King with the 2016 Szent-Györgyi Prize.

BREAKTHROUGH

Dr. Xiang-Lei Yang, a leader in molecular biology, collaborates with NFCR-sponsored Dr. Paul Schimmel in exploring the multifaceted roles of aminoacyl-tRNA synthetases (aaRS). These enzymes, vital for protein synthesis, also regulate angiogenesis and suppress cancer-related factors. Focusing on SerRS, an aaRS enzyme, Dr. Yang's team uncovered its inhibition of c-Myc, a pivotal oncogene controlling blood vessel growth. This discovery could guide innovative treatments for diverse cancers, offering promising therapeutic pathways.



Dr. Yang (left)



BREAKTHROUGH

DR. PAUL SCHIMMEL is a molecular biology and biochemistry luminary. His investigations explore enzymes that direct the genetic code, known as aminoacyl tRNA synthetases, and how they ensure accuracy of protein synthesis – laying the foundation for understanding the genetic code's translation. Dr. Schimmel's research revealed multifaceted roles of tRNA synthetases, with implications in cancer. He helped found multiple companies focused on RNA interference and (RNAi) therapeutics, which helped save an estimated 600,000 lives. Dr. Schimmel's extensive work has ultimately broadened understanding of cellular processes, paving the way for therapeutic advancements.

NFCR DONOR STORY

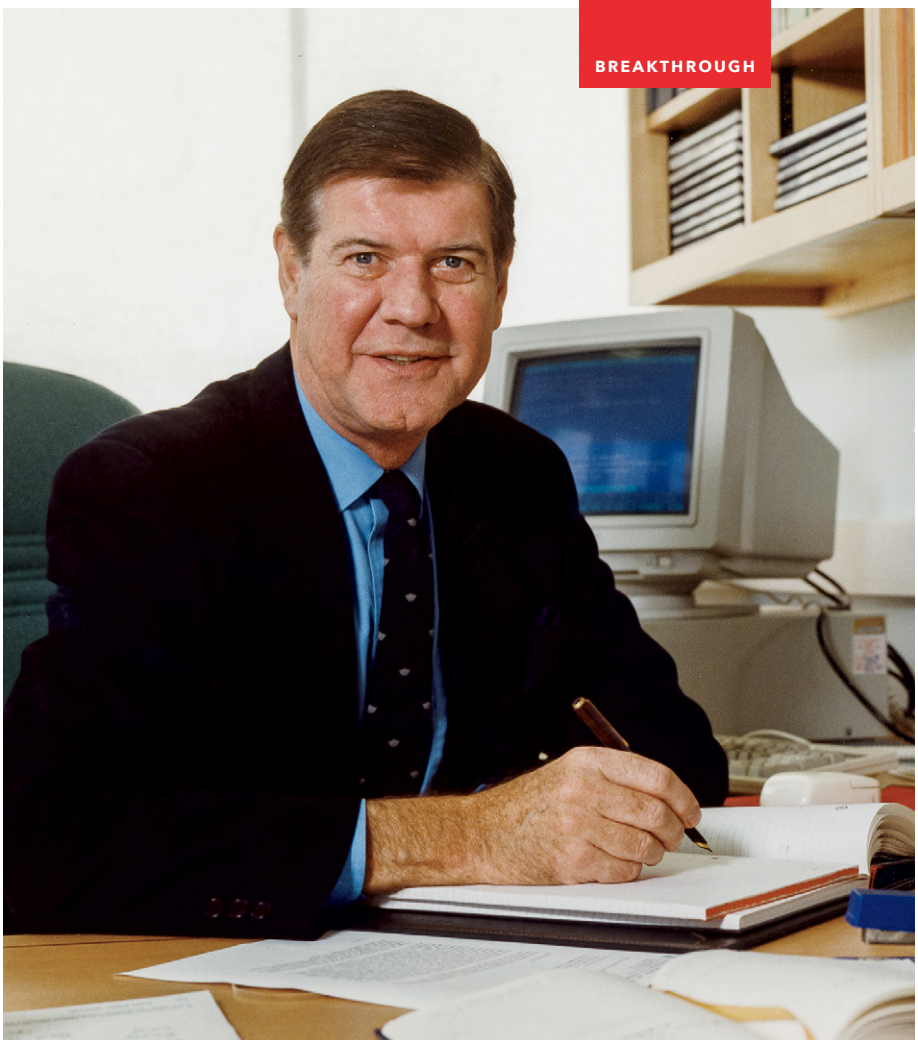
Betty Locke is a champion of cancer research. Her father passed away from liver cancer when she was 12 years old. Then, her husband died in 2001 from the same type of cancer. Betty has loved to travel since she was a little girl. Today, at 92 years young, Betty has combined two of her greatest passions — traveling and helping others through funding cancer research. Since 2008, Betty has been generously supporting NFCR to find cures for cancer. Betty regularly attends NFCR's Annual Global Summit, where she catches up on breakthroughs and her NFCR family.

RESEARCHERS:
DR. GRAHAM RICHARDS
DR. WILLIAM JORGENSEN
DR. JANOS LADIK

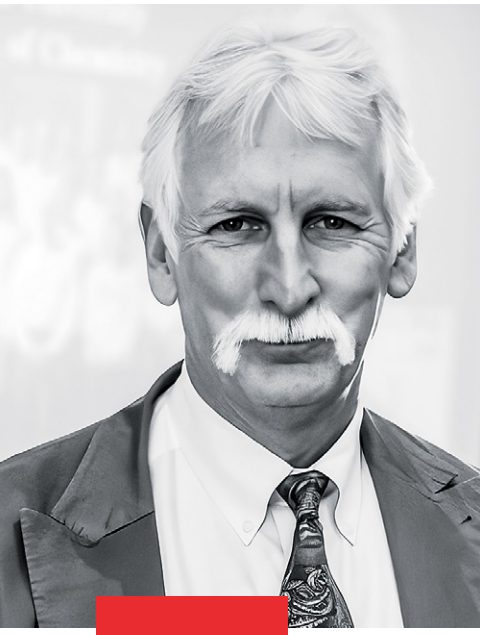
Computation & Cancer

NFCR-SUPPORTED SCIENTISTS HAVE PLAYED A PIVOTAL ROLE IN HARNESSING computational power to unravel cancer biology and develop innovative therapeutic strategies. Dr. Graham Richards, a visionary in computational chemistry, collaborated with NFCR for close to three decades to push the boundaries of cancer drug design. Through molecular modeling and simulations in the Screensaver LifeSaver Project, Dr. Richards aimed to forecast interactions between drugs and cancer-related proteins. This forward-thinking approach expedited the drug discovery process by virtually screening extensive chemical libraries, ultimately leading to the identification of potential anticancer drug targets. Dr. William Jorgensen, another luminary supported by NFCR, developed methodologies and software for computer-aided drug design. Additionally, Dr. Janos Ladik utilized theoretical physics and super computers to investigate the use of DNA intercalating agents as cancer preventive agents, inhibiting the formation of mutations to prevent cancer initiation. Overall, the collaborative synergy among these scientists and NFCR exemplifies the transformative impact of computational approaches on cancer research. The integration of computational methodologies has expedited drug discovery, optimized treatment modalities and unraveled the complexities of cancer biology.

BREAKTHROUGH



Dr. Graham Richards has shaped cancer research through advancements in computational chemistry. Utilizing molecular modeling and simulations, his innovative work in the Screensaver LifeSaver Project used the idle time of more than 3.5 million personal computers linked through the internet to computationally screen a large database of molecular structures. More than 3.5 billion drug-like molecules were screened against 12 cancer targets, which yielded tens of thousands of lead compounds that were used to identify new anti-drug candidates. Dr. Richards' contributions have catalyzed more efficient and targeted cancer therapies, making strides towards personalized medicine and enhanced patient outcomes in cancer care.

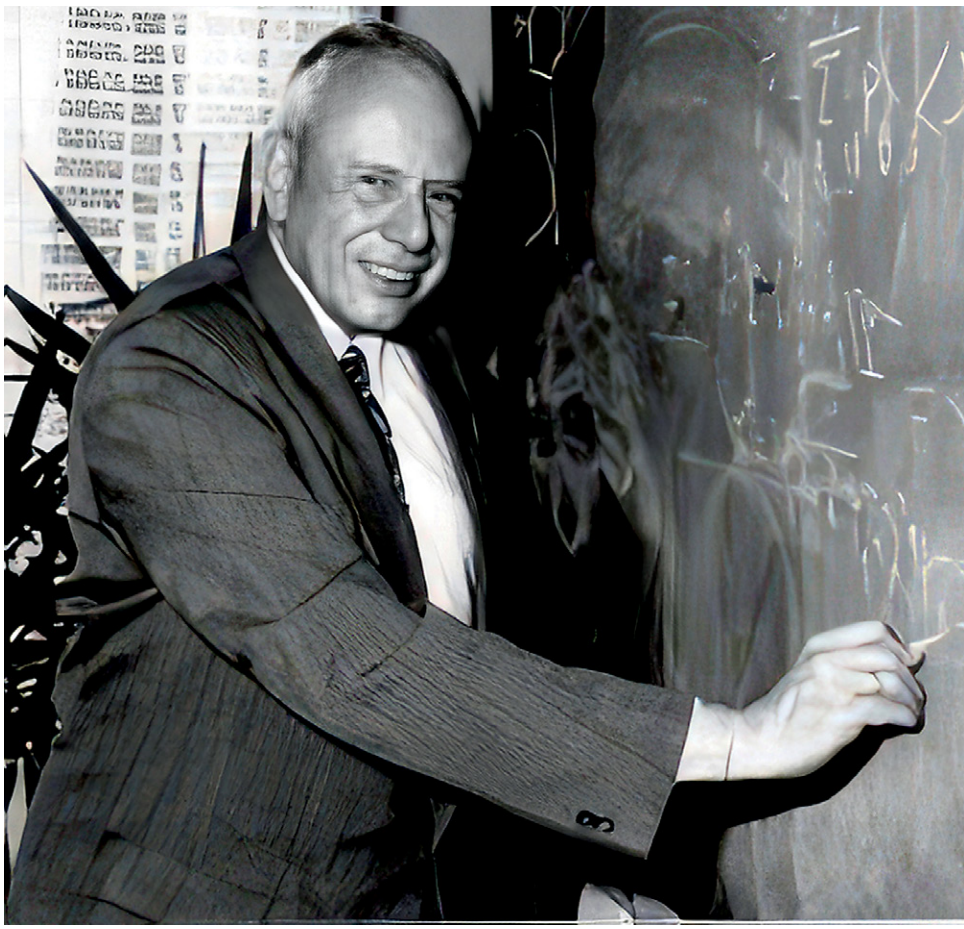


BREAKTHROUGH

Dr. William Jorgensen's contributions to cancer research have reshaped the landscape with computer-aided drug design. With a specific emphasis on enzyme inhibitors, notably directing efforts towards fibroblast growth factor receptor 1 kinase (FGFR1 kinase), Dr. Jorgensen's innovative methodology holds the promise of significant advancements across a range of cancer types. This approach leverages computational modeling to identify potential FGFR1 kinase inhibitors, a vital step toward forging novel therapeutic avenues.

BREAKTHROUGH

DR. JANOS LADIK, a distinguished computational researcher, advanced cancer understanding through the exploration of DNA intercalating agents – specialized anticancer compounds integrating into the DNA double helix. Leveraging theoretical physics, supercomputers and biology, he explored their potential for cancer prevention. By disrupting cell division and RNA/protein synthesis, Dr. Ladik impeded rapidly dividing cancer cells. Dr. Ladik's interdisciplinary approach illuminated intricate cellular processes, informing transformative therapeutic strategies to prevent cancer initiation.



Spotlight Moment: GBM AGILE

EVOLUTIONIZING CLINICAL TRIALS FOR BRAIN CANCER

Dr. Sujuan Ba with GCAR leadership and staff at a strategic brainstorming meeting in 2003 (top). Dr. Sujuan Ba, Dr. Anna Barker, Dr. Web Cavenee, and Dr. W.K. Alfred Yung and other Executive Committee members of GBM AGILE in 2016. (bottom).

IN THE RELENTLESS BATTLE AGAINST glioblastoma (GBM), a devastating and universally fatal brain cancer, the collaborative efforts of over 150 global pioneers across more than 40 leading institutions—including the National Foundation for Cancer Research and several foundations around the world—have given rise to a beacon of hope: GBM AGILE, or Glioblastoma Adaptive Global Innovative Learning Environment.

This groundbreaking initiative, "Rethink GBM and Set a New Course," was initially conceived in 2003 by Drs. Anna Barker, Webster Cavenee and W.K. Alfred Yung as a global effort toward increasing patient survival from GBM.

NFCR and its leadership have played an integral role in the inception, development and ongoing operation of GBM AGILE, consistent with its long-term championship of high-impact collaborative research. NFCR, its generous donors and other non-profit partners stand as proud strategic supporters of GBM AGILE and the sponsor of GBM AGILE, Global Coalition for Adaptive Research (GCAR, GCAResearch.org).

This initiative focuses on developing a novel approach to clinical trials that would shatter the traditional mold. GBM AGILE is revolutionizing the way therapies are evaluated for GBM patients. Traditional clinical trials typically test one treatment against the standard-of-care or placebo, resulting in a lengthy and expensive development path.

In contrast, GBM AGILE is an adaptive platform trial, allowing multiple drugs to be assessed concurrently and incorporating real-time data to make real-time adjustments. This approach optimizes the allocation of patients and time. It promises to seamlessly transition drugs into a confirmatory stage designed to facilitate new approvals while swiftly identifying underperforming candidates. This groundbreaking design significantly accelerates the pace and lowers the cost of drug development. It also expands trial design to require fewer patients and shorter time frames to gauge a drug's effectiveness, offering patients newfound hope. Since opening in July 2019, GBM AGILE has screened more than 1,500 patients and included six investigational drugs/drug combinations to date. There are participating trial sites in the U.S., Canada and Europe, with expansion to Australia underway.

Recognition & Acknowledgments

NFCR recognizes the long-term, outstanding contributions of two key scientific and medical leaders in precision medicine who have guided our cancer research and patient assistance programs:

DR. BRIAN LEYLAND-JONES

Dr. Leyland-Jones served as principal investigator on more than 100 clinical studies and was instrumental in developing numerous cancer treatments, including Herceptin and Taxol. He has served as an instrumental leader of three cancer centers: McGill University Comprehensive Cancer Centre in Canada, the Winship Cancer Center in Atlanta and the Avera Cancer Institute in Sioux Falls, SD. Dr. Leyland-Jones is committed to advancing diagnostics, therapies and patient outcomes. He focuses on ensuring patients receive optimal care and access to cutting-edge treatments. Dr. Leyland-Jones actively collaborates with patient assistance programs, advising patients clinically, coordinating referrals to top oncologists and emphasizing the significance of biomarkers. Serving as the pro-bono Chief Medical Officer for NFCR, Dr. Leyland-Jones continues to drive efforts to enhance diagnostics, therapies and, ultimately, patient outcomes.

DR. RAJU KUCHERLAPATI

Throughout his career, Dr. Kucherlapati has made significant contributions especially in gene targeting, homologous recombination, human gene mapping and physical maps of the human genome, focusing on human chromosome 12. His expertise extends to modifying genes in mammalian cells and cloning numerous human disease genes. His groundbreaking work in cancer research, particularly the Human Genome Program and the Cancer Genome Atlas (TCGA) Program, has significantly advanced understanding of cancer genetics. Dr. Kucherlapati was a founder of several biotechnology companies, including Cell Genesys, Abgenix (acquired by Amgen) and Millennium (acquired by Takeda). He served on the boards of privately held biotechnology companies and is currently a board member of a publicly traded company called PureTech Health that trades on the Nasdaq and London Stock Exchange.

NFCR recognizes the service and contributions of current and former board members:

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Mark R. Baran
Judith P. Barnhard
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