Markey Cancer Center
An NCI Comprehensive Cancer Center

UNIVERSITY OF KENTUCKY MARKEY CANCER CENTER **2023 ANNUAL REPORT**

NCI COMPREHENSIVE DESIGNATION ACHIEVED AND THE PEOPLE WHO MADE IT POSSIBLE


Markey
Cancer Center

In 2023, the UK Markey Cancer Center earned the honor of being Kentucky's first and only NCI-designated Comprehensive Cancer Center.

As the federal government's principal agency for cancer research and training, the NCI awards designations based on excellence in cancer research and prevention, and Markey's new designation is the highest level of recognition awarded by the NCI.

The elevation to an NCI-designated Comprehensive Cancer Center will further enhance Markey's ability to attract top-tier researchers and clinicians, secure additional research funding, collaborate with national and international partners, and give patients access to leading-edge treatments and clinical trials – resulting in better patient care and health outcomes for Kentuckians.


The Power of Advanced Medicine
KENTUCKY'S
FIRST
& ONLY
NCI
Designated
Comprehensive
Cancer Center
UK Markey
Cancer Center

We've reached a pinnacle moment.

The sinuous path to get to this point — diverting, adapting, paving our own way — was made possible by the hands, hearts and minds of the entire Markey team.

With a new facility on the horizon, the goal to diminish the impact of cancer on Kentuckians — and enhance treatment options globally — is now attainable.

2023 ANNUAL REPORT

CONTENTS

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ON THE COVER
On Sept. 18, 2023, faculty, staff, esteemed legislators and other supporters of the Markey Cancer Center celebrated its National Cancer Institute Comprehensive Cancer Center designation at the UK Gatton Student Center. Markey is the first and only center in Kentucky to achieve this designation, which is the highest level of recognition awarded by the NCI.

Moving Forward / **06**

Building the Future / **07**

The Next Phase for Markey / **10**

Historical Timeline / **12**

The Butterfly Effect / **16**

The Original Cohort / **20**

A Joy for Evers / **28**

Trial Runs / **34**

The Power & Promise of Clinical Trials / **40**

Renewed ACTION / **42**

Connecting Communities / **46**

Markey Network Benefits From NCI Comprehensive Designation / **52**

Markey by the Numbers / **54**

Awards & Accreditations / **58**

Left: A rendering of the new Markey Cancer Center (accurate as of December 2023) shows the skywalk that will connect the building to the main hospital.

MOVING FORWARD

We have so much to celebrate at the UK Markey Cancer Center. Achieving the National Cancer Institute Comprehensive Cancer Center designation means we've met rigorous criteria for research, patient care, community outreach, and education. We are in rare company as one of only 56 NCI comprehensive cancer centers in the country. But this isn't a time to relax because we aren't done. Not by a long shot.

The road to comprehensive designation didn't start this year, last year, or even five years ago. Decades ago, pioneering faculty and leaders laid the groundwork here at Markey. They saw the potential and understood the Bluegrass state's need for a world-class cancer center. Their legacy is an inspiration that still shapes our focus.

I see the keys to our success every day. Faculty and staff collaborating to fuel groundbreaking advances across all levels of patient care, working hand-in-hand with local communities, and turning research into real-world benefits. But with progress comes a greater promise to continue leading the way.

We are Kentucky's only NCI-designated Comprehensive Cancer Center. And from the lab bench to the bedside, we're laser-focused on our mission to shrink the shadow of cancer over the Commonwealth. We have outstanding teams focused on reducing lung cancer rates and preventing colon cancer and other cancers common in Appalachia and throughout Kentucky. Our patients benefit from promising clinical trials aimed at addressing these unique challenges.

The impact of our efforts reaches far beyond Lexington. We partner with community hospitals through our Markey Cancer Center Affiliate and Research Networks, bringing expert cancer care closer to home for underserved areas. Through our community outreach programs, we empower individuals and organizations to become active participants in reducing cancer rates. And our Appalachian Career Training In ONcology (ACTION) program prepares and inspires the next generation of young people to take up the fight against cancer. A concrete example of our commitment to Kentucky is our new cancer center building, scheduled for completion in 2027. This cutting-edge center will help us expand patient care, increase access, and amplify our research.

The coming years at Markey are full of promise. That's in large part because of our outstanding faculty and staff. Their dedication inspires me every day. Together, we're all determined to make a difference in the lives of the people we care for. That focus won't ever change. ■

B. Mark Evers

B. Mark Evers, MD, FACS
Director, UK Markey Cancer Center

Markey Cancer Center
An NCI Comprehensive Cancer Center

BUILDING THE FUTURE

A new state-of-the-art multidisciplinary cancer building will bring all UK Markey Cancer Center outpatient services under one roof, creating a patient experience unparalleled in the region. With cancer clinics, screening and procedural areas and space for advanced research, the facility — scheduled for completion in 2027— will position Markey to expand the advanced cancer care it delivers to the people of Kentucky.

"The Markey Cancer Center has long been recognized for high-quality cancer prevention, early detection and care in Kentucky in the region," says Mark Evers, M.D., director of the UK Markey Cancer Center. "This new building will allow us to further develop the groundbreaking treatment and research we provide and position Markey as a leader today and well into the future."

Kentucky has the highest rates of cancer incidence and cancer mortality in the country. Many of those patients come to Markey for treatment and it can be challenging for them to navigate the campus, with some needing to visit as many as four buildings for care.

Luckily, these challenges are being addressed in the design of the new building, which was formally approved by the UK Board of Trustees in December 2022.

The Details

The new Markey Cancer Center building will have a total of nine levels, with eight of those accommodating some form of patient care (the remaining floor hosts the mechanical functions for the building). Cancer specific services will be on: Lower Level, Level 1, Level 4, Level 5, Level 6, and Level 7. Level 2 will be an Ambulatory Surgery and Procedure Center, and Level 3 will host Specialty Clinics.

For Markey providers focused on research and interventional trials, the new building will provide ample space to encourage growth in these areas. There is an ambulatory lab that will serve the building located on Level 2, which is 4,000 square feet, and the Precision Medicine Clinic also includes a lab area. As for research areas, the Precision Medicine Clinic is the primary location in the building to accommodate active research. The Precision Medicine Clinic, along with the Infusion area, encompasses 10,500 square feet. And the Stem Cell Therapy Lab consists of 2,600 square feet.

Hundreds of faculty and staff have been involved in planning for the new facility to ensure the space functions well for patients and

those who work in the building. Markey's Patient Advisory Group has also contributed feedback throughout the planning process, giving advice on parking, wayfinding and more.

Personal Space

UK HealthCare is known for its attention to self-care when it comes to both patients and families, and this ethos is central to the new Markey Cancer Center building as well.

The Arts in HealthCare department has started to identify locations for large-scale art installations in the lobby area to extend a sense of tranquility as patients and guests enter the facility. For those who will be in the building for longer periods of time, a meditation space is being planned on Level 1 that is intended to be a space for calm reflection.

Current plans also include an attached parking garage, a drop-off area at the entrance to make it easy for patients to access the building and a skywalk to connect Markey to the main hospital. ■

Below left: Patients who come to the new UK Markey Cancer Center will walk into an airy and expansive lobby where they can register.

Below right: This rendering of a Level 6 clinic waiting area shows that patient and visitor comfort has been taken into account.

Opposite page: A rendering of the front facade of the new UK Markey Cancer Center.

All renderings are current as of December 2023 and may change.

THE NEXT PHASE FOR MARKEY

GOALS SET EARLY TO CREATE NATIONALLY RENOWNED CENTER IN KENTUCKY

In 2013, the UK Markey Cancer Center earned the state's only National Cancer Institute designation. Then in September 2023, Markey achieved yet another accolade and became an NCI-designated Comprehensive Cancer Center, the highest level of designation NCI awards.

These milestones were not by happenstance, though. From its inception, Markey was intended for great things… not for its own sake but for the welfare of Kentuckians who, until then, had to look outside the borders of the Bluegrass for care.

Still, it was not without many years of struggle and triumph, according to many of the distinguished doctors and researchers who played pivotal roles in elevating Markey. The mission for Markey was always clear: the healthcare system would be competitive at the highest level and would recruit highly skilled doctors and researchers to provide the best care for patients in the region.

When former Executive Vice President for Health Affairs (EVPHA) Michael Karpf, M.D., was hired around 2003, the state lacked a "certain level of medical care, and Kentuckians did not have access to the best advanced subspecialty care," he said. "[Markey] was competing with the community rather than augmenting the community by bringing in services the community could not provide."

Dr. Karpf said his goal was to put effort into developing a cancer center that would get a "hallmark" designation: the prestigious National Cancer Institute designation for research.

Recruiting Special Forces

Native Kentuckian and UK College of Medicine alum, Joseph Zwischenberger, M.D., (known as Dr. Zwisch), embarked on a 30-year career journey in several states before being recruited by Dr. Karpf and Jay Perman, M.D., former dean of the UK College of Medicine and vice president for clinical affairs, in 2007. By then, Dr. Karpf's vision was on the verge of coming to fruition – the university was regionalized and academic-based, but Dr. Zwisch, as UK professor of surgery, chairman of surgery, and surgeon-in-chief of UK HealthCare, trusted his intuition and invested in the vision.

A top recruit would change Markey's future, and one candidate quickly rose to the top.

Michael Karpf, M.D., served as the UK Executive Vice President for Health Affairs from 2003–2017.

In 2008, Hurricane Ike tore through the community of Galveston, Texas, destroying the University of Texas Medical Branch's (UTMB) labs and medical center where Mark Evers, M.D., a surgical oncologist, led a group of highly successful researchers. Coincidentally, Dr. Zwisch had been employed by UTMB for 21 years before coming to UK, and he proposed Dr. Evers as a top candidate after the devastation UTMB had suffered.

In order to attract such a talent, Dr. Karpf, Dr. Perman, Frederick C. de Beer, M.D., former chair of the Department of Internal Medicine, and Dr. Zwisch would have to combine resources to build a competitive package.

The issue for UK was that Dr. Evers came with stipulations – a team of 10 NIH-funded investigators, which would require momentous resources from UKHC. To hire Dr. Evers meant offering, collectively, 40 recruits to move north to Kentucky. "After much consideration, UK leadership and department chairs realized," said Dr. Zwisch.

"This was a brilliant, once-in-a-lifetime chance to suddenly have a crucible of investigators and a leader that could potentially build us into a competitive center."

Joseph Zwischenberger, M.D.

The core group was flown to Lexington from Galveston, were interviewed, and all accepted as a "package deal" to move with Dr. Evers. "Here they were on an island that a hurricane had just destroyed," said Dr. Zwisch. "Their homes were flooded. Their labs were decimated. The rebuilding process that was promised was going to be slow in coming, and now their leader was being recruited to a major university with a big package deal."

The rest was history; the investigators were organized in different departments to align with NCI's expectations for designation and Dr. Evers reported to the EVPHA, the dean, and the provost. Within a very short time, the team recruited several major investigators from the University of Louisville, and the whole team received NCI Cancer Center Designation in just five years from their arrival in Lexington. By 2023, the team earned the coveted Comprehensive Cancer Center Designation, due to continuous support from both the university and UKHC, as well as internal and prolific external funding in grants and philanthropy.

A Deep Commitment to the Mission

As the director of the UK Markey Cancer Center, Dr. Evers is known as the "mission personified," according to colleague and friend Dr. Zwisch. "Evers is a talented surgical oncologist who understood patient care as well as the depth and the multifaceted aspects of achieving the NCI designation," he said. "He understood the relationship between patient care, research, leadership, resources, alignment with the university and state, and the clinicians in the network."

Dr. Evers continues to drive plans to build upon Markey's comprehensive status, always with Kentuckians' well-being at heart. Today, Markey is a leader in precision medicine, with a multidisciplinary tumor board, marrying surgery, radiation therapy, chemotherapy and immunological approaches.

Dr. Karpf describes Dr. Evers as a leader with humility and a model work ethic. "The boss is working harder than everybody, and he is incredibly supportive of the people that he recruits," said Dr. Karpf.

"He develops his people and mentors them to become independently funded investigators. He is committed to excellence and puts his heart and soul into it."

Michael Karpf, M.D.

The team at Markey has achieved two of its major goals, and the next one is to become a Top 25 cancer program in the country, according to Dr. Karpf. The likelihood of his vision seems more than possible with the team in place at the Markey Cancer Center. ■

HISTORICAL TIMELINE

Here's a look back at some of the memorable milestones that cultivated a place of growth and endurance to bring Markey to this pivotal moment of success.

1 | In the late **1970s**, Lucille Parker Markey was approached about a donation to kick-start funding for a clinical and cancer research center. After being approached by the Markey Cancer Foundation, she approved a $1 million donation, the first of many gifts she would make in support of the center that would later bear her name.

2 | In the fall of **1981**, renovation was completed to house a new Bone Marrow Transplant Program. The first bone marrow transplant was successfully completed in 1982. Today, UK Chandler Hospital's Blood & Marrow Transplant and Cellular Therapy Program, located within the Markey Cancer Center, treats all blood-related diseases.

3 | In **1982**, the original UK Albert B. Chandler Medical Center broke ground on the first building, and in 1983, the Lucille Parker Markey Cancer Center was founded.

4 | In **1983**, Dr. Gil Friedell became the first director of the UK Markey Cancer Center. While in this role, he co-founded the Kentucky Cancer Registry (in 1990) – now one of the premiere SEER databases (designated in 2000) in the country.

5 | The Ben F. Roach Cancer Care Facility, one of the first MCC buildings, was officially dedicated in **1985** by Vice President George H. W. Bush.

In **2006**, three community hospitals – Rockcastle Regional Hospital, St. Claire Regional Medical Center and Harrison Memorial Hospital – entered into an agreement with UK HealthCare and became founding members of the Markey Cancer Center Affiliate Network (MCCAN). Since then, the collaboration has grown into a network of 19 affiliate sites across Kentucky.

In **2009**, Mark Evers, M.D., arrives at UK Markey Cancer Center to serve as its new director.

6 | In a monumental occasion that had national, state and local leaders gather in **July 2013**, the UK Markey Cancer Center received the honor of being named a National Cancer Institute Designated Cancer Center. Markey was the 68th center in the country to earn this honor.

Founded in **2015**, the Markey Cancer Center Research Network (MCCRN) is an alliance of doctors conducting clinical research studies in the prevention, early detection and treatment of cancers.

Since **2016**, the Markey Cancer Foundation's Markey Women Strong program has been funding women-led cancer research at Markey Cancer Center. Each year, they award $100K in grants supporting women in research.

In **2017**, Markey was named one of the nation's Top 50 Hospitals for Cancer by *U.S. News & World Report* – a ranking Markey has maintained for the past seven years.

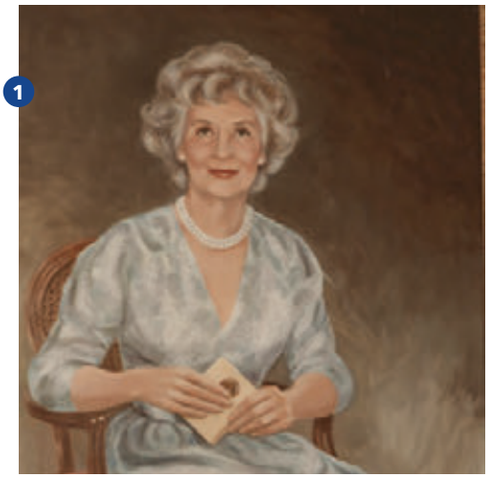
In **2017**, Markey launched the Molecular Tumor Board, a precision medicine initiative that uses genetic analysis to help oncologists choose cancer therapies tailored to each patient's individual needs.

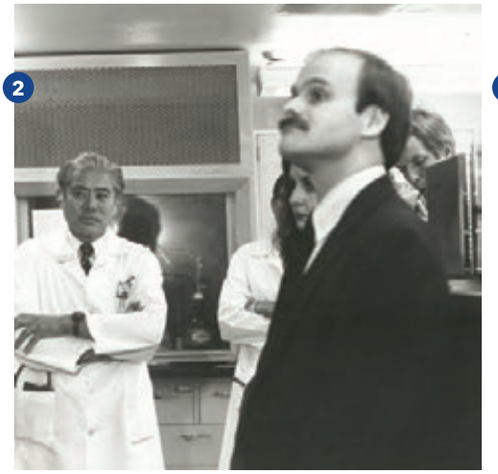
The Precision Medicine Clinic, which focuses on launching early-phase clinical trials, opened in **2018**.

7 | The Markey Science Training in Research, Oncology, Networking and professional Growth (STRONG) Scholars Program was created in **2021** to foster diversity in cancer research. This is one of many Markey educational programs fostering a pipeline of future cancer leaders.

8 | Presented by President/CEO Luther Deaton, Central Bank made an historic gift of $10 million in **February 2022** given to support expanded patient care at the UK Markey Cancer Center.

9 | UK Markey Cancer Center celebrated after the press conference announcing it had earned a National Cancer Institute Comprehensive Cancer Center designation, the highest level of recognition awarded by the NCI. Governor Andy Beshear and other Kentucky dignitaries joined Dr. Mark Evers to honor this achievement.



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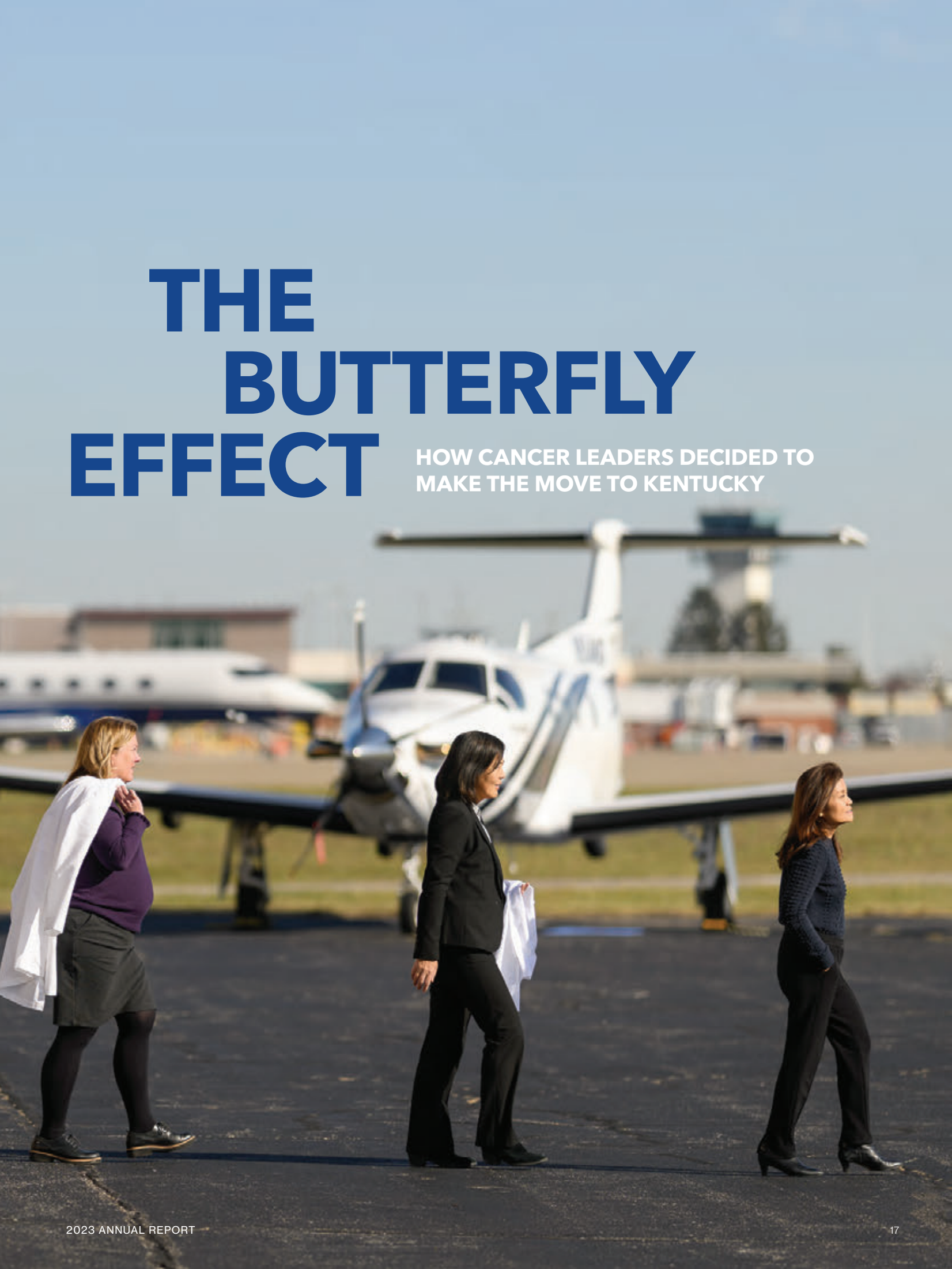
Mark Evers, M.D.

THE BUTTERFLY EFFECT

HOW CANCER LEADERS DECIDED TO MAKE THE MOVE TO KENTUCKY



Leadership at the Markey Cancer Center is a culture that extends from the research lab to the clinic, from bench to bedside so to speak. This is in large part due to the efforts of Mark Evers, M.D., to attract a group of driven and devoted individuals who wanted to contribute to something much larger than themselves. The result was a team that achieved National Cancer Institute (NCI) Comprehensive Cancer Center designation in 2023 and now has its sights set on even bigger achievements for Kentucky's future.

A Hurricane Changes Everything

When Hurricane Ike struck the Texas coast in September 2008, it had devastating effects. The University of Texas Medical Branch (UTMB) in Galveston, where Dr. Evers worked, struggled to recover. Eventually, he sought a new role at Markey, and a group of UTMB faculty and staff joined him. They left Texas for their own personal reasons, but all of them came to Kentucky with a mission to grow Markey and make a difference for the Commonwealth's people.

Heidi L. Weiss, Ph.D., was part of the group that moved from Texas. She is now the associate director for Shared Resources and director of the Biostatistics and Bioinformatics Shared Resource Facility. "I didn't plan to move to Kentucky, but with a natural disaster you cannot plan for anything," said Weiss. "I believed I had a lot to contribute. When bad things happen, something good can come out of it."

The opportunity to build the research infrastructure for the cancer center is what attracted Weiss to Markey. "I came to Markey to develop a biostatistics group, but I had the opportunity to expand the role. It allowed me to set the tone for what our shared resource facilities should be," she said. "We provide the equipment, technical expertise, and services so that our members can execute their research, whether it's clinical trials or laboratory experiments. We cover the entire spectrum of the translational continuum."

For Tianyan Gao, Ph.D., associate director for basic research at Markey, it was an easy decision to come to UK. "I was very impressed by what was already available on campus at the time," said Gao. She has built a basic science research program at Markey focused on the role of obesity and other mechanisms in colon cancer and ways to block the growth of tumors.

"Obesity is a major risk factor for colon cancer and other cancers, and Kentucky has some of the highest rates of colon cancer in the nation," Gao noted. "It's an important challenge we need to address. I think it will have a major impact in the long term for cancer patients in Kentucky."

David Gosky, M.B.A., M.A., had worked with Dr. Evers for six years at UTMB and relished the opportunity to help Markey build toward its initial NCI designation. Gosky served as associate director for administration at Markey from 2009 to 2018 and is now the executive director of administration at The Ohio State University Comprehensive Cancer Center.

He brought with him a wealth of experience from UTMB's own desire for NCI status. "I think the reason that I was helpful and comfortable at Markey is that I was well integrated into the NCI community via a couple of organizations, and so I brought the ability to understand the guidelines," said Gosky.

New Faces at Markey

After his arrival at Markey, Dr. Evers continued to add to the cancer center's roster of experts and researchers, recruiting people who have significantly impacted patient care and research. Like those who came from Texas, these people were inspired by the mission and vision to make a difference in Kentucky.

Lowell B. Anthony, M.D., FACP, chief of the Division of Medical Oncology and co-director of the Radiopharmaceutical Therapy Program, arrived at UK two years after Dr. Evers. Dr. Anthony was working at Louisiana State University Health Sciences Center in New Orleans in fall 2010, when he saw a press release about a new neuroendocrine tumor clinic at UK and knew he wanted to be a part of it. "It took two hurricanes to get us together," said Dr. Anthony, who had decided to leave the Gulf Coast after Hurricane Katrina.

Dr. Anthony has established neuroendocrine and gastrointestinal clinical trials programs at Markey, recruiting and training physicians and staff. "I can say that Markey exceeded my expectations, but at the same time, my expectations were pretty high," he said.

Pamela Hull, Ph.D., associate director for population science and community impact at Markey Cancer Center, oversees cancer prevention and control research as well as community outreach and engagement. She chose Markey because of its strong existing community engagement structure, including the Kentucky Cancer Program and Kentucky Cancer Consortium, and the cancer center's commitment to addressing health equity.

Right: Members of the Markey leadership team have put roots down in Kentucky to support the cancer center's vision.

Previous: (from left) Lowell B. Anthony, M.D.; Xiaoqi Liu, Ph.D.; Jill Kolesar, PharmD.; Tianyan Gao, Ph.D.; Heidi L. Weiss, Ph.D.

"What really drives me in my work every day, the reason I get up every day and I'm excited to go to work, is that I want to work with our team and our partners to make a big impact in the community."

Pamela Hull, Ph.D.

Biochemist Xiaoqi Liu, Ph.D., is the chair of the Department of Toxicology and Cancer Biology. He chose the University of Kentucky because of its highly respected medical school and because of the critical role his department plays in the overall success of the cancer center. "Kentucky has a high mortality rate compared to other states across the country," said Liu, who is also the Lucille P. Markey Endowed Chair in Oncology Research.

When Liu arrived at UK in 2018, he came with a focus on research that involves the molecular mechanisms that cause cancer; specifically, an enzyme known as Polo-like kinase 1, which plays a central role in controlling cell division. "Cancer is a particular issue for this state and we have to address it."

Jill Kolesar, PharmD, co-leader of the Translational Oncology Research Program, joined Markey in 2016 because of the collegiality and the clear mission to get comprehensive status. "For me, it was really exciting to be part of the mission to get comprehensive status," she said, noting the success of the translational working groups that bring together clinicians, basic scientists, and epidemiologists to bridge the gap from discoveries to trials and outreach. (See details about Kolesar's work in clinical trials on page 34.)

For Kentucky

Markey's reach has extended far beyond its physical doors in Lexington and into all corners of the Commonwealth and beyond. "There's been exciting progress in reducing the burden of colorectal and lung cancer in Kentucky in the last decade, along with increased HPV vaccination and reduced smoking rates," said Hull. "The goal now is to no longer be the state with the highest cancer incidence and mortality rates in the country."

Markey's success is a university-wide effort, with support from the highest levels. That support is coupled with Dr. Evers' approach to working with others, leading by example and building bridges to work across the organization. This approach achieves results, whether improving patient outcomes, securing grant funding or publishing a paper. "There's a sense that we're in this together," said Weiss.

With such a strong network of leaders rallying together, Markey is making grand strides in being a catalyst for change in the Commonwealth. "The future is as exciting as it could be for the citizens of Kentucky," said Dr. Anthony. ■

THE ORIGINAL COHORT

HOW THESE ESTEEMED EXPERTS HELPED TRANSFORM THE CANCER CENTER

When Mark Evers, M.D., arrived in Lexington in 2009, the foundation was already laid for the Markey Cancer Center's future growth. A group of faculty with a deep commitment to the cancer center and Kentucky was already hard at work making a demonstrable difference in the lives of the people of the Commonwealth. In the coming years, their contributions would help Markey become a nationally recognized place of research and healing.

Building Hope Through Clinical Trials

An eighth-generation Kentuckian, Susanne M. Arnold, M.D., was a junior faculty member with NIH funding when Dr. Evers asked her to take on a leadership role. She wasn't sure she was ready, but Dr. Evers had no doubt. "He's willing to take a risk, but he also reviews your qualifications to make sure you can do the job before he asks you," she said.

A medical oncologist and now the associate director of clinical translation, Dr. Arnold has shepherded the expansion of clinical trials at Markey. The growth includes trial participants from almost every county in the Commonwealth. "The way we make progress in cancer is through cancer research," she said. "New drugs that are being used today were in clinical trials five or 10 years ago. New discoveries at the bench today will be the future treatments of tomorrow."

In fact, maintaining this focus on high-level research to advance clinical trials is at the epicenter of the comprehensive status awarded to Markey. The center was able to share with the NCI that participation in its clinical studies had increased by 51% (2013-2017 compared to 2018-2022). And it takes someone like Dr. Arnold, with her background and expertise, to lead this charge. It was under her guidance that Markey became a member of the Experimental Therapeutics Clinical Trials Network (ETCTN), which was created by NCI for the early clinical evaluation of innovative cancer therapies. The impact of her leadership has resonated throughout Markey.

This work also has personal significance to Dr. Arnold. She has had three close family members with cancer, so she understands the emotional toll of the disease and that is what drives her. "First and foremost, I think Markey means hope. It means care and concern," she said. "We all recognize that at the end of the day, we just want to cure more cancer." And her dedication is proven in her track record of achievements, including her pioneering field research in Appalachia to study populations at high risk of developing lung cancer.

A Research Expansion

Daret St. Clair, Ph.D., recently retired after working at Markey for 32 years. She was a senior faculty researcher in the department of toxicology and cancer biology when Dr. Evers asked her to serve as the associate director for basic research. "He really energized me and helped me to become a leader," she said.

Right: Daret St. Clair, Ph.D., who began as an assistant professor at UK in 1991, was honored with a research symposium in December 2023 to mark her retirement after 32 years. During her career, Dr. St. Clair served as the associate director for basic research at Markey and co-director of the UK Center for Cancer and Metabolism.

St. Clair's groundbreaking research at Markey has fundamentally shaped the understanding of free radicals in cancer and her innovative studies have propelled redox biology to a cornerstone of cutting-edge cancer research.

Since basic science research is a foundational pillar for research institutions, a large part of putting Markey on the national map has included building and bolstering its research capabilities; this infrastructure included increased grant funding, new researchers and facilities, and expanded education. The basic science departments from across the university have grown with even more researchers and large programmatic project grants in recent years, said St. Clair, whose leadership influenced the career of many fellow researchers and trainees. "Our team has always had an eye and focus on Kentucky's unique cancer problem," she said. "We have not solved all the cancer problems, but we have come a long way."

A Commitment to Patients

In 2009, Markey was a locally and regionally recognized cancer center, but one with the feel of a community-based cancer center, said Frederick R. Ueland, M.D., chief medical officer and director of oncology clinical services, who joined Markey in 1998.

A clinician-scientist and gynecologic oncologist, Dr. Ueland's research led to the first-ever FDA-approved preoperative blood test for ovarian tumors in 2009. As director of oncology clinical operations, he has seen the number of new cases diagnosed annually at Markey grow significantly (from 1,400 in 2000 to more than 4,500 today). To address this growth, Markey paired clinical and research teams to think deeply about treatment options, offering patients more than the standard of care.

"Markey's resources provide a unique opportunity for multidisciplinary care where doctors from many specialties participate in the patient's visit," said Dr. Ueland. "Markey also has an extensive number of clinical trials available to our patients, providing innovative treatments not offered anywhere in the state. For these reasons, patients are choosing to come to Markey or one of our affiliate sites."

And none of it would be possible, he notes, without the commitment, talent, and devotion of Markey's providers, nurses, and staff. "It's our people and our culture that has made us exceptional," he said.

The Measurable Impact of Research

Thomas C. Tucker, Ph.D., M.P.H., came to Kentucky in 1984 to help establish the cancer center. He was the founding chair of the Department of Epidemiology in the UK College of Public Health and established the Kentucky Cancer Registry (KCR).

Left: Susanne M. Arnold, M.D., a medical oncologist and now the associate director of clinical translation, has more than 21 years experience, with an expertise in treating lung , head and neck cancer. She is also an eighth-generation Kentuckian.

Left: Thomas C. Tucker, Ph.D., M.P.H., has been at the Markey Cancer Center since its inception, after his arrival in Kentucky in 1984. He also founded the Kentucky Cancer Registry while at the UK College of Public Health.

Tucker's research has centered on the heart of the Commonwealth, with an emphasis on the people of rural and Appalachian Kentucky. He also built a population-based virtual tissue repository using data from the KCR. The repository gives basic science researchers access to both a wealth of high-quality data and population-based tissue samples in a streamlined process. This is one of only two similar population-based virtual tissue repositories in the nation.

Cancer centers designated by the NCI must have strong programs in basic science, cancer prevention and control and translational research. "But what the NCI really wants to see is that we work across those disciplines," said Tucker. "The key ingredient is engaging people in specific projects where they have to work together to be successful, which Dr. Evers does, and that's a brilliant strategy. Cross-disciplinary work is where Markey made significant progress."

The progress is measurable and real, said Tucker, who previously served as an associate director on Markey's senior leadership team. Markey's collaborative colorectal cancer screening program has reduced cancer incidence by 30% and mortality by 34%. "That means every single year there are 390 Kentuckians who didn't get colorectal cancer because they were screened," he said. "And it means that there are 260 Kentuckians who no longer die each year of colorectal cancer. That's a pretty significant public health impact." And while Kentucky has the nation's highest lung cancer rates, mortality rates are dropping after the implementation of Markey's work in lung cancer screening, propelling Kentucky to the state with the second highest lung cancer screening rate in the nation.

Strength in Unity

Dr. Evers leveraged the groundwork laid by those who came before him, from researchers and oncologists to Ben Roach, M.D., and Lucille Parker Markey, whose efforts resulted in the creation of the Markey Cancer Foundation in 1983. This group of community donors helped secure funding for the new building, managed the money raised and then deeded the building to the university in perpetuity.

By bringing everyone together and fostering a sense of camaraderie, Markey has grown into a cancer center making an impact far beyond Kentucky. It was a unified effort with support and funding from the highest levels and the efforts of the team of clinical and research leaders.

"It's the people that have made this place comprehensive," said Dr. Ueland, "but without a dreamer and a leader with the vision to put it all together, it wouldn't happen."

"We are dedicated to Kentucky — we don't have another boss," said Dr. Arnold of the Markey team. "We are here for the people and hopefully that matters when they need us most." ■

A JOY FOR EVERS

KENTUCKIANS HAVE AN AUTHENTIC ADVOCATE AT THE HELM OF MARKEY

What makes people who they are? Not in the molecular sense, where every living thing on the planet forms its proteins from some combination of the same common 20 amino acids.

No, no. We're talking about something more enigmatic. How do you explain the origins of someone's drive, their ambition and curiosity? Their tenacity? Is it nature vs. nurture? Or, Is it both?

For Mark Evers, M.D., he claims it's something more pure, simple: "You know, I was so terribly naive," he laughed. "I look back now and think, gosh, I was lucky."

What's Luck Got to Do With It?

Yet there's nothing in the career stats of Dr. Evers that alludes to chance playing any part in him landing in Lexington, Ky., to serve as the director of the UK Markey Cancer Center in 2009. That is, unless you count a hurricane as "luck."

Before taking the helm at Markey, Dr. Evers had served as the Robertson-Poth Distinguished Chair in General Surgery and Director of the University of Texas Medical Branch (UTMB) Cancer Center in Galveston, Texas. Then in September 2008, hurricane Ike made landfall at 2:10 a.m. near Galveston. And its 110 mph winds whipped through the city, taking with it an unconscionable amount of data Dr. Evers and his colleagues had been working on.

"I had biospecimens, I had 10 years of colon cancer cases," explained Dr. Evers. "And all that was lost."

With the power wiped out by the hurricane and the lower floors of the building flooded, all of his research was lost. While Dr. Evers had previously considered offers, it wasn't until now that he knew he had to make a move.

The Impact of One Stoplight

But major moves weren't anything new for Dr. Evers; his origin story looks nothing like where he's ended up. With a population of around 1,700, Loretto is a small farming community in southern middle Tennessee and the place where Dr. Evers grew up.

A one-stoplight town has become a familiar way to describe sleepy, rural areas. Yet in the case of Loretto, Tenn., this literally sums up the extent of its transportation planning. But that's all it requires really when the entire town is no bigger than 4 square miles.

Though small in radius, it had a major impact on the future of Dr. Evers. His father worked for the Tennessee Valley Authority for 40 years but spent his free time tending to their family farm ("That was his hobby," explained Dr. Evers).

Left: Having grown up on his family's farm in Loretto, Tenn., Dr. Mark Evers attributes the roots of his work ethic to his summers bailing hay, which also helped put him through medical school.

Previous page: Dr. Mark Evers visits the grounds at the UK Horticulture Research Farm in Lexington, Ky. He takes in a greenhouse of mature Turmeric leaves, which are known for their antioxidant properties and ability to help reduce inflammation.

Yet that very hobby is what put he and his sister through medical school. Of course, they were required to put in a little sweat equity over the summers, baling hay by hand and helping with the cattle. And although his father only went to school through the 8th grade, Dr. Evers learned something just as essential from him as he would in any textbook: work ethic.

While his father provided the inspiration, it was another influential Loretto resident who provided the outlet. Dr. Henry Thomas was your quintessential small-town doctor who treated everything from diabetes in the clinic to removing a gall bladder in the operating room. "I had the good fortune to shadow someone who was sort of the pillar of the community," said Dr. Evers. "There was God, then there was Dr. Thomas right under that."

So, his plan was to go to medical school, then return to Lawrence County (where Loretto is located) to follow in the footsteps of Dr. Thomas.

Best-laid Plans

Dr. Evers attended medical school at the University of Tennessee Health Science Center in Memphis, then completed his residency at the University of Louisville, School of Medicine. This is where he found his role model Hiram C. Polk, Jr., M.D. "Dr. Polk is legendary and has been a tremendous influence on my career path. To this day, I still call him for advice," explained Dr. Evers. "He definitely knew me better than I knew myself."

It was under Dr. Polk's mentorship as the department chair for surgery where Dr. Evers became immersed in all aspects and specialties of surgery. In his last year of his surgical residency, Dr. Evers shared his plan to return to Lawrence County and go into private practice with Dr. Thomas. But Dr. Polk saw another passion in Dr. Evers: research. After learning about an academic track research fellowship in GI physiology, Dr. Polk knew this would be a good move for him and recommended he apply for the two-year opportunity at UTMB. This is where his new path as a cancer researcher would begin.

In a lab led by James Thompson, M.D., it was there that Dr. Evers embarked on research with another outstanding role model and mentor, Courtney Townsend, M.D., to discover the relationship between gut hormones and their effects on cancer.

And thus began his journey into the field of cancer, which brings us full circle… to the hurricane.

A Vision in UK Blue

In the midst of devastation, a silver lining was found by way of Michael Karpf, M.D., the Executive Vice President for Health Affairs at UK HealthCare from 2003-2017. With his sights set on elevating Markey to an NCI-designated cancer center, Dr. Karpf met with Joseph B. Zwischenberger, M.D., a former faculty member at UTMB and now a professor at the UK College of Medicine. He shared his insight on the success Dr. Evers and his team had had at UTMB, and that set Dr. Karpf's plan in motion.

If Markey was to become an NCI-designated cancer center, then it needed a heavy lift … and with a splash as opposed to drop by drop.

"Zwischenberger convinced me that Dr. Evers was not the kind of person who would only come by himself, but he was such a leader that a number of his people would likely come with him," said Dr. Karpf. "Well, when Dr. Evers arrived, he brought seven NIH-funded investigators and laboratory technicians with their families."

And just like that, around 125 people moved from the beach to the Bluegrass. Lexington's population increased by 125 former Galvestonians practically overnight. How did they decide to uproot their lives and move over 1,000 miles based on the word of one person?

Depends on the person, right? "There are several things that make him a good leader. One, he does have humility. And two, he

is an extraordinarily hard worker," explained Dr. Karpf. "If you take a look back and see the people that came with him from Galveston, many of them are now the leaders of critical programs in the cancer center. He matures them into people who could get recruited away but they stay in Kentucky because of the kind of leader Mark Evers is."

"The Big C" Now Stands for Change

As with many of us, the people we grow into is rooted in events that deeply impacted us early on. And this holds true for Dr. Evers, who suffered a devastating loss as a young child. When he was just 4 years old, Dr. Evers lost his best playmate to leukemia. "I mean, that was a shocking experience at that age," he lamented. "One day you're playing with him, the next day you hear he's sick, the next day you hear he's died. Gone."

Such a heavy memory can either evolve into an albatross around one's neck or used as a catalyst for change. Dr. Evers chose the latter.

"I've been in the cancer field now for 30 years and I'm totally serious about this: I'm the most excited that I've ever been."

Mark Evers, M.D.

"When I started out, if you saw a colon cancer patient who had metastatic disease, it was just a death sentence."

Back then, a 25-year-old young woman and a 75-year-old gentleman with the same diagnosis would get one of the two or three drugs available at the time, rolling the dice in hopes it would work for at least one of them. Today, vast inroads have been made thanks to immunotherapy with precision medicine. "We're looking at the tumors and the genetic mutations, and we're able to tailor the drugs based upon specific mutations and that to me is so exciting," he said.

Dr. Evers points to former President Jimmy Carter, who was diagnosed with metastatic melanoma in 2015, as an example of the impact of immunotherapy. "He goes on one of the early clinical trials and, look at him now; he's still alive," he said. "You know, that's just unheard of! So, I see the changes that have occurred, and it makes me excited every morning when I get up. It's the sign that we are starting to make a difference with this terrible disease."

Yet it's not just beloved leaders who are benefiting from these advanced clinical trials. The work done by Dr. Evers and his team at the Markey Cancer Center is driven by one main demographic: the entire populace of Kentucky. "I want to see us move the needle and no longer be the state with the highest cancer incidence and mortality rate," he said. "We're doing this for Kentucky and the nation."

And with a new building in development, it's going to make it that much easier for Kentuckians coming to Markey to receive treatment. Because it's no secret that navigating the numerous corridors that house the various locations and treatment options is, well, overwhelming to say the least. "This place is like New York City!" said Dr. Evers of people coming from rural areas of Kentucky. "[Patients] are so bewildered when they get dropped off that they don't know where to go. There are so many buildings."

The new building will house every treatment option a patient will need from labs to radiology and everything in between. And he credits his team with seeing this come to fruition under his watch. "It's absolutely attainable, and it's all due to them," he said with complete sincerity. "The collaboration, the willingness to work together, to think outside the box. That's what excites us all." ■

TRIAL RUNS

TOMORROW'S TREATMENTS COME TO MARKEY PATIENTS TODAY

In September 2023, the University of Kentucky Markey Cancer Center's researchers and doctors celebrated a National Cancer Institute (NCI) Comprehensive Cancer Center designation, the highest level of recognition in the field, based on excellence in research and prevention of cancer.

Markey continues to make strides through interventional trials, which translate the doctors' and researchers' science from the lab to the patients in the clinic. And according to clinicians, these trials may allow patients to receive faster and more effective treatment.

Jill Kolesar, Pharm.D., a university research professor of pharmacy, is one of the researchers leading the award-winning initiatives. Dr. Kolesar began her career as a first-generation college student at the University of Wisconsin-Madison. After seeing a public access television program about tumor-infiltrating lymphocytes and the immunology of cancer, she knew cancer research was her next career goal.

The Translational Oncology Program at the Markey Cancer Center gained the talented researcher in 2016. While at Markey, Dr. Kolesar and her team's primary goals are to integrate cancer discoveries produced in the lab from the researchers into the hands of the doctors – and then to the patient – in the clinic.

From Clinic to Community

New cancer discoveries can take up to 30 years from the beginning stages of research in the lab to being available to the community as a viable treatment option. Dr. Kolesar and her team aim to accelerate the process with the Molecular Tumor Board, a statewide service available for "clinicians, pathologists and scientists to discuss and analyze tumor genotypes and molecular abnormalities to recommend patient-specific targeted therapies," according to the Markey Cancer Center website.

"We started the Molecular Tumor Board to help treating physicians interpret [genomic] reports, and develop treatment plans for their patients," said Dr. Kolesar. "The goal of the project is for people treated in the community to get the same care that they can get at an academic medical center."

Dr. Kolesar explains that if patients agree to clinical trials with genomic testing that receive a targeted therapy, as recommended by the Molecular Tumor Board, they have better outcomes according to her published research. In a study evaluating the Molecular Tumor Board, most patients lived longer on a Molecular Tumor Board-recommended treatment.

For example, the PRiMAL study – Precision Medicine Randomized Clinical Trial Comparing Molecular Tumor Board Assisted Care to Usual Care – started in April 2022 and currently has around 150 participants. This trial compares Molecular Tumor Board-assisted care to usual care for patients who have newly diagnosed histologically or cytologically confirmed stage IIb-IV Non-Small Cell Lung Cancer (NSCLC) and are planning to undergo treatment for their cancer.

The study will compare survival rates between the two groups as well as the quality of life within a one-year time frame. This trial has gone out into the community through the Markey Cancer Center Research Network (MCCRN). The MCCRN conducts studies initiated by Markey's own doctors and scientists as well as national studies available through the Markey Cancer Center's membership in the National Cancer Institute's National Clinical Trials Network.

"My only goal is to help people," she said. "I feel fortunate that we have developed these advances during my career and that I can contribute to them."

"I'm lucky that things we used to just dream about, think about, and study in our laboratory are actually in the clinic and community."

Jill Kolesar, Pharm.D.

New Therapies in Kentucky

John Villano, M.D., Ph.D., medical director of the Precision Medicine Clinic, leads doctors and researchers through clinical research, clinical trials, and computer control groups at the Markey Cancer Center.

Dr. Villano has a long-term interest in the scientific and medical arena. Still, his residency at the University of Michigan Medical Center is what drew him into the oncology portion of neuro-oncology.

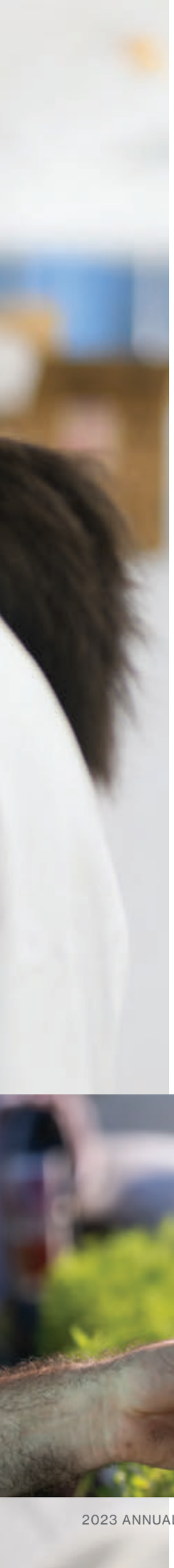
Since joining Markey in 2012, he has specialized in brain tumors, as well as lung cancers, which frequently spread into the brain. Dr. Villano and his team work to find advancements in genomics and target therapies to help Kentuckians find relief in their oncology journey.

"We want our patients in the Kentucky region to not have to travel very far to get the best research and clinical trials," said Dr. Villano. "We want to not only provide drug discovery but opportunities for research to bring new therapeutic treatments to larger and unique patient populations."

Right: John Villano, M.D., Ph.D., works with a Markey patient participating in a precision medicine trial.

Previous: since John Villano, M.D., Ph.D., and Jill Kolesar, Pharm.D., collaborate on research and clinical trials for Markey patients.


Jill Kolesar, Phar
Markey Pract



The state of Kentucky provides a unique opportunity to develop new cancer treatments. Dr. Kolesar and her team are working with a company that is growing the plant Sweet Annie, the source of a commonly-used anti-malarial medication. Historically grown in China, India and Africa, it is now being evaluated as a replacement crop for tobacco in Kentucky. Dr. Kolesar's team has translated Sweet Annie from Kentucky fields to the University of Kentucky lab, demonstrating the anticancer activity of this plant, and it is now into Markey clinics with ongoing clinical trials in ovarian and prostate cancer.

"My real goal is to help people," said Dr. Kolesar. "It's critical for me to do something tangible that helps people. That's why I go to work every day."

Dr. Villano credits the university for being able to provide the research and conduct the many studies it takes to conquer the different types of cancer and provide improvement to the lives of oncology patients.

"There are so many quality-of-life components to cancer care that we sometimes forget," said Dr. Villano. "This includes how patients could benefit from new research methods on investigational drugs and unique therapies. We want to provide a method of evaluating and understanding this process so we can benefit not only a patient's cancer treatment but also their quality of life."

Researchers and providers at Markey Cancer Center continue leading aspects of cancer research with its newest NCI comprehensive designation. "We live in a unique period of cancer research and therapeutics," said Dr. Villano.

"When I started my involvement in cancer care, patients were living in a timeframe of a year or two years, or even seasons, but now patients are living numerous years and potentially cured."

John Villano, M.D., Ph.D.

"We want patients who have cancer to be treated and live a good quality life as long as they can."

The research staff and providers have the same universal goal. "We want to conquer cancer in the Commonwealth, and to improve cancer outcomes for people in Kentucky and beyond," said Dr. Kolesar. ■

Opposite page: Jill Kolesar, Pharm.D., works with a research assistant in her lab.

Left: Sweet Annie, a plant used in anti-malarial medicine, is grown in Kentucky and tested in trials for its anti-cancer capabilities.

THE POWER & PROMISE OF CLINICAL TRIALS

HAO & YANG SERVE AS KEY PHYSICAN-SCIENTISTS IN CANCER TREATMENT DISCOVERY

Markey Cancer Center physician-scientists Zhonglin Hao, M.D., Ph.D., and Eddy Yang, M.D., Ph.D., are leading the way in translating lab discoveries into clinical trials that are improving patient care.

Hao is a medical oncologist and medical director of Markey's Clinical Research Office, and Yang is a radiation oncologist and the chair of the UK College of Medicine's Department of Radiation Medicine. Together, they have decades of experience leading clinical trials for a variety of cancer types.

During a recent roundtable discussion, Drs. Hao and Yang share the importance of clinical trials and how they play a significant role in changing how providers approach cancer care.

Above: Eddy Yang, M.D., Ph.D.; and Zhonglin Hao, M.D., Ph.D.; both physician-scientists at Markey, shared insight into the impact of clinical trials.

A lot of health systems now tout that they offer clinical trials as a selling point. Why is this and what sets Markey apart from other medical centers in this field?

Hao: The biggest motivation is that we're seeing huge benefits from clinical trials. We think of a cure as a five-year survival rate, but new treatments that have come from clinical trials just in the past decade are now extending survival by years. Markey has a huge clinical trial portfolio from which our patients can potentially benefit. The Cancer Moonshot has also helped to increase investment in clinical trials, which is leading to even more progress.

Yang: Patients have access to the latest trials at Markey. Our NCI Comprehensive status is going to drive home the ability to perform even more trials, reach our community in a better way, and give our patients more access to treatments. Another piece that sets us apart is that we're able to perform trials that come directly from our laboratory researchers. This homegrown research focuses on cancer types most prevalent in Kentucky.

How do you present the idea of a clinical trial to patients?

Yang: I always tell patients that clinical trials offer the latest and greatest new treatments. And it's through a lot of work from the laboratory, testing and quality assurances that the clinical trial came about. It depends on the type of trial, but usually we're taking the current standard of care treatments and adding something new to it in hopes to improve the outcomes. I like to say that clinical trials could be the new standard of cancer care.

Hao: I ask them, "What's your goal? Is it to get the standard of care? Or do you want to have extra miles?" If it's the latter, we can offer something beyond the standard of care. It's also an important reminder that today's current clinical care came from yesterday's clinical trial.

There's some inherent mistrust between some populations and the medical/research community. How do you address that?

Yang: I think the important piece is to ensure that there is trust between the patient and the physician. And then from there, really explaining and listening. First is to educate them, in terms of the trial design and what exactly we're doing to give them the best chance for a cure. And then from there, making sure that I understand what their concerns are for not participating so we can address those issues.

How important is it to ensure that clinical trials reflect diversity?

Yang: You need a diverse population of participants to really know that a clinical trial is successful. You could have a very high-impact trial with great results, but

if the patient population is 90% Caucasian, the results might not be applicable to other ethnicities and races. This is because many treatments are based off biology, and there are other social and environmental factors that come into play.

"Our NCI Comprehensive status is going to drive home the ability to perform even more trials … and give our patients more access to treatments."

Eddy Yang, M.D., Ph.D.

Hao: Diversity also includes age, which can be quite a barrier. A lot of providers are hesitant to enroll patients after the age of 80. One of my research projects is focused on how age impacts patient care. We looked at outcomes for 3,000 non-small cell lung cancer patients over 80. As suspected, a majority did not get any treatment. But those that did got just as good a benefit as younger people. If they are healthy enough to participate in a trial, I tell my patients over 80 "We're going to let you try." We have spent so much time developing wonderful trials and drugs. Everyone who could benefit from them should get that opportunity.

How has clinical research changed during your career?

Hao: I tell my patients that this is the era of precision medicine. In the past, we'd test treatments on many different cancer types and those that would show benefit in early phases would be advanced to later stage trials. But today, because of genomic testing, we can now pinpoint the patients more likely to benefit from a trial. Because the selection process is more efficient, there's a better chance for the trial to be successful. In fact, it is now common for patients to see benefits in phase one (early) trials.

Yang: I feel that trials are much more complex, but in a way that we can gather more information and learn more from every patient that participates. Even if the trial is not successful, we learn what makes that drug work in some patients and not in others. I like to coin the term "B-B-B." So it's bench to bedside, but importantly, go back to the bench.

What is the moment you are proudest of?

Yang: To see my work be translated into a clinical trial for the first time after many years of benchwork in the lab. It takes some persistence to get there, and my mentors had said "Eddy, it's going to take some time for anything to come about." My proudest moment was when that trial was activated and IRB approved. I hadn't even enrolled a patient yet, but it was about five years of work to get to that point.

Hao: I am the happiest when my own clinical trial is launched to test the hypothesis and see if the treatment can eventually help patients. Or after some time in research, I discovered that treatment outcomes can be improved without going through a clinical trial. For example, when you treat colon cancer patients in a specific sequence, you have an opportunity to improve their survival.

"Today, because of genomic testing, we can now pinpoint the patients more likely to benefit from a trial. In fact, it is now common for patients to see benefits in phase one (early) trials."

Zhonglin Hao, M.D., Ph.D.

Yang: It's rewarding anytime patients are benefitting from clinical trials and we can bring great news to them, especially when they've been through so much during their cancer journey. For me as a researcher, to be able to say to a patient that the treatment is working, and it's from the work we did in the lab – because lab work can be very frustrating. But that one great moment wipes away all the frustrations. ■

RENEWED **ACTION**

MARKEY IS DEDICATED TO TRAINING THE LEADERS OF TOMORROW

Chezney Boothe has been set on becoming a doctor since the sixth grade, but it wasn't until a recruiter representing the UK Markey Cancer Center's Appalachian Career Training in Oncology (ACTION) Program addressed her small high school class that she had an "Ah-ha" moment.

Growing up in Hazard – a small town of around 5,000 people in eastern Kentucky – Boothe witnessed firsthand the toll cancer took on her family and community. With several family members who had been diagnosed with or even died from cancer, Boothe still never really grasped the full extent of the cancer crisis in Appalachia. But once she joined ACTION as a high school student, which exposed her to oncology and cancer research, this solidified her desire to pursue it as a career.

"I don't want there to be kids like me who grow up without knowing their grandparents or repeatedly lose family members to cancer," said Boothe. "ACTION was the beginning of what has developed into a major passion."

ACTION, led by director Nathan Vanderford, Ph.D., is a cancer education and training program aimed at high school and undergraduate students from the Appalachian region of Kentucky (where cancer mortality rates are 10% higher than the national average according to the National Cancer Institute). During the two-year program, which recently received a $2 million grant renewal from the National Cancer Institute (NCI) to support the program over the next five years, students develop cancer research knowledge and skills through cross-disciplinary, faculty-mentored research experiences including shadowing clinicians, participating in career development activities, and conducting outreach in their communities. The Markey Cancer Foundation provides general operating funds to sustain the program.


Fisherbrand

Boothe is now a freshman at UK continuing her training through ACTION. She is grateful for the continued mentorship that ACTION provides her.

"This has given me so many opportunities with networking and education. I don't think I would be where I am right now without my mentors," she said. "I love that ACTION goes into Appalachian communities and finds really gifted students who are interested in medicine but don't necessarily have the resources to pursue it and supports them in developing that interest through additional education."

ACTION, with its commitment to offering enhanced experiential education to students of all backgrounds, prioritizes diversity and inclusivity as vital elements for the future of cancer research and clinical care.

"We're training these students to be future healthcare providers and researchers who will help us long-term to tackle Appalachian Kentucky's major cancer problem."

Nathan Vanderford, Ph.D.

"This generation of students that we're training will be the providers and the researchers who will ultimately impact change 10, 15 or 20 years from now, and they will help us to solve the burden of cancer in Eastern Kentucky."

Carrigan Wasilchenko is one of those students. Originally from Stanton, Ky., she is currently a third-year medical student at UK hoping to pursue internal medicine and eventually a fellowship in hematology/oncology. She was in the second cohort of the ACTION undergrad program back in 2017. Like Boothe, Wasilchenko has been personally affected by cancer, and she credits ACTION for providing her with an invaluable support system.

"Having a base network of people that you can talk to and rely on is what makes ACTION so special," she said. ■

Above: Chezney Boothe, who works in a research lab as part of her ACTION education, learned about the program as a high school student in Hazard, Ky.

Right: Carrigan Wasilchenko, now a third-year medical student, was a participant in the ACTION program's second cohort in 2017.

ACTION STATS

Participants
Since 2016, ACTION has engaged 125 students from 36 Appalachian counties

- 65 undergraduates
- 60 high school students

Alumni
30 alumni have matriculated to medical school

- 3 of these students have graduated and are now in residency programs (Harvard Medical School, University of Cincinnati and West Virginia University)
- 4 have matriculated to pharmacy school
  - 1 graduated and is now a pharmacist in Hazard and an executive fellow at the Kentucky Pharmacists Association
- 1 student is finishing a Ph.D. in cancer biology
- 3 alumni have matriculated to physician assistant school
  - 1 graduated and is currently practicing at UK

High School Success
31 out of 33 eligible high school students have matriculated to college

National Impact Publications
Students have co-authored 17 peer-reviewed publications in scientific journals

Literary Contributions
2 books have been published featuring 58 poignant personal essays from students describing their personal experiences with cancer

CONNECTING COMMUNITIES

TRANSFORMING CANCER CARE IN KENTUCKY

Conquering cancer in the Commonwealth requires an all-hands-on-deck approach, not just from researchers and oncologists, but the very people who face the relentless impact of disease every day: the community.

Achieving NCI Comprehensive Cancer Center designation requires robust community outreach and engagement, something UK Markey Cancer Center puts high on its list of priorities. Many Markey researchers, staff and community partners have had a hand in developing and enriching a variety of programs and initiatives across Kentucky's 120 counties. Among these dedicated individuals, many have been instrumental in propelling Markey to new heights in alignment with the university's mission of serving everyone in the Commonwealth.

Creating "The Eyes" of Cancer Prevention and Control

The journey into cancer research and epidemiology for Thomas Tucker, Ph.D., M.P.H., took an unconventional path. Having earned a bachelor's degree in political science, his first job following graduation was at the American Cancer Society – where his passion for cancer prevention and control began.

Tucker's career ultimately led him to become the senior director for cancer surveillance at Markey, where he established the Kentucky Cancer Registry (KCR), a vital tool providing data to guide cancer treatment, prevention and research efforts in Kentucky and beyond. Tucker was recruited to the University of Kentucky by Dr. Gil Friedell, Markey's first director. Together, they were instrumental in passing a 1990 law to establish KCR as the official population-based central cancer registry for the Commonwealth of Kentucky.

Subsequently, Tucker's team secured funding from the Centers for Disease Control and Prevention (CDC) to begin collecting data on all cancer cases not necessarily observed in a hospital. In 2001, KCR became a part of the NCI's Surveillance Epidemiology and End Results (SEER) program, and it currently operates under both SEER and the CDC's National Program of Cancer Registries (NPCR).


UK
Markey
Cancer Center

KCR is also active in the North American Association of Central Cancer Registries (NAACCR).

KCR is one of the world's most highly regarded population-based cancer surveillance programs. Tucker fondly refers to the registry, which processes more than 1.1 million records annually, as "the eyes" of a cancer prevention and control program.

"It is a critical piece to measuring success," said Tucker. "This lens helps us to focus and target our limited resources on the cancers that are the highest burden and in the populations that are at greatest risk, all while gauging the effectiveness of our interventions."

The tangible impact of KCR is evident in the case of colorectal cancer. In 2001, the registry revealed that Kentucky had the highest rate of colorectal cancer incidence in the country and the second-lowest cancer screening rate. Collaborative efforts by Markey's researchers and partners led to a remarkable grassroots effort through the Kentucky Cancer Program (KCP), resulting in a doubling of colorectal cancer screenings in Kentucky since 2002. This, in turn, led to a more than 30% reduction in both incidence and mortality rates.

KCR, now led by Director Eric Durbin, Dr.PH., continues to play a crucial role in groundbreaking research.

Previous: Members of the Markey Cancer Center Community Advisory Board are given a tour by Krystle Kuhs, Ph.D., M.P.H., assistant professor and co-leader of the Cancer Prevention and Control Research Program, of the lab where researchers conduct experiments that could go on to support clinical-based trials for Markey patients.

Left: Mark Evers, M.D., director of the Markey Cancer Center, reviews presentation details with Justin Moore, Ph.D., M.P.H., assistant director of community impact, during a Community Advisory Board meeting.

"The registry continues to evolve its data-collection activities to reflect changing technologies in cancer care," said Dr. Durbin. "For example, KCR is the first registry to collect population next generation sequencing molecular data. We are also leading innovations in machine learning and artificial intelligence to improve registry efficiencies and deliver cutting-edge data that allows Markey to further its impact in research advancement."

One of Tucker's latest projects – one of only two in the nation recently funded by the NCI – uses a unique resource from KCR, the population-based Virtual Tissue Repository. This new use for the cancer registry allows researchers to obtain various specimens associated with patients that would otherwise be discarded. Investigators can use these residual tumor specimens to identify unbiased cohorts of historical tumors. This offers researchers the opportunity to substantially elevate the science of their cancer research.

Addressing Health Disparities in Appalachia

When Mark Dignan, Ph.D., M.P.H., a professor in the Department of Internal Medicine at UK, describes the Appalachian region of Kentucky, he can't help but smile in recognizing the region's unique charm, characterized by great music, food and people.

He has studied the region and population for nearly his entire professional career, starting with a research project in the '80s based in Cherokee, N.C. Nearly 20 years later, Dignan found his new academic home at UK, and he says it was only natural to focus his efforts on Kentucky's Appalachian community.

On average, Kentucky sees more than 27,000 new cancer cases each year, and the Appalachian community's unique health care challenges make it particularly vulnerable to high cancer incidence rates.

Dignan's passion for addressing these challenges deepened when the story of cancer turned personal. One of Dignan's loved ones faced a breast cancer diagnosis in their 20's, a case that he says could have been detected earlier.

"I dove even deeper into disparities work, looking at reasons why minority, low-income and rural populations are not the main focus of efforts to increase screening, early detection and treatment," he said. "There are so many factors that govern this, including geographic isolation, limited access to health care and a cultural stigma about seeking care."

Since joining UK in 2001, Dignan has led a series of NCI-funded cancer control investigations focused on Appalachian populations, collaborating with primary care practices, public health departments and Area Health Education Centers (AHEC). His experience has allowed him to learn firsthand about the specific needs, interests and values of the Appalachian population regarding cancer prevention and control.

Dignan is currently collaborating on two NCI-funded research projects to support the development, implementation and evaluation of multi-level interventions for colorectal and cervical cancer in Appalachia. He also co-leads with Nancy Schoenberg, Ph.D., an NCI-funded training grant, Addressing Rural Cancer Inequities through Scientific Excellence (ARISE), which supports postdoctoral training to translate knowledge of cancer risk factors into behavioral interventions implemented in rural communities.

Dignan credits Dr. Mark Evers as the catalyst for Markey's transformation and evolution into an NCI Comprehensive Cancer Center, noting a major culture shift under Dr. Evers' leadership.

"We were working in fourth gear and when Dr. Evers came, we downshifted to third and put our foot to the floor."

Mark Dignan, Ph.D.

"He was like a football coach that created a winning team," said Dignan.

Modeling a Commitment to Community

Impact. It's a word central to the mission of Markey's Community Impact Office and the reason why Pamela Hull, Ph.D., associate director of Population Science and Community Impact at Markey, wakes up excited to work each day.

"Everyone on our team is passionate and really cares about what we're doing to make a difference," said Hull. "That's why I'm so excited to work at Markey. We have the leadership, infrastructure and partnerships in place to be able to make an impact in Kentucky for a positive future."

Hull moved to UK in 2020 and formed the Community Impact Office to consolidate Markey's existing community outreach and engagement programs. The goal of the office is to partner with communities, researchers and practitioners to accelerate health equity and reduce the burden of cancer in the state. Hull and her team have been successful in creating meaningful change. For example, regional staff under the KCP emphasize the importance of listening to and collaborating with local communities to understand their unique needs, priorities and potential solutions.

"People are the experts of their own communities, and they have the answers that can help solve those problems."

Pamela Hull, Ph.D.

"We can collaboratively work to bring them different tools, like research and evidence-based practices, and choose what makes sense for their community. We focus on cultivating and maintaining mutually beneficial partnerships," said Hull.

One example of the Community Impact Office's success is the 2021 Kentucky Cancer Needs Assessment (KY CNA). The comprehensive KY CNA – which combined data and community perspectives – illustrated how social determinants of health, behaviors and biology intersect to tell the current story of cancer in Kentucky and highlighted opportunities to rewrite that story. The KY CNA guided research priorities within Markey and has influenced the new Kentucky Cancer Action Plan. This is a blueprint for the state developed by Kentucky Cancer Consortium, which is managed by the Community Impact Office.

Additionally, Hull's Research Integration Team, which led the KY CNA, also created and launched Cancer InFocus: Kentucky, an online data mapping application that allows users to explore cancer incidence and mortality data alongside population demographics, social determinants of health and behavioral risk factors at various geographic levels across Kentucky. This tool not only supports researchers and partners in Kentucky but has also been adopted by 21 cancer centers across the United States to inform their cancer research priorities.

Hull recently expanded the Community Impact Office team by recruiting Justin Moore, Ph.D., M.P.H., to serve as assistant director of Community Impact. Moore will contribute valuable expertise on cancer health equity and strengthen partnerships in Kentucky's racially/ethnically diverse and underserved communities.

"It has been exciting to see others looking to Markey as a model of community outreach and engagement," said Hull. "We are poised to continue growing our impact even more in the next five to 10 years through initiatives that will ultimately enable us to strengthen our focus on health equity and addressing disparities for unique populations across the state." ■

Left: Community Advisory Board members from across Kentucky work together at an annual in-person meeting at Markey.

MARKEY NETWORK **BENEFITS FROM NCI COMPREHENSIVE DESIGNATION**

UK Markey Cancer Center's comprehensive NCI designation isn't just a victory for Markey and nearby patients in Lexington; it's a win for hospitals and patients across the state and beyond, according to physicians and administrators whose facilities are members of the Markey Cancer Center Affiliate and Research Networks (MCCAN/MCCRN).

The statewide network of 19 community hospitals expands Markey's reach to Appalachia and rural Kentucky, playing a role in the comprehensive-level designation. In return, the Markey honor brings the ability to offer patients additional clinical research trials and cancer services, and ultimately means more opportunities for patients to receive cutting-edge treatment and quality care close to home.

"I want to emphasize how important these networks have been to us," said Mark Evers, M.D., director of the Markey Cancer Center. "With the comprehensive designation, the expectation is that your investigators and clinicians are outside the 'ivory tower' and focused on the problems in our catchment area. That is getting out to Hazard, Paducah, Maysville and Morehead. We are more than a cancer center in Lexington and that is a critical aspect we have demonstrated to NCI."

UK King's Daughters Medical Center in Ashland has been part of MCCAN since 2017 and a member of the Markey Cancer Center Research Network (MCCRN) since 2015. With more than 64,000 patient encounters in the infusion suites at the Ashland and Portsmouth, Ohio, locations last year, the program is high volume and serves an 11-county area that is about the size of New Jersey and includes Kentucky, Ohio and West Virginia.

"We have 43 active clinical trials now," said Sara Marks, president and CEO of UK King's Daughters Medical Center. "The affiliation and the comprehensive cancer center designation allow us to offer more clinical trials and services. And it's important to note that the designation is a huge benefit in the retention and recruitment of physicians."

"It's always a challenge to recruit in a rural area and as I interview candidates, they are thrilled and interested to learn about the comprehensive designation."

Sara Marks

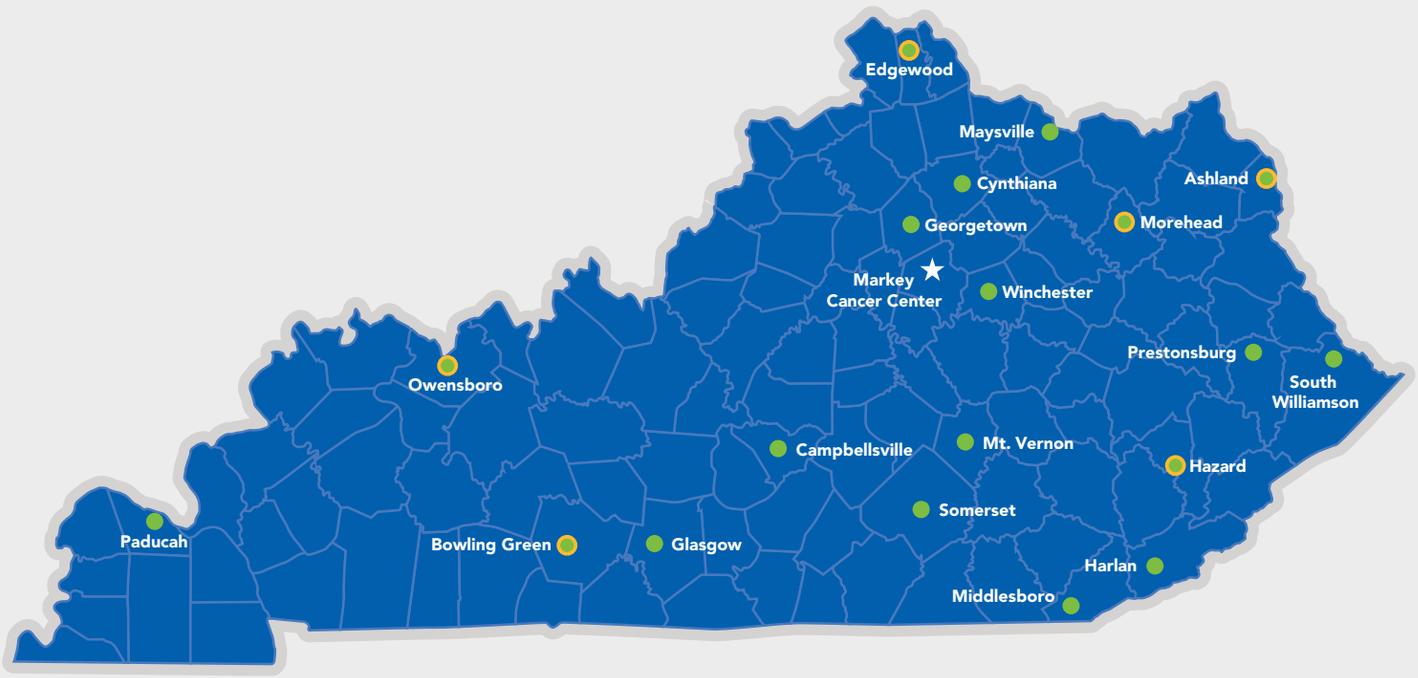
John Montville, executive director of oncology at Mercy Health – Lourdes Hospital in Paducah, which joined MCCAN in 2020, said the designation is a beacon for high-quality oncology. "Patients fighting a disease like cancer want to know they are getting the highest level of care possible. They look for quality indicators," he said. "Comprehensive designation is not handed out lightly. It puts them in the top tier of cancer programs in the nation."

The Mercy Health – Lourdes Hospital cancer program received Commission on Cancer (CoC) accreditation in 2022 and is opening a new cancer center in July, pulling all services together in one convenient location. Having a seamless referral process through MCCAN to Markey has been integral to the growth of the program, said Montville.

Meadowview Regional Medical Center in Maysville became a MCCAN affiliate in 2021 and received CoC accreditation in 2023. "Markey's comprehensive designation brings an even higher level of credibility to the program and raises the bar," said Joe Koch, CEO. "This helps us ensure that our local and regional community can receive quality care close to home."

For job candidates, including physicians, the designation is a draw, Koch added. "Without the relationship with Markey, some candidates would probably not engage in conversation with us," he said. "It's also helping us keep UK medical students in state after residencies and fellowships." Clinical staff also appreciate the variety of CME opportunities available through the network, As clinical education is an important offering of the affiliation.

"Our affiliate sites represent Markey Cancer Center, and comprehensive designation is a significant achievement that goes above the bar," said Cheri Tolle, administrative director of MCCAN. "A comprehensive center deserves a comprehensive network. Together, we share an optimistic vision for the health of our state." ■



MARKEY CANCER CENTER **AFFILIATE NETWORK**

Clark Regional Medical Center, Winchester
Georgetown Community Hospital, Georgetown
Harlan ARH Hospital, Harlan
Harrison Memorial Hospital, Cynthiana
Hazard ARH Regional Medical Center, Hazard
Highlands ARH Regional Medical Center, Prestonsburg
UK King's Daughters, Ashland
Lake Cumberland Regional Hospital, Somerset
Meadowview Regional Medical Center, Maysville
Mercy Health – Lourdes Hospital, Paducah
Middlesboro ARH Hospital, Middlesboro
Owensboro Health Regional Hospital, Owensboro
Rockcastle Regional Hospital, Mt. Vernon
St. Claire Regional Medical Center, Morehead
St. Elizabeth Healthcare, Edgewood
Taylor Regional Hospital, Campbellsville
The Medical Center at Bowling Green, Bowling Green
TJ Samson Community Hospital, Glasgow
Tug Valley ARH Regional Medical Center, South Williamson

MARKEY CANCER CENTER **RESEARCH NETWORK**

Hazard ARH Regional Medical Center, Hazard
UK King's Daughters, Ashland
Owensboro Health, Owensboro
St. Claire Regional Medical Center, Morehead
St. Elizabeth Healthcare, Edgewood
The Medical Center at Bowling Green, Bowling Green

MARKEY
BY THE NUMBERS

RESEARCH

The UK Markey Cancer Center is the only cancer center in Kentucky designated as a Comprehensive Cancer Center by the National Cancer Institute. Markey is driven by 322 research projects representing $62 million in research funding. As a matrix cancer center, our research portfolio is supplemented by $3.2 million in education and training funding.

Markey's research efforts across UK include:

253
Faculty researchers

$62M
Research funding

$3.2M
Education and training funding

322
Research projects

48
Departments

11
Colleges

Data as of September 30, 2023

MARKEY CANCER CENTER VISITS BY KENTUCKY REGION

INPATIENT & OUTPATIENT CALENDAR YEAR 2022

Market UK Healthcare	Area Development District	CY 2022
PRIMARY	Fayette	919
SECONDARY	Bluegrass	1288
TERTIARY	Cumberland Valley	533
	Lake Cumberland	403
	Kentucky River	276
	Gateway	203
	Big Sandy	265
	Fivco	199
	Buffalo Trace	120
OTHER KY ADDs	KIPDA	40
	Lincoln Trail	82
	Northern Kentucky	42
	Barren River	31
	Green River	16
	Pennyrile	14
	Purchase	14
Unknown Out of State	Unknown Out of State	139
Total		**4,584**

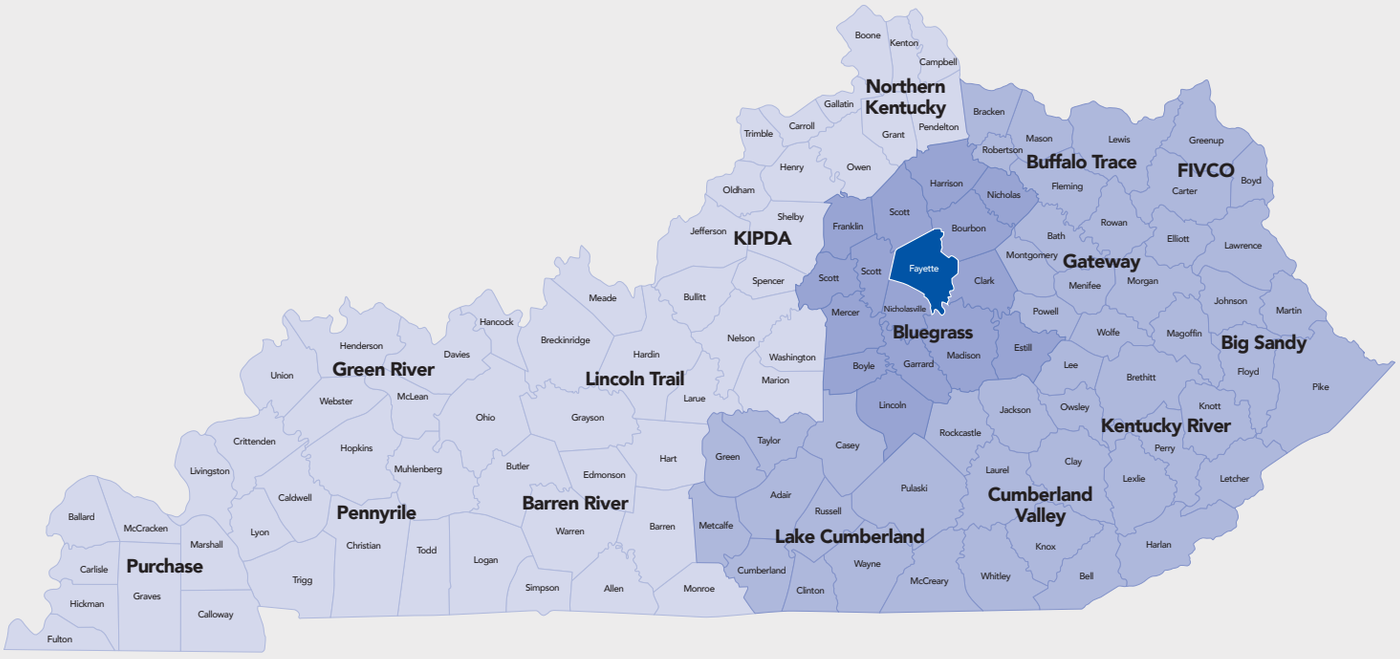
CLINICAL TRIALS ACCRUAL

CALENDAR YEAR 2022

6,019
patients accrued cumulative

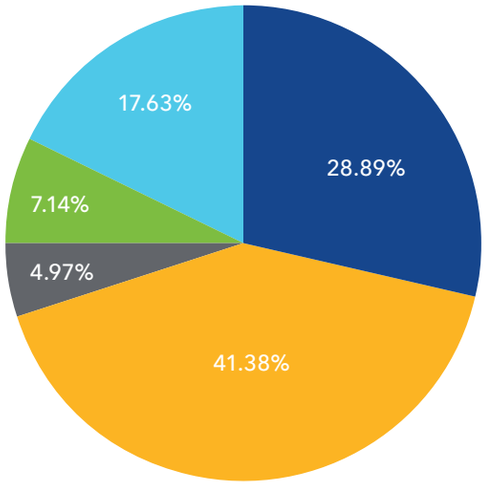
46%
from the Appalachia Region

93%
increase in four years (3,122 in 2018)



MARKEY RESEARCH FUNDING SUMMARY: $62 MILLION

Total costs as of September 30, 2023



- NCI Peer-Reviewed Funding
- Industry Non-Peer-Reviewed Funding
- Other NIH Peer-Reviewed Funding
- Other Non-Peer-Reviewed Funding
- Other Peer-Reviewed Funding

NEW RECRUITS

2023 New Recruits at Markey Cancer Center:

Populations Science and Cancer Prevention
Jayani Jayawardhana, PhD
Delvon Mattingly, PhD
Justin Moore, PhD, MPH
Bethany Shorey Fennell, PhD

Basic Sciences
Cheavar Blair, PhD
Junghui Liu, PhD
Amelia Pinto, PhD
Christopher Radka, PhD
Cody Steely, PhD
Guan-Yu Xiao, PhD

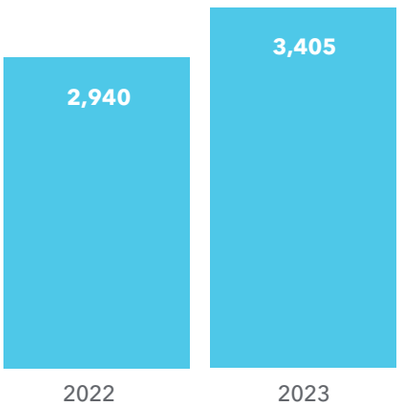
Translational Sciences
Ruta Arays, MD
Ellen Beswick, PhD
Yosra Helmy, PhD
Zhangyan Huang, PhD

New Clinical Faculty
Quinn Dunlap, MD
Veronica Morgan Jones, MD
Melinda Windon, MD
Eddy Yang, MD, PhD

MARKEY
BY THE NUMBERS

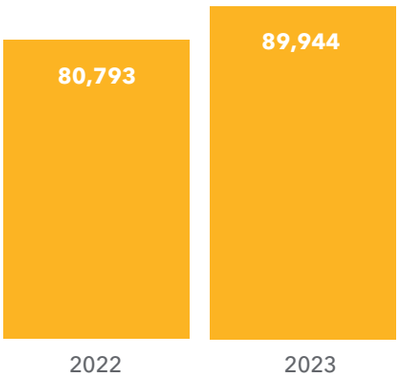
CLINICAL

INPATIENT CANCER ENCOUNTERS
BY FISCAL YEAR



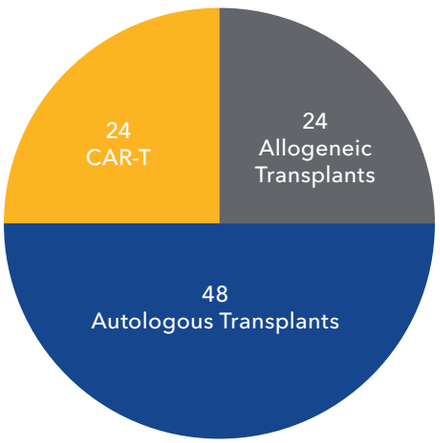
13.7%
Change

OUTPATIENT CANCER ENCOUNTERS
BY FISCAL YEAR



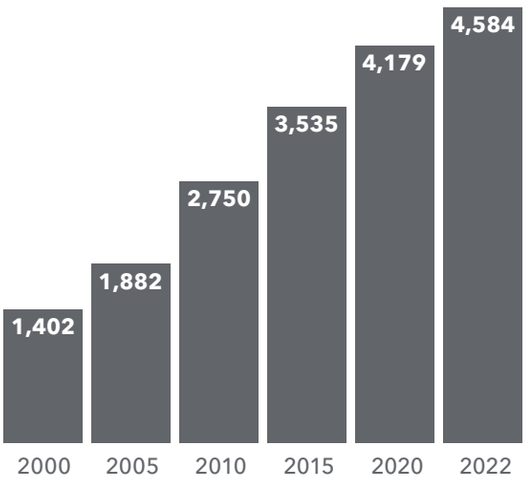
10%
Change

BLOOD & MARROW TRANSPLANT & CELLULAR THERAPIES
CY 2022

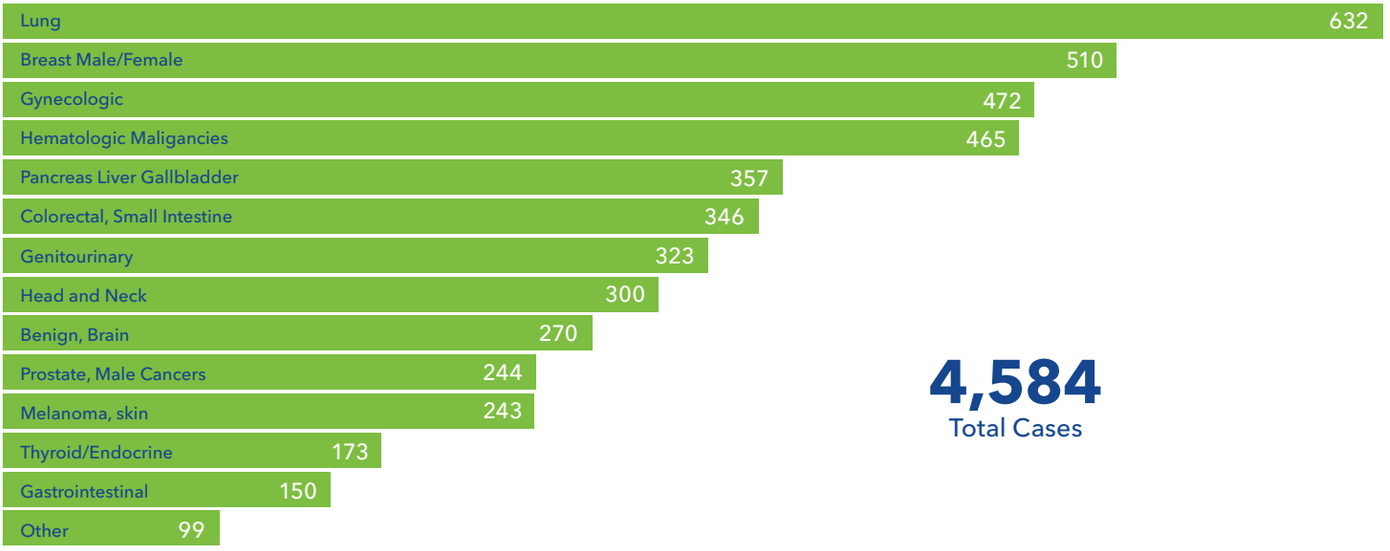


96
Total Procedures

GROWTH IMPACT OF NEW CANCER CASES
BY CALENDAR YEAR

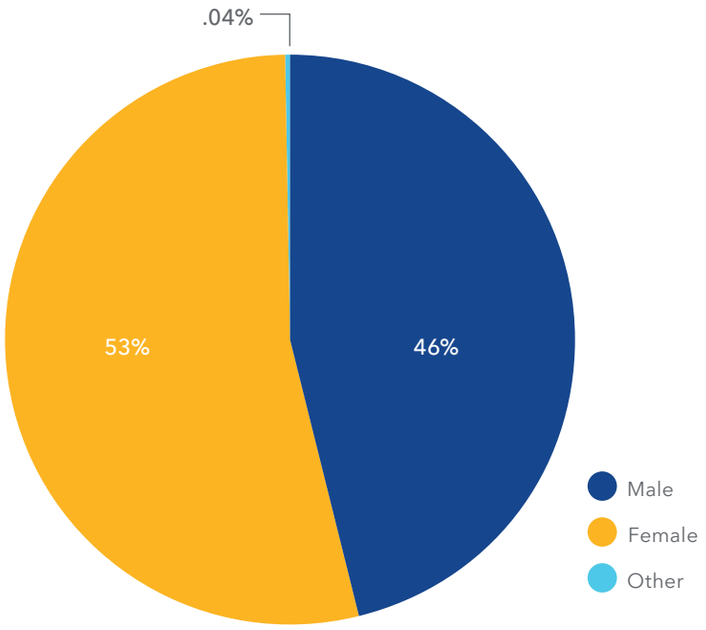


MARKEY CANCER CENTER CANCER CASES BY TUMOR SITE
CY 2022



4,584
Total Cases

UNIQUE PATIENTS BY GENDER
CY 2022



UNIQUE PATIENTS BY RACE
CY 2022

White	4,237
Black or African-American	237
Spanish, NOS	37
Mexican	18
Other Asian or Asian NOS	17
Asian Indian	10
South/Central American (Not Brazil)	6
Asian Indian NOS/Pakistani NOS	4
Chinese	4
Japanese	3
Korean	3
Filipino	2
Vietnamese	2
Thai	1
Puerto Rican	1
Other Spanish	1
Multiracial	1

RANKED AMONG
THE NATION'S BEST

- No. 1 cancer program in Kentucky, No. 44 nationally.
- Highest possible 30-day patient survival
- High patient volume
- Above average nurse staffing
- Endorsed by national organizations, such as NCI, FACT, CoC and Magnet

Learn more about our ranking at **ukhealthcare.com/cancer**.

To make a referral: **800-888-5533**.
Appointments available: **866-340-4488**.

NCI Comprehensive Cancer Center
A Cancer Center Designated by the National Cancer Institute

Fact Accredited

Commission on Cancer® Accredited Program

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER

UK MARKEY CANCER CENTER

Our Vision
Working together for a cancer-free tomorrow.

Our Mission
Reduce cancer burden with a focus on Kentucky and its most vulnerable populations through research, prevention, treatment, education, and community engagement.

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UK HealthCare complies with applicable Federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex.

Mautin Barry-Hundeyin, M.D., is a member of the surgical oncology team at Markey Cancer Center, specializing in the management of hepatopancreatobiliary (HPB) and gastrointestinal (GI) malignancies.


Health Care

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