

# SYNTHESIS

THE MAGAZINE OF UC DAVIS COMPREHENSIVE CANCER CENTER VOL 19 • NO 1 • SPRING/SUMMER 2016



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## MESSAGE FROM THE DIRECTOR

Dear Reader,

Two decades ago, the cancer world looked vastly different. The human genome was being sequenced. Electronic medical records were an idea. Precision medicine, a distant hope. It was in that environment that UC Davis opened the cancer center in 1991. At the time, research was carried out on the Davis campus; patients were seen in Sacramento.

The landscape has changed dramatically since then. Basic science cancer research is now a robust part of clinical science and care in Sacramento, all aimed at improving patients' lives. The cancer center also has partnered with dozens of scientists on the Davis campus, including at the world's best veterinary and agricultural schools and the College of Biological Sciences. Indeed, the cancer center paved the way for true integration of the two campuses.

We also teamed with colleagues at Lawrence Livermore Laboratory to bring their extraordinary expertise to bear on all aspects of the disease. In 2002, we became the 60th cancer center in the country to receive designation by the National Cancer Institute (NCI), and in 2012 became the 41st NCI-designated Comprehensive Cancer Center.

Today, we have more than 300 members, \$100 million per year in cancer-related funding, 90,000 clinic visits and 150 active clinical trials. We have a unique program in Comparative Oncology with vet school colleagues, conducting research that helps both human and canine patients. Our Biomedical Technology Program is unmatched in the U.S. We're engaged in all aspects of improving cancer care through integrative genomics, which is the key to precision medicine.

We built an outstanding program to eliminate cancer health disparities, with a focus on Asian Americans, and a program that helps boost cancer screening in Native Americans. We started a city-wide, early-phase clinical trials program opening access to molecularly-driven advances. Through our Cancer Care Network, we help provide patients outside the Sacramento area the benefit of leading-edge care close to home.

What has remained constant is our focus on patients and their families and our mission to better their lives. There are still many challenges; with the aging population, more and more people will develop cancers. I'm confident that in the years to come our Comprehensive Cancer Center will do more to prevent, alleviate and cure cancer. First, for the people we serve, and then for the nation.

I have greatly enjoyed developing story ideas and introducing each issue of *Synthesis* these past many years. For now, I leave you in the capable hands of our editor, Dorsey Griffith, and in the future director of your Comprehensive Cancer Center.

RALPH DE VERE WHITE

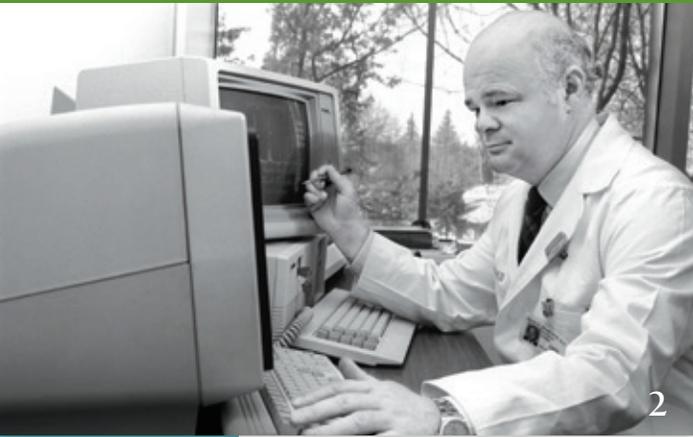
*Director, UC Davis Comprehensive Cancer Center*

*Associate Dean for Cancer Programs*

*Distinguished Professor, Department of Urology*

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THE MAGAZINE OF UC DAVIS COMPREHENSIVE CANCER CENTER VOL 19 • NO 1 • SPRING/SUMMER 2016



*Breaking Barriers to Beat Cancer<sup>SM</sup>*

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*A National Cancer Institute-designated  
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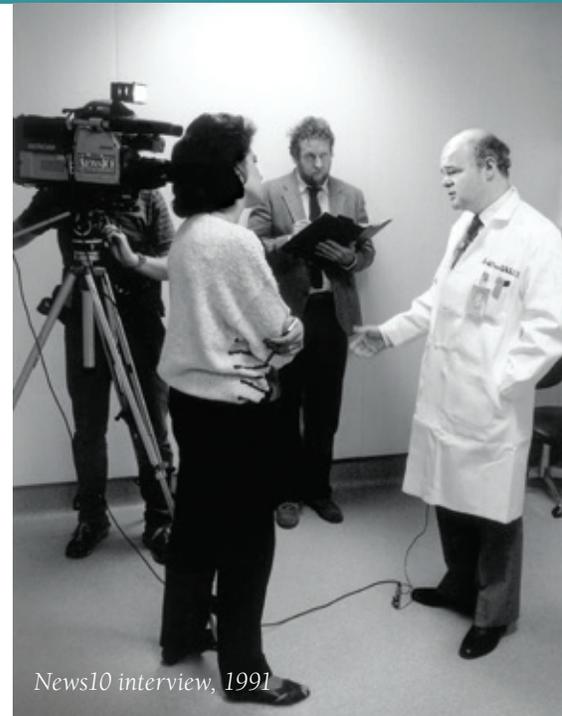
# End of an era:

Ralph de Vere White leaves indelible mark on the cancer center

Ralph de Vere White, whose masterful ability to unite scientists and clinicians throughout UC Davis to create one of the nation's leading cancer centers, will retire after 20 years as its leader on June 29.

De Vere White's legacy, by all accounts, will be one of stunning accomplishment. A renowned urologist, he contributed significant knowledge to the understanding and treatment of prostate and bladder cancers. A beloved physician, his relationships led to lifelong friendships with patients and millions in philanthropic contributions to the cancer buildings, its programs and research. A tenacious leader, his ability to build and inspire teams of scientists and clinicians now serves as a model for the rest of the UC Davis Health System.

"The creation of the cancer center was a really critical mechanism that helped transform UC Davis into a first-rate research medical school," says Lars Berglund, senior associate dean



News10 interview, 1991



Snapshot of Ralph de Vere White's  
**Legacy at the Cancer Center**

**1984** | de Vere White recruited to UC Davis as Chair of the Department of Urology

**1996** | de Vere White named director of the UC Davis Cancer Center

**1998** | Hsing-Jien Kung recruited as Associate Director, Basic Science

**2000** | Cancer Center enters scientific partnership with Lawrence Livermore National Laboratory

**2002** | NCI awards designation to the UC Davis Cancer Center

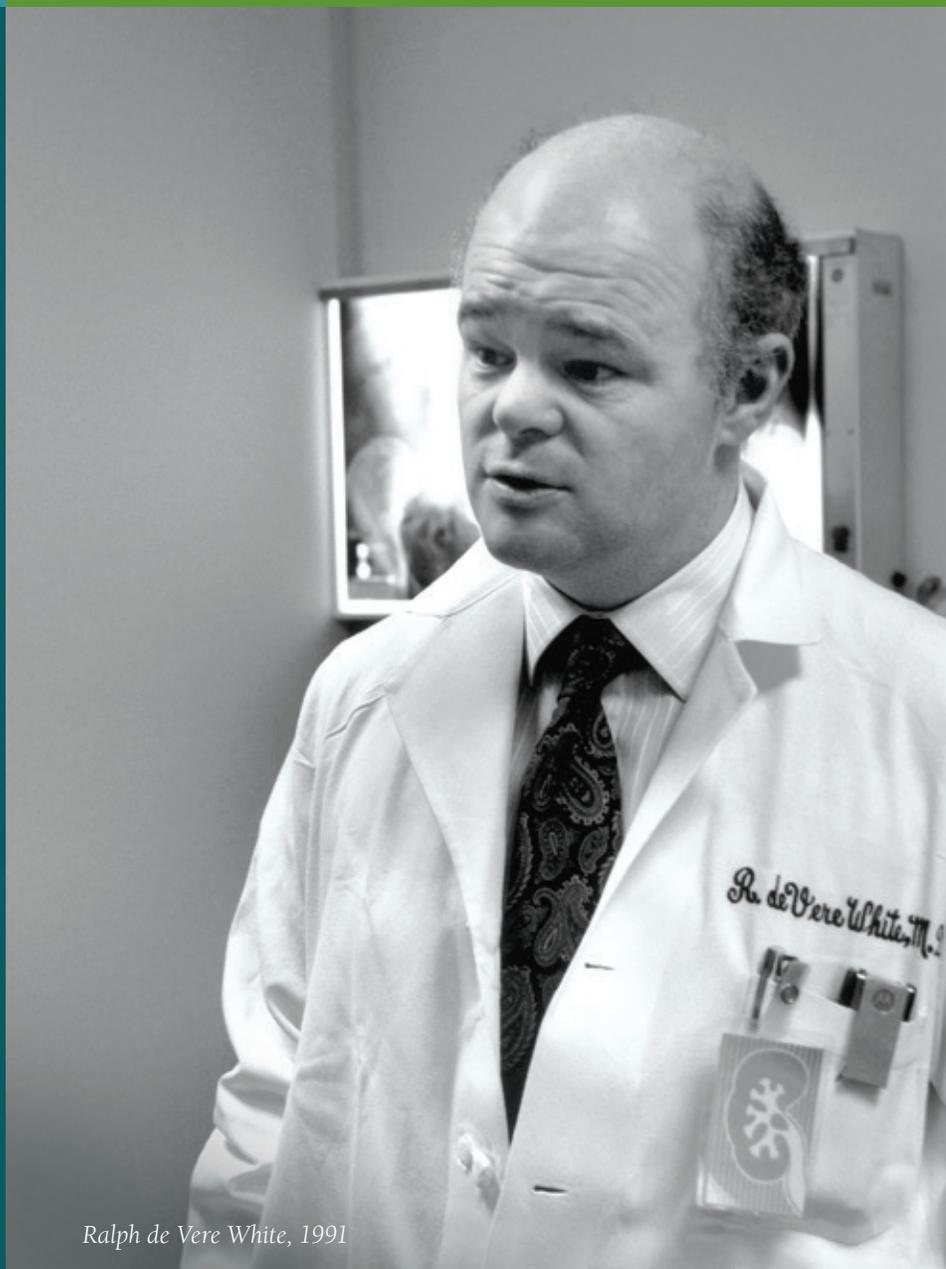
**2006** | Christopher Evans recruited as Chair of the Department of Urology

**2008** | de Vere White named interim chair of the Department of Radiation Oncology

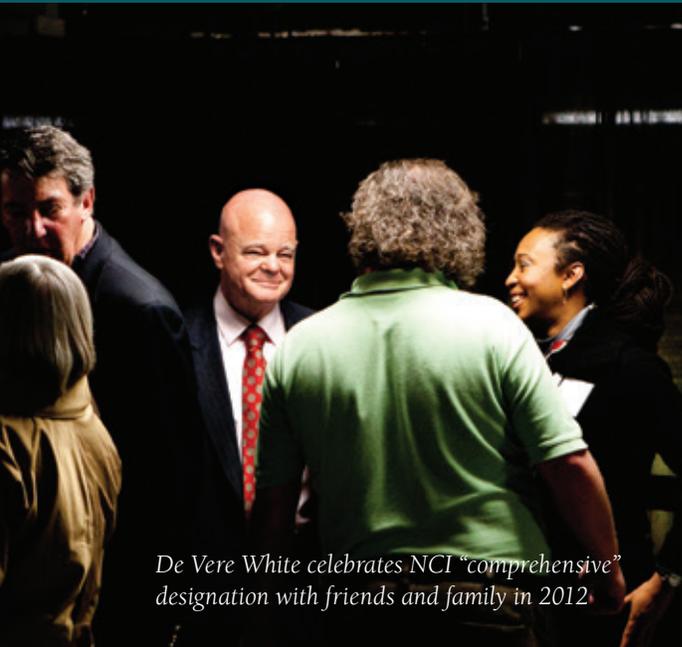
**2009** | Richard Valicenti recruited as chair of the Department of Radiation Oncology

**2012** | NCI awards “comprehensive” status; the cancer center becomes the UC Davis Comprehensive Cancer Center

**2016** | NCI re-designates the UC Davis Comprehensive Cancer Center



*Ralph de Vere White, 1991*



*De Vere White celebrates NCI “comprehensive” designation with friends and family in 2012.*

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The creation of the cancer center was a really critical mechanism that helped transform UC Davis into a first-rate research medical school. **Ralph de Vere White opened the doors and created the conditions** to make everything flourish.

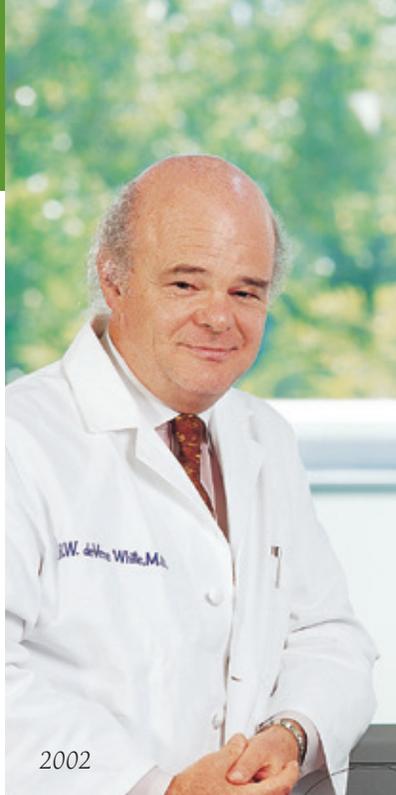
— Lars Berglund

for research and director of the Clinical and Translational Science Center at UC Davis. “Ralph de Vere White opened the doors and created the conditions to make everything flourish.”

### The great beginning

A native of Dublin, Ireland, de Vere White joined UC Davis in 1984 as chair of the Department of Urology, where he assembled a team from basic sciences, pathology, urology, and hematology and oncology at UC Davis and other institutions. Together they won the country’s first National Cancer Institute program project grant to conduct multi-disciplinary prostate cancer research.

The grant fueled work that led to the detection of mutations in the p53 gene in advanced prostate cancer — and sparked additional discoveries into the genetic underpinnings of prostate and bladder cancer. And it was the model to create other research efforts that would lead to the cancer center’s designation by the National Cancer Institute (NCI) in 2002.



“You have to recognize that you can’t be the quarterback, the cornerback and wide receiver. **You have to be the coach.** You have to feel you win when the team wins, and you lose when the team loses.”

— Ralph de Vere White

As he’s known to do, de Vere White uses a sports analogy to describe his leadership approach then — and now.

“You have to recognize that you can’t be the quarterback, the cornerback and wide receiver,” he says. “You have to be the coach. You have to feel you win when the team wins, and you lose when the team loses.”

After then-cancer center director

James Goodnight left to become chair of the Department of Surgery in 1996, de Vere White stepped into the role, an opportunity he calls “a chance to put more people together and to build something bigger that would have more impact on cancer. This was a dream come true.”

Primo “Lucky” Lara is a longtime medical oncologist at UC Davis who now oversees the cancer center’s

“““

I don’t know if (the partnership with LLNL) would have happened without Ralph. He has a passion and enthusiasm for science and cancer that is addictive. He draws you in, and once you’re in, it’s hard to walk away.

— Ken Turteltaub



Young cancer patients join Ann Madden Rice, Jim and Hsing-jien Kung at cancer center expansion

translational research program, which takes work on treatments and technologies from laboratories to patients. Lara was quick to work alongside the new leader.

“He thinks of cancer in a global way,” says Lara, adding that de Vere White has been an important mentor. “He recognized long ago you need multidisciplinary care to maximize outcomes. He was an early adopter of the team science approach.”

Of de Vere White’s vision, Lara says, “I drank the Kool-Aid. I believed in the mission. I thought that even back then we had all the elements. We just needed strong leadership to pull them together. Ralph was that.”

### **Paving the road to NCI designation**

Achieving designation was a goal from the start, says de Vere White. The federal stamp of approval would differentiate the center from others in the region and bring core funding, money later leveraged to garner more grants and philanthropic dollars.

Because designation signified that the center had the infrastructure to produce cancer discoveries, the first order of business was to recruit a basic science leader.

“It had to be someone who was innovative, cooperative, interactive and comfortable in himself or herself,” he says.

A campus-wide search committee found that leader in Hsing-Jien Kung, an expert in molecular and cell biology with a strong research portfolio and who already had ties to UC Davis scientists. Kung arrived in 1998 with a great capacity to recruit talented researchers across the scientific spectrum who were willing to be part of the team. His presence “legitimized the cancer center,” de Vere White says.

Soon afterward, the cancer center had a remarkable opportunity to collaborate with the Lawrence Livermore National Laboratory (LLNL), which at the time was known mostly for its thermonuclear weapons development and work on Ronald Reagan’s Strategic Defense

Initiative, known as “Star Wars.” The Laboratory was expanding to include non-defense research and wanted to utilize its expertise to develop technologies for cancer research.

The idea had its detractors, both at UC Davis and the Laboratory, but eventually, as de Vere White says, the lab’s “cool stuff” won the day, and the emerging relationship would become a key component of the cancer center’s successful bid for NCI designation.

Ken Turteltaub, an LLNL toxicologist with long ties to the cancer center, says de Vere White has been instrumental in keeping alive the novel partnership.

“I don’t know if (the partnership with LLNL) would have happened without Ralph,” Turteltaub says of the collaboration. “He has a passion and enthusiasm for science and cancer that is addictive. He draws you in, and once you’re in, it’s hard to walk away.”

Other collaborations emerged, including with the university’s renowned School of Veterinary Medicine, the Department of Biomedical Engineering and the College of Biological Sciences.

Wolf Dietrich-Heyer, professor and



“““

He thinks of cancer in a global way. He **recognized long ago you need multidisciplinary care** to maximize outcomes. He was an **early adopter of the team science approach**.

— Primo “Lucky” Lara

Otto, de Vere White, Fred Meyers, Jim Goodnight, Jeanine Stiles groundbreaking ceremony in 2010

chair of the Department of Microbiology and Molecular Genetics and co-leader of the cancer center's Molecular Oncology Program, researches how the repair of broken strands of DNA inhibits the ability of chemotherapy and radiation to kill cancer cells. He said that without the encouragement of Kung and de Vere White, his work may never have evolved to reach the prominence it has in the scientific community.

"Ralph really represents what I think an academic leader has to be to be successful, from building a team, acknowledging individual contributions, having a common cause, but also being able to make decisions and move forward," he says.

James Willson, a Texas oncologist who led the NCI's external advisory board that helped the cancer center in its bid for designation, and continues to provide guidance, agrees.

"UC Davis had the components for an outstanding cancer center, but did not have what was needed (for designation) until he arrived and orchestrated putting the

complementary parts together," Willson says. "It's very clear that UC Davis has since emerged as one of the outstanding cancer centers in America."

Not to be lost in the story of success is de Vere White's dedication to the care of patients, both his own and those of every other provider on staff. As a urologist, de Vere White was known for his expert surgical skills, which combined with his belief that non-surgical approaches should always be considered when tackling a difficult case. He was also known for the deeply personal connections he made with patients — the basis for his mantra: "our goal is to make the lives of patients with cancer better."

Patti Roberts of Sacramento will never forget de Vere White, who cared for her father Raymond Roberts, who had bladder cancer. She said she is "grateful threefold" for his medical expertise, his "humanity" and his "Irish charm," which he showed them on occasion

Not to be lost in the story of success is de Vere White's **dedication to the care of patients, both his own and those of every other provider on staff.**

when she and her father went to the family's pub in midtown Sacramento.

"He gave my 80-year-old father the gift of 12 more years of life," she says. "He always communicated warmly and directly with us. And when my father and I would go over to de Vere's Irish Pub on a Sunday night he would insist on buying pints and sharing toasts with us."

Always one to deflect praise, he credits Jeanine Stiles, director of cancer center administration, and her staff, for the seamlessness of scientific and clinical enterprises.

"If we hadn't had Jeanine and the staff she put together, this might have remained a marvelous idea

“ ”

He gave my 80-year-old father the gift of 12 more years of life. He always **communicated warmly and directly with us.**

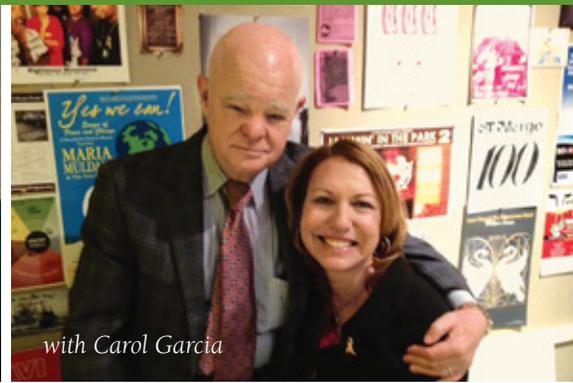
— Patti Roberts



with Dennis Matthews and Virginia Hinshaw at NCI designation press conference in 2002



with Moon Chen



with Carol Garcia



with Dick Cooper



de Vere White in 1991



with Kit and Bonnie Lam



with cancer-sniffing dog-in-training, Charlie

“

Ralph really represents what I think an academic leader has to be to be successful, from **building a team, acknowledging individual contributions**, having a **common cause**, but also **being able to make decisions** and move forward.

— Wolf Dietrich-Heyer

that didn't quite get translated," he says. "Without the nurses and the staff who are going to deliver this care, you are never going to fulfill the mission. It's an ultimate team effort."

### **A force to be reckoned with**

Dapper in elegant suits that seamlessly blend plaids with paisley ties and striped pocket squares, de Vere White's charm, intellect, sense of humor and sincere humanity is matched with a fierce tenacity and determination. Faculty members and managers can recount disagreements, sometimes heated, but note that they typically result in a commitment to do the right thing for the right reasons, and with no hard feelings.

"He's had very few interactions where he wasn't able to get the person to turn around," says Stiles, who has been de Vere White's closest professional partner the past 17 years and knows him better than anyone at the cancer

center. "For Ralph, it's always 'How is it going to benefit the patient, the (researcher's) career, and the global aspects of the health system and broader region.'"

That sense of urgency and mission is contagious among the center's faculty and staff, who share his drive and enthusiasm, and know that his hands-on approach has paid off. The evidence is the cancer center's NCI designation in 2002 and the even more prestigious "comprehensive" designation in 2012, which put UC Davis in the top tier of centers in the country. UC Davis' comprehensive status was reconfirmed in May.

De Vere White also led the charge to raise the money needed from within and outside the institution to nearly double the size of the cancer center, a project completed in 2012. The larger center now houses the pediatric clinic and infusion center, and has additional space for clinical trials patients.

Even as he contemplates

That sense of urgency and mission is contagious among the center's faculty and staff, who share his drive and enthusiasm, and know that his hands-on approach has paid off.

retirement, de Vere White has his eyes on the cancer center's future. He wants to make sure that every area resident has access to early-phase cancer clinical trials through the emerging Sacramento Citywide Oncology Program, that everyone gets cancer-preventive vaccines, that children grow up without suffering the latter effects of their treatment, and that real progress is made in the fight against the thorniest advanced cancers.

"We have walked the walk. But we should never be 'there' yet," he says. "If we are, we'll just go backwards."

“““

For Ralph, it's always 'How is it going to benefit the patient, the (researcher's) career, and the global aspects of the health system and broader region.

— Jeanine Stiles



NCI "comprehensive" designation press conference in 2012



*with Jeanine Stiles*



*with Placer Breast Cancer Endowment Leader Laura Tyrrell*

**UC DAVIS**  
**COMPREHENSIVE**  
**CANCER CENTER**

““

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— James Willson



*with the late Virgil Traynor of the Auburn Community Cancer Endowment*

# To screen or not to screen?

Patient, professional perspectives on guidelines vary

Until recently, Karen Lindfors wrapped up most appointments with a common message to patients: “See you next year.”

The confusion stems in part from **updated mammogram screening guidelines** produced by **two organizations at the front lines** of America’s fight against cancer — and influenced by ongoing research at UC Davis.

As chief of breast imaging at the UC Davis Comprehensive Cancer Center, Lindfors knew that for the majority of women in her care, an annual mammogram made good medical sense.

But new guidelines have changed the mammography landscape, and advising women on how best to detect breast cancer is more complicated today.

“It was a lot easier when we could say, ‘ok, everybody begin screening at age 40 and get screened annually forever,’” recalls Lindfors, who is also a professor of radiology at the UC Davis School of Medicine. “But there is no one-size-fits-all answer anymore, so it’s a more individualized decision. That can be challenging, and I think it’s easy to see why some women are confused.”



The confusion stems in part from updated mammogram screening guidelines produced by two organizations at the front lines of America's fight against cancer — and influenced by ongoing research at UC Davis.

In October 2015, the American Cancer Society changed its position to recommend that women get annual screenings beginning at age 45, rather than 40, and then wait two years between mammograms starting at age 55. The organization also said women should be able to start getting mammograms at 40 if they so choose.

Soon after, the U.S. Preventive Services Task Force, a national panel of experts that makes recommendations on clinical

preventive services, updated its guidelines, advising women to get screened every other year beginning at 50. Women under 50, the task force said, should make a personal choice about biennial screening based on their own preferences and in consultation with their doctor.

**“But there is **no one-size-fits-all answer anymore**, so it’s a more individualized decision. That can be challenging, and I think it’s easy to see why some women are confused.”**

— Karen Lindfors

The guidelines are designed for women who are in good health and do not have a strong family history of breast cancer or other factors that put them at high risk. Both sets of guidelines reflect the medical community's move toward a less aggressive screening strategy

that seeks to better balance the proven benefits of mammography with its downsides. The changes also reemphasize that while mammography remains an essential diagnostic tool, it's not perfect.

Nearly 232,000 American women were diagnosed with breast cancer in 2015 and an estimated 40,000 were expected to die of it, according to the National Cancer Institute (NCI). About one in eight women will be diagnosed with the disease at some point in their lives, the NCI says.

Widespread mammographic screening began in the United States in the 1980s after multiple studies found it prevents breast cancer deaths by detecting breast tumors early, when they are smaller and more treatable. While its benefits remain indisputable — a mortality reduction of at least 25 percent for women aged 50 to 69 — the evidence for women 40 to 49 is less clear, and newer data high-

**What's tricky is that on mammography there is no way to differentiate DCIS that is life-threatening and that which is not.**

light potential harms triggered by mammography in women of all ages, including anxiety surrounding false positive tests and unnecessary biopsies.

Over-diagnosis, too, has sparked concern because some early tumors found by mammograms, ductal carcinoma in situ (DCIS), may never progress to life-threatening invasive cancer. Indeed, because some DCIS tumors are low-risk, some scientists have proposed renaming DCIS to exclude the word "carcinoma."

What's tricky is that on mammography there is no way to differentiate DCIS that is life-threatening and that which is not. As a result, doctors are inclined to treat them all as potentially progressive, an approach that can mean extensive follow-up, which may include biopsy, surgery, radiation and chemotherapy, an approach similar to standard therapy for invasive cancers.

"Mammography detects some cancers that would never have been diagnosed in a woman's life if she hadn't been screened, and we treat those the same way as other cancers," says Diana Miglioretti, a professor of biostatistics at the UC Davis School of Medicine.

Some women see that as a good reason to get mammograms less often.

During a routine physical in 2011, Therese Taylor's doctor felt a lump in her right breast. That led to a mammogram, which found nothing in the right breast but detected micro-calcifications in the milk



"Mammography detects some cancers that would **never have been diagnosed** in a woman's life if she hadn't been screened, and we treat those the same way as other cancers."

— Diana Miglioretti

ducts of her left breast. A biopsy produced a diagnosis — DCIS.

“That was a Wednesday, and by Friday I had a date for surgery,” the 56-year-old Taylor recalls, noting that the quick scheduling implied her situation was urgent. “What I wasn’t told was that there is considerable controversy over whether DCIS should even be called ‘cancer,’ and that even if it was, it would grow slowly, and I could have safely opted to get treated at a later time.”

Instead, Taylor had a mastectomy. And now she believes a lack of information from her doctors and decades of “brainwashing about how mammograms always save lives” drove her to make the wrong choice.

But others, Lindfors notes, are willing to accept the risk of potentially unnecessary procedures when the benefit may be a life-saving discovery.

“If I can’t definitively tell a patient that her lesion won’t become an invasive cancer, and if I say we could just watch it and see what happens, most women will still want to have it treated,” says Lindfors.

Pam Phelps supervises breast imaging at UC Davis. Nevertheless, in 2010 she skipped her annual mammogram. The following year she was diagnosed with invasive breast cancer, had a mastectomy and chemotherapy. She was 54.

“Some researchers say there is frustration, agony and anxiety about false positives, but I don’t buy it,” says Phelps, who now gets both a mammogram and a breast MRI annually to monitor for recurrence. “I would much rather have a false positive result than skip a year like I did, and then



*Christina Bachman, senior radiologic technologist, and patient Peggy Lynn Janzen*

## Widespread mammographic screening

began in the United States in the 1980s after multiple studies found it prevents breast cancer deaths by **detecting breast tumors early**, when they are smaller and more treatable.

find out I have breast cancer.”

At UC Davis, researchers are developing diagnostic equipment that may lead to more concise imaging. Others work in pathology laboratories and hope to unravel

the mystery of which early cancers will progress and which won’t.

“I think we are all converging on the fact that there is some over-diagnosis,” says Joy Melnikow, who directs the UC Davis Center for

Healthcare Policy and Research and has participated in multiple breast cancer studies. “But we still need to determine which cancers will become active in order to avoid overtreatment.”

Melnikow was a member of the U.S. Preventive Services Task Force when it first recommended making mammography before age 50 an individual choice, back in 2009. It was a controversial decision that not only sparked warnings from critics who said it would put lives at risk, but also became a hot topic in the nation’s partisan health care debate.

“It was a challenging experience,” Melnikow says. “But we base our recommendations on the best available evidence about the benefits and potential harms of screening. Beyond that it’s up to doctors to help each woman evaluate her history and

At UC Davis, researchers are **developing diagnostic equipment** that may lead to **more concise imaging**. Others work in pathology laboratories and **hope to unravel the mystery** of which early cancers will progress and which won’t.

preferences and make a decision that’s right for her.”

Miglioretti’s breast cancer research spans 16 years and includes serving as co-leader of the Breast Cancer Surveillance Consortium (BCSC). The nation’s largest collection of information

on mammography, BCSC consists of six breast imaging registries across the U.S. One of her studies, published in 2015 in the *Journal of the American Medical Association Oncology* and based on BCSC data, helped shape the latest American Cancer Society mammogram guidelines.



“...we base our recommendations on the **best available evidence** about the benefits and potential harms of screening. Beyond that **it’s up to doctors to help each woman evaluate** her history and preferences and make a decision that’s right for her. I think we are all converging on the fact that **there is some overdiagnosis**. But we still need **to determine which** cancers will become active in order **to avoid overtreatment.**”

— Joy Melnikow

Miglioretti was also first author on a comprehensive modeling study evaluating the risk of radiation-induced breast cancer. That study, published in the *Annals of Internal Medicine*, was one of several that guided revisions to the task force's mammography guidelines. Melnikow and Joshua Fenton, a professor of family and community medicine and an expert on cancer screening, also contributed.

Scientists hope that technological advances, both with mammography and other screening modalities, will reduce the incidence of false positives. At UC Davis, medical physicist John Boone has worked on breast cancer imaging research since the 1990s, and has developed CT scanners to improve the accuracy and sensitivity of screening.

Boone and his team, which includes Lindfors, have built four such scanners, each incorporating knowledge gained from the previous model. Equipped with a \$2.88 million NCI grant, Boone is working on a project he calls "Breast CT: Final Steps to Translation." The research involves 400 women with suspicious lesions that require breast biopsy.

The study will compare mammography with breast CT to determine which is better at detecting breast lesions ultimately proven to be cancerous. Boone also will compare contrast-enhanced breast CT with contrast-enhanced MRI. If shown to be equivalent to MRI, breast CT would be a "viable and far more cost-effective tool for imaging women with suspicious lesions,"



*John Boone and Ramsey Badawi, associate professor of Radiology*

Boone and his team, which includes Lindfors, have **built four (breast CT) scanners, each incorporating knowledge gained** from the previous model.

Boone says, likely reducing the negative biopsy rate and increasing the predictive value of breast imaging in general.

As Boone sees it, technology will play a key role in the debate

over how best to help women navigate the choppy waters of breast cancer screening and treatment. He hopes his breast CT will "outperform screening mammography so we can change the paradigm and better serve women."

# No butts about it

## Smoking cessation push at UC goes high tech

Buster Halcomb was just 5, a scruffy shoeshine boy in a billiard hall in Cumberland, Ky., when three men approached with packs of “tailor-made” cigarettes.

The program aims to **simplify and streamline** what should be **routine preventive health care**, but too often is neglected by providers.



“Bring them home to your mom and dad,” they told him. He did, and kept a few for himself, too. By age 7, smoking had become a habit, one that the now 66-year-old is ready to quit on account of his own health and for the sake of his new granddaughter.

“I loved that baby even before she was born,” he gushed. “I know that if I smell like smoke, I am not going to be holding her.”

Halcomb, along with his wife, Julia, are quitting smoking together with the help of UC Quits, a University of California program run by the UC Tobacco Cessation Network that links every UC patient who smokes to the California Smoker’s Helpline 1-800-NOBUTTS, through use of the patient’s electronic health record (EHR).

“It’s going well,” says Halcomb. “I mean, you’ve got your ups and downs, but we’re doing it.”



*Buster Halcomb and granddaughter*

By age 7, smoking had become a habit, one that the now 66-year-old is **ready to quit** on account of his own health and **for the sake of his new granddaughter.**

### **Patients more apt to quit with provider push**

The program aims to simplify and streamline what should be routine preventive health care, but too often is neglected by providers. What began as a pilot project at UC Davis through a grant from the UC's Center for Health Quality and Innovation is now a UC-wide program led by UC Davis internal medicine physician

and tobacco control researcher Elisa Tong. Patients seen at UC San Diego, UCLA, UC Irvine and UCSF also have access to the program.

The idea is to reach people at risk of tobacco-related diseases when they are more open to quitting — in the hospital or during doctor visits. Project leaders estimate that at least 100,000 people who get their care at a UC medical center can

directly benefit; already, more than 3,600 patients who smoke have been referred to the California Smokers Helpline, operated by UC San Diego.

The UC Tobacco Cessation Network also is designed to meet federal and other health care targets for improving patient outcomes and lowering the costs of care.

“The goal is to try to address tobacco use at every clinical encounter, and ultimately align with tobacco quality measures set forth by the Centers for Medicaid and Medicare Services, which will probably offer incentives to health systems based on how they are performing on tobacco,” says Tong.

### **Tobacco's toll on health**

The health impacts of smoking are indisputable: tobacco use is a leading cause of preventable illness in the United States, including cardiovascular disease and several types of cancer. By the same token, quitting can have immediate and long-term health benefits. But nicotine is an addictive drug, and most smokers attempt to quit several times before they're successful.

Health care provider involvement increases the chances that someone will quit, explains Linda Sarna, interim dean of the UCLA School of Nursing and a UC Quits nurse champion.

“When a provider has an interaction with a patient who smokes it's an opportunity to connect the dots and help the patient understand how their condition is influenced by tobacco use,” she says.

After several unsuccessful quit attempts, Halcomb acknowledged that his doctor's recommendation in mid-December came at a good time — just hours before his daughter gave birth and brought her new baby to her parents' home to live.

“Everybody who smokes knows that if the doctor says something, deep down they feel ashamed,” he says.

Cancer care providers can play an especially important role in helping patients quit smoking, says Tong.

“When smokers are diagnosed with cancer, it is a ‘teachable moment,’” she explains. “It’s an opportunity to educate patients about the importance of quitting to improve treatment outcomes, as well as to prevent secondary cancers from developing.”

The Surgeon General reports that smoking is associated with poorer response to cancer treatment and wound-healing, and that it increases treatment-related toxicity. Continued tobacco use also decreases cancer survival rates.

But too few providers address tobacco cessation with patients. Even many NCI-designated cancer centers don’t offer tobacco treatment or education materials.

## Training health care providers key

To address the gap in oncology settings outside of the university system, Tong is working with directors of the UC Davis Cancer Care Network of community cancer centers to share UC Quits’ evidence-based tobacco

The idea is to **reach people at risk** of tobacco-related diseases **when they are more open to quitting** — in the hospital or during doctor visits.

cessation practices, lung cancer screening and prevention programs.

“We hope collaborations with our affiliate cancer centers will lead to new programs to improve cancer treatment and survival outcomes,” she says.

Training all UC providers is a critical component of the program. Sarna worked with UC nurses to understand their role in supporting quit efforts, including strategies to help smokers suffering nicotine withdrawal.

At UC Davis, nurse and tobacco specialist Cari Shulkin is a UC Quits consultant who also teaches nurses how to help patients quit smoking.

“We set up a framework to make it easy for them to counsel patients, provide resources, including the helpline, and to do a proper follow-up,” explains Shulkin.

In addition, the Smoking Cessation Leadership Center, run by UCSF Distinguished Professor of Health and Healthcare Steve

Schroeder, coordinated educational materials to help providers flag smokers in the hospital or clinic, inform patients about the benefits of quitting and how to do it. At UC Davis, for example, Halcomb was given a prescription for nicotine patches and tobacco lozenges.

Health care providers now can “e-refer” patients to the helpline, which triggers a call to the patient from a trained counselor, said Helpline Project Director Chris Anderson, whose team worked across the UC health centers to connect the helpline to electronic health record (EHR) systems and integrate the referral capability into clinical workflows.

“Practicing modern medicine is complicated; we’re asked to do a lot with the patient in a short amount of time,” says Scott MacDonald, a UC Davis primary care physician and EHR medical director. He works with information technology analysts to develop EHR alerts to remind physicians to talk to patients about smoking during the office visit.



What **began as a pilot project** at UC Davis through a grant from the UC’s Center for Health Quality and Innovation is **now a UC-wide program** led by UC Davis internal medicine physician and tobacco control researcher Elisa Tong.



**“Practicing modern medicine is complicated; we’re asked to do a lot with the patient in a short amount of time. By putting tools into the EHR, we can make these tasks easier for the doctors.”**

— Scott MacDonald

“By putting tools into the EHR, we can make these tasks easier for the doctors,” he says.

Mark Avdalovic, UC Davis pulmonologist and associate EHR medical director, lends his expertise to ensure that the clinician alerts appear in the EHR at a time when the clinician has the best opportunity to discuss smoking cessation and refer the patient to the helpline.

“The more our physicians are adept at using the EHR, the better the patient will do,” he says.

Offered in six languages, counseling can involve up to six sessions spread over the course of a quit attempt, from a routine intake survey to a quitting preparation conversation and relapse prevention

sessions. Anderson says UC Quits’ long-term goal is to screen patients at every clinical visit, “so the patient who doesn’t quit this time gets encouraged to do so next time.”

Halcomb says this time he’s determined to quit for good.

“They call me from the quitline every week and explain the addiction, give me tools to work with and the motivation to maintain stability,” he says, adding that learning how smoking affects his body and hearing success stories have helped him stay on course.

“They inspire me every time they call,” he adds. “Smoking is not the way to go. Life is too short to mangle it up. And we want to see our grandchildren grow up.”



## UC QUILTS TOBACCO NETWORK

### UC Quits Leaders

**PROJECT DIRECTOR** Elisa Tong,  
Associate Professor, Internal Medicine, UC Davis

**UC-WIDE NURSE CHAMPION** Linda Sama,  
Interim Dean, School of Nursing, UCLA

**UC-WIDE PEDIATRIC CHAMPION** Jyothi Marbin,  
Associate Professor, Department of Pediatrics, UCSF

### UC Quits Champions

#### UC CAMPUS

#### AREA OF EXPERTISE

#### UCSF

Lisa Kroon	Pharmacy
Sujatha Sankaran	Inpatient care
Mai-Khanh Bui-Duy	Outpatient care

#### UCLA

Cait Walsh	Nursing
Tim Fong	Inpatient care
Allison Diamant	Outpatient care
Tina Mamais	Nursing

#### UC DAVIS

Mauricio Rodriguez	Project Manager
Mark Avdalovic	Inpatient care
Susan Stewart	Evaluation
Cari Shulkin	Outpatient/Nursing
Tim Cutler	Pharmacy

#### UC IRVINE

Alpesh Amin	Inpatient and Outpatient
Jamie Anand	IT/Nursing

#### UC SAN DIEGO

Tyson Ikeda	Outpatient
Rob El-Kareh	Inpatient
Laura Giambattista	Nursing
Brian Clay	Inpatient

### Smoking Cessation Leadership Center (UCSF)

Steve Schroeder  
Catherine Saucedo  
Jennifer Matekuare

### California Smokers’ Helpline (UCSD)

Chris Anderson  
Shu-Hong Zhu  
Anthony Mayoral  
Carrie Kirby

# SCOPE opens doors to early-phase clinical trials

Citywide program unique in the U.S.

The history of cancer is filled with promising therapies that ultimately provided only marginal benefits.

When Lodi resident Victoria Pouchés (pronounced poo-SHAY) was told by her primary care physician that she had run out of treatment options for her ovarian cancer, she sought help from the UC Davis Comprehensive Cancer Center. She had received her initial care there from Edwin Alvarez, a gynecological oncologist, and hoped he might offer something new. After three years of battling the disease with surgery and multiple rounds of chemotherapy, Pouchés had developed heart damage, and her cancer was growing.

Alvarez, associate professor in the Department of Obstetrics and

Gynecology, quickly entered Pouchés into a Phase I clinical trial for a new cancer treatment that taps into the patient's own immune system to mount a response and fight the cancer.

"Instead of hospice, I am now part of this cutting-edge treatment," says Pouchés, who is currently undergoing infusions every two weeks as part of the experimental protocol. "I can't tell you how fortunate I feel."

Phase I clinical trials are unique, says Thomas Semrad, UC Davis assistant professor of internal medicine in the Division of Hematology and Oncology. Often the first time that a new drug or drug combination will

“Instead of hospice,  
I am now part of this  
**cutting-edge treatment.**  
I can’t tell you how  
fortunate I feel.”

— Victoria Pouchés

be tested in humans, the studies are designed to determine if the therapy is safe and at what dosage it can be tolerated. For patients like Pouchés with a cancer that wasn’t stopped with standard therapy, participation in a clinical trial of a promising new treatment can be a lifeline.

But conducting such trials is extremely costly, adds Semrad, and the UC Davis Comprehensive Cancer Center is the only facility in the region with the capability to do so. Because the effects of new treatments are inherently uncertain, the safeguards in place to conduct Phase I clinical trials are much more extensive than for later-stage clinical trials, he explains. Patients are monitored extremely closely to ensure that they are tolerating the new therapy. At the same time, frequent imaging and physiological tests are typically conducted to determine whether the treatment is having the desired effect of fighting the tumor.



*Laura Brennan, nurse practitioner, and Victoria Pouchés*

“Phase I trials are among the most intensive stages in new drug development,” says Semrad, who runs the Phase I program with Karen Kelly, associate director for clinical research at the cancer center. “There may be only 20 patients in an individual study, but the behind-the-scenes work to ensure participant safety and that we learn as much as possible about the new therapy can be more intense than for a large trial.”

Finding appropriate patients to participate also can pose a challenge because participants must have already undergone — and failed — standard therapies. And because

some treatments are designed to treat rare cancers, finding enough patients for a trial can be difficult.

Cancer Center Director Ralph de Vere White understands these challenges, and with them saw an opportunity to expand the reach of the center’s Phase I trials to a broader population of patients in the region, and offer hope to more people. In April of 2012, de Vere White took his idea to the editorial board of *The Sacramento Bee*, which later published an editorial promoting a citywide program to “increase the number of and quality of clinical trials” and to “make a dent in the fight against cancer.”

## Enter SCOPE

Today, that vision is a reality. Semrad and Kelly developed a regional effort known as SCOPE (Sacramento Citywide Oncology Phase I program), the first collaboration of its kind among physician partners from the major health care systems throughout Sacramento to share patients and clinical resources with the goal of providing more Phase I clinical trials to the area.

Started in the spring of 2015, the SCOPE partnership already has exceeded goals for enrolling patients in clinical trials, with 112 participants in Phase I trials in 2015 (up from fewer than 100 before the program), and the expectation of eventually conducting trials on some 150 patients annually. Patients stay with their regular doctors and return to their home hospitals after participating in their clinical trial.

“I’m extremely interested in **seeing this program grow and succeed**. Anything that makes **participating in clinical trials more seamless** for our patients is **a great thing.**”

— Deepti Behl, Sutter Health oncologist

Deepti Behl, an oncologist at Sutter Health, has referred patients to Phase I clinical trials and is an active participant on the SCOPE committee.

“I’m extremely interested in seeing this program grow and succeed,” she says. “Anything that makes participating in clinical trials more seamless for our patients is a great thing.”

Semrad added that everyone wins with SCOPE.

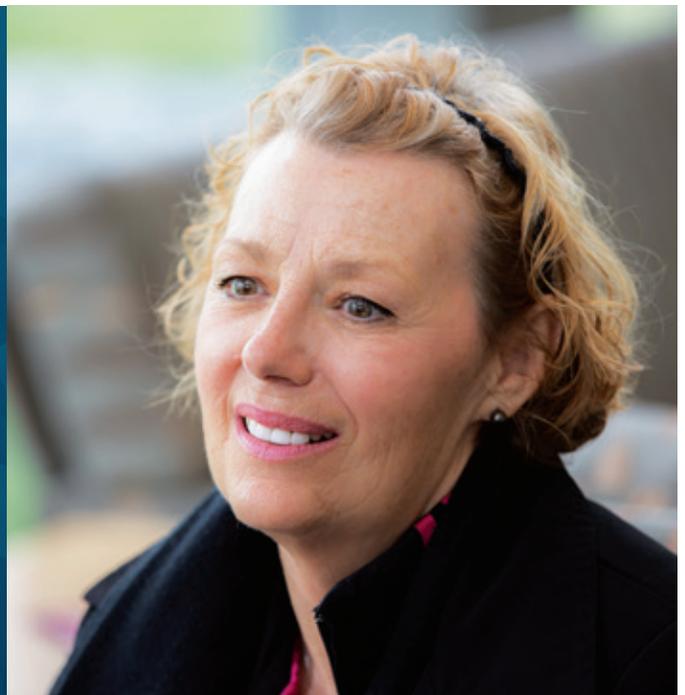
“The bigger our pool of patients, the likelier it is that we can fund new studies,” says Semrad. “And more studies bring better patient access to promising treatments and a better

chance that we will find more effective therapies for difficult-to-treat cancers.”

Semrad notes that the UC Davis Comprehensive Cancer Center is in an optimal position to attract patients for clinical trials of experimental therapies. The only National Cancer Institute-designated Comprehensive Cancer Center in Northern California outside of the Bay Area, the cancer center serves an enormous geographic area encompassing Northern California and the Central Valley, with a population of more than 5 million.

“My overall quality of life has **improved 100 percent**. I have gone from bedridden to now being **able to go for walks in the park** every morning. I am very blessed.”

— Victoria Pouchés





*Gilda Abria, clinical resource nurse, and Victoria Pouchés*

“SCOPE is the only one of its kind I know of in the country,” says Semrad. “Rather than a referral network, this is a real partnership between different medical facilities, all working toward the better health of the community and advancing cancer research.”

Semrad hopes that in future years, SCOPE will result in more partnerships with more health care institutions, the National Cancer Institute and industry. All have stakes in providing patients with better access to Phase I clinical trials.

Bob Rose, a community member who serves as a patient advocate with SCOPE, also thinks that combining community area healthcare resources is invaluable for patients in the area. A cancer

survivor himself, Rose and his wife run a weekly support group in their home for people with cancer.

“The people who come to our meetings are desperate to learn of new options,” says Rose. “They are constantly looking for a trial that they might fit into.”

For the 60-year-old Pouchés, the trial she found was a perfect fit. Many of her symptoms have disappeared, and she was recently told that the cancer biomarkers in her blood have dropped to negligible levels, indicating that the cancer is in remission.

“My overall quality of life has improved 100 percent,” she says. “I have gone from bedridden to now being able to go for walks in the park every morning. I am very blessed.”



**COMMUNITY  
STRONGER THAN CANCER**

SACRAMENTO CITYWIDE ONCOLOGY PHASE I PROGRAM

### SCOPE PARTNER INSTITUTIONS

UC Davis Comprehensive Cancer Center

Mercy Cancer Center

Sutter Cancer Center

Kaiser Permanente Medical Group

Sierra Hematology-Oncology

Building on basics>>

# A priceless view

EyePod lets researchers see 'what's really happening' inside tumors

[ Cancer is not like other diseases. It can grow rapidly and invade surrounding tissues, changing its molecular structure to evade treatments.

Because the disease is so dynamic, any single view — from a scan, biopsy or microscope — is just one frame in a long-running movie. To truly understand how cancer grows and adapts, we need to see the whole movie.

This plasticity has challenged researchers for decades. Scientists have tried various techniques to study how cancer develops over time, with mixed success. Cancer cell lines in a dish can adjust to their environment, adapting to the medium in which they grow. Biopsies are invasive, can only be performed infrequently, and they remove tumors from their native environments. Other approaches also can skew tumor behavior.

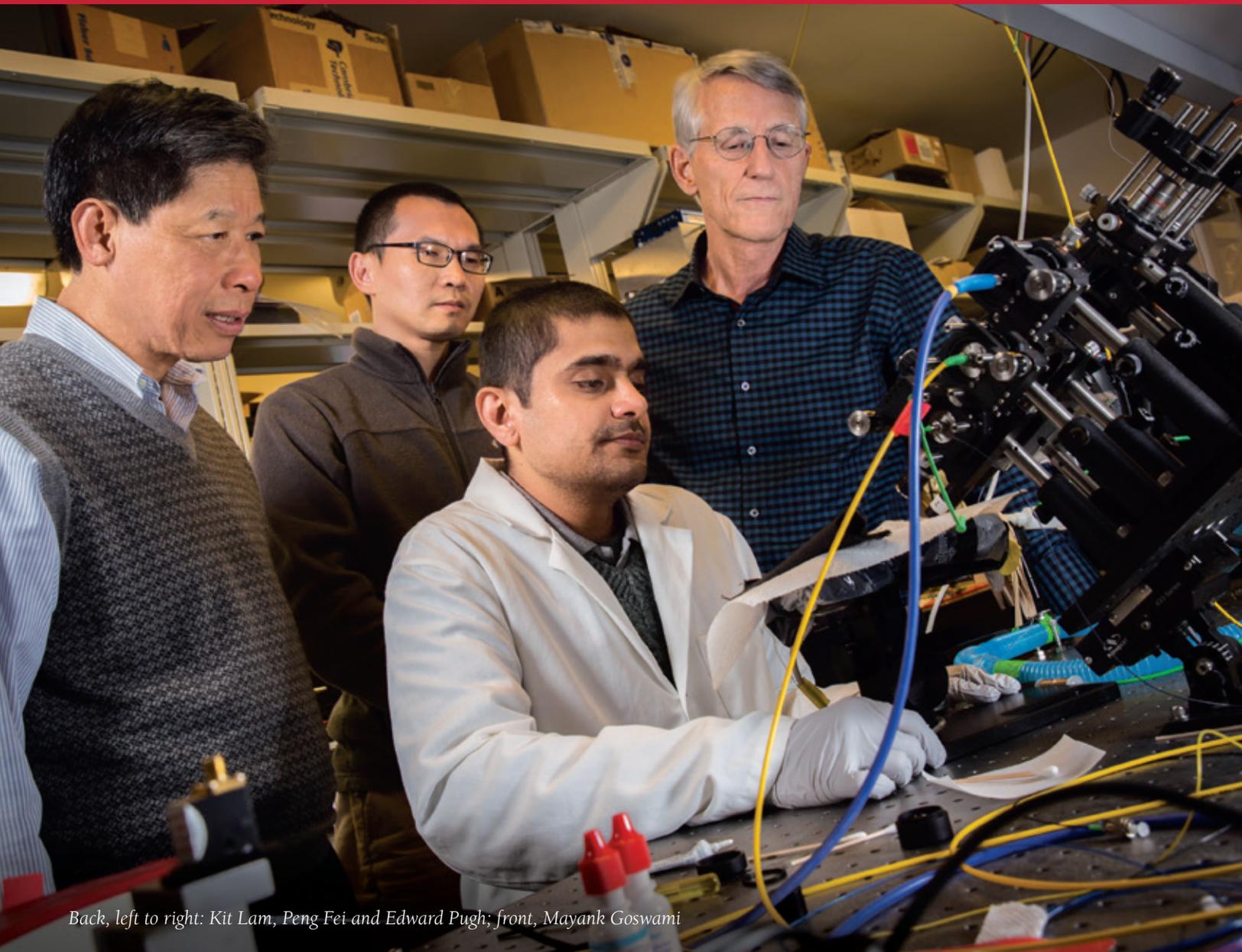
But now researchers at UC Davis have a new tool to follow cancer from its earliest, cellular stage. Using an optical imaging technology called the

EyePod, which takes non-invasive, microscopic images of living mouse eyes, physiologist Edward N. Pugh, Jr., and cancer researcher Kit Lam are monitoring growth of human tumors implanted in mouse eyes in real time.

With this technology, scientists can watch how tumors grow, invade nearby tissues and recruit blood vessels, and observe the migration of host immune and vascular cells to the tumor site. Equally important, researchers can monitor experimental treatments, studying where they travel inside a tumor, where they may fall short, and how the tumor and host cells respond to treatments. As it turns out, the eye may be the window to cancer.

## Building the EyePod

A professor in the UC Davis Departments of Physiology and



Back, left to right: Kit Lam, Peng Fei and Edward Pugh; front, Mayank Goswami

Membrane Biology, and Cell Biology and Human Anatomy, Pugh has spent decades trying to understand how photoreceptors in the eye convert light into brain signals. His work, and that of other researchers, has shown how amazingly sensitive eyes can be.

“Rod photoreceptors can respond to a single photon of light,” notes Pugh. “These cells have achieved the ultimate sensitivity permitted by physics.”

But there was much more to learn from the eye, and Pugh needed new tools to get there. With funds from

“Rod photoreceptors can respond to **a single photon of light**. These cells have achieved the ultimate sensitivity permitted by physics.”

— Edward Pugh

# Building on basics>>

the UC Davis Research Investments in Science and Engineering (RISE) program, and in collaboration with Robert Zawadzki, assistant research professor in the Department of Ophthalmology and Vision Sciences, Pugh built the EyePod laboratory.

The idea was simple: create a suite of devices that use the mouse eye as a window to view cells in the neural retina, which is part of the central nervous system. By taking advantage of the eye's natural optics, the researchers can image cells as if they were using a 20X microscope.

"We can now visualize individual cells and have imaged a single neuron for eight months," says Pugh. "But equally important, we can image the entire capillary bed of the eye's vasculature."

This approach is completely non-invasive — it simply uses the mouse eye's natural optics as a lens to see into the retina, which is a huge advantage. Optical techniques used to view the central nervous system or other internal tissues often require surgical or other invasive approaches, which can alter tissues and invalidate results. With the EyePod, researchers can observe without interfering with the normal biology.

## A shared resource

The ability to record cell behavior inside the body offers incredible possibilities. UC Davis researchers are using the EyePod for various collaborative investigations, including the study of the immune

system's role in retinal degeneration and stem cell and gene therapy treatments for glaucoma and other diseases.

But it soon became clear to EyePod investigators that their technology was useful for more than the study of eyes and their specific diseases. The EyePod could be a powerful tool to examine a disease caused by malfunctioning cells.

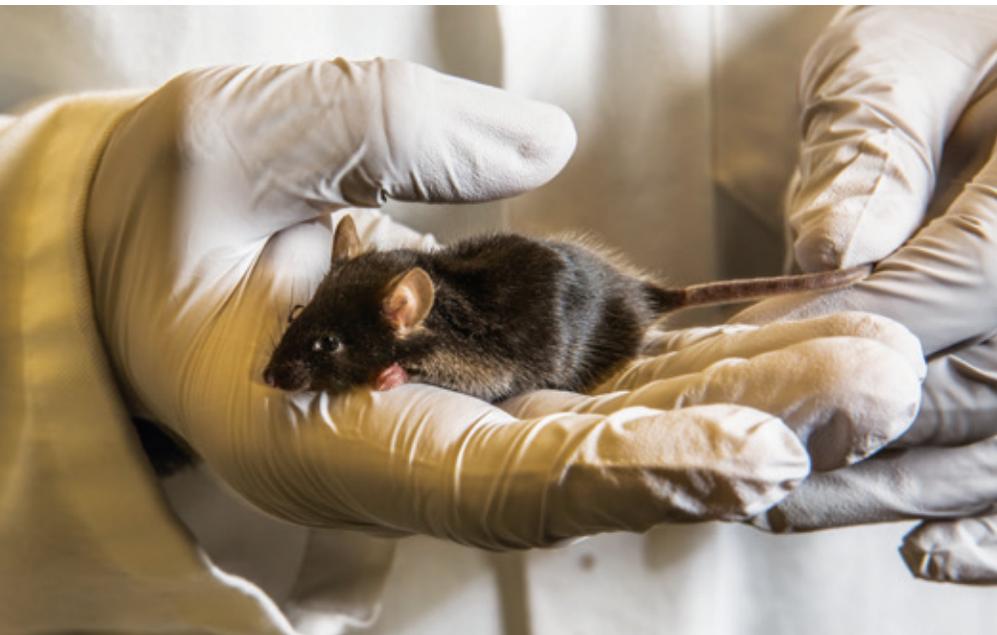
Enter Kit Lam, who chairs the UC Davis Department of Biochemistry and Molecular Medicine, and is a co-leader of the cancer center's Cancer Therapeutics program. He also recognized the EyePod's potential to track cancer development. Long-running observations and cellular-resolution images could provide step-by-step insights into the devious ways tumors grow and ultimately lead to development of new and better therapies.

"The eye is a natural window that we can peek through and see over time: every hour, every day, every week, every month, even over years," says Lam. "Through implanting tumor cells behind the retina of mouse eyes, we can understand how tumors develop, metastasize, form blood vessels and alter their microenvironment. If we treat the mouse with an anti-angiogenesis drug, we can see what happens to the blood vessels and the tumor. If we treat the mouse with immunotherapy, we can see how the host's immune cells interact with the tumor before and after treatment."

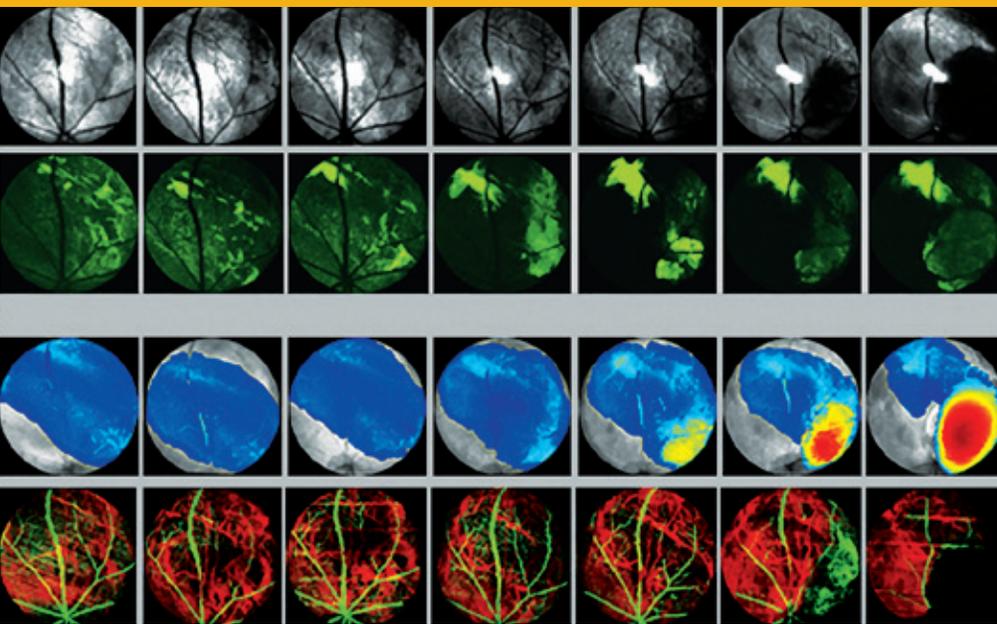
## Developing new treatments

The EyePod also can help Lam perfect a technology his lab has been working on for several years — therapeutic nanoparticles.

One of the problems with chemotherapy is that it's systemic.



**This approach is completely non-invasive — it simply uses the mouse eye's natural optics as a lens to see into the retina, which is a huge advantage.**



These images show **glioblastoma cells growing under the retina of a mouse eye using two different kinds of optical scanning technologies**. The first and second rows show reflected and fluorescent light. In the third row tumor thickness is color coded, with red representing the greatest thickness. The fourth row images blood vessels, with green showing the anterior retinal vessels and the red the posterior choroidal vessels.

Chemo hits tissues throughout the body, both healthy and malignant.

However, Lam's nanoparticles, which are 20 to 50 nanometers (one billionth of a meter) in diameter, can bring chemotherapy straight to the cancer. Because tumors often have leaky blood vessels, these nanoparticles are preferentially released inside them. Lam's group also can attach peptides (pieces of proteins) that home in on specific proteins on the surface of the cancer cell.

Encased in these nanoparticles,

treatments like doxorubicin pose little threat to normal tissue. But once they hit the tumor, the particles release their therapeutic payload, becoming anti-cancer smart bombs.

"The nanoparticle is a way to encapsulate this toxic drug and deliver it to the tumor site so the tumor gets more of the drug than does the normal tissue," says Lam. "There will be less toxicity and more drug going to the tumor."

With these nanoparticles, oncologists could deliver higher

chemotherapy doses, which could increase treatment effectiveness. In addition, lowering toxicity could help patients who have trouble tolerating chemotherapy. When side effects become too harsh, these patients often must suspend therapy for a while to recover. Nanoparticles might provide more consistent treatment.

But developing this high-tech delivery system has been tricky. Researchers lacked important details about how nanoparticles function inside tumors. The EyePod gives Lam's team the ability to actually watch these nanoparticles at work and find ways to improve them.

"By implanting tumor cells in the back of the eye, we can follow tumor formation and, more importantly, we can use the instrument to see how the nanoparticles distribute within the tumor in real time and how the tumor responds to treatment," says Lam.

### National significance

Combining the EyePod's imaging abilities with nanoparticles has generated a lot of excitement. Last year the National Cancer Institute approved a five-year, \$3 million grant to advance the project.

The team already has begun studying two of the most deadly forms of cancer: glioblastoma and non-small cell lung cancer. The hope is that new information from this research will improve patient care.

"This is a very fruitful collaboration — two different disciplines coming together to solve important problems," says Lam. "With this technology, we are no longer shooting in the dark; we can see what's really happening."

## Mathew Evans

### Grateful cancer survivor seeks to create endowed chair in Department of Urology

Gratitude is one of the many gifts that come to cancer survivors once they've journeyed through treatment back to good health.

Sacramento attorney Mathew Evans knows a thing or two about that, having survived bladder cancer diagnosed more than two years ago to return to a full life complete with family, work, golf, skiing — and service to others going through cancer. Evans and his wife, Carol, want to show their gratitude to UC Davis Health System, where Mathew was treated, by launching a drive for an endowed research

chair in the Department of Urology with a \$100,000 gift.

"I came through it all because of the commitment at UC Davis Health System," says Evans. "UC Davis has some of the finest, internationally recognized doctors you can ever hope to attract to Sacramento. We have this center of excellence right in our community."

Evans attributes his survival to leading-edge care at the UC Davis

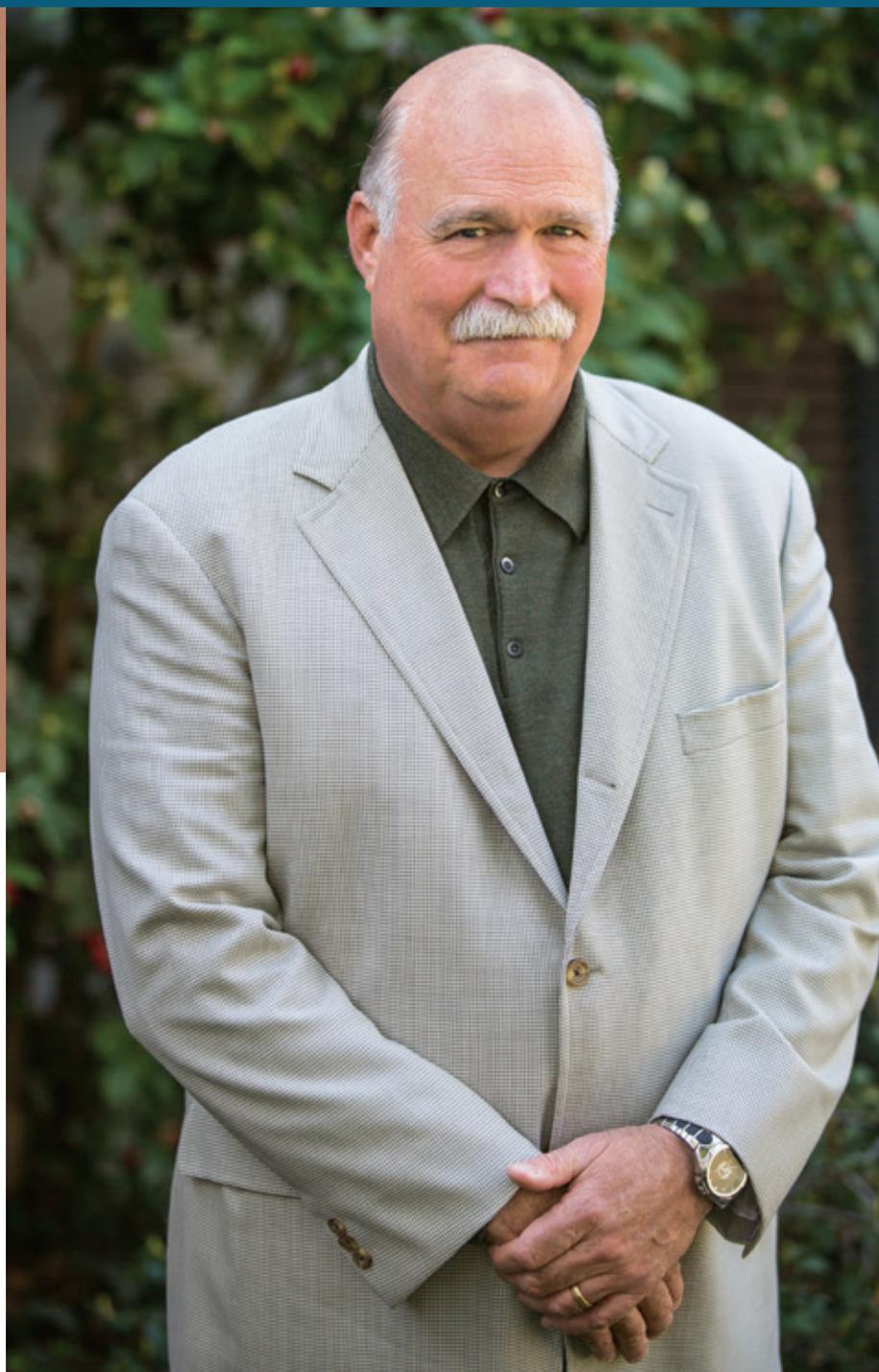
Comprehensive Cancer Center and the UC Davis Department of Urology. Christopher Evans, professor and chair of the Department of Urology and co-leader of the cancer center's Prostate-Urothelial Cancer Program, was part of the team of physicians, including Chong-Xian Pan, a genitourinary oncologist, who treated Mathew Evans. (Dr. Evans and Mathew Evans are not related).

Mathew Evans' care started with a course of chemotherapy to eradicate potential microscopic cancer cells that might have spread. He later had his bladder removed and replaced with a "neo-bladder" or new bladder made from small intestine that functions as a bladder. He enrolled in a surgical clinical trial and was

Dr. Evans says the chair **will go a long way** toward bolstering Department of Urology research, **hopefully resulting in more treatments moving to clinical trials.**



Mathew Evans says **the endowment will not only fund research but outreach and education** — things he believes are critical to increasing awareness of bladder cancer.



randomized to removal of an extended number of lymph nodes. He is now believed to be cancer-free and has few side effects.

“I don’t know how they put men on the moon or how they made my bladder, but they did both,” he says. “I came out of this surgery, and I function 100 percent. I feel blessed.”

Evans is showing his gratitude by working with other men going through bladder cancer, and also by working to create the endowed chair. With his \$100,000 gift as seed money, Evans and his wife hope to bring in more donations to build a \$1.5 million endowment.

Dr. Evans says the chair will go a long way toward bolstering Department of Urology research, hopefully resulting in more treatments moving to clinical trials.

“We do a lot of bench-to-bedside research,” says Dr. Evans, adding that researchers are working to discern new cancer treatment targets and then working to elucidate the molecular pathways to those targets.

“Mathew Evans has been a real

champion for our cause,” Dr. Evans adds. “He appreciates what the urology department brings to the research... he’s a grateful patient.”

Mathew Evans says the endowment will not only fund research but outreach and education — things he believes are critical to increasing bladder cancer awareness.

“During this journey, my wife and I became very cognizant of the

fact that men don’t realize this disease exists,” he says.

Over the next few years, Evans plans to actively fundraise for the endowed chair. In many ways, it will be a labor of gratitude.

“I tell friends that I walked up to the edge and looked in — I was that close,” he says. “I really don’t know why I am here now, but I am here for something positive, and this gift is part of that.”

## “Resilience” resounds

Dancers raise awareness and funds for cancer center

Learn to bend, and you’ll be less likely to break.

Enter the flow, and you may just float through and survive the most treacherous waters.

That’s the mindset behind resilience — the notion that flexibility yields strength and endurance, even in the face of extreme adversity.

Local choreographer Jacob Montoya is in awe of the power of resilience, having watched his grandmother and uncle tap deeply into the human resource as they

### The performance

**generated \$12,000 for UC Davis Comprehensive Cancer Center programs.**

both grappled with cancer. Last year Montoya, who is nationally recognized for his choreography, created a dance production titled “Resilience” to honor the strength of cancer patients and their caregivers. The performance generated \$12,000 for UC Davis Comprehensive Cancer Center programs.

Montoya returns this fall with an encore performance of “Resilience,” and hopes it will again speak to those who live and work with cancer, helping them through their journeys.

“I am very artistically fulfilled in my life, but this gives me a way of giving back,” Montoya says. “I get to, in a way, assist (cancer patients and caregivers) with their mission.”

Montoya is artistic director of Hawkins Contemporary Dance



Company in Folsom. Using Kickstarter, a funding platform for creative projects, he and friends last year launched a separate philanthropic company, the Sacramento Contemporary Dance Theatre (SCDT) with his partner, UC Davis Health System employee Elio Gutierrez. The aim of the dance company is to use dance performances both as a medium to convey uplifting themes, as well as to raise funds for worthy causes.

“We are so grateful to Jacob, Elio and the Sacramento Contemporary Dance Theatre for creating an artistic way to inspire patients, families and health care providers as we collectively battle cancer and motivate others to support cancer research at UC Davis,” says Jonathan Evans, cancer center director of development.





Last year's "Resilience" was a 16-act performance that featured 36 dancers and local singer Sara Logan. The performance featured hospital procedures, waiting rooms and dancers wearing hospital gowns that they later shed. Montoya said this year's performance will likely be somewhat different, but the focus on the themes of strength and peace will remain.

"My relationship with the second show is going to be different," he says. "I want to ultimately grow with the piece, layer it emotionally."

Montoya says the dance follows "the journey of someone who has been diagnosed with cancer and the things people have to deal with." He has been talking with cancer survivors as he develops the second iteration of "Resilience."

This year, Montoya is hoping that more physicians, nurses and other medical staff see the show. He remembers a young woman in medical school who told him the



performance opened her eyes, allowing her to view her cancer patients with greater compassion, particularly a young mother she was treating.

"It provides an interesting space for doctors and nurses to experience and maybe release all of that stuff they've got pent up," he says.

For more information about SCDT visit [www.scdtheatre.org](http://www.scdtheatre.org).

"My relationship with the second show is going to be different. I want to **ultimately grow with the piece, layer it emotionally.**"

— Jacob Montoya

## Leukemia patient's unique T-shirt designs cheer kids with cancer

Despite a cancer diagnosis that turned her life upside down, UC Davis leukemia patient Kristine Tesauro says she's been staying busy making others with cancer feel better. The cheerful 21-year-old from Redding has been designing quirky T-shirts and giving them to kids fighting cancer through Catch Some Air, a new business she launched at the hospital with her sister.

"It all started as a 'stay-happy project,'" explained her sister Brianna, who has kept Kristine company since her April 2015 diagnosis, and who calls herself the "Executive Stick" of the business. When Kristine learned she had cancer, the duo decided they were going to enjoy life no matter what. They redecorated Kristine's room, watched all the episodes of *The Office*, and then decided to give their T-shirts a makeover, scribbling playful cartoonish animal designs and catchy phrases with markers.

"It was so much more fun than being glued to a TV screen," Brianna said. "We found ourselves constantly laughing out loud in the hospital over the designs and the puns we created. It was some of the best medicine."

**To spread their cheer, they gave shirts to other young people in the hospital fighting cancer, giving the first hand-drawn version of the giraffe shirt to a 16-year-old girl fighting lymphoma.**

"It made me happy to know that I could brighten up someone's day while they were going through such a hard time," Kristine said.

The sisters have been designing and selling shirts online ever since. The shirts are available in a variety of styles and colors for children and adults. In addition to the playful kid Tees, like the "Happy as a Hippo" and "Spruce Like a Moose," they offer three-quarter sleeved tops and hoodies with captions ranging from the fun and simple "Stay Happy" to the more inspirational "You were born wild, don't let them tame you."

For each T-shirt sold, they donate a portion of the payment toward a free shirt to give away to a child with cancer.

Currently selling about three shirts per day, Kristine and Brianna have distributed dozens of them to kids, with their first giveaway at UC Davis on March 4.

**"There are no words to describe how amazing these two sisters are," said Amber Svoldal, Kristine's nurse care coordinator. "In a very difficult time they have found a way to bring happiness to others, to staff and pediatric patients. They have truly impacted more lives than they know."**

For more on the Tesauro girls' remarkable story and to find out how to bring a "piece of happiness" to a child with cancer, please visit [catchsomeair.com](http://catchsomeair.com).

Below: Sisters, Kristine and Brianna Tesauro share their unique T-shirt designs. Bottom photo: Pediatric cancer patient Paislee Schumann models her new T-shirt.

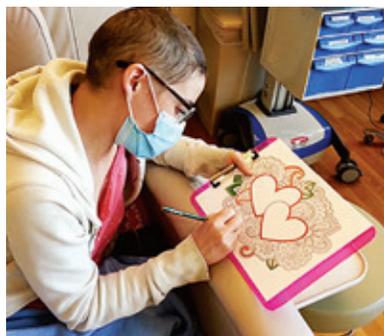


"It made me happy to know that **I could brighten up someone's day** while they were going through such a hard time."

— Kristine Tesauro

## Coloring therapy eases patient stress

The Adult Infusion Center now offers coloring to help patients manage stress during cancer treatment. In addition to movies and cards, patients can pass time coloring pages from adult coloring books that feature an assortment of pre-drawn patterns, from abstract and geometric drawings to unique nature scenes and holiday-themed designs, and provide hours of mindful, calm and creative expression.



Leukemia patient Sandy Gantt colors to take her mind off chemotherapy.

Sold by the millions, **coloring books are the latest anti-stress trend and, according to experts, help by providing a soothing distraction.**

Coloring reduces stress by activating the brain's right hemisphere, explained Kathleen Lorain, an art therapist who facilitates creative projects at UC Davis Children's Hospital to help pediatric patients, their siblings and parents cope with stress.

"When we are stressed or worried, we activate the left side of our brain, which is responsible for analytical and cognitive processes," she added. "But when we color, we switch gears and access the right side of the brain, the creative, artistic region," which quiets the left part, allows creativity to take over and blocks out worries.

Each month, the Adult Infusion Center also organizes a coloring contest for patients and families. Winning pages are selected by patients and staff, and displayed in the unit.

## National Cancer Institute re-designates the cancer center

The National Cancer Institute (NCI) in May announced that the UC Davis Comprehensive Cancer Center has been re-designated as comprehensive, meaning that it meets stringent criteria in the areas of laboratory, clinical and population-based research, professional and public education and in the dissemination of clinical and public advances to the communities it serves.

There are only 69 NCI-designated cancer centers in the United States, and just 45 of them are designated "comprehensive." UC Davis was first designated in 2002, gaining comprehensive status in 2012.

The cancer center's designation was based on an evaluation of a 1,761-page grant proposal that detailed the accomplishments within each of the center's research programs, as well as a day-long visit to the center in March by a 22-member committee of NCI officials and NCI cancer center researchers from around the country.

Cancer Center Director Ralph de Vere White, who led the cancer center's grant proposal submission and site visit, said the NCI's stamp of approval not only brings with it important grant funding to support programs and research, but confirmation that the center is truly a resource for all residents in inland Northern California.

"The NCI has certified that we have demonstrated our expertise in many disciplines that contribute to understanding, diagnosing, preventing and treating cancer," he said. "But we cannot rest on our accomplishments. Our mission is clear, to continue working to reduce mortality from advanced disease and break barriers to beat cancer in our region and beyond."

## Garcia and Riles go bald for kids with cancer

In March, patient care coordinator Venessa Garcia and Anthony Riles, a programmer with the health system's Technical Support Services, shaved their heads as part of the annual St. Baldrick's Foundation fundraiser hosted by Keaton Raphael Memorial (KRM) at de Vere's Irish Pub in midtown Sacramento. Together, they also raised nearly \$2,000 for childhood cancer research.

Garcia, who has been touched by cancer in her own family, said she is especially moved when she meets children who have cancer. She wears a button that says "Every three minutes count," which refers to the frequency of childhood cancer diagnoses in the United States.

"Research will help us find cures and also improve treatments so that these children can lead full lives," Garcia said.

The St. Baldrick's Foundation events in the Sacramento region are hosted by KRM, which has given more than \$1.4 million to the cancer center over the last several years.

To learn more about the St. Baldrick's Foundation and KRM, please visit [gobald.com](http://gobald.com) and [childcancer.org](http://childcancer.org).



Anthony Riles



Venessa Garcia

## Albeck awarded Innovative Research Grant

Funding will help advance understanding of breast cancer cell growth to combat drug resistance

UC Davis molecular biologist John Albeck has been chosen among 10 recipients to receive a 2016 Innovative Research Grant (IRG) from Stand Up to Cancer (SU2C), a non-profit that supports innovative, high-risk, high-reward projects to accelerate the pace of cancer research and give patients access to new therapies as quickly as possible.

The organization made the announcement April 18 at the 2016 Annual Meeting of the American Association for Cancer Research (AACR), SU2C's scientific partner and the world's largest professional organization dedicated to advancing cancer research. Each scientist will receive \$750,000 over three years.

Beginning July 1, the grant will fund Albeck's project, titled "Targeting cellular plasticity in individual basal-type breast cancer cells," a study of breast cancer cell growth toward finding better ways to defeat metastases and drug-resistance. **Using novel imaging technology developed in his lab, Albeck and his colleagues will examine the fundamental internal processes of cancer cell plasticity, a malignant cell's ability to adapt to foreign environments when they spread to different organs.**

"We hope a better understanding of the adaptive properties of cancer cells will help us find better ways to use existing cancer therapies," said Albeck. "We hope our findings will show us which drug combinations will be most effective against an evolving population of cancer cells and will ultimately lead to more effective treatments for patients."



## Targeted hepatitis B virus screening effective

**A community-based hepatitis B virus screening effort led by UC Davis researchers found that targeted outreach to Asian American populations can identify groups at high risk for infection and direct them to appropriate follow-up care to help prevent the onset of liver diseases, including cancer.**

The research, published in *Public Health Reports* involved screening 1,004 Asian American adults in Sacramento County at 28 different events over a one-year period. An outreach team from the UC Davis Comprehensive Cancer Center worked with Asian American community organizations and the UC Davis student-run clinics to promote and co-sponsor hepatitis B screening events.

"We realized that a one-size-fits-all approach would not work because each ethnic group faced different barriers when



it came to screening," said lead author Julie Dang, director of community engagement and outreach at the cancer center. "So we created different campaigns to target each of the communities and came up with the best screening plan for the individual populations."

Screenings were held at churches and community centers in the neighborhoods where the populations are concentrated, and interpreters were on hand at each event to facilitate communication with each person getting screened, Dang said.

Nearly all of those screened were born outside of the United States. Among them, 76 (or 7.6 percent) tested positive for the infection, including 31 Hmong, 23 Vietnamese, 17 Chinese, two Koreans and three from other Asian communities.

The researchers were not able to determine whether every positive individual received appropriate follow-up care; however, 67 percent of those screened and found to have chronic hepatitis B infection received follow-up counseling. Those who tested negative but considered susceptible to the virus (220 individuals) were counseled to get an HBV vaccination through their primary care provider or through the free hepatitis B vaccine program sponsored by UC Davis Health System.

Globally, hepatitis B virus infection is the primary cause of cancer after tobacco use and, if untreated, an estimated 15 percent to 25 percent of those infected will die from a related condition. Among U.S. populations, Asian Americans/Pacific Islanders have the highest rate of liver cancer (up to 7.2 times higher than non-Hispanic whites).

The researchers have launched another two-year effort to screen an additional 2,000 Asian Americans for the hepatitis B infection. The second study also involves screening patients seen at UC Davis Health System, employs navigators for patients who test positive and follows up with patients six months after their first visit.

## Common fish oil could enhance kidney cancer treatment

Researchers at UC Davis have shown that docosahexaenoic acid (DHA), a fatty acid commonly found in fish and fish oil supplements, reduces renal cell carcinoma invasiveness, growth rate, and blood vessel growth when combined with the anti-cancer therapy regorafenib. The study was published in the May issue of the journal *Molecular Cancer Therapeutics*.

“Most renal cell carcinomas learn to escape therapy after a couple of years,” said Robert Weiss, professor of medicine at UC Davis, chief of nephrology at Sacramento VA Medical Center, and head of the kidney cancer working group at the UC Davis Comprehensive Cancer Center. “A simple additive, which is completely nontoxic, could have a positive effect on disease, even rescuing regorafenib and similar therapies from resistance.”

Regorafenib is one of a new generation of anti-cancer therapies that attack tyrosine kinases – enzymes that activate other proteins. Unfortunately, kidney cancers mutate to resist these therapies.

To see whether DHA complemented regorafenib, researchers tested the combination against both cancer cell lines and human tumors in mice. They found that combining these compounds killed kidney cancer cells in both models.

In particular, the combination reduced tumor growth and angiogenesis, the process by which tumors recruit blood vessels to feed their expansion. Specifically, these agents targeted the MAP/ERK kinase, which contributes to tumor growth, and the VEGFR protein, which controls blood vessel development.

Though the results are encouraging, Weiss cautions that there’s no proof that taking fish oil supplements or eating fish like salmon would have any impact against kidney cancer on their own. But he said the findings highlight a relatively simple way patients with advanced kidney cancer could increase the effectiveness of their treatment. The next step will be to combine regorafenib and fish oil in patients.

## Radiation improves survival in older patients with soft tissue sarcomas

**UC Davis researchers have shown that radiation therapy following surgery benefits older patients more than their younger counterparts, a surprising finding that could change the way some patients are treated for soft tissue sarcomas (STS).**

The study, published in the journal *Anticancer Research*, used data from the Surveillance, Epidemiology, and End Results (SEER) program to assess whether radiation treatments after surgery improved disease-specific and overall survival in patients with non-metastatic sarcomas.

They found that radiation did increase survival compared to surgery alone, but the improvements mostly benefited patients 65 and older. This is the first time these outcomes have been analyzed on such a granular level, factoring in both age and cancer subtype.

“We found that older patients had a survival benefit with radiation, but in younger patients, many of those benefits went away,” said Robert Canter, associate professor in the Department of Surgery and principal investigator on the paper. “It seems that older patients respond better to the combination of surgery and radiation.”



There are more than 50 different types of soft-tissue sarcomas, which develop in muscles, fat and other cell types. While these conditions are generally treated surgically, it was not clear whether radiation therapy after surgery improved survival.

To clarify the issue, Canter and colleagues crunched data from SEER, which has gathered detailed cancer statistics since the 1970s. Analyzing data collected between 1990 and 2011, the team identified 15,380 non-pediatric patients with non-metastatic STS who were treated with surgery alone or with surgery and radiation.

The group pulled national data collected from about 15,380 patients, looking at the tumor site, grade, size, cancer subtype and year of diagnosis, as well as the patient’s age, gender and other demographic information. They found significant improvements in overall survival and disease-specific survival in older patients across the majority of sarcomas. Younger patients benefited much less from radiation.

“We sometimes don’t want to treat older people with radiation because we’re worried about the side effects,” said Canter. “However, these results indicate these patients should really be receiving it if they are candidates.”

## McPherson named cancer center associate director



**John D. McPherson, whose work contributed significantly to the sequencing of the human genome, has assumed the role of deputy director and associate director, basic science at the UC Davis Comprehensive Cancer Center and holds the Auburn Community Cancer Endowed Chair in Basic Science.**

McPherson replaces Hsing-Jien Kung, who retired three years ago to become president of the National Health Research Institutes in Taiwan, an organization similar in function to the National Institutes of Health in the United States.

McPherson leads the cancer center's growing human genomics research efforts with an eye toward improving access to precision medicines that target specific gene mutations responsible for tumor growth.

He joined UC Davis after eight years at the Ontario Institute for Cancer Research (OICR) as director of genome technologies. He also held appointments as professor in the departments of Medical Biophysics, and Laboratory Medicine and Pathobiology at the University of Toronto. He holds a doctorate in biochemistry from the Queen's University at Kingston in Ontario, and completed postdoctoral fellowships at UC Irvine in the departments of Biological Chemistry and Pediatrics.

Born in Edmonton, Canada, McPherson enjoyed a 20-year career in the United States before returning to Canada to work for OICR in 2007. He co-directed the National Human Genome Research Center at UC Irvine, and from 1999 to 2003 co-directed the Genomic Sequencing Center at Washington University School of Medicine in St. Louis, Mo. He later held an associate professorship at Baylor College of Medicine in the Department of Molecular and Human Genetics.

McPherson is noted for several major genomics advances, all of which have added to the identification of genes and genetic mutations and their roles in uncontrolled tumor growth. While at UC Irvine, he constructed a physical map of human chromosome 5 in preparation for complete human genome sequencing and work identifying the gene responsible for spinal muscular atrophy. During his Washington University tenure, he played a significant role in the Human Genome Project, pioneering large-scale mapping and sequencing technologies. He also was lead author on the human genome physical map. At Baylor, he established a high-throughput resequencing pipeline with a peak capacity of one million sequences per month of amplified genome targets. The work laid the groundwork for further large-scale efforts using these technologies to unravel the cancer genome.

## Kelly named chair of SWOG Lung Committee

**Karen Kelly, associate director for clinical research at the UC Davis Comprehensive Cancer Center, has been named chair of the Lung Committee of SWOG** (formerly the Southwest Oncology Group), one of the nation's leading cooperative cancer research organizations.

A lung cancer specialist, Kelly oversees the design and implementation of multidisciplinary clinical trials of new lung cancer treatments, including targeted therapies, immunotherapy and cancer biomarkers involving thousands of patients nationwide.

Kelly, a SWOG member since 1992, took the reins of the SWOG committee from another UC Davis faculty member, David Gandara, professor of hematology and oncology. Gandara is the longest running leader at SWOG, having chaired the SWOG Lung Committee for 17 years before announcing in September that he will be stepping down.

Kelly is a fellow of the American Society of Clinical Oncology and holds the Jennifer Rene Harmon Tegley and Elizabeth Erica Harmon Endowed Chair in Cancer Clinical Research at UC Davis.



**Synthesis is published twice each year by the UC Davis Comprehensive Cancer Center.**

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### Ralph de Vere White

Director, UC Davis  
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### EDITOR

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### GRAPHIC DESIGN

**Page Design Group**

### PHOTOGRAPHERS

**Robert Durell  
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### WRITERS

**Dorsey Griffith  
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Pamela Martineau  
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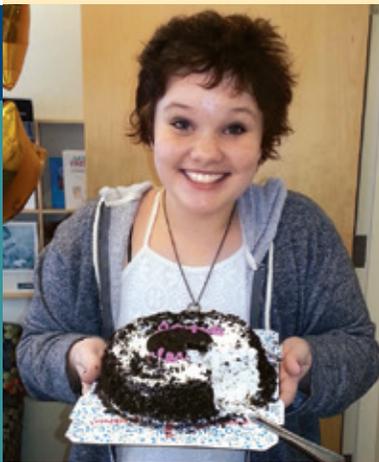
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Actress, singer, dancer, you name it! The ultra-talented Clarity Bortz celebrated completion of her lymphoma treatment in February with an Oreo dessert courtesy of Keaton Raphael Memorial Foundation. Known for her contagious smile and boundless optimism, the vivacious 13-year-old is anxious to get back on stage.

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Synthesis

**Synthesis**—the art of bringing together distinct elements in a way that makes them whole — is a particularly relevant name for the magazine of UC Davis Comprehensive Cancer Center, which is distinct in its commitment to team science. Our research program unites clinical physicians, laboratory scientists, population specialists and public-health experts from throughout UC Davis and Lawrence Livermore National Laboratory with the goals of making cancer discoveries and delivering these advances to patients as quickly as possible. We are also dedicated to sharing our expertise throughout the region, eliminating cancer disparities and ensuring all Californians have access to high-quality cancer care. *Synthesis*—linking the best in cancer science toward the united goal of improving lives — is the name of our magazine, and our promise as your National Cancer Institute-designated comprehensive cancer center.