

# cancer lines

NORTH CAROLINA CANCER HOSPITAL CELEBRATES DECADE OF SERVICE

## 10 years of hope & healing

When Mary Beck was treated for an aggressive breast cancer 23 years ago, she was struck by the incredibly upbeat and positive attitudes of the UNC Cancer Care staff members who cared for her.

She was diagnosed with aggressive stage III breast cancer in 1996 and was treated in what was then the Gravely Building. The facility opened in the 1950s originally as a tuberculosis sanatorium, and the space was overcrowded.

The staff “made all the difference” for patients, but Beck said hospital administration and staff envisioned a physical home for the cancer program that would match the incredible quality of the people there, as well as to keep pace with advances in technology and cancer care.

As the former senior vice president of planning and program development for UNC Health Care, Beck worked with her team to bring the North Carolina Cancer Hospital to life.

“We wanted anyone who walked in the door to feel safe, comfortable, welcome and to know we’re here to help them,” Beck said, speaking at a recent UNC Lineberger Board of Visitors panel discussion.

The discussion was held to mark the anniversary of the cancer hospital, which opened 10 years ago this fall.

### A gift to the people, for the people

With a commitment of \$180 million from the state for the hospital and an adjacent office building, state, local and health leaders launched construction of the new cancer hospital as they faced a growing population of cancer patients in the state, and an existing facility that was overcrowded and inadequate for the delivery of modern cancer care.

The new 320,000 square foot hospital offered multidisciplinary clinic space, facilities for tumor assessment imaging and

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Top: Exterior view of the North Carolina Cancer Hospital. Middle: UNC Lineberger Director Shelley Earp, MD, signs a beam used in construction of the cancer hospital. Bottom: A team of doctors, staff and patients break ground for the new cancer hospital in 2005.

UNC LINEBERGER COMPREHENSIVE CANCER CENTER



3 Private philanthropy makes a difference for N.C. patients



4 Patient's recurring cancer targeted with immunotherapy



5 Physician-scientist focuses on breast cancer questions



8 Roy Williams' Fast Break Against Cancer tops \$3 million for cancer research

the inside lineup

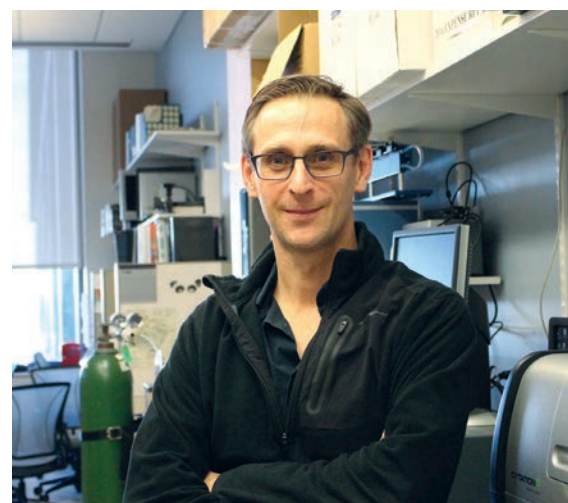
## UNC Lineberger leads the way in e-cigarette research

While cigarette smoking has declined among adults in the United States, use of electronic cigarettes is driving increases in tobacco product use among young people. The number of middle and high school students using e-cigarettes grew by 1.7 million in just one year to 5.3 million users in 2019, according to the Centers for Disease Control and Prevention.

Researchers at UNC Lineberger have led studies to understand the potential long-term health effects of these emerging tobacco products and seek effective ways to communicate these risks, especially for young adults.

“We’re finding evidence that people who use vaping products are at risk for long-term lung diseases; I think that’s the bigger consequence,” said UNC Lineberger’s **Robert Tarran, PhD**. He

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UNC Lineberger's Rob Tarran, PhD, is one of many UNC faculty and staff members studying the effects of e-cigarettes.



Shelton Earp, MD

# director's message

Ten years ago, the North Carolina Cancer Hospital, the clinical home of UNC Lineberger, opened its doors. During the past decade, we have welcomed more patients and families, more doctors, nurses and staff. We followed with increasing expectations of what our researchers could deliver. The progress we've made in the past 10 years is astounding.

UNC Lineberger is growing at a fast pace, with new faculty, researchers and staff on board, working on basic, population, clinical and translational science, side by side with compassionate, patient-centered clinical care. With expanded faculty comes an expansion of creative ideas, too. With brilliant minds in our arsenal, we are making new discoveries that require technology, new employees and research space.

Just like 10 years ago when we increased our clinical care offerings with the N.C. Cancer Hospital, we are looking to expand our Good Manufacturing Practices (GMP) facility. The expansion will allow us to make exciting discoveries coupled with groundbreaking clinical trials, particularly with our chimeric antigen receptor T-cell (CAR-T) immunotherapy.

Our progress with immunotherapy is quickly outpacing our physical space. We are one of only a handful of cancer centers that can harvest, modify and

infuse a patient's own T-cells back into their body to fight their cancer, all in one place. The process takes about two to three weeks per patient, offering a truly individualized therapy. To make this available to North Carolinians and the world, we will expand. To bring this important pillar of cancer care to more patients and to save more lives, we will grow. UNC Lineberger is out to lead the world in this therapeutic innovation.

In this edition of Cancer Lines, you'll read about much more – how our researchers and physicians are leading the charge in vaping research, a topical problem that touches teens and their parents here in North Carolina and beyond; you'll learn about how Katie Reeder-Hayes, MD, MSc, MBA, a physician-scientist, is making inroads in breast cancer research; you'll discover how a patient living in Virginia connected with our own Matt Foster, MD, to give her a fighting chance through CAR-T immunotherapy. Finally, you'll get an inside look at Barbara and Jim Harrell, Jr, a philanthropic-minded couple who are leading the charge to make UNC Lineberger a household name and support the great work we do. They are making a \$1 million gift to support wherever the need is greatest.

We are an ever-evolving, growing and expanding institution, thanks to those donors, physicians, researchers and patients featured in this publication. I look forward to another 10 years of growth, excited about the progress and discoveries we'll make during the next decade. I hope you'll join me in this journey and continue to support today's best care and tomorrow's best hope at UNC Lineberger. 8

## E-CIGARETTE *continued from page 1*

has led work in the laboratory to find that vaping can injure the lungs and lead to changes seen in smokers with emphysema.

Tarran explained that lung cancer and other diseases can impact people after decades of tobacco use. Their experiments tried to identify the biological changes needed to help them predict these longer-term effects.

In a study published earlier this year, Tarran and his colleagues found high levels of proteases in the lungs of people who use vaping products. Proteases are "molecular scissors" that cut proteins, and in high quantities, they can cause degradation to surfaces of tiny air sacs in the lungs.

"Vaping has a measurable biological effect on the lungs," Tarran said.

In addition, Tarran said federal officials are concerned about recent vaping-related deaths, known as EVALI, or e-cigarette-associated lung injury. Federal officials are tracking and studying increasing numbers of vaping-associated deaths around the country. The CDC identified a chemical in lung fluid samples of 29 cases: vitamin E acetate. Tarran has additional questions about EVALI risks.

"Are all e-cigarette users at risk for EVALI?" he said.

Tarran has led a study to dissect the chemicals in vaping products. Out of nearly 150 different e-cigarette products, they found many different chemicals. The more ingredients in the products, the greater the toxicity. That's a problem, Tarran said. "It's not just water vapor."

The products contained not only nicotine, but a chemical that acts as a "vehicle" for both nicotine and THC, the active ingredient in marijuana. They also found flavors and many different flavor chemicals.

"Nicotine is not safe," he added. "It's nicotine that's driving protease release in the lungs, and it will also affect alveolar cells in the lungs and cause inflammation. If you take nicotine as a developing adult, as a teenager, it can lower the threshold of addiction later on in life."

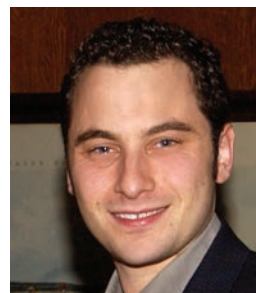
Other UNC Lineberger researchers are working to understand some of the marketing practices that could be drawing teens and adolescents to e-cigarettes. In a review of 51 different research studies, researchers led by UNC Lineberger's **Adam Goldstein, MD, MPH,**



UNC Lineberger's Adam Goldstein, MD, MPH, is working to understand some of the marketing practices that could be drawing teens and adolescents to e-cigarettes.



Rebecca Williams, PhD, MHS



Seth Noar, PhD

found consistent evidence that non-menthol flavors for e-cigarettes attracted young adults to use these products.

Most e-cigarettes include at least one of about 7,000 flavors available for purchase, such as blueberry cheesecake, mango, cinnamon, sweet milk and lemon crumble cake.

"Given the fact that nicotine is highly addictive and can affect brain development, and the clear findings that the impact of flavors on youth is strong and consistent, we believe that banning non-menthol flavors in e-cigarettes will help reduce the epidemic of youth e-cigarette use," Goldstein said.

UNC Lineberger's **Rebecca Williams, PhD, MHS,** is studying access by teens and adolescents to e-cigarettes and other tobacco products online. She's uncovered ways that the tobacco industry has gotten around government oversight, particularly as it pertains to sales to minors.

Researchers at UNC Lineberger are also working to



UNC Lineberger's Kurt Ribisl, PhD, has been named one of the most prolific e-cigarette scientists by an independent analysis.

understand the most effective ways to communicate with young adults about the health effects of tobacco products, including e-cigarettes.

Just this year, the National Cancer Institute awarded a three-year, \$14 million grant to UNC Lineberger's **Seth Noar, PhD,** to develop metrics that will help them measure the effectiveness of tobacco prevention advertisements targeted to adolescents.

Existing metrics to gauge the impact of ads were developed with adult smokers in mind, the researchers report. They were also developed before the advent of e-cigarettes and vaping.

"The project will be successful if it develops a better understanding that helps the FDA and others select more effective ads for their tobacco prevention campaigns," Noar said.

Another researcher, UNC Lineberger's **Kurt Ribisl, PhD,** the Jo Anne Earp Distinguished Professor and chair of health behavior at the UNC Gillings School of Global Health, has been named one of the most prolific e-cigarette scientists by an independent analysis.

The analysis was conducted by researchers at the Rutgers Center for Tobacco Studies and Rutgers Robert Wood Johnson Medical School, and found UNC-Chapel Hill to be the third most prolific producer of scientific publications about e-cigarettes.

"We have prioritized conducting e-cigarette studies at UNC since shortly after they were introduced in the U.S.," Ribisl said. 8

## Gift shows donor support for “some now, some later”

As the chairs of UNC Lineberger’s Board of Visitors Development Committee, Jim and Barbara Harrell want to both lead by example and set one for other donors and members of the board. Through leadership and action, the couple has made an indelible mark on the future of the board and UNC Lineberger.

At a recent board meeting, the Harrells of Elkin, North Carolina, announced their intention to give \$1 million to UNC Lineberger where the need is greatest. The couple thought their gift could do the most good if they gave “some now and some later,” structuring part of it as a planned gift.

“The thing that appealed to us was doing something now would give immediate help, and then long term, knowing that we could do something that would be ongoing. We tend to be benevolent. We always try to contribute and give back where we can in the community. As far as a large gift, both of us see the value. It’s the best thing for people in general — for mankind — to do something for a disease like cancer that truly affects everybody,” Jim Harrell said.

Barbara Harrell said that splitting the gift was something she thought was important to help address a need. “We thought it was more important to give as much as we could now,” she said. “I would rather see the money used now for what’s needed at the moment, rather than waiting to see.”

The Harrells’ dedication to the Carolina community is unwavering, but their involvement with UNC Lineberger is a more recent occurrence. Both Jim and Barbara have been involved for years with the UNC Adams School of Dentistry and Rams’ Club and are life members of the alumni association, with Jim serving as vice president. But they weren’t familiar with the cancer center until they were nominated to serve on the board of visitors.

“I was thrilled to find out that we had the people’s cancer center of North Carolina right here in Chapel Hill,” Barbara Harrell said. “Cancer touches so many people. It’s truly amazing to me how many people are getting treatment, and the survival rate is improving from good treatment.”

As a dentist and health care provider, Jim Harrell screens his patients for oral cancers and sees many



**Barbara and Jim Harrell, Jr.**

patients undergoing cancer treatment. He knows the toll a diagnosis can have on patients and their families. The couple was pleased to discover their first impressions of the cancer center were correct. Not only were patients receiving care that was second to none, they were also able to take advantage of cutting-edge treatments offered at the cancer center.

“We experienced life changing events in the lives of people we’d sent [to receive care at the North Carolina Cancer Hospital, UNC Lineberger’s clinical home]” Jim Harrell said.

All that positivity has made the Harrells dedicated members of the board of visitors and supporters of the forward-thinking research and top-notch care that UNC Lineberger and the cancer hospital provide patients throughout the state and beyond, something they want to see expand.

The couple said their dedication to UNC Lineberger stems from the fact that it’s the only public NCI-designated, comprehensive cancer center in North Carolina – “the people’s cancer center” – and the health and well-being of all North Carolinians is important to them. They also want to reach people beyond those affiliated with UNC-Chapel Hill and inform a broader swath of potential donors and patients about the strides made at UNC Lineberger.

“There are many needs in our society today, but I think the thing that affects the lives of the most people, most profoundly, is cancer,” Jim Harrell said. “Cancer is the enemy, and I believe that UNC Lineberger is our best hope for a cure. We need to find ways to raise awareness of our cancer center and increase support for it. UNC Lineberger truly represents today’s best care and tomorrow’s best hope.”

### Leading the Fight Against Cancer

**Lineberger Leadership Partners is a group of dedicated supporters investing \$1,000 or more in a fiscal year toward the fight against cancer. We are honored to welcome the following new members to Lineberger Leadership Partners so far this year.**

- |  |  |   |                            |
|--|--|---|----------------------------|
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| <i>Kenneth Combs</i>                                       | <i>Jennifer Langfahl Ellison</i>                                 | <i>Sandra C. Morris</i>                                       | <i>Sheryl W. Whicker</i>   |
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| <i>Dean S. Edmonds III and Lynn Ann<br/>Dinger Edmonds</i> | <i>Karen Johansen</i>  | <i>Helen Caldwell Ritch</i>                                   | <i>Betsy Lynn Williams</i> |
|  | <i>Joan Rose Jones</i>   | <i>Stacy Evans Rowland</i>                                    | <i>Emilie F. Woods</i>     |
|  | <i>Eric Ledford</i>  | <i>Dedra Stewart</i>  |                            |

**We are truly grateful for the commitment of Lineberger Leadership Partners who have been with us for more than 25 years.**

- |  |  |  |   |
|--|--|--|---|
| <i>Anonymous</i>   | <i>Richard Byron Lupton<br/>and Linda Close Lupton</i> | <i>Edward Calvin Smith, Jr<br/>and Jo Allison Clary Smith</i>    | <i>Catherine Rosenthal Stuart<br/>and James L. Stuart</i> |
| <i>Lawrence J. Goldrich<br/>and Janice Tolley Goldrich</i> | <i>Elisabeth Lineberger Lyon<br/>and Peter B. Lyon</i> | <i>Verner Eugene Stanley, Jr<br/>and Anna Lineberger Stanley</i> | <i>Charles L. Weill, Jr</i>                               |
| <i>Anna Ragland Hayes</i>                                  |  |  |   |

For more information on Lineberger Leadership Partners, please visit [unclineberger.org/LLP](http://unclineberger.org/LLP).

## CAR-T therapy gives patient options after cancer returns

When Sabrina Shelton received her college degree in 2007, her thoughts were focused on her future. She considered grad school and going straight into the work force, looking for housing and starting salaries, but what she didn't expect was a cancer diagnosis.

In April of 2008, Shelton, now 34, of Bedford, Virginia, was diagnosed with acute lymphoblastic leukemia, derailing her plans for the next phase of her life and fast tracking her into a month of cancer treatment, followed by a year of after care.

"At the time, you're asking yourself, 'what do I want to do? What do I want?'" she said. "It's the kind of existential question that we're all asking ourselves as we graduated college, and then you get your answer."

For Shelton, her cancer journey started off smoothly. She was in remission within a month of starting treatment and was cancer-free for almost five years — a standard cancer survivorship benchmark. But her cancer returned in 2012 and again in 2014. And still again in 2018.

"I just wanted to get to that five-year mark so bad," Shelton said. "I was of course upset about it and disappointed that it didn't at least get me to the five-year mark, because that's the target number that I wanted. With every recurrence, I do have those moments where when I initially hear about it, I'm shocked."

The bulk of Shelton's care had been at the University of Virginia Cancer Center, with the exception of a stem cell transplant with UNC Lineberger's **Paul Armistead, MD**. With her recurrence in 2018, she had exhausted traditional treatment options, so Shelton's care team referred her to UNC Lineberger's **Matthew Foster, MD**, for a chimeric antigen receptor T-cell (CAR-T) therapy clinical trial. CAR-T immunotherapy uses a patient's own immune system to fight their cancer. This involves extracting the patient's T-cells, manipulating them to recognize the patient's cancer, and then re-infusing them into the patient to attack their cancer cells.

"One advantage of these altered T-cells is that they can survive and persist within the body and, not only be an army of cells for one time, but an occupying force," Foster said.

At the North Carolina Cancer Hospital clinic in Chapel Hill, Foster was both optimistic and realistic about Shelton's prognosis, taking time to answer her questions. CAR-T being a relatively new treatment, however, there were not a lot of outcomes and results he could share with Shelton, a self-proclaimed "numbers person."

"I want to know how many people have had it, how many have survived, how long has it lasted?" she said. "And they just can't tell me it's going to last short term or long term. But the clinical trial itself went way better than I had imagined in my mind of how it would go."

Foster and the cellular immunotherapy team at UNC Lineberger look for new treatments for difficult-to-treat cancers, and Shelton was part of the corresponding study that aimed to make treatments safer.

"Fortunately, she had an easier pathway with these CAR-T therapies than she did with her transplant,"



Sabrina Shelton, right, with her mother, Debra Blake. Shelton recently underwent CAR-T immunotherapy under the care of UNC Lineberger's Matthew Foster, MD.



**"One advantage of these altered T-cells is that they can survive and persist within the body and, not only be an army of cells for one time, but an occupying force."**

- Matthew Foster, MD

Foster said. "That's not necessarily true for all patients. There are patients who have had more profound toxicities."

For Shelton, the difference in treatment strategies was significant. With CAR-T, she didn't suffer the same types of side effects she had with chemotherapy and radiation or the lengthy hospital stay and recovery with the stem cell transplant. There was no hair loss; no mouth sores; no bone-deep fatigue. She said her real fear was neurological effects from the CAR-T treatment, but her cognition was unaffected.

"The only major thing I've had was a fever. I never had any of the hallucinations or the other major neurological symptoms," she said. "For that to be the biggest side effect that I had, I was certainly blessed."

"We see a number of young adults and adolescents with acute lymphoblastic leukemia. Unfortunately, this population is often in the midst of launching themselves from under their parents' wings and launching

their careers or education," Foster said. "Sometimes the parents take an active role, and sometimes the parents don't. Sabrina is fortunate to have supportive parents and a great attitude herself in terms of taking care of herself and trying to blend her care for herself with her career aspirations and personal life."

These days, Shelton's focus is on her life outside of cancer. She enjoys volunteering at a bridal shop that receives donated dresses from high-end shops like Kleinfeld Bridal in New York and gives the proceeds to help women in need. She recently took trips to Colorado and California. She's even planning to go to New York — something she couldn't imagine doing during her initial diagnosis and recurrence.

"I see everybody else around me living life. So, I feel like, 'why can't I?'" she said. "Of course, life can happen in between all of these plans, but I'm just not going to sit back and watch life pass me. I'm going to get out there as much as I possibly can." 8

## Oncologist seeks answers to breast cancer questions

When Katie Reeder-Hayes, MD, MSc, MBA, was about 8 years old, her younger sister fell off her bicycle and was severely injured when the two were outside riding alone near their home in the Alabama mountains.

Her sister was bleeding heavily, and her braces were askew. She ended up needing emergency dental surgery just to put everything back together. But Reeder-Hayes wasn't afraid or unsure of what to do.

She used a towel to stanch the bleeding, got her sister out of the road and ran home for help.

It was the moment she knew she had a future in medicine.

"I think I had a desire to be helpful, and a realization I could keep it together in a situation where people were sick or worried or anxious — maybe that was something that steered me in the direction (of being a doctor)," she said. "I think my mom was a little freaked out that I wasn't crying or screaming, though."

Now, Reeder-Hayes cares for patients with breast cancer as a medical oncologist at the UNC School of Medicine. Helping patients understand their disease and medical options so they can make the best decision for their lives is important to her.

And as a researcher at UNC Lineberger, she works to understand and address racial, socioeconomic and other barriers that influence patient survival and other outcomes.

"When I made the connection between the way that patients experience the health system and what actually happens with their cancer, that made it seem really important to me to deal with fixing those front-end things, in order to fix what all of us care about as cancer doctors, which is how likely you are to beat cancer," she said.

Reeder-Hayes knew early on that she wanted to work with cancer patients in medical school at the University of Alabama-Birmingham.

During a surgical oncology rotation, she was drawn in by the meaningful conversations the surgical oncologists had with their patients — even if she didn't want to be a surgeon.

Working with a patient who had a rare disease called systemic amyloidosis, she experienced that firsthand.

The patient's disease was advanced, and some of his family members were sleeping on the floor of his hospital room, cherishing every moment possible with him.

"I spent a lot of time with the patient and his family just helping them understand what it was he had, what were the treatment options, why were some of the more aggressive treatment options not going to be helpful to him, and what were the things he wanted for the last part of his life," she said. "And while that was hard, it was also really rewarding."

She came to the UNC School of Medicine to complete her residency and fellowship training as a hematology oncologist. Now as a physician-scientist who cares for patients with breast cancer and does research, she's made important findings through her



UNC Lineberger's Katie Reeder-Hayes, MD, MSc, MBA.

***"When I made the connection between the way that patients experience the health system, and what actually happens with their cancer, that made it seem really important to me to deal with fixing those front-end things, in order to fix what all of us care about as cancer doctors, which is how likely you are to beat cancer."***

- Katie Reeder-Hayes, MD, MSc, MBA

research about how race and other factors relate to patient outcomes.

She led a study published this year in the journal *Cancer* that found that black women with breast cancer were more likely to start treatment more than 60 days after their diagnosis than white women. This research was part of a multi-pronged effort to understand why breast cancer mortality is high among black women.

In other studies, she and her collaborators found that both breast cancer patients insured by Medicaid and black patients were less likely to receive life-saving endocrine therapy to prevent breast cancer recurrence.

To address issues she's uncovered related to adherence to endocrine therapies, she helped lead a study in which women received individualized coaching to improve their long term adherence to endocrine therapy medications for breast cancer.

Her team is now launching a national randomized study, called "GETSET," in collaboration with the Alliance for Clinical Trials in Oncology, to test their coaching strategy and other aids for medication adherence on a larger scale.

In yet another research endeavor, she's planning to use big data and patient-reported outcomes to address unanswered questions patients have about side effects of these same medications.

"Clinical trials tend to focus on events that are dangerous to people, like blood clots or a recurrence of the cancer," she said. "Those are really important for long-term health, but they don't answer questions that may be very important to a patient like: 'How many hot flashes will I have because of this medicine,' or 'I've gained 10 pounds since I started this medicine, is it because of the medicine?'"

Reeder-Hayes said that in the absence of good scientific answers, patients tend to assume their symptoms and their medications are linked. She hopes to find evidence-based answers that will help patients make educated decisions about treatment.

She's also planning for a study to look at how geographic variation in where patients live might impact care outcomes.

"How do we become a stronger, better network of cancer care providers across the state?" she said.

In addition to her research, she has written about her experiences as a doctor in another form: the personal essay.

In one essay that she published in *The Journal of Clinical Oncology*, she wrote about helping a young patient with advanced esophageal cancer live out the rest of his life the way he wanted to — not in a hospital room.

Essay writing speaks to a long-held interest. As a college student at Vanderbilt University, she majored in both biology and English, and reading and writing have always been important in her life.

"Every physician in this field has ways that they process what happens to them — the experiences they have with patients, how their professional life relates to their personal life," she said of essay writing. "Writing happens to be one of the ways of processing that."

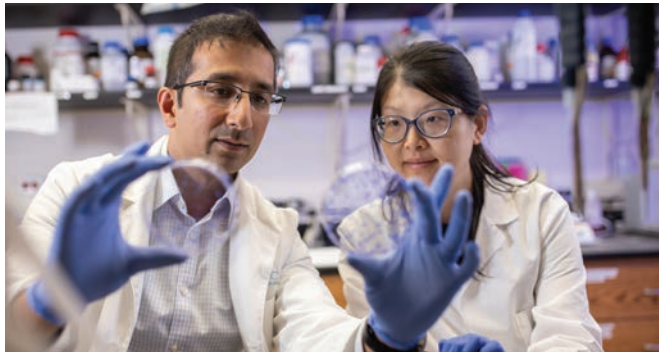
At home, she and her husband are the parents of five children — all boys.

"It's messy and it involves a lot of food," she said with a laugh.

She's tried to pass on the value of helping others to her children.

"They have always heard throughout their lives that if someone needs help, and we know how to give that help, that the help becomes our first priority, and that's what we're here for," she said. "If they absorb one value from the fact that their mother is a doctor, I hope that is it." 🧐

## Scientists implicate genes behind faulty DNA repair in breast cancer



Goarav P. Gupta, MD, PhD, and Wanjuan Feng, PhD, published an article in *Nature Communications*.

UNC Lineberger's **Goarav P. Gupta, MD, PhD**, and **Wanjuan Feng, PhD**, were corresponding and first authors (respectively) of a publication in *Nature Communications*.

Mutations in BRCA cause cells to lose the ability to repair errors in DNA through a common repair mechanism, which can lead to an increase in cancer risk. In the article, the researchers reported they discovered a different set of genes that could cause cells to hyperactivate a more error-prone DNA repair mechanism and result in additional errors in the code.

Their findings reveal insights as to what is driving certain types of breast cancers and provide a potential road map for future therapeutic strategies for cancers that have this hyper-activation.

## Researchers develop strategy to block immunosuppressive signals in melanoma

Cancer cells have a clever approach to avoid key immune cells intent on killing them. Researchers report in the journal *Cancer Immunology Research* they have developed a strategy to shut down signals that keep cancer-killing immune cells from infiltrating melanoma.

By blocking receptors on the surface of a certain type of cell, the researchers could increase the number of cytotoxic T-cells – cancer-killing immune cells – that reach melanoma, the deadliest form of

skin cancer. Their preclinical studies showed promise for a combination immunotherapy strategy, increasing median survival and slowing tumor growth in laboratory models.

“We found that a family of receptors expressed on the surface of immature immune cells can regulate a whole immunosuppressive pathway,” said UNC Lineberger's **Alisha Holtzhausen, PhD**. “By inhibiting the signaling pathway of these cells, we can stop the suppression of these cells, allowing more cytotoxic T-cells to come in and kill the tumor. And if we pair that strategy with standard-of-care immunotherapy, we get a better response and increased survival.”

## Favorable survival, fewer side effects after reduced therapy for cancer

Researchers reported that reducing the intensity of radiation treatment for patients with human papillomavirus-associated head and neck cancer produced a promising two-year progression-free survival rate and resulted in fewer side effects.

The findings, published in the *Journal of Clinical Oncology*, were drawn from a phase II clinical trial that included 114 patients with HPV-linked head and neck cancer and a limited smoking history. The researchers reported they saw a similar progression-free survival rate with fewer long-term side effects in the study compared with patients who received

standard intensity treatment in previous studies.

“A simple de-intensification strategy of reducing radiation and chemotherapy appears to be as effective at cancer control as the standard seven-week regimen,” said UNC Lineberger's **Bhishamjit S. Chera, MD**. “Furthermore, patients felt better with fewer toxicities.”

## Researchers identify gene key to multiple myeloma development, progression

Researchers have discovered a gene whose over-expression is key to the development and progression of multiple myeloma and a potential treatment strategy to block its downstream effects.

UNC Lineberger's **Greg Wang, PhD**, and colleagues reported in the journal *Blood* that the PHF19 gene is critically involved in development and progression of multiple myeloma, a disease where plasma cells grow out of control.

The researchers also demonstrated that an experimental therapeutic, UNC1999, a UNC-developed drug, showed early promise in laboratory models of multiple myeloma.

“We identified a crucial cancer promoting pathway in multiple myeloma, and we have promising evidence for a potential new way to treat this type of blood cancer,” Wang said.

## Scientists publish overview of the latest in cancer vaccine target research

In the journal *Nature Reviews Cancer*, UNC Lineberger researchers outlined current research into targets for therapeutic cancer vaccines, an area of active investigation focused on boosting immune responses to cancer.

“Cancer vaccines are different; we're studying them to be used therapeutically. We're studying whether we can take a tumor, identify potential targets that can activate immune responses and design a personalized vaccine to develop the immune response to fight the tumor,” said **Christof Smith**, first author of the review paper.

The authors reviewed research focused on different types of tumor-specific antigens – irregular markers on cancer cells that are not on healthy cells – that might be beneficial to explore as immune targets.

To find these irregular markers on cancer cells, scientists scan the genetic makeup of a cancer cell for an individual patient and then use computational methods to predict which ones might generate an immune response.

“There's tremendous interest in cancer vaccines, and key challenges for the field are to discover the best targets and align vaccine development research with optimal target identification research,” said UNC Lineberger's **Benjamin Vincent, MD**.



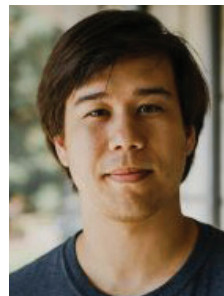
Chera



Wang



Holtzhausen



Smith



Vincent

## Honors and Awards

### Honors

**Antonio Amelio, PhD**, was named the first place recipient of the 2019 IADR Joseph Lister Award for New Investigators.

**Jessica Islam, MPH**, was awarded the 2019 Marci K. Campbell Dissertation Award, a competitive award given to recognize excellence in dissertation research focused on cancer and the population sciences.

**Gina Ogilvie, MD, MSc, FCFP, DrPH**, was honored with the Michael S. O'Malley Alumni Award for Publication Excellence in Cancer Population Sciences.

**Greg Wang, PhD**, has been honored as one of four recipients of this year's Phillip and Ruth Hettleman Prizes for Artistic and Scholarly Achievement.

The American Society for Radiology Oncology has awarded its highest level of accreditation to the UNC Medical Center's **Department of Radiation Oncology**.

The **North Carolina Cancer Hospital** was ranked as the top cancer center in North Carolina and 27th nationally in the U.S. News & World Report 2019-20 Best Hospitals survey.

### Awards

The St. Baldrick's Foundation has awarded a research grant to **Thomas Alexander, MD, MPH**, to support research on acute lymphoblastic leukemia.

**Yuliya Pylayeva-Gupta, PhD**, has been awarded a \$559,799 grant from the U.S. Army to investigate the role of the immune system in promoting pancreatic cancer's spread.

**John Sondak, PhD**, was awarded a \$971,484 Screen to Lead grant from the Leukemia and Lymphoma Society to search for potential inhibitors of two enzymes that can be mutated in lymphoma and leukemia.

The Lung Cancer Initiative of North Carolina has awarded \$25,000 to **Mark Woodcock, MD**, to support a research effort to identify characteristics of lung cancer patients who will respond to treatments that unlock the immune system against cancer.

Susan G. Komen awarded \$1.45 million in research grants to **Lisa Carey, MD, FASCO, Hector Franco, PhD**, and **Charles Perou, PhD**, as part of a national campaign focused on metastatic breast cancer, developing new, more effective treatments, and addressing disparities in breast cancer outcomes.

## Hyundai Hope On Wheels awards Smitherman \$200,000 grant



Jake Hanley adds his handprint to Andrew Smitherman's lab coat at the Hyundai Hope on Wheels event.

UNC Lineberger's **Andrew Smitherman, MD, MSc**, was awarded a two-year, \$200,000 Hyundai Young Investigator Grant to investigate approaches to identify those patients most at risk for late stage side effects from cancer treatment. According to Smitherman, knowing in advance who will develop treatment-related health issues may make it possible to reduce the severity of, or even prevent, those complications.

Smitherman was honored during a ceremony at the North Carolina Cancer Hospital that included comments from Jake Hanley, 15, diagnosed with osteosarcoma in 2018 and one of Smitherman's patients. John Szymanski,

general manager, Mid-Atlantic Region, Hyundai Motor America; and Grant Loftin, owner of New Bern Hyundai, helped present the award.

"Unfortunately, two thirds of (pediatric and adolescent cancer) survivors will develop long-term side effects from their treatment, like second cancers, heart disease and lung disease," Smitherman said. "Many of these conditions within the general population wouldn't occur until individuals are in their 60s or 70s, but these are occurring in childhood and adolescent cancer survivors in their 20s, 30s and 40s. We're looking at ways that we can identify survivors who are at risk of early aging so that we can intervene sooner to prevent those long-term side effects of cancer treatment."

## 2019 Oncology Excellence Awards honor compassionate nurses, staff

Five members of the North Carolina Cancer Hospital team were recognized at the 2019 UNC Oncology Excellence Awards ceremony in October.

The awards honor oncology nurses, allied health professionals and administrative staff for exceptional care of and devotion to individuals with cancer and their families and to the oncology profession.

The awards are given in memory of Charmayne Gray, an exemplary oncology nurse practitioner who died in an auto accident in 2002. "She was emblematic of what



Lisa Carey, MD, FASCO, and Brendan Fitzpatrick, associate vice president for cancer services, stand with 2019 Oncology Excellence Awards recipients Michelle Gardiner, PharmD, BCOP, CPP; Colleen Davis, RN, MSN, CPHON; Joan Martinho, RN, BSN, CURN, OCN; Mary Knowles, MSN, APRN and Bridgette Pineiro.

we look for in the people here," said **Lisa Carey, MD, FASCO**, physician-in-chief of the N.C. Cancer Hospital and the Richardson and Marilyn Jacobs Preyer Distinguished Professor in Breast Cancer Research, who emceed the award ceremony. "Her spirit lives on."

### Oncology Nursing Excellence Awards recipients

Colleen Davis, RN, MSN, CPHON

Mary Knowles, MSN, APRN

Joan Martinho, RN, BSN, CURN, OCN

### Oncology Service Excellence Awards recipients

Michelle Gardiner, PharmD, BCOP, CPP

Bridgette Pineiro

## 10 YEARS *continued from page 1*

treatment, amenities for patient support, and a healing environment, among other features.

"I'm thankful that you and the people like (UNC Lineberger Director **Shelley Earp, MD**) had the insight and foresight to develop this a decade ago," said **Wesley Burks, MD**, dean of the UNC School of Medicine, UNC Health Care CEO and vice chancellor for medical affairs. "Like you, my family is thankful for this opportunity that we all have, the people of North Carolina, to get the best, the latest, the best care ever, at the hospital here."

"The biggest benefit of the new hospital was giving the people of North Carolina a cancer hospital that valued them, their time, and their experience," said **Lisa Carey, MD, FASCO**, the Richardson and Marilyn Jacobs Preyer Distinguished Professor in Breast Cancer Research in the UNC School of Medicine Division of Hematology/Oncology.

### A focus on comprehensive cancer care

Carey knew a new facility was needed on her first day in January 1998, she said. The infusion center moved consistently as patient volumes grew.

"People were amazingly kind about it – both doctors and patients – but the beautiful new infusion center was such a relief after the darkness of Gravelly," she said.

The new hospital provided a focus for the different aspects of a comprehensive cancer program, including patient support and education, easy access to radiation oncology, and other services, said **Joel E. Tepper, MD**, the Hector MacLean Distinguished Professor of Cancer Research.

**Jonathan Serody, MD**, the Elizabeth Thomas Professor of Medicine, Microbiology and Immunology, also highlighted the importance of the hospital as a focal point for cancer care.

"It's a huge help to have radiology, clinics, the infusion facility and the inpatient beds in one area," he said.



More than 700 gathered in 2009 to witness the dedication of the \$180 million, 320,000 square foot North Carolina Cancer Hospital. Gov. Beverly Perdue made an official proclamation. Other dignitaries in attendance included Erskine Bowles, president of the University of North Carolina System; Charles A. Sanders, MD, chair of UNC Health Care System Board of Directors; Holden Thorp, chancellor of UNC-Chapel Hill; Tony Rand, majority leader of the N.C. Senate; Joe Hackney, speaker, N.C. House; and William Roper, MD, MPH, CEO of UNC Health Care.

Carey said the people who worked there were the best thing about the old facility – and that's still true.

When they were planning for the move into what then seemed to be an "impossibly large, cavernous environment" of the new hospital, one of the biggest concerns staff had was about maintaining the same sense of connection and intimacy for patients, said Ian Buchanan, MD, MPH, the former vice president for cancer and children's services for UNC Hospitals. He is now president of ambulatory and post-acute care for UNC Health Care.

"What they were worried about is ... how are we going to maintain that sense of family and intimacy going forward?" he said.

As the hospital's cancer services, patient volumes and staff have grown, they've worked to maintain the family atmosphere between providers.

Earp said the staff was crammed in, with medical oncologists, surgeons, radiation oncologists and staff

working in very close proximity. They learned to work together well.

"Being able to move forward and grow ... and keep that modus operandi between caregivers has been one of the truly exciting things," he said.

### A healing environment

Twenty-three years after receiving chemotherapy through a clinical trial, as well as surgery and radiation at UNC, Beck is healthy and well.

Seeing cancer care delivery from both an administrator's and a patient's perspective informed the hospital planning process, she said.

She worked behind the scenes – along with other leaders and collaborators including Melvin S. Hurston, senior vice president of professional and support services at UNC Health Care – to provide a wonderful patient experience in the new facility, starting at the front door.

"When we were planning and designing the cancer hospital, we wanted it to have lots of light – as much natural light as we could," she said. "We wanted to use materials that were resilient, that felt good and were warm. We wanted to have artwork that supported the feeling of healing and the positive nature that we wanted people to feel when they came in the building."

While Beck said they tried to build flexibility into the design, she said she knows that change will be a constant.

"I expect UNC to continue to be a leader in the state and the country, trying to make people's lives better for the care they receive," she said. "I expect constant enhancements in every part of the model – research, patient care, the patient experience, the staff experience. I expect that to continue well into the future. That's the only way we make progress."

To learn about the history of the hospital and to read reflections from patients and doctors, visit our 10-year anniversary website <https://unclineberger.org/10-years/>.

# calendar of events

## March

13<sup>th</sup> Polar Challenge, Chapel Hill

28<sup>th</sup> Blue Ribbon Run, Wilmington

## May

16<sup>th</sup> Victory Ride, Raleigh

For more information about these events and other UNC Lineberger news, visit [www.unclineberger.org](http://www.unclineberger.org), or follow us on [f](#) [t](#) [i](#)

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### Holbrook calls for support to give kids like his son a 'fighting chance'

University of North Carolina Men's Basketball Coach Roy Williams wants to hear more success stories, and he doesn't mean just about basketball wins. At the 15th annual Fast Break Against Cancer event, Williams aimed to raise money for UNC Lineberger Comprehensive Cancer Center so he can hear about more cancer treatment successes.

"I understand we love (treatment) success stories, and we have the chance to get more success stories with the more money we raise," Williams said.

Over the past 15 years, Roy Williams' Fast Break Against Cancer has raised more than \$3 million to support UNC Lineberger.

The breakfast was held Friday, Sept. 27, on the Roy Williams floor of the Dean Smith Center in Chapel Hill and featured both a silent and a live auction with unique UNC sporting experiences and memorabilia.

The guest speaker was Chad Holbrook, the head baseball coach at College of Charleston. When Holbrook was an assistant baseball coach at UNC, his son Reece was successfully treated at UNC for acute lymphoblastic leukemia. In his keynote, Holbrook called for support to give kids like his son a "fighting chance." Reece, who was initially diagnosed in 2004



Left: UNC Men's Basketball Coach Roy Williams. At right, from left to right: Cooper Holbrook, Reece Holbrook, UNC Lineberger's Stuart Gold, MD, Chad Holbrook and Jennifer Holbrook.

and treated by UNC Lineberger's **Stuart Gold, MD**, is now a junior in high school.

"The pediatrician said those words that no parent wants to hear: 'We're afraid your son has leukemia; he needs to be admitted to the hospital right away,'" Holbrook said.

UNC Lineberger Director **Shelley Earp, MD**, spoke about a clinical research effort by UNC Lineberger physician-scientists to develop new cellular immunotherapies to fight the cancer Reece had after other treatments have failed, and for other cancers.

They are working on clinical trials for chimeric



antigen receptor T-cell, or CAR-T, therapies that harness the power of a patient's own immune system to fight the patient's disease. Earp said that part of the promise of these immunotherapies is fewer side effects.

"These new types of therapy that we hope to be moving further and further up front so we don't have to wait until so much toxicity occurs," Earp said. "It's all clinical research; it's high risk, high reward; it's funded by the things that we do today; it's funded by federal grants and the wonderful gifts we have from both donors and the state's University Cancer Research Fund."



UNC Lineberger's Victoria Bae-Jump, MD, PhD, and Shawn Hingtgen, PhD, at center, speak at the 6th annual She ROCKS event in Wilmington, North Carolina.

### Wilmington She ROCKS event features Bae-Jump, Hingtgen

The sixth annual She ROCKS luncheon was held recently in Wilmington, North Carolina.

The annual event raises money and awareness for ovarian cancer research. She ROCKS (Research Ovarian Cancer Knowledge Support) exists to bring awareness and attention to ovarian cancer through funding groundbreaking research and by helping

women who are undergoing treatment for cancer.

UNC Lineberger's **Victoria Bae-Jump, MD, PhD**, and **Shawn Hingtgen, PhD**, both attended the event and spoke about their research and research successes into ovarian cancer.

Since She ROCKS was established in 2013, the organization has raised more than \$640,000 to help fund research at UNC Lineberger.