Will you join our quest to cure cancer?

Duke Cancer Institute
Disease Groups

Duke Cancer Institute operates focused Disease Groups, each led by a trio of experts representing clinical care, clinical research, and basic research, who work together to advance the diagnosis, treatment, and continuing care of patients with:

- Breast Cancer
- Endocrine Neoplasias
- Gastrointestinal Cancer
- Genitourinary Cancer
- Gynecologic Cancer
- Head and Neck Cancer
- Hematologic Malignancies and Cellular Therapy
- Melanoma
- Pediatric Cancer
- Primary Brain and Spinal Cord Tumors
- Sarcoma
- Thoracic Cancer
COLLABORATION

If I had to find one word that describes Duke Cancer Institute, it would be collaboration. At Duke, our talented faculty and staff work together across disciplines and boundaries that traditionally separate doctors and scientists, departments and schools. We build partnerships and share information with colleagues at Duke, at other universities, and in the biomedical research industry.

Why are these collaborations so important? Because cancer is a complex disease, with medical, psychosocial, economic, and personal implications. Multidisciplinary teams and approaches are necessary to provide the most advanced and compassionate care.

These partnerships enable Duke physicians to offer our patients hundreds of clinical trials of new cancer treatment strategies, many developed at Duke. If one treatment stops working, another emerges that can offer new hope. And it is not just Duke patients who benefit—patients and their loved ones nationally and around the world reap the rewards of Duke cancer research.

When patients come to Duke Cancer Institute for care, they can meet their entire health care team on one day, in one place. Before they leave, they receive an evidence-based, personalized action plan for their cancer treatment.

All of this is possible because of Duke Cancer Institute’s unique structure, a merger of all research and patient care activities taking place in the rich setting of Duke University and the Research Triangle, with all the multidisciplinary collaborations that this structure nurtures.

In these pages you will read about just a few of the many promising collaborations that are leading Duke Cancer Institute and our patients down a path toward cancer prevention, treatment, survivorship, and one day, a cure.

Will you join us in our quest to cure cancer?

Michael B. Kastan, MD, PhD
Executive Director, Duke Cancer Institute
William W. Shingleton Professor of Pharmacology and Cancer Biology
Duke establishes one of the nation’s first brain tumor programs with the arrival of Barnes Woodhall, MD, as chief of neurosurgery and the only neurosurgeon in North Carolina.

Guy Odom, MD, professor of neurosurgery, and Barnes Woodhall, MD, establish a neuropathology tumor laboratory and brain tumor clinic.

Duke launches a training program for its medical students focused on the treatment of patients with cancer.

R. Wayne Rundles, MD, PhD, leads the creation of the Southeastern Cancer Chemotherapy Cooperative.

Duke-trained surgical oncologist William Shingleton, MD, is appointed to the National Cancer Advisory Committee of the National Cancer Institute.

Duke is named a Comprehensive Cancer Center by the National Cancer Institute, one of the nation’s original eight.

The Edwin A. Morris Building opens, thanks to a $1 million gift from Mr. Morris, bringing together multidisciplinary inpatient and outpatient cancer care.

The Edwin L. Jones Cancer Research Building opens, thanks to a $1 million gift from Edwin L. Jones Jr., and funding from the NCI.

Wolfgang Karl “Bill” Joklik, DPhil, is the first to examine the mechanism of action of interferon, the first cytokine to be recognized, in molecular terms.

The National Cancer Institute awards Duke $5.4 million toward the Animal and Laboratory Isolation Facility, the first of its kind in the Southeast.
1983
Duke begins using nuclear magnetic resonance imaging (MRI) using a scanner that is the largest in the nation.

1983
Gertrude Elion, a drug development pioneer and recipient with George Hitchings and Sir James W. Black of the 1988 Nobel Prize in Medicine, begins serving as a mentor to Duke medical and graduate students in neuro-oncology and pediatric bone marrow transplant.

1983
Duke begins using nuclear magnetic resonance imaging (MRI) using a scanner that is the largest in the nation.

1992
Duke creates the nation’s first outpatient bone marrow transplantation program.

1990
Jeffrey Crawford, MD, and colleagues lead the development of an innovative, multidisciplinary treatment for thoracic cancers and win FDA approval of G-CSF to prevent chemotherapy-induced neutropenia.

1993
Duke researchers, led by Joanne Kurtzberg, MD, are the first in the world to use umbilical cord blood from an unrelated donor to treat children for leukemia and other diseases, a program later expanded to cure some once-fatal genetic blood disorders.

1992
Duke creates the nation’s first outpatient bone marrow transplantation program.

1993
The Levine Science Research Center opens, named for Leon Levine, in recognition of a $10 million gift.

1993
Duke Scientists help discover the BRCA1 and BRCA2 genes responsible for many inherited forms of breast and ovarian cancer.

1993
The Duke Center for Cancer Survivorship is founded.

1996
Duke establishes the Carolinas Cord Blood Bank, one of the nation’s first public umbilical cord blood banks.

2003
The Duke Cancer Patient Support Program’s Seese-Thornton Garden of Tranquility opens, offering a quiet place for meditation and reflection.

2004
Duke leads a multi-center study that leads to FDA approval of the drug Avastin to treat colon cancer.

2005
Thanks to a $10 million gift toward brain tumor research and faculty support, Duke’s Brain Tumor Center is named to honor the late Preston Robert Tisch.

2006
Duke researchers play a role in the development and testing of Tykerb, approved by the FDA for resistant HER2 positive breast cancer.

2012
Duke Cancer Center opens, providing integrated research and care in a patient-centered environment.

2010
Duke Cancer Institute is created as Duke’s first single entity for all cancer care, research, and education.
At this moment, scientists are beginning to truly understand the molecular pathways that fuel cancer and how to block them. Duke scientists and physicians are using that knowledge to design treatments that kill cancer cells but spare healthy cells.
Our scientists’ innovative ideas translate into clinical trials that save lives. We are revealing new and unexpected ways to prevent cancer. And we are sharing these findings nationally and around the world.

To accelerate our efforts, we seek endowments for faculty, fellowships, and clinical research, as well as developmental funds to support promising pilot studies and expand the size and sophistication of our capabilities in biobanking and informatics.
HER-2 positive breast cancer is so aggressive that even after Sally Goin had six rounds of chemotherapy, then a double mastectomy followed by radiation, it still spread quickly throughout her upper body.

“I was scared to death,” the 56-year-old wife, mother, and grandmother says. “HER-2 has a very high mortality rate.”

Goin’s Greensboro oncologist then referred her to Duke clinical oncologist Kimberly Blackwell, MD, who for good reason was named one of Time magazine’s 100 most influential people in 2013. Of the four new cancer drugs against aggressive HER-2 breast cancer to come to market in nearly a decade, Blackwell has played major roles in the development and testing of two. One is so revolutionary it has opened the door to the holy grail of cancer treatment: killing cancer cells while sparing healthy ones. The drug—TDM-1—is affectionately being called a smart bomb because of its targeted attack on cancer.

“We’ve envisioned a world where cancer treatment would kill the cancer and not hurt the patient,” Blackwell told The New York Times. “This therapy does that.”

Blackwell was principal investigator for TDM-1. She gave Goin the drug in April 2013, as soon as the U.S. Food and Drug Administration approved it. The results were immediate.

“Even before I took my second round of the drug the lumps on my chest and thyroid were flattened out,” Goin says. “This drug is incredible.”

continued on page 8

“We’ve envisioned a world where cancer treatment would kill the cancer and not hurt the patient.”

Kimberly Blackwell
T-DM1 is a conjugate of the drug Trastuzumab (Herceptin), a monoclonal antibody that binds to HER-2 positive breast cancers, and a chemotherapeutic agent called mertansine (DM1). Because of the specificity for HER-2 positive breast cancer cells, T-DM1 delivers a deadly payload to cancer cells with near-pinpoint accuracy while sparing healthy cells. It has been shown to significantly increase survival rates of HER-2 patients with far fewer side effects.

During the clinical trial, 84.7 percent of patients treated with T-DM1 were alive after one year, compared to 77 percent in the control group. Calculated with another measure, T-DM1 reduced the risk of death by 38 percent.

Another important thing about TDM-1, Blackwell says, is that people don’t lose their hair.

“Going bald while receiving treatment has a pretty significant impact on the quality of life,” she says. “It’s amazing for me to see patients coming in for treatment and still having a full head of hair.”

Decreased side effects are a valued bonus for Goin.

“After a treatment, I just feel a little under the weather, but nothing as bad as I felt with the other drugs,” she says. “There’s no vomiting, and I’m still able to go to work afterwards.”

Goin is a registered nurse in Greensboro and comes to Duke Cancer Center for TDM-1 treatment every three weeks.

“Dr. Blackwell is amazing,” Goin says. “I trust her completely. She knows what my needs are and keeps me up to date on what’s going on. I’m so fortunate to be living near Duke. If I were in other parts of the country I wouldn’t have the same possibilities for treatment that I get here.”

Recently, Duke researcher Neil Spector, MD, and his lab identified a mechanism of therapeutic resistance to both Lapatinib and Trastuzumab that was published in Breast Cancer Research. That mechanism of resistance also turns out to be a newly identified mechanism of resistance to T-DM1, which inevitably will occur in advanced stage HER-2 positive breast cancer patients.

“In our article, we describe a combination strategy to overcome this particular mechanism of resistance that Dr. Blackwell and I are planning to test in the clinic,” Spector says.
"We want to apply everything we’ve learned and turn our successes into therapeutics, antibodies, or vaccines to help women facing triple-negative breast cancer.”

Kimberly Blackwell

Blackwell, meanwhile, has teamed up with Sandeep Dave, MD, an associate professor of oncology at Duke, to turn her sights on an even more aggressive breast cancer that currently has no effective treatments—triple-negative breast cancer. This cancer tests negative for three indicators: estrogen receptors, progesterone receptors, and HER-2 receptors. It is much harder to treat because most chemotherapy drugs target just one of those receptors.

Blackwell recently reported a groundbreaking study at the 2013 San Antonio Breast Cancer Symposium, where triple negative breast cancers were characterized utilizing full exon-genome sequencing.

This study took the science of Dave’s lab and turned it into actionable results for patients facing triple-negative breast cancer. More importantly, the study looked at recurrent breast cancer, which is very poorly understood.

“We matched pairs and are pulling out the mutations that drive recurrences in order to target them therapeutically,” Blackwell says.

Dave says the knowledge gained by identifying gene mutations that cause recurrence has opened a new area of study for cancer researchers.

“This study has shown us what genes are doing and the role they play in recurrence,” he says.

Says Blackwell: “We want to apply everything we’ve learned and turn our successes into therapeutics, antibodies, or vaccines to help women facing triple-negative breast cancer.”

“In the end,” Dave says, “every patient is an individual and their tumors are equally unique. We now have a clear definition of what makes these tumors unique.”

>Adds Blackwell: “We have a really tremendous team of people here and we’re not just going to sit on our success with fighting HER-2 positive breast cancer. We’re turning up the volume and going after this particularly challenging type of cancer.”
THE COPPER CONNECTION

Some types of cancer cells soak up copper like a sponge. Scientists have tried to use that knowledge to create better cancer treatments. But they have largely come away disappointed.

Now two different research teams at Duke Cancer Institute have found ways to turn cancer’s love of copper against it that are promising enough to test in patients. Both potential therapies came about because a basic scientist found something interesting, then connected with clinicians a few steps away at Duke Cancer Institute who had the expertise and the energy to put these good ideas to work in real people.

Researchers aim to start enrolling patients in both these clinical trials in 2014.

BENCH TO BEDSIDE: IT’S REALLY HAPPENING HERE

As cancer biologist Chris Counter, PhD, says, many discovery science projects never leave the lab. “A lot of really neat discoveries made at the bench don’t make it to the bedside, or it takes years and years to make this happen,” he says.

But sometimes everything falls into place. That’s what happened with a new clinical trial at Duke Cancer Institute. The trial may help melanoma patients, using a treatment that’s already approved by the Food and Drug Administration for use in another disease.

Counter is expert in a signaling pathway that involves a protein called B-Raf, which plays a role in 60 percent of melanomas. B-Raf keeps the gas pedal pressed to tell melanoma cells to keep growing. To work, B-Raf must “talk” to another protein called Mek1.

Counter works in the Levine Science Research Center, a research building tucked behind the cancer center. Just upstairs from him is Dennis Thiele, PhD, who studies how the body uses copper. One day Thiele, the George Barth Geller Professor of Pharmacology and Cancer Biology, told Counter that in studies in fruit flies, he
had found that Mek-1 requires copper. Counter was intrigued. It’s known that melanoma cells take up copper. And he had been thinking more about melanoma than usual; his mother-in-law, Linda, had been treated for the disease and was in remission. She would eventually die from it.

Donita Brady, a postdoctoral fellow in Counter’s lab, worked with Michelle Turski, who at the time was a graduate student in Thiele’s lab, to conduct a pilot study that turned out to be promising. Then Brady took the project and ran with it. “I’d had some experience with these pathways, but this allowed me to really dive into this type of signaling,” she says. In mice in which human melanoma tumors had been planted, she used a drug that removed copper. The tumors stopped growing. Then she conducted other work in mice that naturally get a cancer similar to melanoma that’s driven by B-Raf. Those animals survived longer when given a drug that removed copper.

“Every experiment built on the last one and strengthened the idea that what Dennis found in flies might actually be extremely valuable in human cancers,” Counter says.

That’s when Counter called Doug Tyler, MD, a surgical oncologist and director of the melanoma program at Duke Cancer Institute, and April Salama, MD, associate director of melanoma clinical research. He talked to them about the fact that a copper chelator is already approved to treat a disease in which people accumulate toxic levels of copper, called Wilson’s disease. So it’s known that the drug is safe in people. Salama and Tyler decided to start a clinical trial to find out if this drug can help people with melanoma.

But first they needed funds to launch the trial. That’s when Duke Cancer Institute executive director Michael Kastan, MD, PhD, stepped in with a pilot grant.

The trial, which has begun enrolling patients, will pair the copper chelator with a drug already in use to treat patients with melanomas that involve a B-Raf mutation (vemurafenib). “Vemurafenib has provided a lot of hope and benefit for patients, but it doesn’t result in a cure,” Salama says. “Most tumors become resistant to it after six to seven months. We hope that adding a copper chelator will increase that time before resistance develops and improve response.”

The idea could have stalled at any of those steps before making it to a clinical trial. Counter says that Duke is one of the few places where it could have made it this far. “There aren’t many places where a researcher like me can call an extremely busy surgeon and say, hey, can we meet for a cup of coffee to talk about how we can test this finding in the real world?” he says.

That’s part of the reason Duke Cancer Institute exists—to ensure that great ideas from the lab can actually make it to the clinic. “I have never come this close to seeing something leave the lab bench,” Counter says. “That’s part of the magic of Duke; this is really happening here.”
A Trojan Horse to Fight Prostate Cancer

Most treatments to fight prostate cancer inhibit androgens, the male hormones that prostate cancer cells thrive on. But those treatments work only for a short time. Often, patients will try three or four different androgen inhibitors in sequence. Eventually, they all fail.

Cancer biology researchers Donald McDonnell, PhD, and Rachid Safi, PhD, a postdoctoral fellow in McDonnell’s lab, have found an alternative way to get at the cancer. It’s well known that prostate cancer cells love copper. But, in the type of prostate cancer the team has been studying, taking away the copper doesn’t kill the cancer effectively. So Safi thought, if removing copper doesn’t work, why not use the copper to get to the cancer?

He found a drug that was lethal when it bound to copper within prostate cancer cells. Called disulfiram, or DSF, it’s already approved by the FDA for another use. The catch—this drug has been tested against prostate cancer in a clinical trial by other researchers without much success. But Safi found a way to make it work; he gave the cancer cells more copper. When there’s enough copper, DSF binds to it, setting off a reaction that leads to cell death, but only in the prostate cancer cells with an abundance of copper and not in normal cells.

When Safi gave animals in his study a simple copper salt as a supplement with DSF, their tumors stopped growing. “Copper is like a Trojan horse; it makes the cancer cells vulnerable to another drug,” McDonnell says.

Dan George, MD, director of Genitourinary Oncology in Duke Cancer Institute, likes this approach because it’s totally different from current therapies. Rather than blocking the androgen receptor, it makes use of it to kill the cancer. Safi found that androgens play a role in keeping copper in balance in the cancer cells. “If we can’t suppress the androgen receptor, let that receptor turn on, and then let’s use that biology against it,” George says.

George has developed a clinical trial using disulfiram and a copper salt to treat prostate cancer in patients who have become resistant to other therapies. The trial is approved by the Food and Drug Administration. “We could start the trial tomorrow if we had the funding,” George says.
AN OUTRAGEOUS IDEA: ATTACKING BRAIN TUMORS WITH POLIOVIRUS

WHEN 22-YEAR-OLD STEPHANIE LIPSCOMB’S brain tumor first returned, she was not doing well. She had begun having seizures again. She had trouble concentrating at school.

Then her neuro-oncologist, Annick Desjardins, MD, offered her the chance to enroll in a clinical trial of an experimental treatment created and offered only at Duke.

In November 2013, 18 months after receiving the treatment, which uses a modified form of the poliovirus to help kill tumor cells, Lipscomb had started continuing her work as a nursing student. On a recent visit to Duke, she was excited to tell Desjardins that she had learned how to start an IV on a patient.

Most patients with tumors like Lipscomb’s (glioblastoma) live only 14 to 17 months after being diagnosed, and 7.5 to 9 months after the tumor begins to grow bigger in spite of treatment. Lipscomb is doing well almost three years after her first diagnosis and almost two years after the tumor recurred. “Not only has she survived, but she is a successful young person who will help other people,” Desjardins says.

continued on page 14
“This is one of the most promising new treatments for glioblastoma multiforme I’ve seen in my 40-plus years of research in the field,” says Darell Bigner, the Edwin L. Jones Jr. and Lucille Finch Jones Cancer Research Professor and director of the Preston Robert Tisch Brain Tumor Center at Duke. “Glioblastoma is the most common malignant brain tumor and the most lethal. **Response to this treatment in the first few patients has been truly remarkable.**”

The treatment that is helping Lipscomb took more than a decade of work and cooperation to create. Matthias Gromeier, MD, came to work at Duke with the purpose of using poliovirus to combat cancer. Before that, he had been manipulating the virus just to understand how it works. Back in 1994, he had altered poliovirus so that it wouldn’t cause disease in animals, in an attempt to understand the mechanisms of how the virus causes poliomyelitis. Then he discovered that the altered poliovirus can suppress tumors. In 2000, Gromeier published a paper showing that his altered poliovirus would grow and spread in brain tumor cells in culture, and that in mice, it would lock onto brain tumor cells and kill them.

Gromeier’s lab at Duke spent years conducting animal studies demonstrating the safety and effectiveness of that approach. In 2012, the Preston Robert Tisch Brain Tumor Center at Duke launched the clinical trial to test the treatment in humans. “I came to Duke because of the Preston Robert Tisch Brain Tumor Center,” Gromeier says. “It’s my belief that this kind of work cannot be done anywhere else in the world but here. We have the clinical neuro-oncology team that can handle trials like this, and we see more patients than anybody. We have surgeons who have the skills to do the infusion of the virus into the brain. And **we have leadership that supports high-risk, high-reward research.** There are many brain tumor centers where people are not aggressive. This is on the outrageous side of things, what we are doing.”

Gromeier says the trial wouldn’t have been possible without the brain tumor center’s encouragement of close collaboration between its basic scientists and its clinicians. “You can’t sit alone in your lab and brood there with your ideas. You have to be rooted in the reality of this disease,” he says. With Lipscomb, who was the first patient to be treated, Gromeier reviewed her MRIs with Desjardins, he went to all of the follow-up appointments, and he talked to her family. **“For 16 to 18 months, I thought about her every day,”** he says.

When the Duke team presented preliminary results at the Annual Meeting of the American Society of Clinical Oncology in May 2013, seven patients had received the treatment, and three, including Lipscomb, had been doing well for a year or more. Two additional patients did not respond well, and two others had just received the treatment. New patients are enrolling regularly.

Much more work is required to ensure that the treatment works and to show how it works. But the researchers suspect that the initial hit of poliovirus damages the tumor cells somewhat, then jumpstarts the immune system so it can finish them off.
Desjardins cautions that these results are preliminary. But she is almost at a loss for words to describe what it’s like to see some of the patients who have received the treatment still doing well more than a year after their tumors had initially returned. “They are not declining, and they are not sick like I see my patients get when their tumors come back,” she says. “It’s very encouraging.”

Henry Friedman, the James B. Powell Jr. Professor of Neuro-Oncology and deputy director of the Tisch brain tumor center, is equally encouraged. “This therapy gives us a chance to impact on patients in the very worst category we have right now: those whose tumors have proven refractory to current therapy,” Friedman says. “The entire neuro-oncology field is desperate for a regimen that will benefit these patients. The poliovirus treatment, in its preliminary studies, looks like it will do exactly that.”

Tisch was treated for a brain tumor at Duke and passed away in 2005. The family honored him with an initial gift and ongoing support. In recognition of the gift, the brain tumor center was named for Tisch. The Tisch family has also provided support for many other research successes at the Preston Robert Tisch Brain Tumor Center at Duke, including research on the drug Avastin, which was the first new drug approved for brain tumors in more than a decade.
Researchers Reveal How Cholesterol May Fuel Breast Cancer

OBESITY IS LINKED TO MANY TYPES OF CANCER.

Now Duke Cancer Institute member Donald McDonnell, PhD, chair of the Department of Pharmacology and Cancer Biology, has shown a reason why, and the discovery suggests a simple way to reduce risk of breast cancer.

Some previous studies had suggested that obesity and high cholesterol are linked to breast cancer, but no one knew exactly why. McDonnell and colleagues in his lab have shown how it works, and that the culprit is not cholesterol itself, but one of its metabolites (a compound produced when the body breaks down cholesterol).

The hormone estrogen fuels about two-thirds of breast cancers, and the increased estrogen produced by fat cells is thought to be part of the reason why obesity is linked to breast cancer. McDonnell’s lab studies estrogen receptors—the proteins in the body to which estrogen binds. McDonnell became interested in a cholesterol metabolite called 27-hydroxycholesterol (27HC) when a graduate student in his lab showed that it can activate estrogen receptors. That is, it behaves like estrogen does.

This molecule, 27HC, is created when the body breaks down cholesterol, and levels of cholesterol and 27HC mirror each other—the higher your cholesterol, the higher 27HC rises.

To learn more about 27HC, McDonnell’s team, led by Erik Nelson, PhD, fed mice high-cholesterol diets. The mice developed breast cancer. Then the scientists showed that the cancer wasn’t caused by the cholesterol itself, but by 27HC. When the scientists removed 27HC from these mice, their cancer incidence plummeted, despite their high cholesterol diets.

Then the researchers confirmed the importance of these findings using human breast cancer tissue. Specifically, they found that the more aggressive tumors had higher levels of an enzyme that converts cholesterol to 27HC. So, essentially, these more aggressive tumors could make 27HC and use it as an alternative fuel source, just as they would use estrogen.

McDonnell said the findings suggest that a simple way to reduce the risk of breast cancer may be to keep cholesterol in check, either with statins or a healthy diet. “This data suggests that in the near term, we should be advocating for lowering cholesterol not just for heart disease but for cancer,” he says.

Reducing cholesterol levels may be especially important for women who already have breast cancer. “If you’ve got a breast tumor, this molecule, 27HC, is likely to reduce the effectiveness of common therapies, such as tamoxifen,” McDonnell says. If further studies confirm these findings, then adding statins, which are already approved for general use, to treatment regimens for women with breast cancer may make sense, he says.

Kimberly Blackwell, director of the breast cancer program at Duke Cancer Institute, has plans to explore these findings in clinical studies with breast cancer patients. “The promising thing about what Donald found is that it suggests we can take currently available agents and apply them right away to breast cancer patients. Statins are already available, and we know they’re safe,” she says.

Blackwell is planning to conduct a clinical study to determine whether patients who take cholesterol-lowering drugs show decreased levels of the cancer-fueling metabolite in their tumors and in surrounding breast tissue, and whether the drugs work to reduce tumor growth. If she finds the funding, she aims to launch a study in the near future. “If we could demonstrate that what Donald saw in the lab works for people, that would be a major breakthrough for breast cancer patients,” she says.
“This data suggests that in the near term, we should be advocating for lowering cholesterol not just for heart disease but for cancer.”

Donald McDonnell
Glaxo-Wellcome Professor of Molecular Cancer Biology
PEOPLE WITH CANCER FACE A DIZZYING ARRAY OF TESTS, crucial treatment decisions, and the prospect of life-changing side effects. Duke Cancer Institute is forging new models of cancer care centered around the patient. Our multidisciplinary teams create personalized, evidence-based plans to make treatment more successful for each patient. We offer novel therapies to
patients who—just a few short years ago—had no options. We are creating programs to help survivors live better lives and to eradicate health disparities.

To succeed, we seek endowments for faculty and clinical research fellowships; capital for new buildings, equipment, and programs; and developmental funds to support promising early-stage clinical trials.
When Nelson Chao, MD, visited his bone marrow transplant patient, David Lenat, one recent morning, the scene was not what you’d expect. No sterile hospital room, no awkward gown or face mask. Instead, Lenat sat in his own Raleigh living room in a comfortable leather recliner by a crackling fire, steaming mug of coffee in one hand and a copy of The News & Observer open on his lap. His wife, Georgia, returning from her morning run, leaned down to kiss his forehead.

Lenat is one of the first patients in the world to benefit from a new clinical trial of at-home bone marrow transplant led by Chao, chief of the Division of Cellular Therapy and professor of immunology.

Normally, the Lenats would have had to rent an apartment close by Duke University Hospital during the one- to two-month transplant and recovery. Instead, he received outpatient chemotherapy at Duke to treat multiple myeloma, then went home, where nurses and other practitioners came several times a day.

The actual transplant was performed at Duke in the outpatient setting. Lenat’s stem cells were harvested from his bone marrow. Next, he received an injection to wipe out his remaining stem cells, leaving him with no immune system. Finally, the harvested stem cells were returned, and he went home to endure the month-long process of waiting for his immune system to regrow.

“I spent a lot of time reclining in a fancy leather chair my wife bought me,” says Lenat. “We didn’t have any real disruptions, no daily trips back and forth to Durham. [Renting an apartment] doesn’t sound so bad, but there are a bazillion little things that you would miss.”
Chao, who holds the Donald D. and Elizabeth G. Cooke Cancer Research Professorship, says trying the risky and challenging at-home transplant was motivated in part by listening to patients, who craved the security and comfort of home while undergoing a frightening, difficult procedure and recovery. He also was intrigued by a study in Stockholm, Sweden, in which patients were allowed to stay at home post-transplant. Those patients experienced fewer infections and a lower incidence of graft versus host disease. He hypothesized that patients who stayed at home kept their microbiome—the collection of microorganisms living in our guts and on our skin that help maintain health and immunity—intact.

Part of what attracted Chao to Duke in the mid-1990s was a willingness he observed among the faculty to push the boundaries of care to make patients more comfortable during treatment and to focus on translational research. Back then, Duke was among the first to offer outpatient bone marrow transplant, allowing patients to stay in nearby rental housing and return to the hospital daily for monitoring. Before that, patients had to spend weeks living on the sterile ninth floor of Duke Hospital, separated from the comforts of home and family.

“We are committed to moving this field forward, making treatment more successful for every patient.”

Nelson Chao

In the hospital they wake you up at 6:00 a.m. to have your blood drawn and weight checked. It’s a cold, sterile environment, and there are germs lurking all over the place. I absolutely feel the home is a safer environment for patients,” says Chao.

As part of the trial, patient samples will be tested to evaluate their microbiome status. The treatment protocol, which requires two home visits from an advanced practice nurse and a daily online chat with a physician, will also be evaluated for cost effectiveness. If patients have fewer infections or complications, the hope is that in-home transplant will be a viable option for some patients.

So far, fewer than 10 patients have participated in the trial, but all have done well. For Chao and his team, seeing his patients healthy and comfortable has been well worth the trouble.

“This has been a major collaboration—among hospital administration, the nursing staff, physicians, the pharmacy, the blood bank—and everyone has been very supportive,” says Chao. “We are committed to moving this field forward, making treatment more successful for every patient.”

A year and a half post-transplant, Lenat’s myeloma is in remission. He’s no longer able to run with his wife, due to spinal damage from the cancer. But he’s taken to cycling and looks forward to his 15th year of riding in a fund-raiser for multiple sclerosis.

David Lenat was able to recover in his own home with his wife Georgia immediately after his bone marrow transplant.
Using Teamwork to Tackle Sarcoma

Sarcomas, malignant tumors that affect the body’s soft tissues and bones, are, fortunately, a rare form of cancer; Brian Brigman, MD, PhD, head of Duke Cancer Institute’s Sarcoma Research Program, tells patients that you could fit everybody diagnosed with sarcoma in the U.S. in a given year into Cameron Indoor Stadium.

But despite their infrequency, sarcomas—which include more than 100 different types of tumors—can be very serious, and their rarity and variety make them difficult to research, because the pool of potential clinical trial subjects is limited, and to treat, because relatively few clinics see enough cases to develop expertise.

Brigman established the Duke Multidisciplinary Sarcoma Program in 2007 to give patients the opportunity for the highest quality of care, and to conduct research that will advance our understanding and treatment of these difficult cancers.

“Because there are relatively few cases in the U.S., a fair number of patients end up getting treated by physicians who don’t really know what they’re dealing with, and they often end up in some trouble because of that,” Brigman says. “It’s very important for these tumors to be treated in a center that sees a lot of them, that knows how to treat them, and that can apply all the modalities necessary to give patients the best outcome.”

One key to the Duke program’s success is its multidisciplinary approach: in a single visit, a patient will see an orthopedic oncologist (Brigman or Will Eward, MD, DVM), a medical oncologist (Rich Riedel, MD), and a radiation oncologist (Nicole Larrier, MD, or David Kirsch, MD, PhD). Depending on the case, the team may also draw on other specialists such as surgical oncologists, pathologists, radiologists, or pediatric oncologists.

That focused, multi-faceted approach allows the team to quickly assess each patient from multiple perspectives and agree on a treatment plan.

“People often talk about multidisciplinary care, but oftentimes they do it in isolation; they’ll examine a patient and say, ‘Let me send you to my colleague,’ and the patient will have to schedule a separate appointment and may have to wait a day or more,” says Riedel. “We try to do it in one day, in one location. We put the providers in the same room on the same day with the patient; we see patients in tandem, discuss each case in real time, and build consensus. Patients appreciate that when they walk out the door they have a good sense of what our recommendation is.”

About half of all sarcomas affect the extremities, and 30 years
ago the routine approach was surgery alone, usually amputation of the affected limb. Today, in most cases doctors can save limbs, and radiation—and, in some cases, chemotherapy—is usually used in conjunction with surgery.

“That’s why a multidisciplinary approach is so important,” Riedel says. “For these patients, we often have one attempt to get it right. Sarcomas have a high risk of recurrence, and are often very large tumors. If they are treated by someone who doesn’t see them on a regular basis, inappropriate procedures are done, and then you wind up with an even bigger challenge.”

A PLACE TO MAKE A DIFFERENCE

After spending much of his career at MD Anderson Cancer Center, James Abbruzzese, MD, a leading national expert in treating and studying pancreatic cancer, joined Duke in 2013, as associate director for clinical research and training at Duke Cancer Institute and chief of the Division of Medical Oncology. Abbruzzese says he was attracted by Duke Cancer Institute’s unique structure—a large cancer center that is connected to all that Duke School of Medicine and Duke University has to offer. “There are a lot of opportunities in a university setting that you don’t get in a stand-alone cancer center setting to broaden our thinking and work with people who think about all aspects of cancer care and research—financial, legal, ethical,” Abbruzzese says.

People with pancreatic cancer get exceptional care at Duke, Abbruzzese

continued on page 24
Ellen Tauscher’s approach to life has always been to tackle challenges head on. While serving seven terms in the U.S. House of Representatives and later while working to rid the world of weapons of mass destruction as undersecretary for arms control and international security, she earned a reputation for being a blunt, tough negotiator with a sense of humor.

When she learned she had esophageal cancer, she confronted the disease with an unwavering resolve, even after getting the news she’d have to have her esophagus removed.

She gave her cancer a name and imagined it slurping up the chemotherapy drugs and kneeling over in pain as it shriveled away. The irony of the situation wasn’t lost on her.

“I was using weapons of mass destruction to kill my cancer,” she says. “So much for arms control!”

Of course, Tauscher was devastated when her Washington, D.C., doctor first told her in 2010 that she had cancer of the esophagus, which according to the National Cancer Institute has a five-year survival rate of just 17 percent in the U.S. At the time, she wasn’t aware of the exact numbers, but because her grandmother had died an excruciating death from the very same cancer 45 years earlier, she had a pretty good idea they weren’t good.

“I knew how bad it was,” she says of her grandmother’s situation. “She was losing weight rapidly. Her surgeon told my dad that she would starve to death before the cancer killed her.”

Tauscher began assembling a medical team. That’s where the wide network of friends and colleagues she gained through years of public service came in handy. Everyone had recommendations for surgeons as she began interviewing cancer specialists. But only one name came up multiple times: Thomas D’Amico, MD, the Hock Family Professor of Surgery and chief of the section of general thoracic surgery at Duke Cancer Institute. It quickly became clear where she should go for surgery.

After eight rounds of chemo and 25 rounds of radiation, Tauscher came to Duke to have her esophagus removed. Even before meeting D’Amico in person, she had a good feeling about her decision, thanks in part to the level of attentiveness she received, particularly from physician assistant Scott Balderson, PA-C.

“I had a four- to five-inch (medical) file,” Tauscher says. “He had clearly read it. I’m not easily impressed, but I was impressed by Scott.”
Once D’Amico walked into the room, she was pleasantly surprised by the surgeon’s calming demeanor. “I’m used to surgeons being like swashbucklers. He was very measured and put me completely at ease.”

Even more impressive to Tauscher was D’Amico’s surgical techniques. He performed what is known as the modified McKeown procedure, which Tauscher says should be renamed “the D’Amico.”

Recovering from the surgery was no picnic. It took nearly two weeks to be able to walk far enough to meet her doctor’s requirements for discharge, and after a second surgery to repair a leak, she came down with pneumonia. But throughout her recovery and treatment, she was determined to get better and continue working. In fact, she fielded calls from her hospital bed as the Senate voted on two major pieces of legislation: the New START Treaty that she had negotiated with Russia and the bill she introduced while in Congress to overturn the “Don’t Ask, Don’t Tell” policy on gays and lesbians in the military.

Today Tauscher is cancer-free. Since resigning from public service, she has returned to the private sector, currently working as a strategic advisor for law firm Baker Donelson. Outside of her work with the firm, she has become an advocate for increasing federal funding for esophageal cancer research, particularly with her work as chair of the National Comprehensive Cancer Network Foundation (NCCN) board of directors.

“I was using weapons of mass destruction to kill my cancer.”
Ellen Tauscher

Former U.S. Representative Ellen Tauscher fought her esophageal cancer at Duke.
“Our challenge as health care providers is, on the front end, to try to better identify and predict who will get thyroid cancer, and on the back end, to better treat them...”

Julie Ann Sosa

Meeting a Rising Need

For a long time, says Julie Ann Sosa, MD, MA, people thought she was “a little eccentric, a little crazy” to have devoted so much of her life and career to the study of thyroid cancer. Tumors of the thyroid are seldom fatal—the survivability rate at five years is about 93 percent—and with proper treatment most patients are able to live very normal lives. The disease is sometimes even referred to as “the good cancer” (but don’t call it that around Sosa).

“In oncology, you can count on one or two hands the number of people who do thyroid cancer for a living,” says Sosa, who became chief of endocrine surgery at Duke in January 2013. “But that number is growing exponentially. There is a lot of interest in thyroid cancer now. I just got there earlier than most. It’s a little bit like putting your money on a horse, and the horse is at the back of the pack, and it’s gray and not too pretty and not from Kentucky, and then all of a sudden it’s a thoroughbred and running in front. And it’s all based on patient need. There is an enormous patient need for expertise in this area.”

That’s because by all indications thyroid cancer is exploding, not just in the U.S. but worldwide. According to some studies, in the last two decades the reported incidence of thyroid cancer has increased by an astounding 240 percent, Sosa says. It is the fastest-rising type of cancer among women and men; within just a few years, thyroid cancer is projected to become the third-most common cancer in women of all ages. Mortality rates are also rising. And, Sosa argues, mortality is hardly the only measure of a disease’s impact. Most patients survive, but they endure surgeries, radioactive iodine treatments and re-treatments, a lifelong regimen of hormone therapy, anxiety, and frequent recurrence. And because most patients live with the disease for decades, they consume a great deal of health care dollars and resources.

No one knows for sure what is causing the booming rates of thyroid cancer, Sosa says. But the effects are clear.

“The impact of this epidemiological shift, this epidemic, is profound,” Sosa says. “Our challenge as health care providers is, on the front end, to try to better identify and predict who will get thyroid cancer, and on the back end, to better treat them, monitor them for recurrences, and especially to figure out how to treat patients for whom the conventional treatments don’t work.”

At Duke, she has led a multi-faceted initiative to meet those challenges. One aspect of that is an emphasis on conducting molecular testing to help pinpoint which thyroid nodules—common, usually harmless growths—are, or are likely to be, cancerous. Until now, most tests were unable to make a definitive diagnosis in up to 30 percent of patients. That uncertainty leads to unnecessary surgeries, needless anxiety, and missed or late diagnoses.

Duke now offers several varieties of diagnostic tests that identify molecular markers that indicate the presence or probability of cancer, Sosa says. With that advantage, physicians can make much more accurate diagnoses, and
can also prepare personalized therapy programs to meet the needs of each patient.

“As a surgeon, if I can help patients avoid an operation they turn out not to need, that’s a good thing,” she says. “It doesn’t matter that we’re losing ‘business.’ It’s better for patient care.”

Under her leadership, Duke recently opened a multidisciplinary endocrine neoplasia clinic for thyroid, parathyroid, and adrenal disease/cancer patients. The clinic gives patients the opportunity to be seen by a range of specialists and do all their diagnostic testing in one visit. The clinic was full from day one, and has been enthusiastically embraced by patients.

Sosa is also organizing a survivorship clinic. “There is no cancer better suited for a survivorship clinic than thyroid cancer, because most people don’t die from this disease, they live with it,” she says. The clinic will offer survivors a range of services and will also build up a tissue bank that will help fuel future research.

On the research front, Duke is engaged in clinical trials testing highly promising new medications for thyroid cancer, and Sosa, a member of the International Thyroid Oncology Group, says more trials are likely on the way. One of the new drugs, which is in a Phase III trial, is designed to enhance the effectiveness of radioactive iodine, the main non-surgical treatment for the most common forms of thyroid cancer.

The endocrine neoplasia diseases group, which only last year became a part of Duke Cancer Institute, is expanding to meet the need.

“We have a ton going on,” Sosa says. “Our volumes are way up, the complexity of our practice is way up. People are coming together around this passion for endocrine neoplasia. You just have to get people involved, and then it’s like the masses have been unleashed. It’s incredibly exciting.”

Julie Ann Sosa, chief of endocrine surgery at Duke
VITAL SUPPORT FOR PEOPLE WITH CANCER

Duke Cancer Institute provides an extensive array of support services to meet our patients’ full spectrum of needs. On the next pages, you will read about two initiatives—the Duke Center for Cancer Survivorship and the Office of Health Equity and Disparities—that are emblematic of our large suite of programs in cancer supportive care and survivorship.

Some of our other offerings include:

- Duke Cancer Patient Support Program, providing therapy and other services and resources to support patients and their loved ones throughout their experience with cancer
- Palliative Care and Pain Management Program
- Tobacco Cessation Program, helping patients take the vital step of quitting smoking before surgery and other treatment
- Patient Navigation Services to seamlessly steer patients to the resources they need and enable increased access to all available care.

Many of these essential services are provided free of charge as part of Duke Cancer Institute’s comprehensive approach to holistic treatment. Thus, ongoing philanthropic support is critical to sustainability.

In addition to providing vital supportive care services to our patients, these programs also serve as important platforms for conducting leading-edge research that will enable Duke Cancer Institute to create models and best practices that we can disseminate to the nation and the world.

Steven Patierno, PhD
Deputy Director, Duke Cancer Institute
Professor of Medicine
Professor of Community and Family Medicine
Professor of Pharmacology and Cancer Biology
Living as a Survivor

Melissa Culbreth of Youngsville, N.C., was deployed in Iraq in 2009 when she found a lump in her breast. After an ultrasound suggested cancer, Culbreth, a chaplain with the North Carolina National Guard, was flown back to North Carolina, and she sought treatment at Duke. With the same single-minded focus she had needed during deployment, Culbreth set to work fighting her cancer. “My job was to go to doctor’s appointments,” she says. “The treatment room became my world. I knew everybody up there. Then, suddenly it was over.”

For Culbreth, leaving active treatment was just as much of an adjustment as coming home from a deployment. There was the same feeling of “what now?” And people were reluctant to hear about her experience.

continued on page 30
“Just as people don’t want to know what happened in war, they don’t want to know what happened with your cancer,” Culbreth says.

The Duke Cancer Patient Support Program helped her begin to make the transition, with counseling that began during her treatment and continued afterward. “I reluctantly went to art therapy, and it helped me a lot,” Culbreth says. “We were doing something rather than just sitting in a circle and talking. Art therapy helped me begin to start expressing and getting out that big knot of stuff that was inside.” The support program offers its services to patients and families free of charge, as a standard part of care at Duke Cancer Institute.

After her cancer treatment, which included a mastectomy and reconstruction, Culbreth found another lump. She had chemotherapy, and now she takes a long-term hormonal therapy to keep the cancer from progressing. But one of the side effects of the therapy is that it makes her tired 24/7. She is considering other treatment options. “Cancer is a marathon, not a sprint. It’s something you live with forever,” she says. “The fear of recurrence is your constant companion. All of this stuff becomes a fact of life. It’s the reality, and you have to learn how to live with it.”

Culbreth is not alone. Nearly 14 million cancer survivors are moving forward with their lives in the United States, and many people are surviving for decades after cancer. More than half of survivors report problems associated with cancer or its treatment, including chronic pain, fatigue, fear of recurrence, depression, or financial and job-related concerns. To better meet the needs of survivors, Duke is building the Duke Cancer Survivorship Center, led by Jeffrey Peppercorn, MD.

“While we’ve been helping survivors for decades, we’ve now launched a new effort, comparable to what we are doing to diagnose and treat cancer, that will bring together world-class clinical care with research to help get survivors back to a better state of health,” Peppercorn says. “This work will not only inform what we do at Duke but inform what’s going on around the country and around the world.”

One of the center’s first priorities is providing each patient leaving active treatment with an individualized assessment and survivorship plan, as well as help from patient navigators who will connect them to the resources they need, within Duke or outside of Duke. Also in the works is a cardio-oncology rehabilitation program being formed in collaboration with colleagues at Duke Heart Center. Duke is also a national leader in developing a specialized clinic for survivors of prostate cancer, bladder cancer, and other genitourinary cancers, which addresses potential side effects of treatment such as impotence and incontinence. All of these programs provide opportunities for donor support.

As for Culbreth, she continues to keep her cancer at bay while also forging a new path in life. She has always wanted to become a licensed therapist. Counselors at the support program connected her with a master’s program at NC Central University. She aims to open a private counseling practice in which she can manage her schedule around bouts of fatigue. She is almost finished with her course work, and she is excited that her article about play therapy for families will soon be published in a scholarly journal. “Life is short,” Culbreth says. “I decided I’m going to do what I always wanted to do.”
When a patient doesn’t show up for a scheduled mammogram or another doesn’t make an appointment with his doctor after learning about his risk for prostate cancer at a health screening, the clinician may just chalk it up to indifference or denial on the part of the patient.

Yet there may be larger, more complicated factors at play—factors that make it harder for some minorities and underserved populations to gain access to treatment, clinical trials, or basic education and awareness that could ultimately save lives.

Duke Cancer Institute’s Office of Health Equities and Disparities (OHED) was created in 2012 in the hopes of eliminating barriers to cancer resources such as education, screening, treatment, survivorship services, and clinical trials, regardless of race, ethnicity, or socioeconomic status.

The fight against cancer is a tough one for all patients. But some groups experience a disproportionate burden of the disease. Recent research has shown that African Americans are far more likely to be diagnosed with prostate cancer and colorectal cancer than any other race. Likewise, Asian men are twice as likely to have stomach cancer as white men, and Asian women are almost three times as likely to have stomach cancer as white women.

In North Carolina, African Americans are dying from prostate cancer at a far higher rate than Caucasians or any other race. African American women are dying from cervical cancer and female breast cancer at a higher rate than any other race, which is especially concerning to clinicians, as black women are less likely to get breast cancer but are more likely to die from it.

Nadine Barrett, PhD, director of OHED and a medical instructor in Duke’s Department of Community and Family Medicine, says Duke has a pivotal role to play in eliminating such disparities, and it starts with developing trust and understanding among providers, patients, and the community. However, trust isn’t always a given, especially considering the U.S. medical community’s history of racial discrimination and unethical research practices involving minorities, such as the infamous Tuskegee syphilis experiment.

“We are committed to engaging our community in a meaningful way and ensuring that our health care providers have the training and support they need to effectively reach and serve a diverse audience,” Barrett says.

After conducting 10 focus groups made up of more than 100 cancer survivors, caregivers of survivors, clergy, social agency representatives, and leaders within African American, Latino, Asian, and other underserved communities, the Office of Health Equities and Disparities made recommendations to improve access to cancer screening, treatment, and support for underserved populations.
“...we added the Duke Cancer Institute patient navigators to provide critical follow-up support to participants with abnormal findings and ensure men get the care they need.”

Nadine Barrett
communities, OHED made six key findings related to access to cancer care.

Participants of the focus groups revealed that many factors can hinder patients from taking simple yet important steps during treatment, including:

- Cost
- Lack of information and resources on cancer risks, symptoms, treatment, screenings, and clinical trials
- Cultural influences
- Lack of spiritual support for the patient and caregiver
- Fear
- Difficulty accessing resources such as insurance and transportation.

Comments from the focus group participants included this one from a leader in the Asian community: “The older generation, they figure it’s a death sentence. They break, they worry. Sometimes they don’t even want to let people know...if they are diagnosed.”

OHED, which is made up of six full-time staff members and numerous community partners and volunteers, has developed a number of outreach programs and events in response to the focus groups, including a community-wide Cancer and Health Education Series in partnership with Durham Public Library and several Latino and Asian outreach programs and faith organizations.

The office also offers a Patient Navigation Program designed to eliminate the barriers that prevent members in the community from accessing cancer information and screenings, and if needed, connect diagnosed cancer patients to a treatment/survivorship navigator who will guide patients to available resources, whether they need help coordinating appointments or figuring out financial issues.

In fall 2013, OHED became the coordinating office of the prostate cancer screening event that has been at Duke and Lincoln Community Health Center for more than 20 years. In 2013, Duke involved Duke Cancer Institute patient navigators in the event to ensure participants received the proper follow-up. Since then, the program has been renamed the Duke Men’s Health Initiative and has been expanded to include diabetes and hypertension screenings through the Durham Diabetes Coalition, CAARE INC., and Duke Heart Center.

“In previous years, participants used to just get a letter with their results and a list of Duke doctors,” Barrett says. “In collaboration with Duke Urology, we added the Duke Cancer Institute patient navigators to provide critical follow-up support to participants with abnormal findings and ensure men get the care they need.”

Through its community and faith-based initiatives, OHED uses volunteers called health ambassadors to work closely with the OHED’s staff to organize workshops, screenings, support groups, and lectures at faith and civic organizations. This creates a critical link between the medically underserved, including the poor, and diverse ethnic groups, and Duke Cancer Institute. Barrett, the OHED staff, and other community and Duke partners frequently speak at churches, supplementing pastors’ messages with talks about cancer screenings, resources, and other health topics.

OHED is currently working to create a diverse patient advocate group focused on supporting community outreach and Duke Cancer Institute research efforts. This group will oversee grant applications and speak in community settings. OHED is also spearheading disparities training in conjunction with clinical research nurse Bonnie Vernalli, the Duke Office of Institutional Equity, and the Office of Diversity and Inclusion.

“It’s important to facilitate community dialogue,” Barrett says, “and to have all types of patients at the table.”

Barrett says the next steps for the office include seeking funds to support and expand the reach of the health ambassador, patient navigation, and community screening programs. The office also hopes to create more training and research pilot opportunities for clinicians and research staff in order to increase their knowledge of minority participation in research and to help them provide culturally sensitive care.
Duke has long invested in training the next generation of scientists and clinicians, and those investments yield tomorrow’s energetic, compassionate cancer doctors and researchers.
Residents and fellows are the lifeblood of innovation in both research and patient care.

We seek endowments for faculty and clinical research fellowships, as well as support for cancer-specific training opportunities across all specialties, including medical oncology, neuro-oncology, radiation oncology, pediatric oncology, and surgical oncology.
Finding Mentors Everywhere
A single patient cemented the decision of Phuong Doan, MD, to focus her career on hematologic malignancies. She took care of him every day for a month during a clinical rotation during medical school at UNC-Chapel Hill. “He was getting chemotherapy for acute myeloid leukemia for the first time. I met him when he first came in and was robust, then I saw him at his sickest and in a wheelchair. Finally, I got a chance to see him recover. During this month, I sensed a lot of suffering in him. So I started thinking about how I could change that,” says Doan, now assistant professor of medicine at Duke.

In 2007, Doan began her fellowship in hematology and oncology at Duke. Since then, she has found many mentors who have helped her as she has grown to become a physician-scientist forging new ground in understanding how stem cells regenerate and how to improve treatment for leukemias and other blood cancers. John Chute, MD, who is now a faculty member at UCLA, was her primary research mentor during her fellowship. She credits his mentorship for largely shaping how she approaches science. But many others have also nurtured Doan’s research, including Nelson Chao, MD, chief of the Division of Hematologic Malignancies and Cellular Therapy, as well as Neil Spector, MD, and David Kirsch, MD, PhD. Spector studies breast cancer, and he is an expert in a cancer signaling pathway that Doan has delved into, and Kirsch has been a collaborator and a source of expertise regarding radiation biology and mouse genetics.

Doan says her fellowship helped hone her skills at developing valid research questions based on issues that arise with the patients she treats. Both the second and third years of the fellowship, which are devoted mostly to research, were transformational, as was the ability to apply for internal research grants and submit abstracts to Duke Cancer Institute research events, even as a fellow.

As she transitioned from fellow to Duke Medicine faculty member, Doan says she received substantial support from Duke Cancer Institute and from Chao to make sure she could have a productive research career in addition to treating patients. “I realize it’s a tremendous luxury to limit clinical time to certain days of the year. That protected time has enabled me to be creative and think broadly about research questions,” she says.

“One of the most important things we do at Duke, after taking care of our patients, is our commitment to training the next generation of scientists and clinicians,” says Chao. “This is a costly proposition since there is the need to protect the individuals’ time to focus on research. But without that, it would be difficult for them to succeed.”

In 2013, Doan reached a milestone in her research career, publishing in the journal Nature Medicine the results of a study in which she and collaborators found that a particular protein plays a role in stem cell regeneration after radiation injury. The finding has been highly cited by other scientists and points to a way to improve recovery for people who receive total body irradiation in preparation for a stem cell transplant or for victims of radiation disasters.

Moving forward, Doan aims to continue to explore questions that could help improve cancer treatment. “I have begun focusing on how leukemia stem cells renew and proliferate and different ways to eliminate them,” she says. Whatever her current research question, she knows she can find the support she needs at Duke, just as when she first started her research career as a fellow. “When I was interviewing for fellowships, even though I didn’t know exactly what area of research I wanted to go into, I chose Duke because I knew I would be able to find great mentors who would be invested in my career development,” she says.

“I chose Duke because I knew I would be able to find great mentors who would be invested in my career development.”

Phuong Doan
Finding a Passion

When Lindsay Rein, MD, began conducting research in the lab of Robert Lefkowitz, James B. Duke Professor of Medicine, she had almost no basic science experience. “I had never touched a mouse. I’d never done cell work,” she says. Rein had a lot of learning to do, but Lefkowitz, recipient of the 2012 Nobel Prize in chemistry, helped her work through the challenging periods.

“He tells this story from his early career, which is that for the first year and a half he was in the lab, few things worked. It’s really encouraging for me to hear that from somebody who has achieved as much as he has,” Rein says.

Rein has been focused on treating patients and solving research questions in hematology/oncology since she was a medical student. But she had envisioned herself going into some aspect of clinical research. Then, after a Duke residency in internal medicine and one year of clinical fellowship at Duke in hematology and medical oncology, she found out that Lefkowitz was looking for someone to work on a research project related to chronic myeloid leukemia (CML). The project fit well with her clinical interests, and she jumped at the chance.

“The fellowship program and Dr. Carlos de Castro, my fellowship program director, have been incredibly supportive of my going outside the box and joining a lab that is not part of the hematology and medical oncology divisions,” Rein says.

In the Lefkowitz lab, she is exploring the role of a protein called beta-arrestin-2 in the development of CML. The ultimate aim of her current research is to identify a potential drug target that could lead to new therapies. Rein has presented some of her research at a national meeting, and she was one of 20 early-career hematologists chosen to participate in the American Society of Hematology’s 2013 Translational Research Training In Hematology Program.

After finishing the third year of her fellowship, Rein joined the Duke School of Medicine faculty as a medical instructor, continuing her research in Lefkowitz’s lab and rounding as an attending on the leukemia and lymphoma service. “I am excited about coming to work. Duke has given me the opportunity to find what I’m really passionate about. Because of that, I push myself to be successful,” Rein says. “Dr. Lefkowitz is a fantastic mentor. He makes you question what you’re doing and continually analyze it, so you can do better work.”

“Duke has given me the opportunity to find what I’m really passionate about. Because of that, I push myself to be successful.”

Lindsay Rein and mentor Robert Lefkowitz
Mission: Make Better Cancer Therapies

At Duke, Jeffrey Clarke, MD, feels he has found the ideal place to pursue his goal of connecting patients with cancer to better therapies. As a second-year fellow in hematology and oncology, Clarke conducts research with professor of medicine Herbert Hurwitz, MD, who leads phase 1 clinical trials, which are the first step in testing new therapies in patients after they show promise in the lab.

But Clarke took a detour on the way to this dream assignment. After completing an internal medicine residency at Duke, he went on to his first year of fellowship in hematology and oncology, which is a clinically-focused year. Then he was asked to take a year off to serve as chief resident for the Department of Medicine. It wasn’t a role he had planned to fill, but it ended up teaching him skills he will need to be a well-rounded physician scientist. “I learned a lot about being a leader, solving problems, and how to communicate with others,” he says.

Now, back in his fellowship, he’s working with Hurwitz as well as Andrew Nixon, PhD, associate professor of medicine, to develop new cancer therapies or new combinations of therapies that work by blocking the growth of blood vessels that feed tumors. Most recently, Clarke worked with Nixon to use profiles of proteins in blood to track how well an individual drug is working in a given patient. “We’re trying to gain information about how the drug is affecting the cancer and use that to ultimately either find different ways to target the cancer or to better select therapies for the patient,” Clarke says.

Clarke knew early on in medical school at Indiana University that he wanted to focus his love of biology on tackling cancer. “I’ve always found cancer biology fascinating,” he says. But it’s his desire to help people that ultimately drives him. “Most of our cancer patients are on an unimaginably difficult journey with their disease,” he says. “The thought of being able to one day help relieve their suffering, cure their cancer, or help them live longer is what keeps me coming to work every day.”

“The thought of being able to one day help relieve their suffering, cure their cancer, or help them live longer is what keeps me coming to work every day.”

Jeffrey Clarke

Herb Hurwitz has been a mentor to Jeffrey Clarke.
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As part of Duke Medicine’s historic $1.2 billion campaign, Duke Cancer Institute seeks $200 million to advance cancer research, care, and education. We need your help to succeed in understanding and defeating cancer. We seek philanthropic investment across three key areas.

Will you lead with us?

LEADING DISCOVERY

Building on Duke’s long history of leadership in cancer research, we aim to develop more effective ways to prevent cancer, create new therapies that target the abnormal biology of tumors while sparing normal cells, and accelerate our translation of discoveries from the lab to our clinics, to patients nationwide.

Goal
- Endowments for faculty, fellowships, and clinical research
- Developmental funds to support promising pilot studies and expand the size and sophistication of our capabilities in biobanking and informatics

LEADING CLINICAL CARE

We seek to deliver advanced, integrated cancer care; improve quality of life for those with cancer; increase prevention and screening rates and reduce health disparities; provide world class clinical care to bring cancer survivors back to a better state of health; and disseminate best practices in cancer and survivorship care to patients nationwide and around the world.

Goals
- Endowments for faculty and clinical research fellowships
- Capital for new buildings, equipment, and programs, including a facility for personalized tumor modeling
- Developmental funds to support promising early-stage clinical trials

LEADING EDUCATION

We seek to nurture the next generation of physician scientists through intensive clinical experience, mentoring relationships with leaders in cancer research and care, opportunities for leadership, and dedicated time for research.

Goals
- Endowments for faculty and clinical research fellowships
- Support for cancer-specific training opportunities across all specialties, including medical oncology, neuro-oncology, radiation oncology, pediatric oncology, and surgical oncology

Our campaign goal includes gifts to the Duke Cancer Fund (the unrestricted fund for Duke Cancer Institute); gifts to establish endowed funds for fellowships and faculty support; gifts of capital support for new buildings, equipment, and programs; gifts to expand capabilities in bio banking, informatics, and personalized tumor modeling; and gifts of developmental funding that can immediately be applied to early-stage research and clinical trials.
If you no longer wish Duke Medicine to contact you regarding fund raising or giving opportunities, you may opt out by contacting us by mail, phone or e-mail. That contact information is listed below:

Office of Associate Vice President Development and Alumni Affairs
710 W. Main Street, Suite 200
Durham, NC 27701
e-mail: dukemed@mc.duke.edu
phone: 1-800-688-1867
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dukeforward.dukemedicine.org/cancer

Duke Cancer Institute