

SYNTHESIS

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Dear Reader,



This issue of *Synthesis* brings hope — for patients, clinicians and researchers alike — as UC Davis Comprehensive Cancer Center continues to advance groundbreaking therapies that offer people with cancer a new lease on life when standard treatments fail them.

Molecularly targeted medicines as well as immunotherapy that taps the body's own cancer-fighting responses are giving patients back what they thought would be impossible: a reasonably normal life.

However, we have a responsibility to ensure that everyone has an equal opportunity to access such innovative care.

It starts with a commitment to ensure that the cancer burden does not weigh more heavily on certain populations than on others. As we innovate in cancer care through research, we need to drive a culture change that rectifies disparities in cancer screening, diagnosis, treatment, and outcomes.

In this issue of *Synthesis*, you will learn about our inaugural Center for Advancing Cancer Health Equity and our new chief diversity officer, who oversees programs to optimize health equity and patient access throughout the very large and diverse catchment area we serve. As an example of how we are equalizing cancer care, our new program to deploy “promotors” in underrepresented neighborhoods is helping women gain access to breast cancer screenings and treatment. We are also finding new opportunities to create bidirectional conversations with the community to allow cancer researchers an opportunity to get feedback from many other stakeholders.

We also have exciting news to share in this issue about UC Davis Comprehensive Cancer Center becoming the first in the region to develop genetically modified cancer-fighting cells that are manufactured on-site. Read about the first patient to receive these highly innovative engineered CAR T cells that are trained to find and destroy cancer cells.

We're also first in the region to launch a targeted liver cancer treatment program in which a pump is implanted under the skin to directly destroy tumors. We are excited to report that the first patient to undergo the procedure has been declared cancer free.

Read about what we're doing to treat advanced malignant melanoma and gain inspiration from one woman's determination to prevent a recurrence of this otherwise deadly skin cancer.

Kids with cancer might seem to possess superpowers as they get through it all — but we know the realities of what it is truly like, and our new pediatric patient and family navigator is busy helping young patients and their parents navigate the twists and turns of treatment. Support from generous donors have made this navigation program possible.

You will also learn in this issue the many ways in which our researchers are studying the unique psychological impacts of cancer treatment on adolescents and young adults, and what we can do to help this age group.

Finally, get ready to be motivated by one young cancer patient, hospitalized during his early childhood and again as a teenager, as he invites you to join him in creating hope for a future that will be less traumatic on other young cancer patients.

We hope you enjoy this issue of *Synthesis*, and we thank you for your dedication and continued support for the important work being done here. Your support not only sustains our mission but also accelerates the impact we are making in the lives of people with cancer — or at risk of developing cancer — in our region and beyond.

Primo “Lucky” Lara Jr., M.D.

DIRECTOR, UC DAVIS COMPREHENSIVE CANCER CENTER

BREAKING BARRIERS TO BEAT CANCER™

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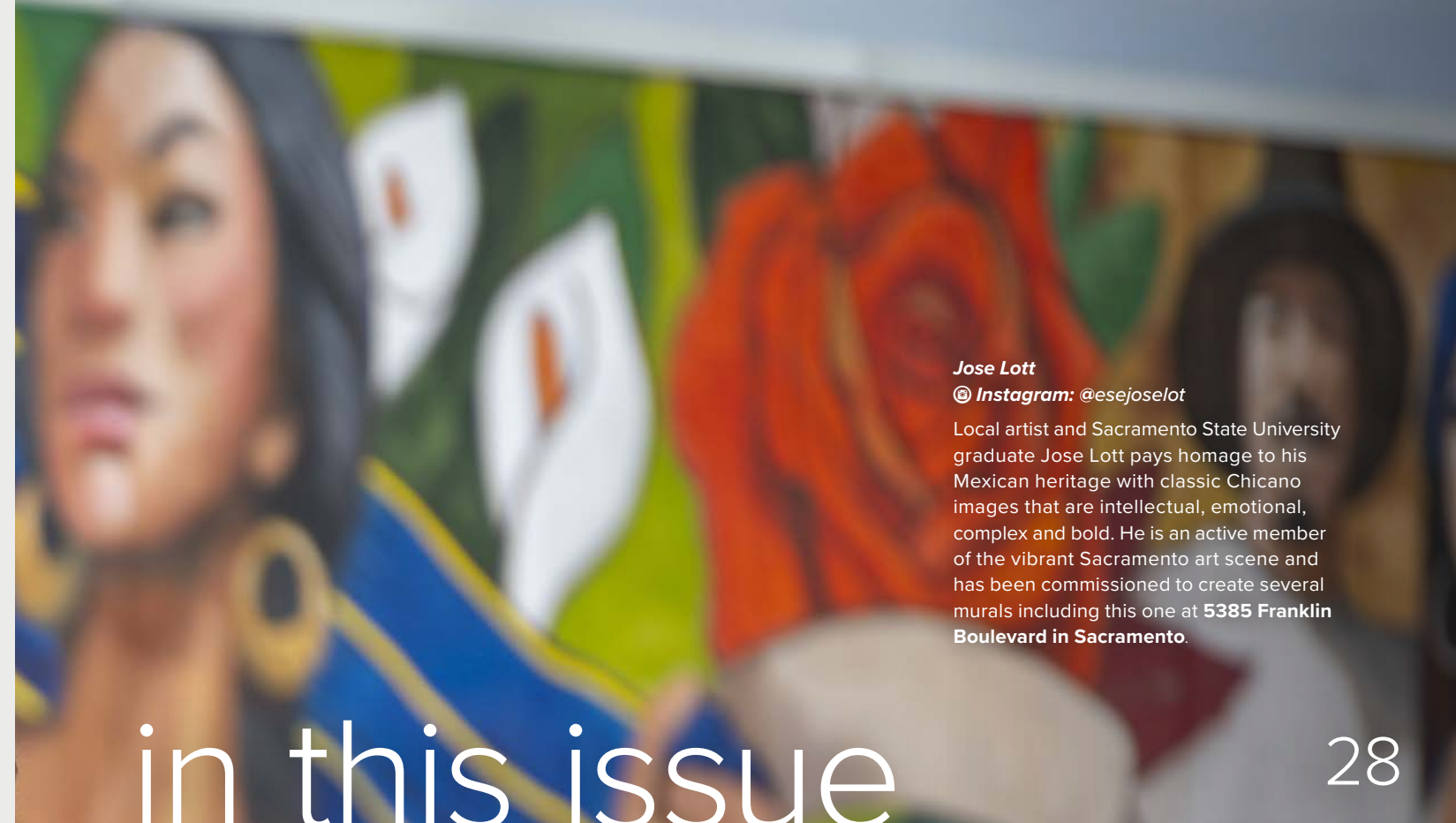
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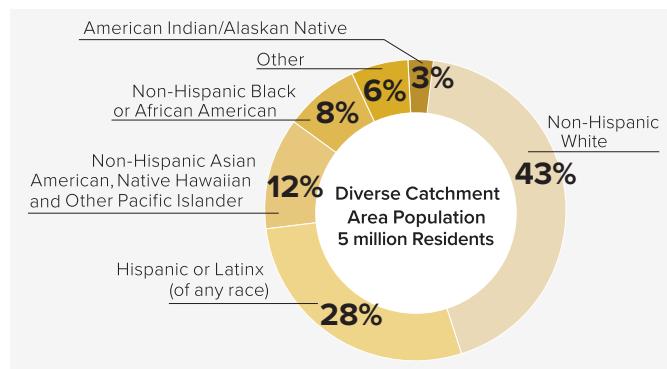
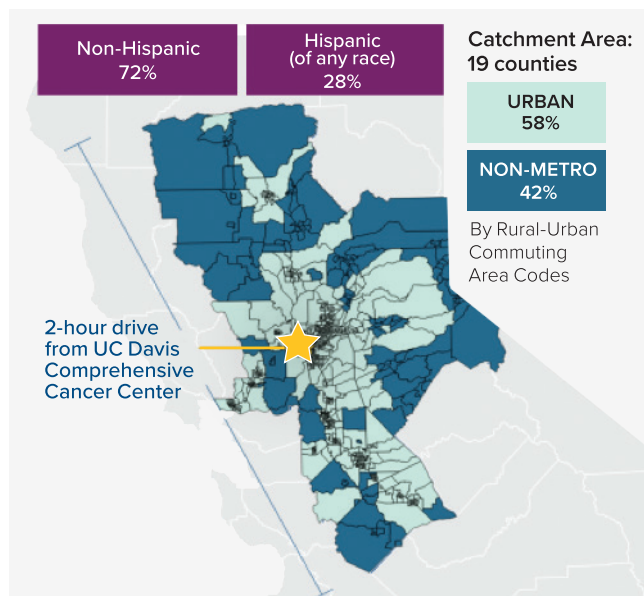
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Understanding the communities and people we serve

The geographical area served by a cancer center designated “comprehensive” by the National Cancer Institute (NCI) is referred to as its “catchment area.” The UC Davis Comprehensive Cancer Center has one of the largest and most ethnically diverse catchment areas in the country. The cultural makeup of the catchment area is a critical element of the mission of the cancer center and is fundamentally important in maintaining its “comprehensive” cancer center status.



Defining features of the UC Davis Comprehensive Cancer Center catchment area include:

- Minority-majority population — percentage of Asian American and Pacific Islanders (API) is twice the national catchment area average
- 37% speak a language other than English at home
- 30% of the people are Latino; 14% Asian and Pacific Islanders; 8% African American; and 3% Native American
- Geographically, 42% of area is non-metropolitan and makes up 28% of the state’s farmland
- 16% of residents live below the federal poverty level
- Higher mortality than the U.S. overall in prostate, breast, ovarian, liver and bile, colon and rectal cancers
- Compared to the 2010 Census, the percent of those ages 65 and older increased by 51%



Center for Advancing Cancer Health Equity

Cancer health outcomes are not equal across populations. Rural residents and communities of color face numerous challenges that nearly always increase their cancer burden. Cancer health disparities are the differences in cancer incidence and outcomes among population groups and are driven by social determinants.

Examples of social determinants

- Socioeconomic/education/income level
- English language fluency/culture
- Access to adequate, affordable health care
- Availability of fresh produce and other healthy food
- Lifestyle behaviors
- Genetic susceptibility
- Surrounding environment (i.e., exposure to pollution or pesticides)



Luis Carvajal-Carmona, UC Davis Comprehensive Cancer Center chief diversity officer and founding director of the Center for Advancing Cancer Health Equity

To address cancer disparities, UC Davis Comprehensive Cancer Center is launching the Center for Advancing Cancer Health Equity, which will conduct community-engaged research and interventions using multi-level approaches.

The new center will build on the progress made to date in reducing health disparities, particularly through the cancer center’s population sciences and health disparities research programs along with the Office of Community Outreach and Engagement.

“The ultimate goal is to achieve cancer health equity within the entire catchment area,” said Luis Carvajal-Carmona, founding director of the new center. “The concerted efforts of the Center for Advancing Cancer Health Equity will not only contribute to improved health outcomes in our underserved populations but will also result in a body of work that will influence cancer-related policy decisions at the county, state and national levels.”

“We need to continue to address the root causes of cancer health disparities,” said UC Davis Comprehensive Cancer Center Director Primo “Lucky” Lara, Jr. “Avoiding or surviving cancer should not depend on your zip code and that’s why we have established the Center for Advancing Cancer Health Equity, because everyone deserves an equal chance at a healthy life.”

The new center will also make important contributions to diversity, equity and inclusive excellence by promoting and supporting the careers of women, people of color, and those from other underrepresented groups at UC Davis.

“We cannot achieve health equity if our clinicians, scientists, staff and trainees do not reflect the racial/ethnic and socioeconomic background of the patients and communities we serve,” said Carvajal-Carmona, who was also recently appointed as the cancer center’s chief diversity officer and who will oversee our new Office of Diversity, Equity and Inclusion.

Engaging the community to advance the mission

“Our Community Advisory Board (CAB) members inform us on issues of interest to the broader community with a special focus on access to high-quality health care. They are dedicated community activists and valued volunteer leaders. Members are drawn from throughout the region to reflect the needs and concerns of various ethnic, economic and cultural groups within our catchment area.”

—JULIE DANG, COE EXECUTIVE DIRECTOR



Chester Austin is the medical director for Northern Valley Indian Health, with clinics in Chico, Red Bluff (dental only), Willows and Woodland. His prior work experience includes serving as medical director of a federally qualified health center and as a physician in a rural health clinic. Austin has focused his career on care and leadership for underserved patients in rural communities.



Shauntay Davis is the program director of California’s Comprehensive Cancer Control program and also administers the state cancer coalition California Dialogue on Cancer. She has 12 years of professional experience in cancer prevention and control.



Kathy A. Dunn was a registered nurse for 10 years, working in the ICU and with newly diagnosed cancer patients. She retired after 25 years with Genentech, where she focused on disease state and product training for nurses in the community, as well as assisting physicians with investigator-initiated trials to phase IV study development and implementation.

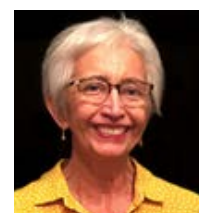
Office of Community Outreach and Engagement

The cancer center’s Office of Community Outreach and Engagement (COE) envisions a future free of disparities in cancer outcomes for all. Working in partnership with diverse stakeholders, COE personnel seek to understand and address the cancer burden among diverse populations in inland Northern and Central California through community-engaged research, shared decision-making and mutual learning.

Moon Chen Jr., the cancer center’s associate director for COE, said, “Our role is to foster bidirectionality and harness

the research assets of the cancer center to mitigate the cancer burden among the populations and communities in our catchment area and beyond.”

The office functions with an active Community Advisory Board (CAB), composed of representatives reflecting the racial and ethnic demographics of the populations throughout the catchment area. The CAB helps inform the cancer center about the community’s perspectives regarding cancer priorities.



Lupe Gonzales, a breast cancer survivor and a former participant in a cancer clinical trial, is a retiree with a history of working for nonprofit agencies and state departments with a focus on improving the lives of individuals and communities. Bilingual in English and Spanish, she helps recruit others to participate in cancer clinical trials in Sacramento County.



Debra Oto-Kent is the founder and executive director of the Health Education Council, a nonprofit organization committed to promoting health and preventing chronic disease in underserved communities. For over 25 years since its founding in 1991, the Health Education Council has worked at the forefront of cross-sector collaboration to create innovative, model programs that intersect community well-being and chronic disease prevention.



Jose R. Rodriguez is the president and CEO of El Concilio, which is the largest Latino community-based nonprofit agency in the Central Valley. El Concilio helps people create better futures for themselves and their families, become leaders for the community, and in turn empower others.



Cindy Snelgrove is the chief clinical services officer for Ampla Health, which is a network of 14 community-based federally qualified health centers offering comprehensive medical, mental health, and specialty health care services, plus six dental facilities, in Butte, Colusa, Glenn, Sutter, Tehama and Yuba counties. She is responsible for implementation, delivery coordination, and supervision of clinical and programmatic services.



Tsia Xiong is the chapter director of API Leadership of Faith in the Valley, a faith-based grassroots community organization affiliated with PICO California, a faith-based community organizing network. Xiong is based in the Merced chapter of Faith in the Valley, which is focused on access to good jobs, clean air, clean water, alternatives to incarceration, quality healthcare and safe neighborhoods.



Jo Ann Yee is the co-founder of the Francis Yee Fund for Cancer Health Disparities Research. She retired from the Sacramento City Unified School District after having taught approximately 5,500 students over the course of her career.



Marshall joins UC Davis Cancer Care Network



Marshall Medical Center and UC Davis Health have announced an affiliation for cancer services that allows Marshall patients access to the renowned UC Davis Comprehensive Cancer Center through the UC Davis Cancer Care Network. The National Cancer Institute recently renewed the prestigious “comprehensive” designation of the cancer center, recognizing it as one of the top 51 cancer centers in the country.

The affiliation will offer Marshall patients leading-edge cancer care without leaving the western slope of El Dorado County. The collaborative cancer services will be based in Cameron Park and known as “Marshall Cancer Center, a UC Davis Health Affiliate.”

Siri Nelson, CEO of Marshall Medical Center, said, “It’s exciting to expand and elevate cancer services in a way that will also preserve our standing as a nonprofit, independent hospital. Under the agreement, our cancer center will stay under the Marshall umbrella, with the hospital retaining ownership, licensure and clinical oversight for patient care.”

Nelson added, “Marshall’s vision is: We are a cohesive healthcare team that partners in delivering exceptional quality, access and value in all we do. Launching these services with UC Davis Health is aligned with our vision and helps us to expand exceptional cancer care to more residents of El Dorado County.”

“We are pleased to welcome Marshall Medical Center into the UC Davis Cancer Care Network,” said UC Davis Health CEO David Lubarsky. “Our goal is to improve cancer care in community hospitals so that patients can access top-notch cancer care. This alliance brings El Dorado County residents the latest discoveries in cancer care without having to leave the convenience of their local hospital,” Lubarsky said.

The new alliance is a “transformative partnership,” in the view of UC Davis Comprehensive Cancer Center Director Primo “Lucky” Lara Jr.

“Through the affiliation, Marshall patients will be able to obtain access to the latest cancer clinical trials,” Lara said.

Inclusion in the UC Davis Cancer Care Network allows Marshall oncolo-

gists to work directly with UC Davis Comprehensive Cancer Center oncologists to ensure that the latest diagnostic and treatment options are available to their patients.

“Cancer cases at Marshall will be discussed during our virtual tumor board meetings that bring together our top oncologists, pathologists, surgeons and other cancer experts,” said UC Davis Comprehensive Cancer Center Physician-in Chief Richard Bold.

Marshall’s providers and clinicians will have access to continuing medical education opportunities at UC Davis Health. University medical residents and fellows correspondingly will be able to participate in clinical rotations with instructors at the Marshall Cancer Center.

UC Davis Health has similar arrangements with other community hospitals, including Gene Upshaw Memorial Tahoe Forest Cancer Center in Truckee, Adventist Health and Rideout in Marysville, Mercy Medical Center in Merced, and Barton Health in South Lake Tahoe.

New on-site Cancer Care Network coordinators increase diversity in clinical trials

UC Davis Comprehensive Cancer Center is working to increase diversity in clinical trials, by dispatching coordinators to UC Davis Cancer Care Network (CCN) sites to link patients at remote hospitals directly with clinical trials.

“This approach is one we feel will be critical to helping patients living in remote areas access clinical trials,” said new CCN Clinical Research Director Ashley Tydon. She’s already hiring staff and setting up the infrastructure for on-site clinical research participation at CCN affiliates.

“As it grows, the UC Davis Cancer Care Network is uniquely positioned to help address the lack of diversity that has historically plagued clinical

trial participation — largely limited to patients located near a comprehensive cancer center,” Tydon said.

She explained that many cancer patients living in rural areas are not inclined to participate in a clinical trial because of the often hours-long drive to a major cancer center.

“They also want to stay with the doctor they know and love,” Tydon said. “With our CCN affiliation, they can continue to be seen by their community oncologist and still participate in an array of clinical trials that could give them access to novel therapies or new approaches to health care.”



Ashley Tydon

Physicians at CCN sites will be able to select clinical trials and research studies that are best suited to their populations, whether many of their patients are farmworkers in rural settings or patients living in the high Sierra or in its foothills.



Megan Daly

MEGAN DALY APPOINTED AS INTERIM LEADER FOR CANCER CENTER CLINICAL RESEARCH

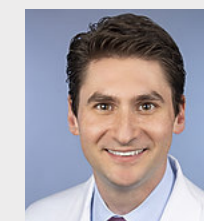
Megan Daly has been named the interim associate director for Clinical Research at UC Davis Comprehensive Cancer Center.

Daly replaces Karen L. Kelly, who announced in December she is taking on a new role as chief executive officer of the International Association for the Study of Lung Cancer.

Daly, a radiation oncologist and associate professor, joined UC Davis Comprehensive Cancer Center in 2011. Her research interests focus on the use of radiotherapy for the treatment of early-stage lung cancer, integrating radiation and immune checkpoint inhibitors in solid tumors, clinical implementation of new PET (positron emission tomography) tracers, and reducing radiation-related toxicity.

gies, and new diagnostic and therapeutic approaches to cancers found in the lung, thymus gland and esophagus, and other thoracic cancers such as mesothelioma. The program is nationally recognized for excellence in lung cancer treatment.

Riess’ clinical interests include lung cancer and other thoracic cancers (mesothelioma and thymoma). He currently serves on the Non-Small Cell Lung Cancer/Malignant Pleural Mesothelioma/Thymomas and Thymic Carcinomas Panel for the National Comprehensive Cancer Network (NCCN).



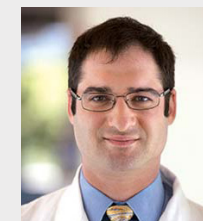
Orin Bloch

UC DAVIS BRAIN SURGEON APPOINTED TO CO-LEAD CANCER CENTER BIOMEDICAL TECHNOLOGY PROGRAM

Neurosurgical oncologist and professor Orin Bloch has been appointed as the new co-leader of UC Davis Comprehensive Cancer

Center’s Biomedical Technology Program. Bloch replaces Chief of Nuclear Medicine Ramsey Badawi, who stepped down from the role in 2021.

Bloch’s clinical practice is focused on innovative treatments for benign and malignant tumors of the brain and skull base, including metastatic disease to the brain. Bloch directs the UC Davis Brain Tumor Immunotherapy Laboratory, funded by support from the National Cancer Institute. He has been the principal investigator for multiple national clinical trials of checkpoint immunotherapy, which is a treatment that blocks proteins that stop the immune system from attacking cancer cells.



Jonathan Wesley

NEW MEDICAL DIRECTOR NAMED TO LEAD CANCER CENTER THORACIC ONCOLOGY PROGRAM

A new medical director has been appointed to oversee UC Davis Comprehensive Cancer Center’s Thoracic Oncology Program. Jonathan

Wesley Riess replaces David R. Gandara, who will soon co-direct a new center in experimental cancer therapeutics.

The Thoracic Oncology Program provides a wide array of clinical and research services. They include prevention strate-

Kent Lloyd appointed to National Institutes of Health (NIH) Council of Councils

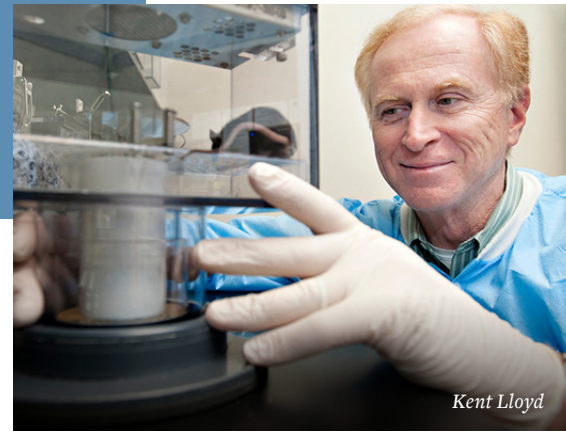
Kent Lloyd, associate director of the Comprehensive Cancer Center, director of the UC Davis Mouse Biology Program and professor in the Department of Surgery, has been appointed to serve as a member of the National Institutes of Health Council of Councils, effective in January of this year.

Appointees to the NIH Council of Councils provide professional and expert advice to NIH leadership on numerous areas of activities and policies in the Director's Office. The council is made up of 27 members, selected from the advisory councils of NIH institutes and centers, representatives nominated by the Office of the Director program offices, and broad lay representation.

Speaking about his role, Lloyd said, "I look forward to providing input on issues related to my area of expertise, including animal modeling of human disease, rigor and reproducibility in science, mouse genetics, preclinical and translational medical research, veterinary medicine, and academic teaching and training."

This will be Lloyd's second time serving as a Council of Councils member. His prior appointment spanned from 2011 to 2014.

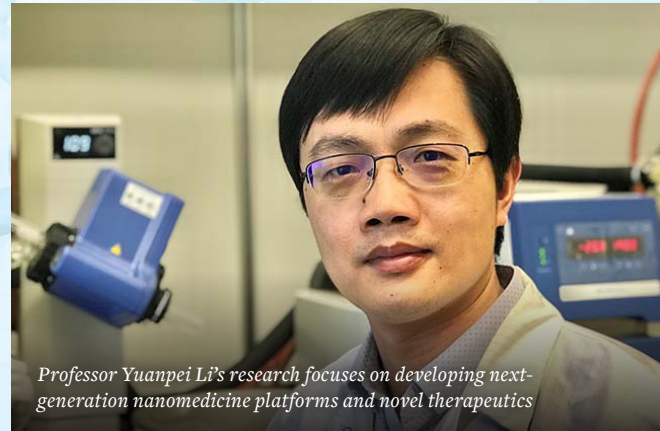
Lloyd has authored more than 180 scientific publications and serves as the principal investigator and project



Kent Lloyd

director of the Knockout Mouse Project, the Mutant Mouse Research and Resource Center, the Mouse Metabolic Phenotyping Center and the Mouse Biology Shared Resource for the NCI-designated Comprehensive Cancer Center at UC Davis. "Knockout" mice are laboratory mice bred with specific genes silenced or "knocked out." These mice have been invaluable for fundamental research on a wide range of diseases and conditions.

UC Davis nanomedicine scientist recognized as a top biomedical engineer in the U.S.



Professor Yuanpei Li's research focuses on developing next-generation nanomedicine platforms and novel therapeutics

Biochemist and molecular medicine professor Yuanpei Li has been elected to the American Institute for Medical and Biological Engineering (AIMBE) 2022 College of Fellows. The College of Fellows comprises the top 2% of medical and biological engineers in the country. They are regularly recognized for their contributions in teaching, research and innovation.

Li was nominated, reviewed and elected by peers and College of Fellows members for outstanding contributions to the development of intelligent nanomedicine platforms to improve drug delivery.

Li's research focuses on developing next-generation nanomedicine platforms and novel therapeutics by learning from nature and clinical practice. Li and his team then apply their findings to fighting diseases such as cancer.



Researchers make double the impact on cancer fight

UC Davis recently recruited two married translational researchers from the University of Virginia (UVA) as associate professors in the UC Davis Department of Medical Microbiology and Immunology. Jogender Tushir-Singh and Sanchita Bhatnagar are also members of the UC Davis Comprehensive Cancer Center.



Jogender Tushir-Singh



Sanchita Bhatnagar

Tushir-Singh and The Singh Lab conduct research using protein engineering to generate multi-targeting antibodies and conjugates (anti-cancer agents linked together) as potential cancer therapeutics. Before joining UVA, Tushir-Singh held senior and principal scientist positions at pharmaceutical company AbbVie Inc. and Boehringer-Ingelheim Pharmaceuticals. He has worked closely with clinical antibodies and antibody conjugates in drug discovery settings, bringing distinctive and rare expertise to

harvest the vast potential of protein therapeutics.

When the COVID-19 pandemic hit, Tushir-Singh began thinking of a unique antibody design that might work to limit the spread of the coronavirus. What resulted was a study involving a novel approach that interferes with a critical cell

mechanism to reduce transmission of the virus that causes COVID-19. Tushir-Singh said he is highly excited about new possibilities and collaborations, and is ready to contribute to the growth of research activities in the cancer center's Cancer Therapeutic Program.

The Bhatnagar Lab team studies epigenetic mechanisms controlling mammalian gene expression and examines how these mechanisms are deployed during development. The lab utilizes various genetic, biochemical and genomic experimental approaches. The Bhatnagar Lab has made important discoveries that have significantly contributed to the understanding of gene regulation and revealed novel strategies to treat breast cancer and childhood neurodevelopmental disabilities.

The research couple met in their native India and came to the U.S. to obtain their graduate degrees at the University of Notre Dame. Bhatnagar and Tushir-Singh have two sons, Abhay Singh (9) and Arjun Singh (15). The family enjoys traveling to new places, but often returns to their favorite destination: Disney World.

Cancer news via podcast!

The cancer center has launched Beat Cancer, a new podcast that offers an in-depth discussion of the science, research and advancements taking place at UC Davis Comprehensive Cancer Center. Learn about the latest cancer news including prevention, screening and treatment—and how we are breaking barriers to beat cancer in our community and beyond. Find Beat Cancer on cancer.ucdavis.edu or your favorite podcast platform. Want a topic covered? Email us at beatcancer@ucdavis.edu.



UC Davis becomes first in region to create cancer-fighting CAR T cells



Genetically modified cancer-fighting cells are now developed on campus as part of a new cellular therapy program



Alan Gaines

Alan Gaines did two tours in the Vietnam War as a Navy fighter pilot — so being brave isn't new to him. At 77, he was diagnosed with an aggressive blood cancer. When it failed to respond to treatment and his prognosis didn't look good, he found courage and turned to his faith, as always.

That's when UC Davis oncologist Joseph Tuscano asked if he'd like to try a clinical trial that involved removing cancer-fighting cells from his body and re-training the cells to attack his disease. Essentially, his body's own natural cancer killers, T cells, would be genetically modified to target the cancer.

Gaines' bravery turned to excitement. "I have a degree in engineering, and

I know the importance of science," Gaines said. "I told my wife, Ann, 'Let's go for it' because I thought if it doesn't work for me it will help others down the road."

Gaines had a form of lymphoma that was resistant to standard treatment and rapidly fatal without waging a formidable attack. Not only did the CAR T-cell therapy work for Gaines, but as a participant in the clinical trial, the retired commercial airline pilot became a pioneering patient — the first to receive CAR T cells genetically manufactured on-site at UC Davis Health in Sacramento. The development comes as a new study shows that CAR T-cell therapy can cure leukemia.

The CAR T-cell therapy worked

"I know how deadly this blood cancer can be, and I want to give him the best chance to be cured. Alan is our first patient to take part in what is expected to be a very successful and robust cellular therapy program."

—JOSEPH TUSCANO, UC DAVIS ONCOLOGIST



Alan and Ann Gaines getting good news from oncologist Joseph Tuscano that the CAR T cell-therapy worked.

potently for Gaines. On a follow-up visit to the UC Davis Comprehensive Cancer Center this past January, Gaines was given the remarkable news that his fast-growing type of non-Hodgkin lymphoma appears to be headed toward complete remission.

"I was so excited to be able to tell Alan and Ann that it worked," said Tuscano, interim director of the UC Davis Stem Cell and Bone Marrow Transplantation Program. "I know how deadly this blood cancer can be, and I want to give him the best chance to be cured. Alan is our first patient to take part in what is expected to be a very successful and robust cellular therapy program."

T-cell manufacturing at UC Davis

Tuscano credits UC Davis Health CEO David Lubarsky with "making the dream a reality" after nearly three years of planning for the launch of the CAR T-cell lab. UC Davis is now among only a few medical centers in California manufacturing CAR T cells on site, and the only University of California campus doing so.

"The results are early, but extremely promising," said Lubarsky. "We are starting our CAR T-cell therapy program with blood cancers, but we anticipate using this revolutionary therapy as a breakthrough treatment for many other

diseases in the not-too-distant future."

A gene manufacturing lab in the UC Davis Institute for Regenerative Cures, the Good Manufacturing Practice (GMP) facility, is where production takes place. The T cells removed from patients are transformed in the lab into super cells that target cancer with precision.

"It's like a sci-fi story," said Mehrdad Abedi, an oncologist and professor at UC Davis who is the primary investigator for this trial. "T cells have receptors that are uniquely designed to latch onto cancer cells and then kill them by injecting them with toxins. But sometimes the cancer cells dodge the T cells and that's when the cancer grows. CAR T-cell therapy is often the only hope for patients who are given little to no chance of survival."

The re-engineering of T cell receptors

Chimeric antigen receptor T-cell therapy works by modifying the receptors of the T cells so they spot specific cancers — even if the crafty cancer cells try to stay hidden. It's considered immunotherapy because it uses the body's own defenses, its immune system, to fight disease.

The U.S. Food and Drug Administration first approved CAR T-cell therapy in 2017.

Rather than contracting with a commercial lab, which returns frozen T cells that require expensive specialized shipping, CAR T cells that can be manufactured on site are key to more efficient and effective CAR T-cell therapy.

Manufacturing the T cells at UC Davis provides a fresh product that will leave the T cells more "persistent and with a better memory of how to go after cancer cells," Abedi said.

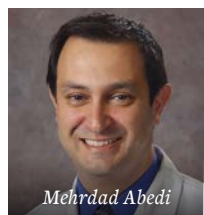
"We also think we can reduce the cost of CAR T-cell therapy by manufacturing on site," Abedi continued. "Currently, commercial products can run as high as \$500,000 per patient. By local manufacturing and removing the storage and transportation costs, we expect to get the cost down to as low as \$50,000 per patient, which makes this product more affordable, even for insurance companies."

Jan Nolta, who directs the Institute for Regenerative Cures, said, "Giving more patients equal access to CAR T-cell therapy is important because we're in the business of saving lives. Cultivating these potent cancer killers in our own lab is opening the doors to innovation. We're already looking at the cancers we want to tackle next, including ovarian, kidney and bladder cancers. As a cancer survivor myself, I am particularly passionate about CAR T-cell therapy."



From bedside to bench and back again

T cells are first removed from a patient’s blood during a process called “leukapheresis.” The patient stays seated or lying down for two to three hours during the procedure. Sent to a lab via a mobile refrigerator, the T cells are then altered by adding a gene specific to the receptor. Over the course of several weeks, these CAR T cells are grown in the lab until they number in the millions.



Mehrdad Abedi

Once they mature and amass into a lean, mean cancer-fighting machine, the CAR T cells are ready to be infused back into the patient. But first the patient goes through what’s called “lymphodepleting conditioning,” a type of chemotherapy that makes more room for the

CAR T cells to expand as they conquer and destroy cancer cells. “Our Phase I trial at UC Davis allows us to get more innovative about how we do CAR T-cell therapy. For example, because we can transform the T cells on site, we have better control over the quality of the product,” said Abedi. “We feel this is the best way to ensure the CAR T cells continue to grow, over the lifetime of the patient, providing a constant

army of re-engineered T cells ready to attack any cancer cells that show up.” In addition to providing access to all patients, the clinical trial is examining the precise dose of conditioning treatment before infusion of the cells. The goal is to determine the best way to ready the patients’ immune system for the new and improved T cells. “The CAR T cells can persist long after the patient enters remission,” said Abedi. “We think the conditioning prior to the re-infusion can improve the persistence of the cells in the body. That’s another reason why this Phase I clinical trial is so important.”

Careful monitoring required
CAR T-cell therapy is highly effective but comes with the risk of serious side effects.

As the CAR T cells multiply in the body, they can release chemicals called cytokines into the blood, which can cause the immune system to go awry. That’s why the treatment should be given only at a medical center that is specially trained in its use and why patients need to be monitored closely.

they used the time together in between follow-up visits to plan for what they want to do next in their lives. “The staff here at UC Davis is so caring and so positive,” Ann said. “We feel so confident now with Alan’s treatment behind us that we are looking ahead to hiking, biking, camping this

“Our Phase I trial at UC Davis allows us to get more innovative about how we do CAR T-cell therapy. For example, because we can transform the T cells on site, we have better control over the quality of the product.”

—MEHRDAD ABEDI, UC DAVIS ONCOLOGIST

Patients stay at the hospital for at least a week after receiving treatment. For another month after leaving the hospital, patients need to stay near the medical facility for frequent follow-up appointments.

“We took advantage of the lodging accommodations on the UC Davis campus since we live in the Sierra foothills,” Alan Gaines said.

Ann was by his side during the entire process. Married more than 50 years,

summer and a possible cross-country trip in our travel trailer to visit our children and grandchildren.”

Her husband agreed, “I feel terrific. I’m here and I feel great,” Alan said. “Fortunately, the only side effect for me was tiredness and a mild rash. Dr. Tuscano is a terrific supporter with a wonderful personality and a way of making sure we were well informed every step of the way. I’m feeling very positive about the future.”



Alan and Ann Gaines

UC Davis staff working “behind the scenes” to launch the CAR T-cell therapy program

- Naseem Esteghamat, hematologist oncologist
- Grace Chan, stem cell transplant nurse coordinator, Bone Marrow Transplant Program
- Gerhard Bauer, director of the GMP Facility
- Brian Fury, manager of manufacturing, GMP Facility
- Dane Coleal, manufacturing supervisor, GMP Facility
- Jeannine White, advanced cell therapy project manager
- Jordan Pavlic, cell manufacturer, GMP Facility
- Geralyn Moser Annett, director, Alpha Stem Cell Clinic
- Trisha Yassear, Alpha Clinic operations manager
- Erika Crawford, lead senior certified clinical research coordinator, Alpha Clinic
- Nataly Magner, cell and gene therapy specialist, Alpha Clinic
- Karen O’Donnell, cell and gene therapy specialist, Alpha Clinic
- Ashley Ramsay, cell and gene therapy specialist, Alpha Clinic
- Dara Feleciano, clinical research nurse, Alpha Clinic



CANCER MOONSHOT

President Joe Biden announced this year that the Cancer Moonshot initiative he launched in 2016 as vice president has been reignited. The new Cancer Moonshot 2022 has a goal to cut cancer deaths in half over the next 25 years. The aim to end cancer as we know it will focus on increasing cancer screenings and addressing disparities within cancer care and research, both in the United States and internationally.

The 51 National Cancer Institute (NCI)-designated cancer centers, including UC Davis Comprehensive Cancer Center, will play an important role in the Cancer Moonshot. Our role will be to help accelerate scientific discovery in cancer, foster greater collaboration, and improve the sharing of data.

A Cancer Moonshot progress web page will keep the public and medical professionals in oncology updated on the latest developments.



Photo courtesy of University of Texas Health Science Center at San Antonio

UC Davis Comprehensive Cancer Center's Laura Fejerman (third from right) and First Lady Jill Biden (center) at Cancer Moonshot event

UC Davis scientist meets with First Lady Jill Biden

As part of the Cancer Moonshot 2022, President Joe Biden and First Lady Jill Biden issued a call to jump-start cancer screenings that people missed as a result of the pandemic. They also want to help ensure that every American equitably benefits from the tools to prevent, detect and diagnose cancer.

UC Davis Comprehensive Cancer Center's Laura Fejerman, director of the Women's Cancer Research and Care Program (WeCare), met the first lady in February during a Cancer Moonshot event at the Mays Cancer Center in San Antonio, Texas. Fejerman was one of three scientists who presented on cancer health disparities research.

"It was truly an honor to participate in the Cancer Moonshot event by sharing with the first lady what we are doing at UC Davis to fight the disparities that lead to a higher cancer burden for Latinas," said Fejerman, who also co-directs the cancer center's Latinos United for Cancer Health Advancement (LUCHA) initiative.

Fejerman presented findings regarding cancer risk assessment in Latinas, including two factors contributing to disparities: lack of access to high-quality care and limited data availability for improving risk prediction in diverse populations. She also reported on the Tu Historia Cuenta program, which connects Latinas to "promotores" — health educators who refer Latinas to breast cancer resources in their communities (described in an article on page 28).

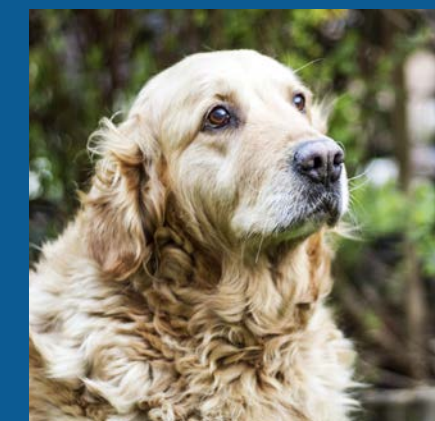
UC Davis Comprehensive Cancer Center comparative oncology program highlighted in Cancer Moonshot 2022 initiative

The UC Davis Comprehensive Cancer Center's comparative oncology program is highlighted in a new Cancer MoonshotSM video that describes approaches to researching cancer treatments in both dogs and humans.

With immune systems similar to those of people, our pet dogs can benefit from many of the same cancer breakthroughs, including immunotherapies that work by helping the immune system recognize and attack cancer cells.

Thanks to its unique partnership with the country's top-ranked UC Davis School of Veterinary Medicine, the cancer center is one of the few institutions to study comparative oncology — the collaborative study of tumors in dogs and humans to better understand cancer biology and test treatments.

UC Davis received the first NCI grant in the country to fund a comparative oncology training program. In this first-of-its-kind federal grant, more than \$2 million has been awarded to the cancer center's five-year program to train the next generation of oncology researchers collaborating on curing cancer in both humans and dogs.



First-in-region targeted liver cancer therapy gives patients new hope

Patient who received implanted chemotherapy infusion pump is now cancer-free

One of the first patients in the region to undergo a targeted cancer therapy directed at the liver through a pump implanted under the skin has been declared cancer-free. UC Davis Comprehensive Cancer Center is the first medical facility in Northern California, including the Bay Area, to start what is called a hepatic artery infusion program.

Peter Romero, 63, said the procedure was a “real game changer,” and remarkably, he was able to keep exercising through the duration of his therapy. He walked up to eight miles a day and rode a bicycle during the entire three months of treatment.

Hepatic artery infusion delivers chemotherapy directly to the liver through a pump the size of a hockey puck. The pump is implanted under the skin between the ribs and the pelvis. It is connected by a small catheter to the

circulatory system that feeds the hepatic artery supplying blood to the liver. A powerful chemotherapy drug is deposited into the pump and refilled every couple of weeks.

For patients with metastatic colon cancer that has spread to the liver, hepatic artery infusion can be transformative. It was for Romero, who said, “If the amount of chemotherapy that went directly into my liver was given to me through a port and into my whole body, it would have killed me. Instead, the pump fed targeted chemotherapy straight into my liver, destroying those stubborn cancer cells.”

Romero, who works in the agriculture industry, was diagnosed with colon cancer in 2018. He immediately underwent surgery and received standard chemotherapy at a local hospital near his home in Monterey. Traditional chemotherapy is given intravenously, which dilutes it as it enters the body systemically.

In 2019, CT scans showed that Romero’s colon cancer was gone, but spots had materialized on his liver — indicating that the cancer had metastasized or spread. He underwent surgery at Stanford Health Care to remove the liver tumors, but three months later scans revealed more spots on his liver. Genetic tests revealed that Romero had an overexpression of the HER2 gene, normally associated with breast cancer.

The gene also shows up in 2–6% of patients with colorectal cancer.

Romero endured another round of chemotherapy, this time in pill form, as well as targeted therapy against HER2, but the spots remained on his liver. That’s when his surgeon at Stanford, in conjunction with his oncologist in Monterey, went through the process of connecting him with Sepideh Gholami at UC Davis Comprehensive Cancer Center.

“She is in your backyard and this might be the right approach for you,” Romero said about his doctor’s strong recommendation. Romero had the surgery to install the pump in July 2020. He and his wife drove the three hours to UC Davis Comprehensive Cancer Center for treatment every two weeks. During this time, he and his wife decided to move to Scottsdale, Arizona. However, they continued to fly to Sacramento every two weeks, despite the pandemic, to have his pump refilled, alternating with standard chemotherapy.

Gholami is one of the nation’s few oncology surgeons performing hepatic artery infusions, even though the technique was developed several decades ago. The institution with the most experience in the highly skilled procedure is Memorial Sloan Kettering Cancer Center in New York, which is where Gholami practiced after getting her medical degree and completing her residency at Stanford. She obtained two fellowships at Memorial Sloan Kettering in complex and general surgical oncology, as well as hepatopancreatobiliary surgery (involving the liver, pancreas, gallbladder and bile ducts).

“An estimated half of patients with colorectal cancer will eventually develop colorectal liver metastases. Only a minority of patients are eligible for liver surgery, and 75% of these

patients will still experience a recurrence of their disease despite traditional chemotherapy,” Gholami said. “That’s why I wanted to start a hepatic artery infusion program at UC Davis Comprehensive Cancer Center. I wanted to give patients like Peter another chance to thrive.”

Hepatic artery infusion involves the continuous flow of floxuridine, a chemotherapy drug classified as an “antimetabolite” that destroys cancer cells by tricking them into thinking it is one of their genetic building blocks: RNA and DNA. Once the cells absorb the drug, they can no longer divide into more cells. Because antimetabolites target cells as they are multiplying, they are good at killing tumors that are growing quickly.

UC Davis infusion nurse Deborah Small traveled to Memorial Sloan Kettering to receive training, and Gholami said she has been instrumental in the success of the hepatic artery infusion program launch.

“The pump delivers chemotherapy right into the liver without negatively impacting the rest of the body,” Small said. “It is a very rewarding experience to work with these patients who are able to go on with many of their normal activities while being given a chance at fully recovering from difficult cancers that used to give families little hope for their loved ones.”

“Peter has a passion for life, and I am so glad that he took that important step to call us so we could do all we could to help him fight his cancer. Patients like him give us the motivation to continue to leverage every available avenue to save lives.”

—SEPIDEH GHOLAMI, UC DAVIS COMPREHENSIVE CANCER CENTER.



Sepideh Gholami and Deborah Small

Last November, Romero got the news he was waiting the past couple of years to hear when his oncologist in Arizona said, “Your scans are clean. Your cancer is gone.”

“Marsha, my wife of 37 years, and my three children have heard me say this: ‘I love my doctor,’” Romero said of Gholami. “She not only provided for my physical care, but my mental care as well. Dr. Gholami is a special person, and now we are close friends. She was one of the first to see a photo of my first grandchild, and she never hesitates to answer my texts.”

Gholami has implanted several more cancer patients with the pumps this year and is hopeful that they, too, will have outstanding results like Romero’s.

“Peter has a passion for life, and I am so glad that he took that important step to call us so we could do all we could to help him fight his cancer,” Gholami said. “Patients like him give us the motivation to continue to leverage every available avenue to save lives.”



Cancer patient Peter Romero gets instructions about his pump care from infusion nurse Deborah Small.

Exploring links between circadian rhythm, cholesterol and cancer

In a Q&A with Hongwu Chen, professor of biochemistry and molecular medicine at UC Davis Health, we discussed how a special receptor protein known as ROR γ impacts cancer growth and cholesterol synthesis. Chen is the director of the Cancer Metabolism Initiative of the UC Davis Comprehensive Cancer Center.

Chen and his team are studying the function of ROR γ and other related receptor proteins in the development and progress of different cancers.

What are the receptor proteins and what is their link to cancer?

A receptor is a protein that binds to a specific molecule called a ligand. Studies show that some receptor proteins are master regulators of cancer metabolism, or the way in which cancer cells make the energy they need to spread. Receptor proteins can affect cancer on multiple levels and through different mechanisms, such as controlling tumor cholesterol pathways.

ROR γ is a receptor protein that directly activates cholesterol biosynthesis in cancer cells. REV-ERB α , another receptor protein, is also connected to cancer development. When REV-ERB α and ROR γ 's normal functions are disrupted, they alter gene activities in promoting cancer progression.

How are cholesterol and cancer connected?

Cholesterol is not simply a cell membrane component for normal or cancer cells. It plays a crucial role in membrane signaling through an intricate dynamic communication process. In fact, cholesterol metabolism is one kind of cancer metabolism.

Most solid tumors show hyperactivity in cholesterol biosynthesis and metabolism and have a significantly higher cholesterol content than normal tissues. So, changes in the cholesterol metabolism are considered a major contributor to the progression of many types of cancer, including prostate cancer, lung cancer and estrogen receptor-positive (ER+) or ER-negative breast cancer.

Your work links the disruptions in the body's biological clock to cancer. Can you tell us about this relationship?

The circadian rhythm, also known as the biological clock, is very important for our body's normal physiological functions. It controls our sleep and wake patterns, feeding schedules and metabolism. Disruption of this internal clock has been linked to cancer development and progression.

We found that this disruption has something to do with the abnormal functioning of ROR γ and REV-ERB α proteins, both of which are key regulators in the circadian rhythm.

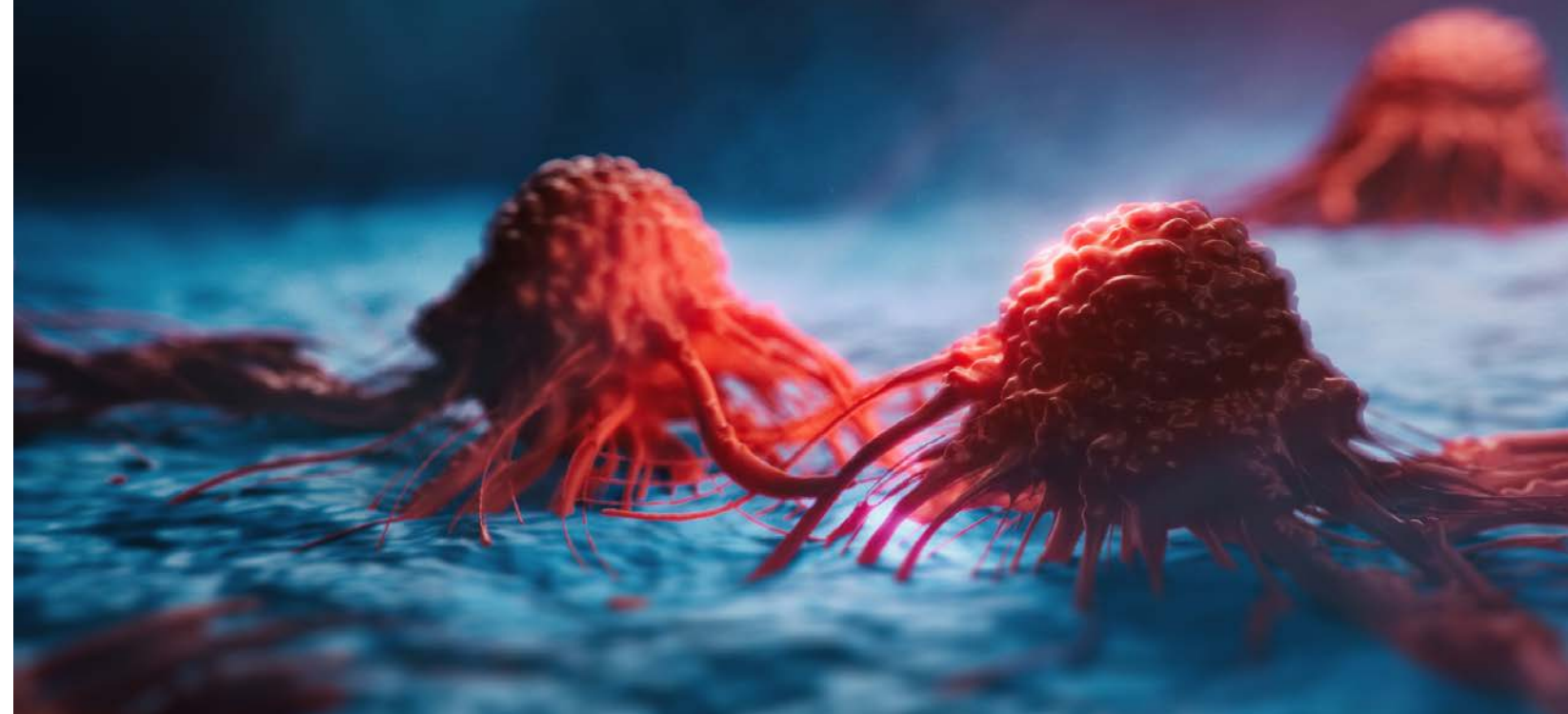
Interestingly, ROR γ and REV-ERB α proteins can act similarly in a cancer setting but very differently in normal circadian rhythm. They have opposite functions when it comes to the circadian rhythm: where one is activating genes, the other is repressing them.

Your research addresses the use of statins as a possible cancer therapy. How would that work?

Statins are a class of drugs primarily used to prevent cardiovascular diseases caused by high blood cholesterol levels. Statins are widely used and considered relatively safe.

Many studies looked at the relationship of statin use to cancer development or progression. It's quite clear there's a significant negative correlation between statin use and the progression of many cancers. In preclinical studies, scientists found that giving a high dose of statins will kill cancer cells and inhibit tumor growth in mice.

Yet, many clinical trials failed to prove a therapeutic effect of statin drugs in treating tumors when given to cancer patients.



So, why didn't statin use show a positive effect in cancer clinical trials?

It's kind of a clinical dilemma. With the safe dose allowed for patients, statin in the tumor will likely cause an activity called negative feedback. This means that the tumor cell will increase the number of enzymes needed for cholesterol production to compensate for the decrease of cholesterol caused by the drug.

In our preclinical model, we saw that inhibiting ROR γ receptor can block this statin-induced feedback. This makes statin treatment highly effective in blocking tumor growth and metastasis when combined with a ROR γ inhibitor. Interestingly, this combination effect on cholesterol is seen in the tumor and not in the normal mouse liver of the preclinical model.

You propose ROR γ inhibitors as potential therapeutics in cancer treatments. What did your studies show?

As a receptor protein, ROR γ can bind to ligands of small molecules, making it a very attractive therapeutic target.

It was unexpected for us to find out that ROR γ inhibitors with different chemical structures display very distinct effects when used to treat different cells. Some ROR γ inhibitors, like the ones we designed, are very potent in blocking the ROR γ functions in cancer cells and tumors. Yet, they are not so active in affecting the ROR γ function in other kinds of cells, such as certain immune cells. Similarly, other inhibitors designed to impact the ROR γ function in immune cells seem not to work in cancer cells.

This means we can develop small molecule inhibitors of ROR γ with distinct structures that selectively block the abnormal function of ROR γ in cancer without significantly affecting its other functions.

How do you see the way forward for testing ROR γ in cancer therapy?

I believe ROR γ is a great therapeutic target for different kinds of cancer, including advanced forms of breast cancer, lung cancer, pancreatic cancer and prostate cancer. The development of small molecules displaying distinct activity against the abnormal ROR γ function will be the way to go.

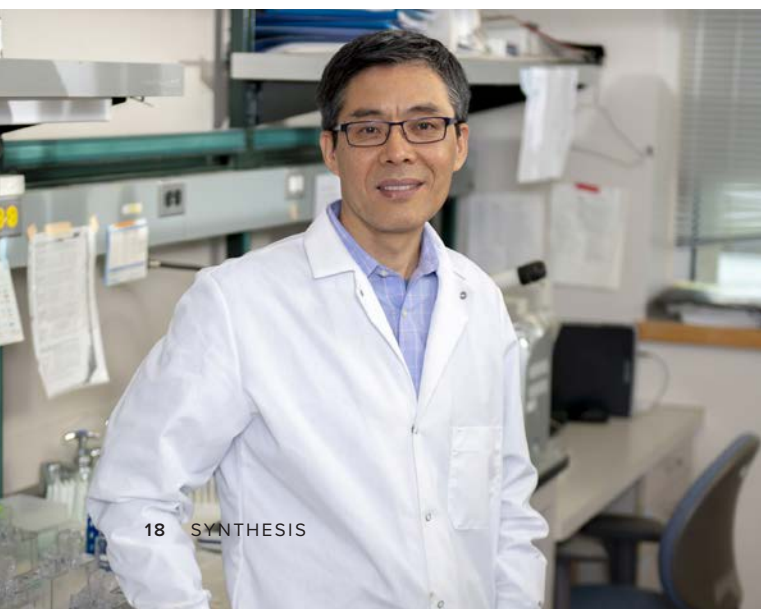
This is, in essence, a precision medicine type of study, as the inhibitors developed will target precisely a disease-linked functional feature of the ROR γ receptor.

Also, finding a drug to combine with the distinct molecules targeting ROR γ to achieve highly effective therapy is a future study direction. It might be statins or something else; we don't know at this point. Our deeper understanding of the function of ROR γ in cancer will guide us.

Two main takeaways

1. ROR γ and its related receptor proteins can be effective therapeutic targets in certain types of cancer, such as prostate cancer and breast cancer.
2. ROR γ functions distinctively in normal cells versus cancer cells or tumors, which provide the foundation for the development of cancer-specific therapeutics targeting it.

Learn more about ROR γ in a review article by Chen published in *Biochemical Pharmacology*.



Stress is often a costly side effect for young cancer patients



New research finds the psychological distress experienced by adolescents and young adults (AYA) who receive a cancer diagnosis has a significant economic cost. A study led by UC Davis Epidemiology Ph.D. graduate Ola A. Abdelhadi shows these costs often compound the expenses associated with their care.



Abdelhadi's study was published online Jan. 10 in the American Cancer Society journal *Cancer*. The findings illuminate the need for psychological care interventions for short- and long-term AYA cancer survivors. The study is the first to put a price tag on the phenomenon.

Abdelhadi and her team found that cancer survivors diagnosed with the disease at 15 to 39 years of age are twice as likely as people without a history of cancer to experience:

- depression
- anxiety
- panic attacks
- post-traumatic stress disorder
- worry
- anger or other forms of psychological distress

The psychological distress was also found to be high many years after the diagnosis.

"The results show there is an economic cost to the psychological impact of cancer on young people," said Abdelhadi.

"My hope is that the research will help inform the care that is given during and after cancer treatment so that these young people feel supported as they face their futures."

Abdelhadi said psychological counseling provided early during their survivorship care plan may help AYA

patients recover from cancer and, ultimately, lower overall medical expenses.

The researchers determined that medical expenses associated with psychological distress averaged \$2,600 more for AYA cancer survivors than for adults without a history of cancer. No prior studies have evaluated the additional medical expenses and health care utilization associated with psychological distress in these survivors.

Abdelhadi collaborated on the study with several UC Davis Health researchers. They included Bradley H. Pollock, professor and Rolkin chair in the Department of Public Health Sciences, Jill G. Joseph, professor emeritus at the Betty Irene Moore School of Nursing, and Theresa Keegan, a professor of medicine in the Departments of Internal Medicine and Public Health Sciences. Keegan specializes in cancer epidemiology in adolescents and young adults.

The faculty members working with Abdelhadi on the study are part of the Population Sciences and Health Disparities Program of the UC Davis Comprehensive Cancer Center. Pollock and Keegan are integral leaders in AYA oncology research efforts that include training young investigators such as Abdelhadi.

Abdelhadi is a past junior investigator presentation winner at the cancer center's annual Spotlight on Early Career Investigators. Her presentation focused on research on chronic conditions in AYA cancer patients.

Global study shows need for changes in cancer care for teens and young adults

While cancer survival rates have improved for pediatric patients and adults over the age of 40, outcomes for certain types of cancer have lagged among the age groups in between. That includes what is known as adolescent and young adult (AYA) cancer patients. In fact, cancer remains a leading cause of non-accidental deaths among 15- to 39-year-olds.

Pediatric oncologist Elysia Alvarez is advocating for changes in how cancer care is provided for this age group after leading a study that looked at the global burden of cancer on AYAs. The research was published recently in the prestigious medical journal *The Lancet Oncology*.

Alvarez, a UC Davis assistant professor of clinical pediatrics, was lead author of the global study involving 730 collaborating scholars. She said approaches to clinical care often fail to acknowledge the unique physical and emotional needs of people in this age group who are engaged in transition from childhood to adulthood. With respect to cancer diagnosis treatment and research, AYAs are figuratively drifting on an ice floe between the pediatric and adult domains.

The study found that adolescents and young adults not only develop certain cancers that are common among children but also some types of cancers more typical among adults. In addition, AYAs are more susceptible than younger



or older individuals to specific types of cancers, including Hodgkin's lymphoma and testicular tumors. As a result, adolescent and young adult cancer patients may have difficulty finding care that is optimal for their cancer type and their age-related treatment and support needs.

The report noted that cancer treatment teams often are not well resourced to help these patients manage the psychosocial problems they may experience in response to a diagnosis of cancer. The authors wrote: "The age range of adolescents and young adults encompasses their formative years in life, and spans the time from completing education, to possibly starting a career and raising children, and potentially contributing to society more broadly. A cancer diagnosis during these years can have a considerable impact on individuals' future life trajectory through major stressors, including feelings of isolation, anxiety and depression, concerns about infertility, discontinuing schooling or work, and financial hardship."

CTSC's KL2 Program nurtures early-career scientists



Elysia Alvarez, a pediatric oncologist since 2014, became a researcher two years ago after getting the training and support she needed through the UC Davis Clinical and Translational Science Center's KL2 Program. Participants, chosen through a highly selective process, gain research training through coursework, workshops and mentorship by experienced faculty researchers.

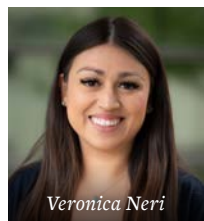
The National Institutes of Health and the UC Davis School of Medicine Dean's Office fund the program, which offers up to three years of support enabling participating early-career faculty scholars to conduct patient-oriented research.

"The KL2 program provides the amazing opportunity to protect your time for research and career development. It also enables access and opportunity to collaborate with and obtain feedback from researchers from different fields and backgrounds that I might not normally have the opportunity to meet," Alvarez said.

She expresses gratitude for the mentorship of the KL2 Program's director, James Holmes, a professor and executive vice chair in the Department of Emergency Medicine.

"Jim has been a very thoughtful mentor. He has helped me prioritize what is important for my research and future goals," Alvarez said. "I am grateful to be his mentee, which might not have happened without the KL2 program."

New pediatric patient and family navigator position created by *Super Fritz & Friends* Fund



Veronica Neri

The Super Fritz & Friends Fund supports families of children being treated for cancer at UC Davis Comprehensive Cancer Center. The fund was started in 2019 by Ruth and Paul Flowers after Fritz, the toddler of family friends Anna and Ben Stark, underwent treatment

for an aggressive blood cancer.

Fritz Stark, now 9, faced B-cell acute lymphoblastic leukemia when he was about 2 years old. Around the time of his diagnosis, the young boy was given the nickname “Super Fritz” by family and friends because of his can-do spirit and love for superheroes.

Super Fritz’s parents joined the Flowers in supporting the Super Fritz & Friends Fund after their son completed his successful treatment and they watched, in gratitude, as Fritz went on to lead the active, normal life of a high-energy youngster.

“The impact a pediatric cancer diagnosis has on a family is tremendous. The treatment provided by the UC Davis medical team was incredible and in Fritz’s case, it saved his life,” said Anna. “The beauty in why we established this fund is that our dear friends, Ruth and Paul Flowers, watched us go through this journey and recognized the non-medical struggles that Ben and I were up against. It was the most challenging time of our lives and the stress, worry, loneliness and fear we experienced were devastating. We are honored to work with UC Davis to help families battling pediatric cancer.”

The Super Fritz & Friends Fund’s main goal is to make life easier on families by connecting them with community resources that can help. As a result of the generosity from the many supporters of the Super Fritz & Friends Fund, a pediatric patient and family navigator position has been established.

“We are overwhelmed with gratitude,” said Ruth Flowers. “UC Davis embraced our seed of thought and made it become a reality. Our families, friends and community embraced and

supported our mission to provide vital support to families from the time their child is diagnosed with cancer.”

Veronica Neri was hired into the navigator position and met with her first patients and their parents in November 2021. Neri is bilingual in Spanish and English, and brings a great deal of knowledge from her experience in a similar position at Shriners Hospital. She works in tandem with the team of licensed clinical social workers to serve cancer center families from diagnosis to survivorship. Neri helps make families feel less alone and better well-equipped to navigate what it means to have a child with cancer and the impact it has on the whole family.

As Neri shares, “I witness how devastating cancer treatment can be for families battling pediatric cancer. When parents endure caring for a child with a life-threatening illness, the day-to-day tasks can appear unmanageable. Families often feel overwhelmed with doing essential needs associated with home, school or work. By providing guidance and help in tackling those challenges, I not only allow the pediatric oncology team to focus on clinical care, but I also give the family the opportunity to be more devoted to their child with cancer. I am honored to be a part of their journey.”

Neri helps families by:

- Evaluating their needs for lodging assistance (for families traveling more than 35 miles to treatment), insurance coordination, school assistance for both the patient and siblings, and financial assistance for essential needs like groceries and transportation.
- Assisting families apply for In Home Support Services (IHSS), Family Medical Leave (FMLA), DMV placards, and financial and supportive resources from community organizations like Make-A-Wish and American Cancer Society.

Ongoing donations can be made to the Super Fritz & Friends Fund, which has already touched the lives of more than 300 families experiencing the challenges of battling pediatric cancer. Donations can be made at give.ucdavis.edu/CCAD/324631.

A Child With Cancer

BY SANTINO AYALA

**I am not even 10 years old
And I’m already brave and bold.**

**While the other kids are crying because they
have to go to school, I am fighting cancer and
I’m going to win because I rule.**

**When all the adults get done with their
chemo and want to find a bed to lay
I still have the strength to go outside and play.**

**When everyone else is praying for my saving grace
you always see a smile on my face.**

**I love Batman and Spiderman
And like them will fight my villain till the last stand.**

**I won’t forget Captain America and his mighty shield
so cancer, you better stop and yield.**

My superpowers have yet to be revealed.

**I might struggle with multiplication and division
but cancer if you think you are going to take my life,
think again because you don’t have my permission.**

About the poet, Santino Ayala



Shortly after the start of the COVID-19 pandemic, poet Santino Ayala decided to become an emergency medical technician (EMT). His interest in helping people in medical crises came after he faced a medical challenge of his own at the age of 19. While serving in the U.S. Army at Fort Bragg,

North Carolina, he was diagnosed with non-Hodgkin lymphoma.

Ayala underwent a year of grueling cancer treatment that included a bone marrow transplant. After he was declared cancer-free, he felt overwhelmed with gratitude toward the medical team that treated him and was invigorated by his own courage.

During COVID-19 surges, ambulances were sometimes lined up outside area hospitals waiting to unload patients. It was during one of those waits in an ambulance outside the UC Davis Medical Center that Ayala began thinking of the children inside with cancer.

“I thought about what they were going through, which was likely similar to what I went through, and I felt inspired to write a poem that would represent the bravery required of kids with cancer,” Ayala said.

At 26, Ayala said he is ready for the next chapter of his life but will continue to write poetry to express himself, which he regards as a positive mental health practice.

His next challenge is stepping into a new role as a federal police officer in Richmond, Virginia, but he affirms that he will always remember tending to those in medical crises from the back of ambulances and looking up at floor after floor of hospitalized patients — knowing that some of them are young, facing cancer and feeling invincible.

Young and facing melanoma

Patient Kelsey Kelley recently appeared in a local PBS special *More than Skin Deep—Surviving Melanoma* airing on KVIE in April.

Sacramento woman perseveres with career and marriage as she seeks advanced treatment after her cancer returns

A childhood in the Central Valley often means hot summer days cooling off in the pool — and enduring the sunburns that often come with the sizzling temperatures. As a kid growing up in Fresno, Kelsey Kelley said those summer sunburns, although only a few, likely contributed to her melanoma diagnosis when she was only 21.

“It was shocking to find out I had melanoma,” said Kelley who, a decade later, is coping with a return of her cancer. Kelley shared something in common with many of her family members of Scottish descent: fair skin and moles. Even though she visited a dermatologist annually to check her skin and remove suspicious moles, she wasn’t prepared for what she spotted on her forehead near where she commonly parted her hair.

“It was a strange-looking mole that was changing color,” said Kelley. Still, she wasn’t too worried because all the other moles that were removed previously turned out to be benign.

This mole, though, was melanoma.

“It was a lot to deal with during my senior year at Cal Poly,” said Kelley. “Some of my hair was shaved and I walked around campus with a big bandage as I prepared to graduate.”

Life went on, though. A dermatologist in her hometown performed the surgical removal of the melanoma, which was the only treatment required at the time.

A few years later, Kelley’s mother, in her mid-50s, also was treated for melanoma.

Fast forward 10 years: Kelley was a busy environmental consultant in Sacramento, getting ready to marry her fiancé, Brian, when two crises hit. First, the COVID-19 pandemic arrived, forcing the delay of her November 2020 wedding, and then she received more unwelcome, unexpected news: her cancer was back.

Kelley said she “felt something hard and circular on my left cheek” in the spring of 2021. An ultrasound and biopsy at UC Davis Comprehensive Cancer Center confirmed it was a cancerous mass. This time the cancer was in a salivary gland known as the parotid.

That’s when the cancer center booked an appointment for her with innovative oncology surgeon Cameron Gaskill, an internationally recognized expert specializing in the treatment of patients with cancers of the stomach, pancreas and skin. Gaskill, who completed a fellowship in complex general surgical oncology at MD Anderson Cancer Center in Houston, Texas, is highly skilled in robotic surgical techniques.

As part of Gaskill’s aggressive approach with Kelley’s treatment, he teamed up with the UC Davis Department of Otolaryngology — Head and Neck Surgery to perform the intricate operation on Dec. 10, 2021, to remove Kelley’s

affected parotid gland as well as 28 of about 200 lymph nodes in her neck, as a precaution.

“Fortunately, Kelsey’s recurrence was limited to her lymph nodes and parotid gland, and she was responding well to immunotherapy,” said Gaskill. “The best chance to cure Kelsey was to perform surgery and remove all of the remaining cancer.”

Kelley said that along with Gaskill and the surgical team, her UC Davis medical oncologist, Scott Christensen, has been an instrumental part of her positive experience while being treated at the cancer center.

“Kelsey benefited from recent advancements in melanoma treatment due to immunotherapy,” said Christensen. “She has tolerated treatment immensely well and her immune system has shown a terrific response.”

Melanoma is a cancer that responds well to immunotherapy, which improves the body’s natural ability to fight cancer.

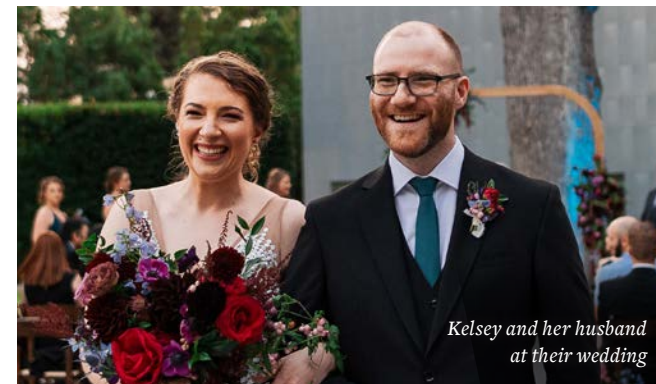
Christensen recommended Kelley undergo 12 rounds of Opdivo (nivolumab) a powerful form of intravenously administered immune therapy called an immune checkpoint inhibitor — a monoclonal antibody that helped her own immune system attack cancer cells.

Kelley received nine rounds of Opdivo prior to her surgery, after which she was given another three rounds. Her last infusion at the cancer center was on March 3, one week after she turned 32.

“We’ll be celebrating soon in Hawaii,” said Kelley, who added that her long-awaited nuptials finally took place on Sept. 25, 2021, at the Crocker Art Museum.

Kelley said her husband, Brian, and other close family and friends — as well as her golden retrievers Maldon and Roux — have been her main source of strength. But, she feels the medical professionals she met at the cancer center also supported her emotionally by making sure that she was treated as more than just a cancer patient.

“Dr. Christensen and the staff at the cancer center showed an interest in me beyond my cancer,” Kelley said. “That really made a difference as I got through my treatment.”



Kelsey and her husband at their wedding

Uncovering the genetics behind melanoma



Research is underway at UC Davis to understand what causes melanoma and to uncover the role that genetics plays in the disease.

As a physician, Maija Kiuru sees patients with hereditary cancer at the UC Davis Dermatology Clinic and diagnoses cancers and diseases of the skin under the microscope at the UC Davis

Dermatopathology Service.

In addition to earning a medical degree, Kiuru earned a doctorate in medical genetics. She spends much of her time in research investigating genetic alterations in skin tumors. As she peers through her microscope, she often thinks of the patients who will be given difficult news.

“There is a growing number of patients who are being diagnosed with melanoma, and melanoma is one of the most common cancers in young women between the ages of 20 and 40,” said Kiuru. “We don’t think intentional tanning is the sole culprit causing this increase. Hormonal and immunological changes are something we are looking into, and genetics also is a factor.”

Kiuru’s research shows that nearly 15% of melanomas occur in patients with a family history of the disease, and a subset of these patients have a germline mutation in a melanoma predisposing gene. One such germline mutation involves the “cyclin-dependent kinase inhibitor 2A” or CDKN2A.

“It is thought to be responsible for the majority of hereditary melanoma, but many other susceptibility genes have been discovered in recent years such as BAP1,” Kiuru said.

Additionally, melanoma risk is increased in mixed cancer syndromes caused by mutations in the PTEN, BRCA2, BRCA1, RB1 and TP53 genes. Early onset, multiple tumors and family cancer history remain the most valuable clinical clues for hereditary melanoma.

Kiuru said that genetic testing and counseling are recommended if three or more melanomas occur among members of a family.

Report details cancer burden facing Black patients in California

Study shows why addressing the root causes of cancer disparities is essential to saving lives

In the first report of its kind, researchers with UC Davis Comprehensive Cancer Center conclude that Black patients in California are more likely than white patients to be diagnosed with cancer at a later stage, which means they are less likely to survive.

The report, *The Burden of Cancer Among Black/African Americans in California*, highlights some concerning cancer trends among Black communities in the state and points to the potential underlying causes.

The cancer center report includes detailed statistics that were mined from the California Cancer Registry (CCR), the state-mandated, population-based cancer surveillance system. The CCR collects demographic, diagnostic and treatment information on cancer cases diagnosed in the state.

Since 2012 the California Cancer Reporting and Epidemiologic Surveillance (CalCARES) program, within UC Davis Comprehensive Cancer Center, has partnered with the California Department of Public Health to manage the operations of the CCR.

“While cancer rates are dropping in California, progress has not been equal for everyone,” said Cyllene Morris, CalCARES research program director and primary author of the report. “Disparities persist for many racial and ethnic groups, especially Black patients, and addressing these underlying conditions and root causes is essential to achieving health equity for everyone.”

The cancer center report includes detailed statistics that were mined from the California Cancer Registry (CCR).

Key findings in the report include:

- The cancer incidence rate for all cancers combined was lower among Black women and men compared with white patients, but death rates for Black women were higher.
- A significantly higher percentage of Black (vs. white) patients with lung,



New study concludes that cancer in many Black patients in California remains undetected until later stages when cancer is harder to treat

oropharyngeal, cervical and breast cancers were not diagnosed until late stages, when outcomes are often worse.

- 15.8% of Black patients had three or more comorbidities (health conditions) as compared to 9.8% of white patients. Black patients also were more likely than white patients to live in impoverished areas (43.4% vs. 17.4%) and to be covered by Medicaid or other forms of public insurance (20% vs. 7.8%).
- Specifically, Black patients had worse survival rates for cancers of the breast, prostate, bladder, thyroid, uterus, oropharynx, and non-Hodgkin lymphoma even after accounting for sex, age, comorbidity level, socioeconomic status, stage of disease at diagnosis, and type of health insurance.
- Interestingly, Black patients had higher survival rates for multiple myeloma and lung cancer, compared to white patients when accounting for the same sociodemographic and clinical factors.

“It is incredible that when we match modifiable variables like socioeconomic status, stage at diagnosis and type of

health insurance, Black Californians have lung cancer outcomes at least as good as white patients. This finding shines a floodlight on the fact that disparities in social determinants of health, and population health interventions such as lung cancer screening, are impacting whether someone survives or dies from cancer,” said David Tom Cooke, professor and chief of the Division of General Thoracic Surgery and co-author of the report.

The report points out that, overall, Black patients are more likely to be socioeconomically underprivileged compared to whites, which in turn can lead to reduced access to high-quality health care.

“By providing information on the burden of cancer among Black/African Americans, the CalCARES Program hopes to contribute to efforts toward equity across the cancer care continuum,” Theresa Keegan, professor and CalCARES principal investigator said.

Additional authors of the report include Ani S. Movsisyan, Brenda Hofer, Arti Parikh-Patel and Theodore Wun.



The California Cancer Registry (CCR) is a statewide population-based cancer registry that collects information about almost all cancers diagnosed in California. Cancer reporting has been required by state law since 1985. All cancer professionals and facilities responsible for treating or diagnosing cancer patients are required to report demographic, diagnostic and treatment data to the CCR. This includes hospitals, physicians and pathologists.

The CCR aggregates and analyzes this statewide data and performs many phases of quality control. The program is part of the California Department of Public Health's Chronic Disease Surveillance and Research Branch. The California Cancer Reporting and Epidemiologic Surveillance (CalCARES) program, within the UC Davis Comprehensive Cancer Center, has partnered with the California Department of Public Health to manage the operations of the CCR.

“Data is key to driving advances in cancer research, which is why the California Cancer Registry is so critical,” said UC Davis Comprehensive Cancer Center Director Primo “Lucky” Lara Jr. “The registry helps California stand out internationally with regard to oncology science because it provides cancer researchers the information they need to do their jobs.”

Cancer researchers request and obtain data through CCR, which collects and aggregates statistical information.

“Analysis of CCR data is conducted by researchers and greatly expands our knowledge of various cancers, which improves cancer diagnosis and treatment practices as we work hard to find a cure,” Lara said.

The site also provides general information about CCR and about cancer, as well as resources to help the people who are most deeply impacted by cancer, including patients, caregivers and the general public. CCR monitors cancer statistics for California as a whole, statistics for specific regions of California and statistics for individual counties.

Tu Historia Cuenta: Your Story Matters



Co-director of the new Women's Cancer Care and Research Program (WeCARE) Laura Fejerman (on the left) meets with promotora Maria Gonzalez (on the right) in south Sacramento.

The story of breast cancer in Hispanic women or Latinas is one that has not been fully told or investigated. Overall, breast cancer rates in this population are 28% lower than in non-Hispanic white women — but that doesn't give the complete picture.

Because of health disparities that prevent access to adequate and affordable health care, breast cancer in Latinas and Hispanic women may remain undiagnosed until later stages when it is more difficult and expensive to treat. That's one reason Hispanic women and Latinas are about 30% more

likely to die from their breast cancer than non-Hispanic white women. They are also at higher risk for triple-negative and human epidermal growth factor receptor-positive breast cancers, which are more aggressive than other types of breast cancer.

UC Davis Comprehensive Cancer Center wants to improve the detection and survival odds of Hispanic women and Latinas by seeking them out in the community and connecting them to resources for prevention, screening and treatment of breast cancer.

Tu Historia Cuenta, which in Spanish means "your story matters," is the name of a new program led by Laura Fejerman, co-director of the cancer center's new Women's Cancer Care and Research Program (WeCARE). The project examines hereditary breast cancer risks and screening in Hispanic women and Latinas in Northern and Southern California, and provides family risk assessment and navigation to services.

Fejerman, who is also co-director of the cancer center's Latinos United for Cancer Health Advancement or LUCHA, said that Latinas are less likely to seek genetic counseling or testing for breast cancer compared to non-Hispanic white women. They also have lower rates of mammography screening.

"Low-income Latinas are getting left behind because they are not aware of the role genes play in breast cancer and, if they become aware, often they don't have access to genetic counseling and testing," said Fejerman.

Inspired by and in partnership with Ysabel Duron, a Latina advocate and founder of The Latino Cancer Institute in San Jose, Fejerman designed a specific program that focused on hereditary breast cancer as a community partnership. Health educators known as "promotores" are trained to educate Latinas about how to access resources for breast cancer screenings and treatment.

Fejerman said UC Davis Comprehensive Cancer Center wants to better serve Hispanic and Latino cancer patients and their families, and that starts by developing community relationships that can overcome language and cultural barriers. Promotores conduct outreach in Spanish and spend about an hour talking with individual Latinas.

During the COVID-19 pandemic, the program began conducting hereditary breast cancer education sessions in Spanish via Zoom so that progress could continue despite social distancing safeguards.

The California Initiative to Advance Precision Medicine, part of the Governor's Office of Planning and Research, is funding Tu Historia Cuenta, which UC Davis, UC San Francisco and City of Hope are operating collaboratively.

Fejerman said Tu Historia Cuenta is the first step in reducing health disparities and addressing the breast cancer burden that exists currently in the Hispanic and Latino community.

Meet a promotora

Maria Gonzalez is a promotora — a community health educator. The Centers for Disease Control and Prevention recognizes promotores de salud, also known as promotoras, as important lay health workers who are trusted and empowered to educate

and connect their peers to information and resources that can save lives.

"Maria represents the people she is trying to help," said Fejerman, who depends on Gonzalez and three other promotores in the Sacramento and San Francisco areas to conduct outreach among Hispanic women and Latinas as part of her Tu Historia Cuenta breast cancer project.

Gonzalez, 49 and a mother of five, knows the importance of connecting her family, friends and neighbors to resources that keep them healthy. She first helped other parents with special-needs children navigate access to resources, including those provided by the UC Davis MIND Institute after receiving care for her child at the research and treatment center for neurodevelopmental conditions.

Now, after battling breast cancer eight years ago, Gonzalez works for an agency called Visión y Compro-

miso that was contracted by the Tu Historia Cuenta program. She was trained to educate members of her community about hereditary breast cancer and navigate them to screening services.

"I like the idea of helping women like me, educating them and building relationships while connecting them with resources that give them access to care," said Gonzalez.

One of those programs is the state-funded Every Woman Counts screening service, providing mammograms free of charge to underserved women. Typically, Gonzalez connects with 15 to 20 women a month, speaking in Spanish to them via Zoom meetings set up in advance.

Gonzalez makes presentations at churches, schools and community group meetings, where she registers women for classes. Through Fejerman, who translates her Spanish into English, Gonzalez said she doesn't usually have to initiate contact with community members. Women typically find her because she is well known in the community and considered a key intermediary to health care resources.

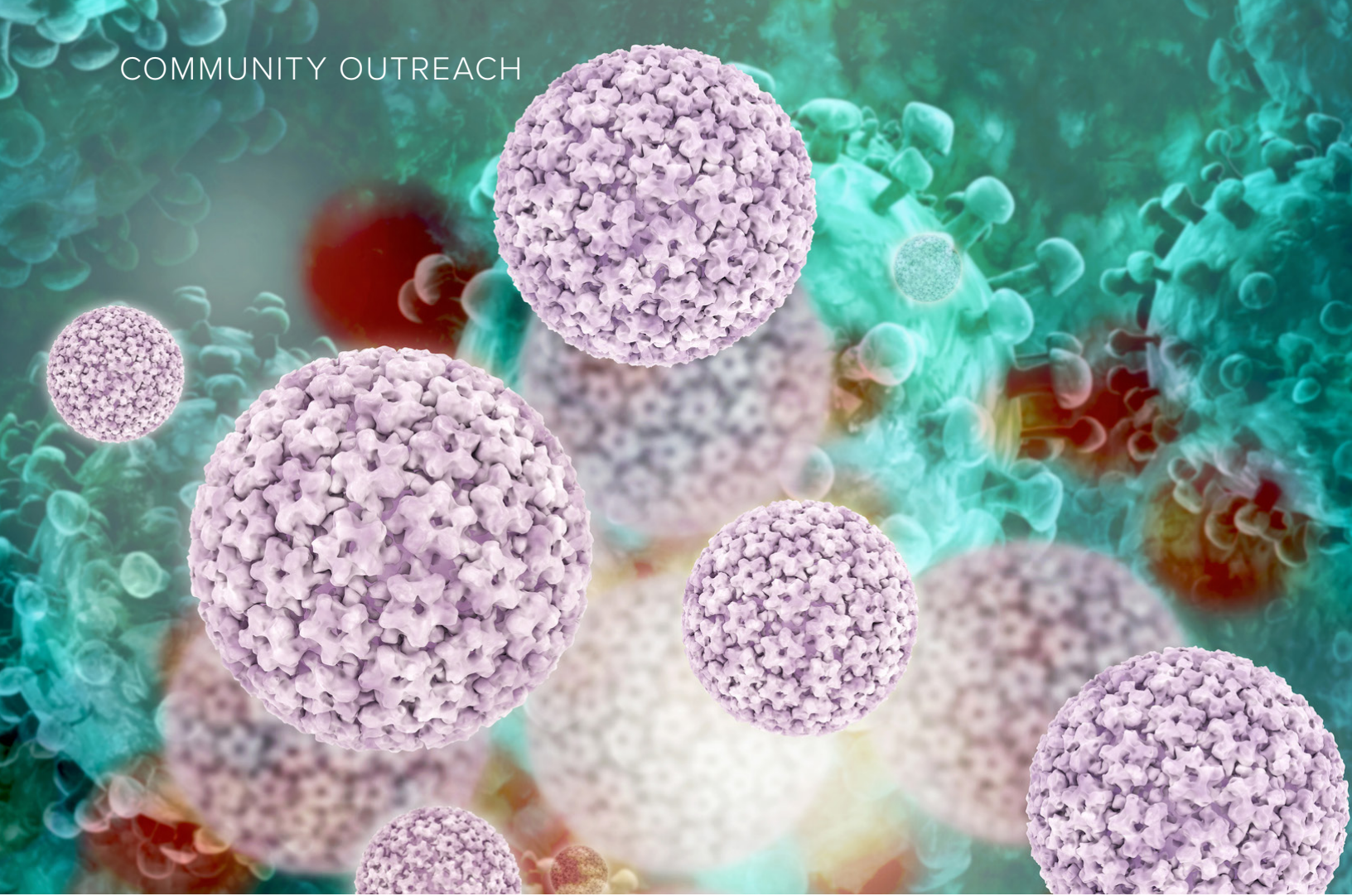
"Mainly, people know me through word-of-mouth," said Gonzalez. "People are coming to me already to get health information."

Identities of the women whom Gonzalez interviews are kept private.

"Gonzalez is a crucial link in growing the trust network in our community," Fejerman said. "I feel we will finally make progress in addressing the cancer burden in Hispanic and Latino communities by leveraging promotores such as Gonzalez who have a strong passion and a commitment to healthier communities."

"Low-income Latinas are getting left behind because they are not aware of the role genes play in breast cancer and, if they become aware, often they don't have access to genetic counseling and testing."

LAURA FEJERMAN,
CO-DIRECTOR, WOMEN'S
CANCER CARE AND RESEARCH
PROGRAM (WECARE)



Learning collaborative held to increase HPV vaccination rates

The human papillomavirus (HPV) vaccine can reduce cases of cervical cancer by nearly 90%. But the shot is not going into arms at a significant rate, and that concerns public health officials.



The American Cancer Society (ACS) recommends young people get the vaccine between the ages of 9 to 12, before they become sexually active. Most cervical cancers are caused by HPV, which is the most common sexually transmitted infection. The Centers for Disease Control and Prevention reports that 9 out of 10 cervical cancers are caused by HPV, making it among the most preventable cancers.

Julie Dang, executive director of the UC Davis Comprehensive Cancer Center's Office of Community Outreach and Engagement, is co-chair of the California HPV Vaccination Roundtable's Engaging Health Systems and Providers Workgroup, which launched "The HPV Vaccination Learning Collaborative."

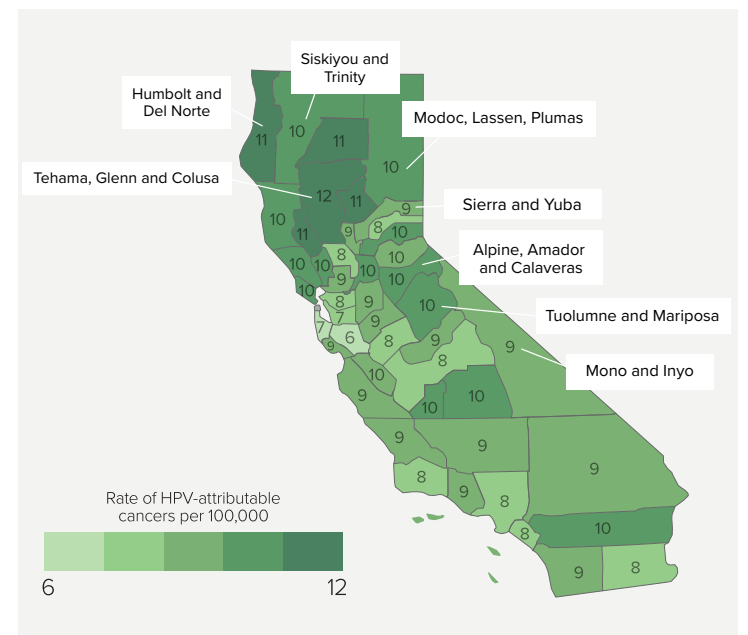


"HPV vaccination rates are down due to the COVID-19 pandemic, and we are concerned this is putting teens and young people at risk of developing HPV-related cancers later in life," Dang said.

The HPV Vaccination Learning Collaborative is held quarterly throughout the year to raise awareness among health care professionals about the importance of increasing HPV vaccination rates in California as a means to help prevent cancer later in life.

"We hope this series of open forums will help educate the medical community and allow us to share best practices," Dang explained.

The Centers for Disease Control and Prevention estimates that HPV is responsible for more than 90% of anal and cervical cancers, about 70% of vaginal and vulvar cancers, and 60% of penile cancers. Other cancers suspected of having a link to HPV include cancers of the throat and tongue.



"HPV vaccination rates are down due to the COVID-19 pandemic, and we are concerned this is putting teens and young people at risk of developing HPV-related cancers later in life."

-JULIE DANG

Testing for cervical cancer

Until the mid-20th century, cervical cancer was commonly undetected in women until advancing to lethal stages, but the death rate fell after Pap tests became routine in the early 1940s. The vast majority of women whose cervical cancer is detected early, while it is still localized, can be treated successfully.

In recent years, an HPV test was approved as another screening test of cervical cancer. The HPV test is designed to detect infection by high-risk types of HPV that are more likely to cause pre-cancers and cancers of the cervix. The

HPV test can be used alone (primary HPV test) or at the same time as the Pap test (called a co-test).

The American Cancer Society has updated its guidelines for cervical cancer screening. The new guidelines recommend an HPV test every five years for people with a cervix who are aged 25 to 65 years and have an average risk for cervical cancer. Co-testing that combines an HPV test with a Pap test every five years is another option. If no HPV test is available, a Pap test alone should be done every three years.



Bassem Mansour

Photo courtesy of Sylvie Bergeron

UC Davis Health gives patient a second chance at life — twice

Nine surgeries and counting

Mansour had suffered 14 fractures, lost much of the skin on his lower body, and his left leg was nearly severed.

“My leg was basically being held on only by skin. It was literally hanging by a thread,” Mansour recalled.

In total, Mansour required nine surgeries including multiple skin grafts, a bone graft and a flap on his left foot. Creation of a flap is a surgical technique in which a section of healthy tissue is partly detached intentionally, while leaving its blood supply intact, and shifted to cover a wounded area. The procedures were coordinated and performed by Philip R. Wolinsky, professor of orthopaedic trauma; Robert Allen, professor of orthopaedic surgery; Claire Manske, assistant professor of orthopaedic surgery; and Brian Haus, chief of the Division of Pediatric Orthopaedic Surgery.

“All of the surgeons have been amazing and so open to all of my questions,” he said. “They have always been honest about what they were going to do during the procedures, what my recovery was going to look like and how painful it would be. They never tried to soften the blow and sugarcoat things. I felt very informed.”

Mansour still has little feeling in his legs, but with a few surgeries still ahead and a lot of physical therapy he hopes to be able to walk again.

“I can already walk a little with a specialized walker,” he said. “I know I still have a lot of rehab work, but I’m determined to get back on my feet.”

Cancer first put him in hospital

Mansour was only 6 months old when he was first hospitalized at UC Davis Medical Center to begin treatment for a

neuroblastoma the size of an orange growing near his spine. During his treatment, he underwent intensive chemotherapy to shrink the neuroblastoma sufficiently to enable it to be removed surgically.

“The care Bassem received as a baby and as a teenager from the pediatric nurses and staff was top notch,” recalled Sylvie Bergeron, Mansour’s mother.

Among the nurses who provided care to Mansour was Jana Poeling, who was one of his primary nurses when he was a baby as well as when he was a teenager following his accident.

“It almost felt like I had a second mom taking care of me when I was in hospital,” joked Mansour. “It was so reassuring having someone I knew and trusted there with me. I could not have asked for better care.”

Caring for the whole person

One of the challenges Mansour faced during his second stay at UC Davis Health was managing the complex feelings and emotions he felt following his accident.

“At times I felt like I was being punished for something I had done,” Mansour remembered. “I would sit there and just think ‘what did I do to deserve this?’”

Yakout Mansour, his father, said that supporting Bassem’s mental health was the biggest difference between his hospital stay as a baby and as a teenager.

“As a baby, Bassem was not aware of the situation,” he said. “However, after the accident he was suffering from a lot of PTSD. The UC Davis doctors, nurses and staff were incredible, providing care not just for his physical well-being but also his emotional well-being.”

During his nine-week hospitalization, UC Davis Health psychology specialists from the Division of Pain Medicine worked closely with Mansour to familiarize him with resources to work through the trauma he experienced.

“It was great to have their team provide this type of care in addition to treating his physical pain,” said Yakout Mansour. “They really provided him holistic care.”

Mansour also received support from UC Davis Health’s child life specialists, who work to minimize the anxiety of hospitalization for young patients. Following one of his nine surgeries, the team decorated his hospital room with a Star Wars design bedspread, curtains and other items.

“After having a Star Wars themed room, a lot of residents and nurses would stop by my room to chat about the latest Star Wars movie,” said Mansour. “It was great being able to connect with them about something other than my surgeries or rehab, since I couldn’t have my friends visit because of COVID-19.”

Getting back on the slopes

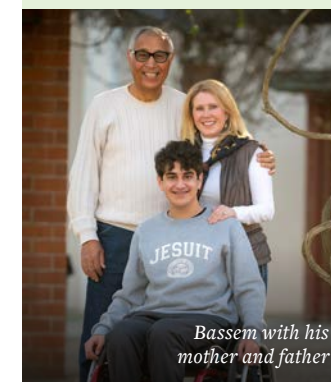
Now a junior at Jesuit High School, Mansour is making the transition back to life as a teenager. For now, he gets around campus in his wheelchair, where he performs in the Jesuit music program as a percussionist with the jazz, symphonic and funk bands.

Mansour still faces multiple procedures, including reduction of the thickness of the flap graft on his left foot, but he is trying to focus on enjoying the remainder of his time in high school.

During a recent appointment, his physical therapist introduced him to monoskiing, a form of adaptive skiing.

“Skiing has always been huge part of my life — I learned to ski when I just 3 years old,” Mansour said. “I’ve only used the monoski a few times, but I’m starting to get the hang of it. Being back on the slopes gives me a sense of normalcy I have not felt since the accident, and it really feels great.”

GRATEFUL TO GIVE BACK: BASSEM MANSOUR PEDIATRIC TRAUMA THERAPY FUND



Bassem with his mother and father

Whether it is getting a friendly nuzzle from pediatric facility dog Huggie, listening to music or waking up after surgery to a room filled with Star Wars décor, Bassem Mansour said he will always remember the Child Life and Creative Arts Therapy Program during his nine-week hospitalization at UC Davis Medical Center.

“The extra support helped me cope with the stress of being hospitalized,” Mansour said. “I don’t think people realize how traumatizing it is to face the uncertainty and the

pain of going through surgeries, which is why I want to start a fund to help other young patients deal with emotional trauma.”

Mansour and his parents have started the Bassem Mansour Pediatric Trauma Therapy Fund to raise money through the Child Life program to help pediatric patients with music and art therapy, as well as other types of creative therapy that will tend to their mind and spirit while doctors mend their bodies.

Mansour was in the hospital so much as a toddler that his mother said he learned to walk by holding onto an IV pole. A drum he was given by child life specialists also helped inspire his interest in music.

“I will never forget the support I received, which went far beyond my medical care,” said Mansour. “My mission is to expand and develop new trauma therapies at UC Davis, but I will need others in the community to get involved.”

Contributions to the Bassem Mansour Pediatric Trauma Therapy Fund can be made by: give.ucdavis.edu/HSYS/9400719.



UC Davis Health CEO David Lubarsky talks with fellow cyclist Sheri Stone, CAO, Dept. of Obstetrics and Gynecology

Eighth annual Crush Challenge bike ride supports cancer research and camaraderie

The eighth annual Crush Challenge bike ride is planned for Aug. 27, 2022 as part of a daylong series of events to raise money for UC Davis Comprehensive Cancer Center. Crush Challenge starts with 25- and 37-mile bike rides through the beautiful Napa Valley. The deLeuze Family Charitable Foundation and ZD Wines are hosting the fundraising event along with the cancer center. In 2021, the event raised \$117,000 to help advance research into nontoxic treatment for lymphoma.

Norman deLeuze, founder of ZD Wines, was the inspiration for Crush Challenge. Diagnosed with an aggressive cancer, the iconic Napa winemaker sought treatments beyond traditional radiation and chemotherapy with UC Davis oncologist Joseph Tuscano, who specializes in cancers of the blood.

As ZD Wines President Brett deLeuze explains, “My father, Norman, was diagnosed with non-Hodgkin lymphoma. After

the diagnosis, he went in search of nontoxic treatments. Along his journey, he met Dr. Tuscano. The relationship resulted in the establishment of the UC Davis deLeuze Family Endowed Professorship focused on researching nontoxic cures for cancer. Today, Crush Challenge continues to support that research and the UC Davis Comprehensive Cancer Center.”

Tuscano, who researches alternatives to treating lymphoma, discovered a naturopathic remedy that shrank deLeuze’s tumor and extended his life. Although deLeuze eventually died from his cancer, ZD Wines and the deLeuze family continue Norman’s legacy through the establishment of the deLeuze Family Endowed Professorship and the annual Crush Challenge.

Top teams earn recognition

The ZD Wines cycling team Zero Defects was the top fundraising cycling team in 2021, with more than \$25,000 in donations generated last year. But the 55-member UC Davis cycling team, co-captained by UC Davis Health CEO David Lubarsky, wasn’t far behind with \$16,554 raised.

“We’ve all been touched by cancer in some way, so it’s great to team up with others who have similar experiences and train together, as we work to complete the Crush Challenge and raise money and awareness for the important research that may save the lives of future cancer patients,” Lubarsky said.

Tuscano cycles with the UC Davis team and is grateful for the growing interest in the Crush Challenge, which raises not only funding but also awareness regarding the critical importance of cancer research.

“I see the faces of the victims of lymphoma and other blood cancers daily. But I also carry with me the kindness of those whose faces I will never see and yet they support us in this challenge to ‘crush cancer,’ and I’m grateful because we cannot do it alone,” Tuscano said.

Tuscano rode in honor of Gustavo Barisone, a Tuscano Research Lab scientist who died from pancreatic cancer this year. Barisone was honored at the event with The Power of Influence Award, given annually by the deLeuze family.

“Dr. Barisone dedicated his life to battling a disease that eventually took his life and is one of the many anonymous research heroes who are fighting cancer every day,” Tuscano said.

Food and wine for all

Non-cyclists enjoy the after-ride fundraising events, supporting the Crush Challenge by buying tickets to a Barrel Tasting at ZD Wines in Rutherford and a lively, music-filled Food & Wine Marketplace at the North Yountville Park.

The festivities include a Lobster Boil & ZD Wine Dinner in the evening, which sold out quickly in 2021. This year’s event is expected to do likewise, so consider purchasing tickets soon!

Female cycling club honors member who passed away from leukemia



A Sacramento area women’s bike club called Bodacious Biking Babes raised nearly \$3,000 in last year’s Crush Challenge. The group rode in honor of fellow cyclist Sandy Bussey Cole, a longtime

member of the club who was treated first for breast cancer and then leukemia at UC Davis Comprehensive Cancer Center.

“Dr. Tuscano was Sandy’s favorite oncologist and she hoped to join him on the Crush Challenge ride. Unfortunately, she lost her battle with cancer last year, so we decided to ride in her honor this year,” her close cycling friend Colleen Rich said.

The “biking babes,” as they call themselves, made photo buttons of Sandy to wear on their bright pink jerseys.

Tuscano also wore her photo button on his UC Davis Health jersey.

“Sandy is a perfect example of why we ride and why we need more research funding,” Tuscano said about the wife, mother, cyclist, and businesswoman from El Dorado Hills.



Sarcoma research at UC Davis gets boost from Shingle Springs Subaru



Sarcoma surgeon Lor Randall accepts check from Shingle Springs Subaru after the annual Subaru of America Share the Love Event.

Local Share the Love Event helps adolescents and young adults with rare cancer

Shingle Springs Subaru customers can help the El Dorado County car dealership raise money for sarcoma research. In 2021, the dealership presented a check for \$82,671 to the UC Davis Comprehensive Cancer Center as part of its annual Subaru of America Share the Love Event.

Cancer center sarcoma surgeon R. Lor Randall received the oversized check from Shingle Springs Subaru dealership executive general manager Bryant McCarver and his wife, Kirsten.

The McCarvers' teenage daughter Kate was one of Randall's pediatric patients.

Randall, who is chair of the Department of Orthopaedic Surgery, is leading research into sarcoma, a cancer that invades the bone or muscle. Unlike most types of cancers, sarcoma is often found in children and young adults.

Kate was only a sophomore at Oak Ridge High School when a sarcoma was detected close to her scapula — the shoulder blade. The El Dorado Hills volleyball player thought she had injured her shoulder, but a scan spotted a tumor at the site of her sharp pain. Randall carefully removed the cancerous growth and, fortunately, it has not returned.

"She went back to competing on her volleyball team, but then COVID-19 hit and the season ended," her mom said. "Kate is now a college student studying psychology, and we could not be more grateful for the cancer care she has received at UC Davis. We were impressed to find out we could get this type of high-caliber care close to home."

The McCarvers were so inspired by the successful treatment their daughter received for her rare cancer that they decided, beginning in 2019, to "give back" to UC Davis sarcoma research. As part of Subaru's national Share the Love Event, the company donates \$250 for each new car sold during the holiday season. Shingle Springs Subaru decided to match that at their dealership.

Shingle Springs Subaru customers buying new cars from November through January each year get to choose among several causes to which Subaru should donate, and now one of those choices is sarcoma research at UC Davis Comprehensive Cancer Center.



Kate McCarver was an avid volleyball player and a sophomore at Oak Ridge High School when she was diagnosed with sarcoma.



Colorful mural greets patients

The UC Davis Comprehensive Cancer Center is blooming in vibrant colors as part of Sacramento's Wide Open Walls mural festival that activates spaces throughout the city to promote diversity through artistic expression. Local artist **Ana Valentine** painted a mural on the side of the cancer center in 2021. This is the third mural at UC Davis Health that is part of **Wide Open Walls** and the second by Valentine, a self-taught artist. For inspiration for her paintings, Valentine shared, "You can take pictures of nature with a camera. Through painting, I have trained myself to look at life differently." For the cancer center project, Valentine created a mural composed of tulips and a daffodil, with each flower having a bird and some flowers having a mother and baby bird.

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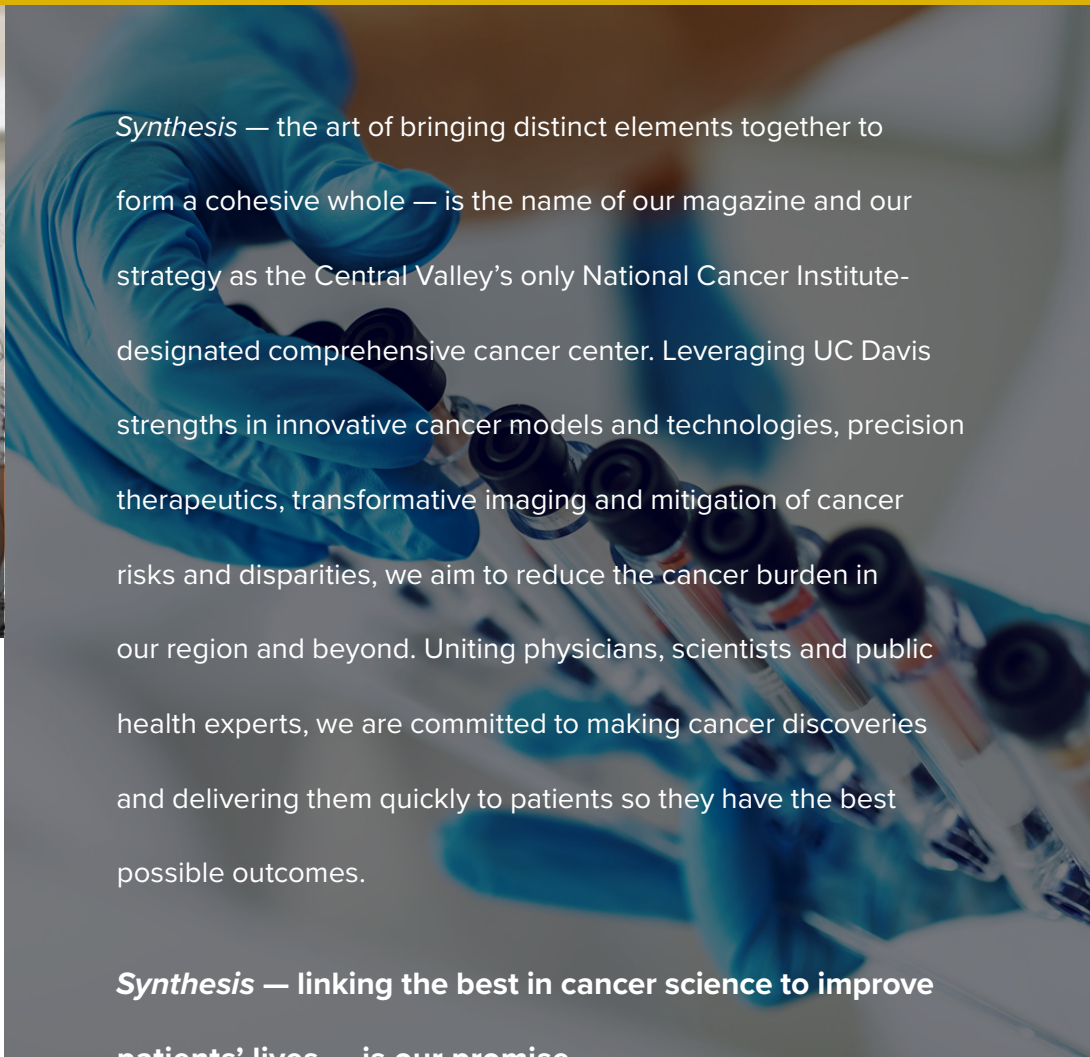
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We have **better cancer treatments** today because **people like you participated in a clinical trial.**

If you're interested in exploring new treatment options, a clinical trial may be right for you. **Ask your doctor today about clinical trials.**

Breaking Barriers to Beat Cancer



Synthesis — the art of bringing distinct elements together to form a cohesive whole — is the name of our magazine and our strategy as the Central Valley's only National Cancer Institute-designated comprehensive cancer center. Leveraging UC Davis strengths in innovative cancer models and technologies, precision therapeutics, transformative imaging and mitigation of cancer risks and disparities, we aim to reduce the cancer burden in our region and beyond. Uniting physicians, scientists and public health experts, we are committed to making cancer discoveries and delivering them quickly to patients so they have the best possible outcomes.

Synthesis — linking the best in cancer science to improve patients' lives — is our promise.