

# SYNTHESIS

THE MAGAZINE OF UC DAVIS CANCER CENTER VOL 11 • NO 2 • FALL 2008

## Life after stem cell transplant



New community  
cancer-care network

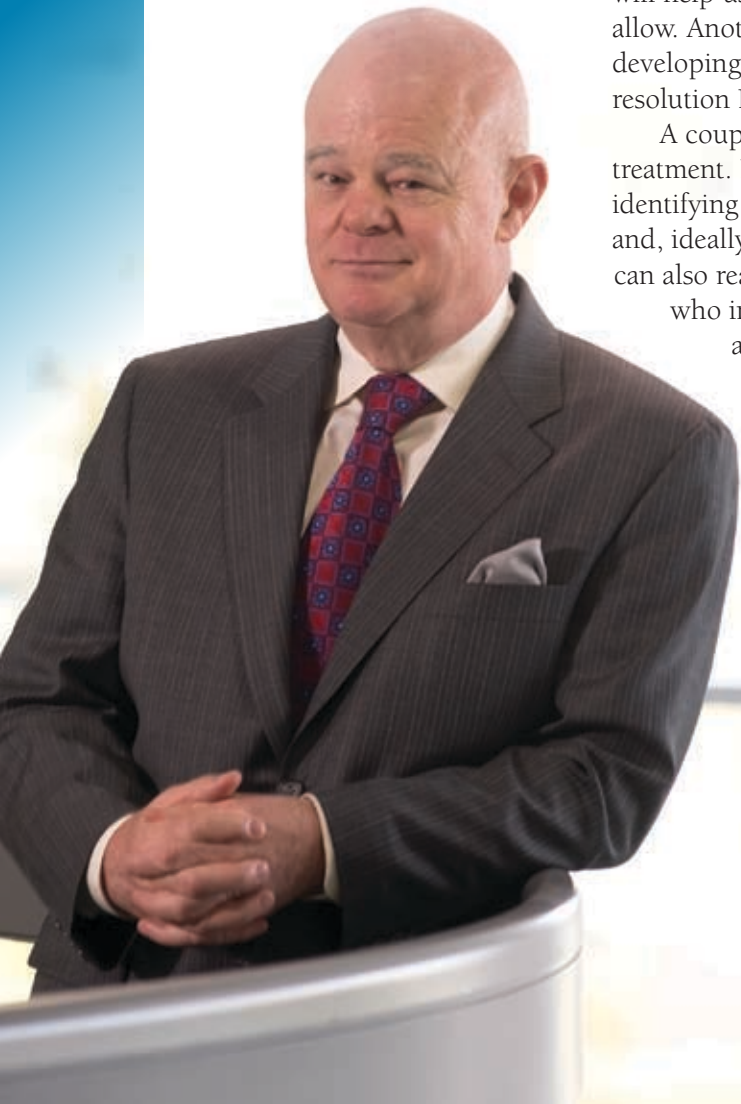
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PET/CT

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Dear Reader,

UC Davis Cancer Center is a leader in team science, and this issue of Synthesis shows how our novel approaches to research and treatment are improving patients' lives.

I am particularly proud of our new organization – the UC Davis Cancer Care Network – which unites our institution with community cancer centers in Marysville, Merced, Pleasanton and Truckee. On August 14, medical teams at each location participated in our first “virtual tumor board.” We all listened and watched via teleconferencing technology as Dr. Larry Heifetz of Tahoe Forest Cancer Center presented information about one of his patients. Cancer specialists in all five locations then contributed their perspectives and experiences to a discussion on how best to cure that patient's breast cancer. From that moment on, a new era in cancer care began in our region.

Two more projects involve advances in cancer imaging. Ramsey Badawi has added PET capabilities to the dedicated breast CT machine developed by his colleague, John Boone. Together, the two technologies will help us detect breast cancer earlier than other imaging systems allow. Another of Dr. Badawi's colleagues, Julie Sutcliffe, is concurrently developing new contrasting agents that help produce ultra high-resolution PET images of cancer.

A couple of established researchers are leading the way in cancer treatment. Kit Lam, the combinatorial chemist of our program, is identifying compounds that distinguish cancer cells from healthy ones and, ideally, will help deliver treatments to those discrete targets. You can also read the touching stories of three patients of Carol Richman, who initiated the UC Davis Stem Cell Transplant Program 15 years ago. For each patient, a stem cell transplant provided an option for treating tough cancers.

I am also proud to share with you the story of Barbara Fingerut, a breast cancer survivor and woman of great character who has committed a sizeable donation toward establishing a new cancer center endowed chair. We are grateful for her trust in us and will use the funding to further expand our first-rate team of scientific talent.

The cancer center has a reputation for bringing the best researchers to UC Davis for the benefit of cancer patients. This issue of our magazine highlights why that reputation is so well-deserved.

Ralph deVere White  
*Director, UC Davis Cancer Center*  
*Associate Dean for Cancer Programs*  
*Professor, Department of Urology*



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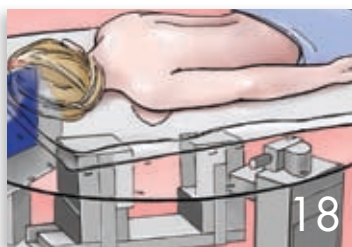
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**UCDAVIS**  
CANCER CENTER

*A National Cancer Institute-  
designated cancer center*



# Life after stem cell transplant

## Three people, three stories, one outcome

**Once considered impossible to survive, stem cell transplants are today a widely accepted and often first-line defense against tough diseases.**

**“ A stem cell transplant is certainly not considered an easy treatment, and it’s definitely not for every patient. But it can be very powerful and effective in fighting cancer.”**

**~ Joseph Tuscano**

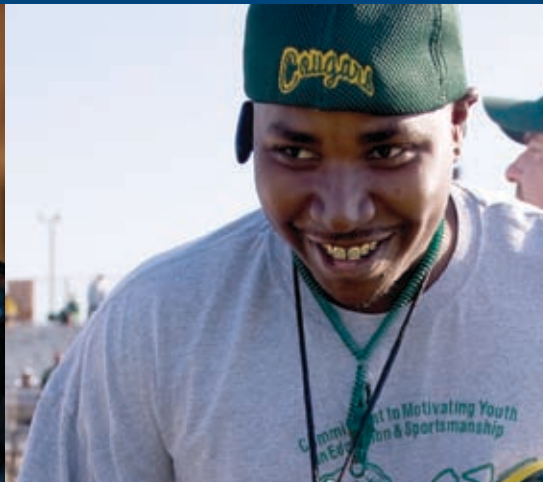
Not long after David Rhodes underwent a stem cell transplant to treat his leukemia, the nurses at UC Davis Cancer Center gave him a nickname: Ironman.

Rhodes has no immediate plans to compete in a triathlon. Unlike most transplant patients, he is a senior citizen – and a grandpa. As recently as the mid-1990s, Rhodes, 72, would not have been a candidate for the procedure that saved his life. Advances in the use of lower-toxicity therapies changed that.

“People used to say you had to be an Olympic athlete to tolerate a transplant,” says Carol Richman, professor of hematology and oncology and director of the UC Davis Stem Cell Transplant Program. “Mr. Rhodes is a great example of how far things have come.”

Rhodes is one of more than 500 patients who have received stem cell transplants at UC Davis Cancer Center since 1993. Led by the widely respected Richman, the team includes specialists in all areas of transplant science and patient care. The program is the largest and most experienced of its kind in inland Northern California and the region’s only National Marrow Donor Transplant Program, giving patients access to potential donors worldwide.

Richman and pediatric oncologist Douglas Taylor oversee up to 60 transplants each year, achieving success rates that



meet or exceed national averages. In May 2008, the program was accredited for the full range of adult and pediatric transplant services by the Foundation for the Accreditation of Cellular Therapy. This milestone gives UC Davis patients access to a wider range of national transplant clinical trials and increases the number of insurance companies covering the procedure.

Complex and intense, the field often leads to burnout for physicians, who shoulder a caseload of seriously ill patients requiring intensive follow-up. Against that backdrop, Richman stands out, says Ted Wun, who performed UC Davis' first stem cell transplant with her in 1993.

"I honestly, truly have never seen another physician more devoted to patients," says Wun, vice chief of hematology and oncology at

UC Davis. "She gives them her pager number and follows up with them while she's on vacation or at medical meetings. It is extremely rare to find a physician like her nowadays."

Richman came to UC Davis in 1992 from Chicago, where she had a reputation as a skilled and compassionate physician. Early in her career, she participated in some of the first stem cell transplants at Dana Farber Cancer Institute in Boston and has since been driven to perfect the process. When she arrived at UC Davis, she established the transplant program, eliminating the need for patients to travel long distances for the procedure.

For Richman, watching patients recover and regain or even improve quality of life is tremendously rewarding. Here are a few of their stories.

**"Over the past 15 years, stem cell therapy has matured, enabling more patients to receive this lifesaving treatment. The environment for major progress in stem cell science is very supportive right now, and UC Davis will continue to play a lead role in this field of medicine."**

**~ Carol Richman**

(pictured above, right, with Brandy Perkins)





## A benevolent stranger

It began with some shortness of breath and heart palpitations during a trip to San Francisco. Brandy Perkins, 28 at the time, attributed the symptoms to altitude, a reaction to her 6,000-foot descent from her home in South Lake Tahoe, Calif., to the sea-level city by the bay.

Doctors uncovered a different reason, and in December 2004 Perkins was diagnosed with myelodysplastic syndrome, a disease of the blood and bone marrow. A transplant was vital if Perkins was to survive.

Like two-thirds of all transplant candidates, Perkins lacked a relative suitable to serve as a donor. That left her waiting, along with about 6,000 other patients, for an unrelated donor match to surface through the National Marrow Donor Program. Eight candidates were tested and

rejected. In April 2005, a match was found.

Next came six days of chemotherapy treatment to destroy her malignant stem cells. Then it was transplant time, an experience that was far different than Perkins expected.

“I was envisioning a huge operation, but it was not like that at all,” Perkins recalled. “I watched TV and ate applesauce while it was happening.”

Through it all, one piece of information was kept secret. According to protocol, Perkins was not given the name or hometown of her donor: “All I knew was that she was female and 21.”

Perkins, moved by the knowledge that a stranger had voluntarily shared the cells that saved her life, wanted to know more. The rules, however, require a yearlong wait before any communication between donor and recipient.

At the year mark, after battling intestinal problems resulting from graft-versus-host disease, Perkins asked her UC Davis transplant coordinator to pass on her request to make contact. A long wait ensued, but finally a name, e-mail address and phone number arrived. Her donor was a college student in Long Beach, Calif., named Ashley Wysocki.

Too nervous to pick up the phone, Perkins sent an e-mail, introducing herself and asking Wysocki if she’d be interested in a dialogue. The response – an enthusiastic “yes” – came quickly, and the two women found they had “an amazing connection from day one,” Perkins says.

Their first face-to-face meeting came later that year. Perkins and her husband, Adam, traveled to Southern California and met Wysocki at a steakhouse: “It was so emotional,” Perkins recalled. “I think we hugged for five minutes.”

“We sat and stared at each other a lot,” Wysocki says. “And for me it was almost awkward because I felt like I hadn’t done much of anything, but here I was up on this pedestal because I had saved her life.”

Since then, the friendship has blossomed and now includes their families. They are even planning a camping trip for both clans at Lake Arrowhead.

For Perkins, meeting her donor and knowing that her transplant happened “because of someone else’s beautiful, selfless act has really changed the path of my life. I appreciate every day and realize that my relationships and quality of life are what are truly important.”

Meeting her donor and knowing that her transplant happened “because of **someone else’s beautiful, selfless act** has really changed the path of my life.”

~ Brandy Perkins (pictured above, left, with Ashley Wysocki)



**“The diagnosis made me focus my mind on **all the ways I could contribute** if I was able to **beat this disease.**”**

~ Curtis Richards

### **A focus on the future**

When Curtis Richards was diagnosed with non-Hodgkin's lymphoma in 2002, the news sent his life into a tailspin. He became depressed. He felt hopeless. His mind could not let go of the question that haunts so many patients facing a serious disease – “Why me?”

Richards was 26 at the time – young, married, with three children to raise. An avid basketball player, youth sports coach and concert promoter, he was now completely sidelined by a very aggressive cancer.

It began with mysterious back pain that was so intense it brought Richards at one point to an emergency room. Doctors initially attributed it to a sports injury and gave him cortisone shots for the

pain. Then his right leg began going numb and walking became difficult. Finally, after falling in the shower and at a birthday picnic, he went back to the emergency room and encouraged his doctor to follow up more thoroughly. Tests showed a tumor pressing on his spine.

“When I found out I had cancer, it pretty much devastated me,” Richards recalled. “I had no idea what non-Hodgkin's lymphoma was or what the treatment would be. When I heard a transplant was my best option, I was worried, very emotional.”

Support from Richards' mother, wife and Dr. Richman eased his fears. The transplant, performed on April 3, 2003, was a success.

Unlike Perkins, Richards served as his own stem cell donor. In this type of transplant, a patient's own stem cells are removed from the blood, frozen and preserved before being reinfused back into the bloodstream.

For Richards, the transplant aftermath brought some complications – a rash, a few infections, cardiac problems and lingering back pain. Overall, he has fared very well. He is off all transplant-related medications, and the once-frequent doctor visits are now few and far between.

The best news, of course, is Richards' prognosis. Now that he is five years beyond his transplant and cancer-free, his future looks bright.

That prospect underscores Richards' new perspective on life, one that took root during those bleak days shortly after diagnosis. Through prayer and the encouragement of family and doctors, he came to view his cancer as a turning point, one that refocused him on his passion – coaching.

“I wasn't the best kid growing up, I was into all sort of things,” he recalled. “The diagnosis made me focus my mind on all the ways I could contribute if I was able to beat this disease.”

In 2006, that desire to contribute prompted Richards and his cousin to launch a youth sports and mentoring organization, the Sacramento Junior Cougars. It serves about 275 boys and girls in Richards' Pocket/Meadowview neighborhood. Richards also coaches youth basketball and baseball.

“With the transplant and recovery, I had a lot of time to think about my life,” he says. “You come to realize that God has his reasons for our trials, that there is a positive in all of this. My confidence is high, and I'm living for my kids and for the future.”



“ I could not have made it without (my wife) Virginia. **Having her there with me made it possible** to get through the tough parts.” ~ David Rhodes

## Back on the dance floor

The leukemia came on like a thunderclap. One week, David Rhodes was playing golf by day and ballroom dancing with his wife by night. The next, recalled the retired chemist from Dixon, Calif., “I could hardly walk 100 feet.”

Rhodes was 69 at the time, and the prognosis for a person of his age with acute myeloid leukemia was poor. He underwent a course of chemotherapy, but relapsed after about nine months.

That’s when his oncologist approached Richman about a transplant. After some tests, Rhodes recalled, “they decided I was in good physical shape and took a chance on me.”

Until recently, a senior citizen would not have been cleared for such a procedure. Historically, the high-dose chemotherapy that precedes a transplant was too toxic for patients over 50. Gradually, however, the use of less-toxic but still highly immunosuppressive drugs have paved the way for reduced-intensity transplants suitable for older patients. Rhodes got the green light.

One of seven children, he found a donor in a younger brother, Phil, living in Jackson, Miss. The sibling’s




healthy stem cells were transferred to the ailing Rhodes on March 15 of last year.

Rhodes battled some complications after the transplant – rashes, fatigue, heart issues, intestinal surgery – and stayed in his house for months to avoid exposure to germs. Slowly, the Ironman regained strength. He now walks more than a mile a day on his treadmill and holds the title as UC Davis’ oldest donor stem cell transplant patient.

“I could not have made it without Virginia,” he says, referring to his wife. “Having her there with me made it possible to get through the tough parts.”

His next goal? To return full throttle to the hobby he and Virginia so dearly love: ballroom dancing.

“The transplant prolonged my life, I would have died without it,” Rhodes says. “And my fingers are crossed that it will allow me to continue doing the things I love.” 



# TRANSPLANT EVOLUTION

Perspectives on stem cell transplants have changed since the first successful procedure in the 1950s. They were once considered treatments of last resort for young cancer patients who were otherwise healthy and had an identical twin bone-marrow donor. As technology, stem cell sources and knowledge of the immune system changed, more patients have been able to benefit from the procedure.



"We have become much better at doing transplants and identifying patients who should have them," said Joseph Tuscano, associate professor of hematology and oncology and part of the UC Davis stem cell transplant team. "The process is much safer, much more controlled and much more tolerated now than it was even 10 years ago."

Today, transplants can be a preferred treatment for cancers such as leukemia, lymphoma and myeloma, as well as for congenital or acquired bone marrow disorders. They can be used to replace an abnormal immune system or help circumvent the damage caused by high-dose chemotherapy.

In addition to bone marrow, stem cell sources now include peripheral and umbilical cord blood. Nearly half of all transplants are allogeneic, in which cells are provided by a donor with closely matched human leukocyte antigens. An autologous transplant involves using the patient's own stem cells following treatments to "coax" them from bone marrow.


The process begins with intensive chemotherapy for up to one week to eliminate the patient's own immune system and, in the case of malignancy, eradicate diseased cells. In a matter of hours, the donor's – or patient's own – cells are transferred through intravenous infusion. From

that point on, the patient's bloodstream is forever transformed.

When donor cells are used, physician oversight is required for months to years to monitor for graft-versus-host disease, which causes the new immune system to attack its host's organs. Autologous transplant patients are usually referred to the care of their own oncologists after just one or two months.

"A stem cell transplant is certainly not considered an easy treatment, and it's definitely not for every patient. But it can be very powerful and effective in fighting cancer," says Tuscano.

Carol Richman, director of the UC Davis Stem Cell Transplant Program, plans next to expand the use of umbilical cord cells for patients who do not have matched donors, use stem cells to treat more non-malignant diseases, and work with the new UC Davis Institute for Regenerative Cures to develop novel treatments for restoring failing organs and preventing graft-versus-host disease.

"Over the past 15 years, stem cell therapy has matured, enabling more patients to receive this lifesaving treatment," she says. "The environment for major progress in stem cell science is very supportive right now, and UC Davis will continue to play a lead role in this field of medicine." 

# Connections>>



# When worlds collide



## Researcher and breast cancer survivor improves cancer imaging

When Julie Sutcliffe was diagnosed with breast cancer three years ago, she found herself the beneficiary of her own experiments and the expertise of her colleagues.

As a researcher, Sutcliffe was testing novel cancer drugs and creating new compounds that would facilitate clearer imaging of cancer cells.

As a patient, she enrolled in a clinical trial of a new breast CT scanner – custom built by UC Davis biomedical engineering Professor John Boone – that provides comfortable, accurate imaging of breast tumors. Another colleague and now great friend, Richard Bold, was the surgeon who removed her tumor. As part of her treatment plan, she was given the drug Herceptin, which helps prevent breast cancer recurrence. Sutcliffe was previously involved in the preclinical testing of this compound.

“It was quite a balancing act to be a patient, a colleague and a scientist all at the same time,” says Sutcliffe, an associate professor in the Department of Biomedical Engineering and director of the cyclotron and radiochemistry facility for the Center for Molecular

and Genomic Imaging. “It gave me a whole new perspective,” she says of her battle with the disease.

With her cancer now in remission, Sutcliffe is driven more than ever by her passion for improving molecular imaging for cancer detection and treatment planning. She is working to develop new short-lived radioactive imaging agents for use in PET (positron emission tomography) scans.

PET is a powerful imaging tool that allows physicians to precisely pinpoint tumors and see them in action, providing valuable information to help fight the disease. Using this technology requires selective imaging agents – radioactive compounds called “radiotracers” – that provide very high contrast between diseased and healthy tissue and the means to examine the biology of cancer.

Sutcliffe’s laboratory focuses on finding new selective agents for cancer imaging that rapidly



**Julia Choi is creating an imaging agent that targets a cell-surface protein found on metastatic breast cancer cells.**





**Postdoctoral researcher Sven Hausner is designing imaging probes to target diseases such as head and neck cancers, pancreatic cancer and breast cancer.**

distribute throughout the body and clear quickly from non-target tissues. The specific agents Sutcliffe focuses on bind to certain molecules on cancer cells, literally making the cancer glow on a PET scan's computer-generated, three-dimensional images.

Currently, there is only one FDA-approved PET radiotracer used to image and stage cancers. This compound mimics glucose and, therefore, goes to any cell that metabolizes glucose. Because it is metabolized by cancer cells at about 25 times the rate of normal cells, glucose is excellent for detecting primary cancers and metastases. The problem is that this agent cannot distinguish disease from infection.

"PET scans of glucose metabolism are highly informative, but there is a need to image more specific biological processes of cancer with more selective targeted imaging agents," Sutcliffe says. "Right now, we're way behind on the translation of these compounds from the bench to the bedside to realize the full potential of PET."

### **From chemistry to patients**

Sutcliffe and her lab team have already developed one new promising imaging agent that binds to a particular protein found almost exclusively on the surface of cancer cells. The protein – alpha-v-beta-6 – belongs to a family of

proteins called integrins found on the surface of many different kinds of cancer cells, including breast, pancreatic, colon and lung cancer. Its presence is considered a reliable predictor of poor outcome.

"Knowing that cancer is present and the pathological course it is likely to take are powerful tools in developing successful treatment plans," says Sutcliffe. "Our work brings much greater precision to diagnosis and treatment of the disease."

The imaging agent Sutcliffe designed uses part of a protein made by a virus – the one that causes foot-and-mouth disease – that selectively binds to the alpha-v-beta-6 integrin. She radio-labeled this peptide using  $^{18}\text{F}$  fluoride and, in 2007, showed for the first time that it was highly visible in tumors using a small-animal PET scanner developed by colleague Simon Cherry, director of the UC Davis Center for Molecular and Genomic Imaging.

Based partly on her integrin results, Sutcliffe received a highly competitive grant from the U.S. Department of Energy to produce more high-quality imaging agents for use in humans. According to Sutcliffe, the agents she's developing could be used to image any cell surface receptor associated with a particular disease. To that end, she has received a UC Davis Cancer Center Support Grant to develop



“Julie is **driven by her passion** and will to win against all odds. These personal qualities, combined with her scholarship, make her a **remarkable scientist.**”

~ Michael Phelps

targeted molecular imaging agents for a marker of tumor angiogenesis – the process by which tumors form blood vessels. A marker for these tumor-associated blood vessels would allow physicians to see how a tumor is able to sustain itself and, potentially, allow them to track the efficacy of anti-angiogenic drugs intended to “starve” the tumor by shutting off its blood supply.

“Julie is driven by her passion and will to win against all odds,” says Michael Phelps, Norton Simon Professor and chair of Molecular and Medical Pharmacology at UCLA. “These personal qualities, combined with her scholarship, make her a remarkable scientist. Julie has developed truly innovative approaches to rapidly develop diverse arrays of imaging probes for PET, providing the means to examine diverse arrays of therapeutic targets in cancer patients. Her unique approach expands the value PET molecular imaging diagnostics can provide to better manage the biology of cancer to the benefit of cancer patients. All of this is part of the wonderful evolution of Julie as a person and as

a scientist. It is my privilege to be her colleague and her friend.”

Sutcliffe expects to begin human clinical trials of the integrin-targeting imaging agent within the next 18 months. Grants from the National Institutes of Health will help fund a new radiochemistry laboratory and provide an ultra-clean environment to derive cellular products for patients involved in clinical trials.

“Taking what we find in the lab and moving it into clinical applications is a big step,” Sutcliffe explains. “It’s expensive and complicated, but being able to use PET for biological examinations will make a big difference in the way we see, understand, diagnose and treat cancer.”

### **Back to the clinic**

Getting back to clinical work has been Sutcliffe’s goal since arriving in 2002 at UC Davis. Her path to academia was quite unconventional. At age 22 and with just an undergraduate degree in chemistry, she joined the world-renowned PET group at the Hammersmith Hospital in London. She spent two

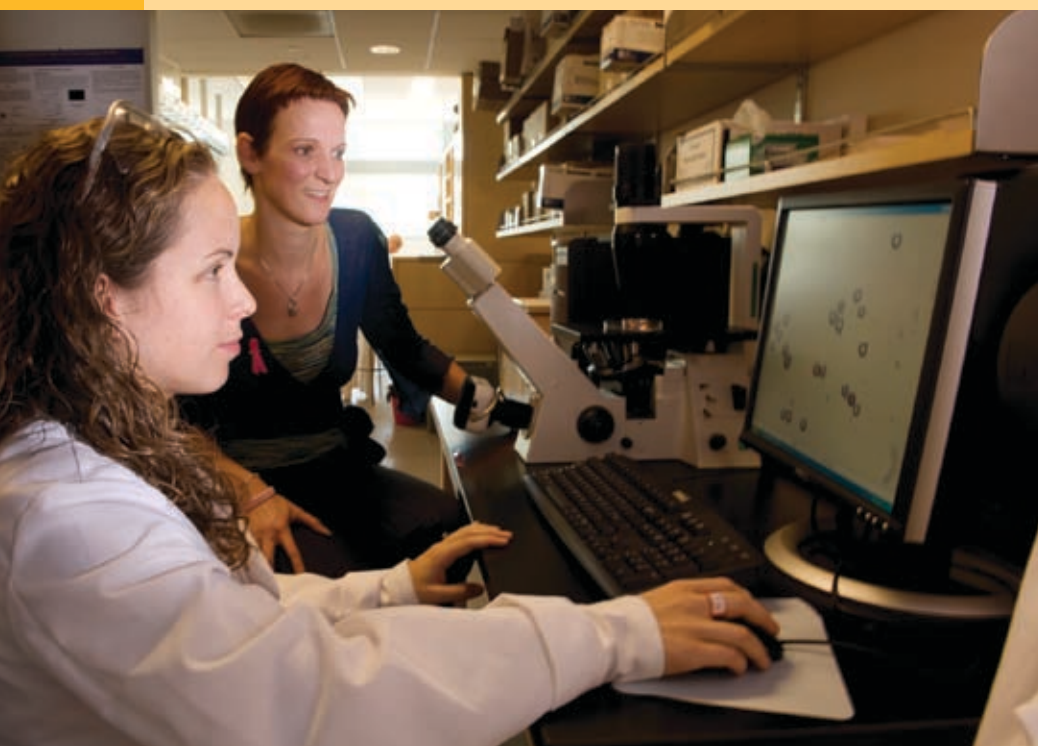


**Dave Kukis (above left) and Lina Planutyte manage the daily responsibilities of running a cyclotron and producing the short-lived radioisotopes necessary for Sutcliffe’s research program.**

## Connections >>

“Taking what we find in the lab and moving it into clinical applications is a **big step**. It’s expensive and complicated, but **being able to use PET for biological examinations will make a big difference** in the way we see, understand, diagnose and treat cancer.”

~ Julie Sutcliffe (pictured below, right, with Karen Gagnon)



invaluable years there gaining a wealth of experience and skills at an emerging time for clinical PET. She was fascinated with the radiochemistry and by the almost science fiction-like quality of the imaging machines used on patients.

“This was a brand new field and few people knew how to do the medicinal chemistry I was learning. These were fun, exciting times,” Sutcliffe says.

Two years later, she applied for and got a job running the radiochemistry lab at the prestigious St. Thomas’ Hospital in London.

Eventually, Sutcliffe realized that becoming an innovator in her field meant getting more degrees. She went to night school, earning a master’s degree in synthetic organic chemistry. Later, she enrolled at King’s College School of Pharmacy, conducting her Ph.D. research in her own lab.

That was when Cherry asked Sutcliffe to come to UC Davis, and she jumped at the chance to work with a recognized leader in imaging science. She filed her dissertation and, a month later, arrived at UC Davis where her work has so far focused on bench science and pre-clinical trials.

“I love my work, but I must admit that I have missed the clinic,” Sutcliffe says. She is excited that next she will see how her imaging agents perform in patients. “Now I can do what I really came here to do, which is show how the work in the lab connects with improvements in cancer care.” [UCD](#)





# Team Sutcliffe

Julie Sutcliffe focuses on developing new agents for non-invasive cancer imaging. That work, however, requires many minds, and she has specifically recruited the right talent mix to her lab.

“My lab team includes the people who are committed to taking the imaging agents we develop from bench to bedside,” Sutcliffe says. “This multidisciplinary, translational approach will yield results sooner rather than later.”

Finding candidate molecules specific to the biological processes that transform normal cells into cancer is the first challenge in creating an imaging agent.

Postdoctoral fellow **Karen Gagnon**, an organic chemist, is taking a random high-throughput approach, screening thousands of potential candidates. Postdoctoral researcher **Sven Hausner**, also an organic chemist, is designing imaging probes based substantially on known target structures.

“The great thing is that, coming at the problem from different angles, they are starting to come up with some of the same answers, confirming where we should focus our efforts,” Sutcliffe says.

The Sutcliffe lab also includes three graduate students – all biomedical engineers – with backgrounds that complement those of Sutcliffe and two post-doctoral fellows:

**Julia Choi**, who has a degree in biomedical engineering, is creating an imaging agent that targets a cell-surface protein found on metastatic breast cancer cells.

**Cathy Stanecki**, who also has a biomedical engineering degree, is looking to target new molecules on angiogenic blood vessels that supply tumors, focusing on the application of such a probe in breast cancer.


**Jason White**, who has a degree in mechanical engineering, joined the lab from a private health-care research company, where he worked in radiochemistry. He brings the unique perspective of what it takes to commercialize health-care products. He is excited to learn probe development from the bench

upwards but is more fired up by the opportunity to see his compounds used to benefit patients.

Staff members working with the Sutcliffe team include **Dave Kukis**, the cyclotron facility manager, and **Lina Planutyte**, a staff research associate, who manage the daily responsibilities of running a cyclotron and producing the short-lived radio-isotopes necessary for Sutcliffe’s research program.

“It is the team that makes my research successful, they are the ones who deserve the credit,” Sutcliffe says.

Sutcliffe provides a comfortable, collaborative family-like atmosphere in her lab, where she sees her role as leading all the team’s work toward targeted research goals.

“I really love what I do. It’s my job and my hobby, so I tell my team: ‘If you’re not happy, go do something else.’ Life is too short,” she says. 

**“ I really love what I do, so I tell my team: ‘If you’re not happy, go do something else.’ Life is too short.”**

**~ Julie Sutcliffe**



# Quality care close to home

New organization unites regional cancer centers and **raises the bar** overall on patient care

He is 77 years old and has been in good health since being treated for prostate cancer almost two decades ago. That, however, is changing. Recent tests show his cancer is back.

He is not in the room and his name is not known as his physician shares radiology, pathology, medical history and exam details with colleagues. Afterwards, more than two dozen oncologists, radiologists, urologists and surgeons – a dream team of prostate cancer specialists – ask questions. How was his first cancer treated? How long did it take his prostate-specific antigen level to double? What was his Gleason

score five years ago compared to today? Does he have any other health issues? In what organs and where, exactly, is his cancer now? Does a scan indicate bone cancer?

They then all share similar patient cases and outcomes, related research they have conducted or reviewed, treatment options they can offer and new medications that could help, including innovative therapies available through clinical trials.



**State-of-the-art videoconferencing links cancer specialists throughout Northern and Central California and significantly expands perspectives on patient care.**



“In many ways, this is a typical tumor board,” says Ralph deVere White, UC Davis Cancer Center director, referring to standard meetings of cancer experts to devise treatment plans. “The goal is always to give patients the best chance for cure. The big difference with this tumor board is that all participants are not in the same room.”

UC Davis Cancer Center recently initiated “virtual tumor boards,” where state-of-the-art videoconferencing links cancer specialists throughout Northern and Central California and significantly expands perspectives on patient care. These electronic meetings of the minds are also part of the glue that links four community hospitals with the cancer center as part of the new UC Davis Cancer Care Network, which launched in October of this year.

### **A new organization**

The new network actually began eight years ago, when alliances were first developed with Fremont-Rideout Cancer Center in Marysville and Mercy Cancer Center in Merced through business partnerships – or limited liability corporations. These agreements have since been expanded to include formal clinical connections.

These successful affiliations led to expanded interest in decentralized cancer care. To explore options, a management team was formed that included cancer center Director Ralph deVere White along with Scott Christensen,

a UC Davis associate professor of hematology and oncology; Kay Harse, chief administrative officer for the UC Davis Cancer Care Network; Patricia Keast, regional affiliations officer for UC Davis Health System; and Jeanine Stiles, the cancer center’s associate director for administration.

Agreements have since been initiated focusing on access to clinical trials and specialty care with Tahoe Forest Cancer Center in Truckee and Regional Cancer Center at ValleyCare in Pleasanton. Add three UC Davis Cancer Center satellite clinics in midtown Sacramento, Elk Grove and Rocklin and the UC Davis Cancer Care Network was born.

### **Innovative approach**

The specialty-care network is one of the first in the nation to be linked with a public health-care institution. While it may seem a little entrepreneurial for academia, Keast notes that the network supports UC Davis’ distributed care model of providing clinical services along with the outreach commitments of its National Cancer Institute-designated cancer center.

“It truly is a unique approach to providing health-care services, yet it is a natural outcome and an expectation of our role as the leading cancer research center in the region and the only one with NCI designation,” says Keast. “The network formalizes our commitment to collaboration with community providers and





“Cancer is not a disease that travels well, and **being in familiar surroundings** and having a **strong support network** nearby are very important aspects of **treatment and recovery.**”

~ Scott Christensen

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~ Patricia Keast

promoting first-rate patient care across the region.”

Keast is responsible for structuring network agreements and, while each is unique based on a menu of services and fees, the unifying goal is to assure that quality cancer care is provided to patients as close to home as possible.

“Cancer is not a disease that travels well,” says Christensen, who was recently named the network’s first medical director, “and being in familiar surroundings and having a strong support network nearby are very important aspects of treatment and recovery. That’s why our priority is to make sure each site has what it needs to provide the best care right in the community setting.”

### **Access to specialists**

There are specialty and subspecialty services that are unique to UC Davis, and patients at network sites can be easily referred for those services. This was especially important to

Jenny Walker, a patient of Mercy Cancer Center.

In diagnosing her breast cancer, medical oncologist Lucio Nobile also found a suspicious spot in her lung. He referred Walker to Royce Calhoun, UC Davis surgical director of thoracic oncology and the only cardiothoracic surgeon in the region using video-assisted thoracoscopic surgery – or VATS.

The procedure involves making small chest incisions for inserting a tiny fiber-optic camera and specialized surgical instruments. There is no cutting or spreading of the ribs as there is with the traditional thoracotomy. Instead, the surgeon performs the entire operation through the small incisions, using images from the camera projected onto a video monitor for guidance. When compared to open chest surgery, VATS patients experience much less pain, shorter hospital stays and quicker recovery times.

Walker was thrilled to be a candidate for the less-invasive

## PARTICIPATING SITES>>

approach and did very well following surgery. While she is happy for the connection between her physician and UC Davis, she is even happier to be home.

“I do much better in the comfort of my own bed,” she says.


### **A new model for specialty care**

Now that the formal network is launched, expansion plans are, once again, in the works.

“We are seriously considering a number of other hospitals that have asked about joining the network, but those opportunities need to move forward carefully. We need to be sure to balance growth with the necessity of meeting current obligations,” says deVere White.

The specialty-care model that he and the team started, though,

fits well into the culture of care and community at UC Davis and could easily expand.

“The Cancer Care Network is an exciting partnership that will increase access to state-of-the-art care for patients across our region,” says Claire Pomeroy, UC Davis vice chancellor of Human Health Sciences and dean of the School of Medicine. “Together with four outstanding community hospitals, we will increase early cancer detection, enhance quality of life and improve survival rates for our patients. This new model for specialty care reflects UC Davis’ deep commitment to our community and is a shining example of our passion for advancing health for all.” 

**There are specialty and subspecialty services that are unique to UC Davis, and patients at network sites can be easily referred for those services.**



FREMONT-RIDEOUT CANCER CENTER  
Marysville • [www.frhg.org](http://www.frhg.org)



MERCY CANCER CENTER  
Merced • [www.mercymercedcares.org](http://www.mercymercedcares.org)



REGIONAL CANCER CENTER  
AT VALLEYCARE  
Pleasanton • [www.valleycare.com](http://www.valleycare.com)



TAHOE FOREST CANCER CENTER  
Truckee • [www.tahoecancercenter.com](http://www.tahoecancercenter.com)



UC DAVIS CANCER CENTER  
Sacramento  
[www.ucdmc.ucdavis.edu/cancer](http://www.ucdmc.ucdavis.edu/cancer)

## Dynamic duo: PET plus CT

### First-of-its-kind imaging system improves breast cancer detection

Before becoming a researcher, Ramsey Badawi saw firsthand the power of noninvasive nuclear imaging technology. Badawi got a job as a computer technician at a London hospital that introduced him to the power of positron emission tomography – or PET. It was the start of his new career in health care.

“I believe PET technology has the ability to make personalized medicine a reality,” says Badawi, a UC Davis physicist and now 17-year PET veteran.

Unlike other forms of imaging, PET can accurately measure physiological functions such as blood flow, oxygen use and glucose metabolism. It can determine how well organs are functioning, help monitor the efficacy of drugs and distinguish benign from malignant tumors. In recent years, scientists have combined PET technology with X-ray CT, or computed tomography, allowing them to overlay PET scans onto computer-generated three-dimensional maps of the body’s structure.

“PET gives you the physiological information, while CT gives you the anatomical information,” Badawi says. “Together, the whole story they tell is truly greater than the information the two technologies can provide separately.”

### Bringing PET/CT to breast cancer

Currently, the combined technologies are only clinically available on full-body PET/CT scanners, which cannot easily pinpoint tumors smaller than one-half inch in size. As screening has improved and become more targeted, many women are diagnosed with small, early-stage breast tumors. Imaging these small tumors with PET/CT could improve staging and surgery planning, as well as allow physicians to evaluate the effectiveness of chemotherapy.

“We’ve known for years from full-body PET/CT that the two technologies complement each other, but full-body imagers just don’t have the resolution you need to image primary breast cancer,” Badawi says.

Badawi took up the challenge of developing the first clinical breast PET/CT scanner upon arriving at UC Davis in 2004 from the Dana Farber Cancer Institute at Harvard. He was lured to UC Davis by the prospect of working with Simon Cherry, who directs the UC Davis Center for Molecular and Genomic Imaging and built the first PET machine with enough resolution to accurately image tumors in mice.



**Ramsey Badawi merges the best of two imaging technologies to bring the process of seeing cancer to new levels of distinction.**

“Deep in my heart, I wanted to build PET scanners, and UC Davis has one of the top PET engineers in the world in Simon Cherry,” Badawi says.

Thanks to Cherry, Badawi found a new collaborator in UC Davis radiologist John Boone, who built the first dedicated breast CT scanner. At that point, the idea to create more than just another PET scanner was born.

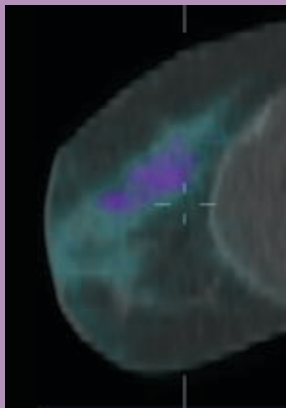
“I took one look at Boone’s dedicated breast CT scanner and knew there was plenty of room to mount a PET scanner. It seemed like the obvious thing to do,” he says.

According to Cherry, the three-way collaboration of himself, Badawi and Boone is quickly making the transition of breast PET/CT from pre-clinical to clinical applications a reality.

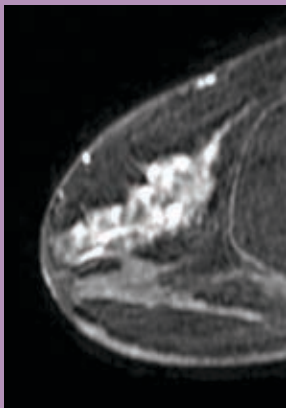
“UC Davis has the right people at the right time to bring these technologies together,” says Cherry, whose lab meets weekly with Badawi’s. “Through these interactions, my group gets to see the clinical side, how their efforts are being used and how they can make a difference in the lives of breast cancer patients.”



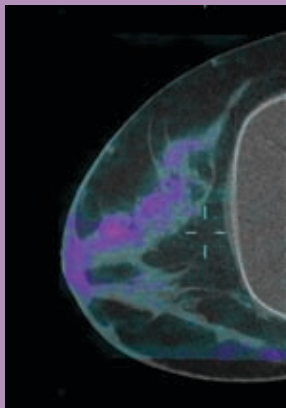
**Conventional  
whole-body PET/CT**



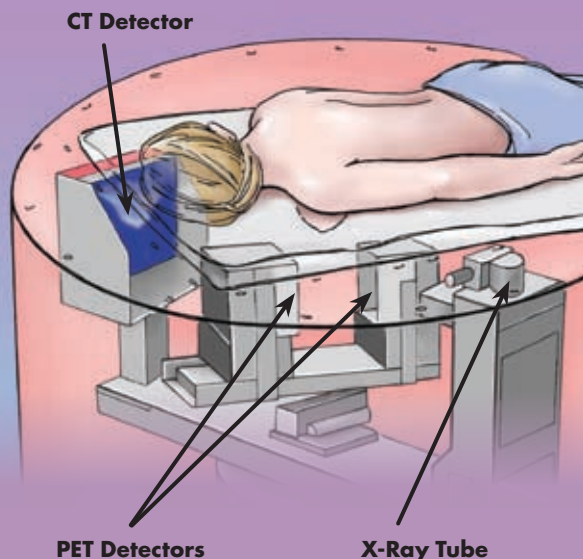
**Breast MRI**



**UC Davis dedicated  
breast PET/CT**



**The PET/CT image on the far right shows areas of possible malignancy (purple), fibro-glandular tissue (green/gray), adipose tissue (dark gray) and breast implant (light gray).**



### How dual imaging works

A breast PET/CT scan takes about 10 minutes per breast. Just the same as with breast CT, the patient lies on a padded table while the breast hangs down through a circular opening. In one study, Boone and UC Davis chief of breast imaging Karen Lindfors found that this type of system is more comfortable and preferred by patients to standard compression-based imaging systems.

The CT images are generated first using an X-ray source and detector that are rotated around the breast to produce a three-dimensional map showing the internal structures of the breast.

For PET images, the patient is first injected with a radiotracer – fluorodeoxy glucose, or FDG – which is absorbed into the body in proportion to the amount of sugar that the cells are using. Cancer cells use more sugar than normal cells, so the FDG reveals them as “hot spots” on PET scans. As with CT image production, a gamma ray detector rotates around the breast to produce a second three-dimensional map.

The combination of the two three-dimensional maps shows the precise location of cancer as “hot spots.”

In December 2007, Badawi’s lab produced the first-ever images of a patient’s breast cancer using for the very first time a PET/CT scanner designed specifically for imaging the breast. Badawi admits that he spent a day-and-a-half staring in amazement over the first image his team produced.

“It was quite exciting. The resolution was startling,” says Badawi. “You could see clearly the patient had several different manifestations of the disease. Compared to the whole-body scans, the detail was exquisite.”

Badawi predicts that breast PET/CT will be most useful for surgery planning in women who have been diagnosed with breast cancer. The technology promises to improve neoadjuvant chemotherapy, which shrinks tumors prior to surgery. Physicians will be able to tell within a matter of weeks if the drugs are working.

Badawi also believes PET/CT may be useful in women who have had lumpectomies and whose scar tissue makes it difficult to look for


recurrence using X-ray alone. It may also help in screening dense-breasted women who are at an increased risk of developing breast cancer due to inheritance of breast cancer genes.

### Building on breakthroughs

It has been gratifying, Cherry says, to see what Badawi has done with the technology he first developed.

“We had PET technology we were using in small animals that gave us better spatial resolution than you find in clinical systems,” he says. “Now we’re applying that to breast cancer.”

For his part, Badawi is looking forward to completing the first clinical trial using the current breast PET/CT machine. He is also, of course, anticipating building the next-generation machine and incorporating biopsy capabilities.

“We have now built PET detectors with twice the resolution of the existing system. We hope to start using them to build a new scanner in early 2009. We will be able to see a hot spot, take a sample, and know sooner rather than later if the patient has breast cancer,” Badawi predicts. “The sooner the better.” 

## The power of staying positive — and golf

### Donors' gift forever links their names with cancer research

The first thing Barbara Fingerut did when she awoke after breast cancer surgery was to try and make a fist. Even through the pain, she was able to do so.

“Oh good,” she thought. “I can still play golf.”

She was out of the hospital in four days, back to work in nine days and swinging a golf club again in four weeks.

The love of golf and a determined, positive attitude have piloted Fingerut throughout life. Constantly lowering her handicap in the game she first played in her teens has matched her value for being physically active and provided a measure of achievement in the mostly male world of banking. She began her career as a bookkeeper and worked her way up to vice president and branch manager at a time when females in such positions were few.

“I play well,” she says with pride. Her colleagues knew she was a powerhouse to be reckoned with, “especially when we golfed together.”

Her drive to stay positive has gotten her through everything else, including the losses of her mother and husband to cancer.

“It truly is the ‘big C,’ but I don’t let it get too big,” Fingerut says.

Fingerut met her future husband, Stanley Fingerut, in Oakland, Calif.,

where she grew up and they both hung out in the same youth groups. Her father was a Navajo Indian and the person who inspired her admiration for hard work and wise humor. Her mother was Jewish and the person from whom she learned life’s best lesson: how to enjoy it. It was a tough lesson to appreciate, however, when her mother died. Fingerut was just 18 years old.

She recalls saying at the time to her sister, “I don’t think I could ever handle it,” recognizing her fear of getting cancer. “But my sister said to me, ‘What do you mean? Our mother could handle it, but you couldn’t?’ I realized that fear was no way to honor my mother. From that point on, I decided to do what I want to do today and not wait until tomorrow, because you just don’t know what can happen tomorrow,” Fingerut says.

Fingerut modeled her mother’s strength when she learned of her own cancer. It was the 1970s, when words like “breast cancer” were not openly discussed. When reviewing treatment options, her doctor had a hard time looking her in the eyes. He talked about a standard approach for the time: a surgical

**In looking at the complete landscape of their giving options, Stanley and Barbara Fingerut decided to leave some of their assets to an important part of their family – the university.**

biopsy to see if the lump she had found was cancer, then a second surgery for a mastectomy if it turned out that she did have breast cancer. Fingerut didn’t think twice about what she said next.

“I told him, ‘You’ve seen a lot of cancer before, so if you do this first surgery and can tell that it’s cancer, take it all right then, because I’m not coming back.’ I made it clear that he would have me on the operating table just one time,” she says.

As a result, Fingerut had a complete mastectomy on April 19, 1977, and she has been cancer-free ever since.

“When the doctor told me after the surgery that he took everything out, he also warned me that my days of bikinis, strapless dresses and low-neck blouses were probably over,” she said. “I let him know, ‘That’s OK, because I’ve never worn them before anyway.’ That wasn’t what mattered to me.”

What did matter to her was enjoying every minute of life with the love of her life. Stan’s job brought



“The endowment is also my hope that our money can help others with cancer. **I am very lucky.** I am a longtime survivor. And **I want others to be very lucky too.**”

~ Barbara Fingerut

them to the Sacramento area, where they lived starting in 1965. When they weren't working, they played bridge and, at times, he joined her in a game of golf. He officiated softball, becoming umpire-in-chief for the California-Nevada-Hawaii region of the American Softball Association. They traveled the world together four times. They raised two very large dogs – a great Pyrenees and a Newfoundland. Most of the time, they laughed – a lot. Stan died of amyloidosis, an outcome of multiple myeloma, in 2001.

“Stan's wit was what first attracted me. He was a big man with an even bigger sense of humor. He had to be funny in his line of work,” Fingerut says, referring to Stan's job as a factory representative for a hosiery supplier. “When asked what he did for a living, he would say, ‘I'm into ladies' pantyhose.’ He made people laugh throughout his illness too.”

With the exception of their dogs, the couple did not have children. So, when they started talking about wills, they had a big

decision: To whom would they leave their assets?

“We realized that we consider the university to be our child,” she said. “This is where Stan's disease was treated with compassion and quality. This is where we feel like family.”


As a result, Fingerut has promised that, upon her death, UC Davis Cancer Center will receive stock and funds totaling \$1.5 million to establish the Stanley Allan Fingerut and Barbara Esquibel Fingerut Endowed Chair in Cancer Research.

Endowments are highly valued by the university for their recruitment power, and the Fingeruts' commitment to an endowment is especially appreciated by the cancer center.

“Our job is to continuously improve on what we do by hiring and retaining the world's best clinicians and researchers,” says Ralph deVere White, the cancer center's director. “Barbara and Stan's gift is a major contribution

toward that effort and will help us quickly advance our research program by bringing even more top talent to our UC Davis cancer team. Barbara's leadership and the example she sets in establishing the endowment are a great honor to us.”

Fingerut appreciates the longevity of her gift and the hope it offers others as well.

“Both of my family names – ‘Fingerut’ and ‘Esquibel’ – will be permanently associated with cancer research and the university, and that means a lot to me,” she says. “The endowment is also my hope that our money can help others with cancer. I am very lucky. I am a longtime survivor. And I want others to be very lucky too.” 

For more information on giving options to UC Davis Cancer Center, call Ann Pridgen at (916) 734-9675.



# Color-coding cancer

“Rainbow beads” simplify cancer diagnosis and open new avenues of drug discovery

You never know what sort of wonders will emerge from the laboratory of Kit Lam. In addition to being chief of the Division of Hematology and Oncology at UC Davis Cancer Center, Lam is also a combinatorial chemist, plowing the outermost edges of the burgeoning field of biotechnology in an effort to develop novel cancer treatments.

Combinatorial chemistry involves the rapid synthesis and screening of large numbers of different but related chemical compounds. Lam's particular mission is to develop and arm peptides to hunt down and kill targeted cancer cells without destroying their healthy neighbors. He holds Ph.D. and medical degrees, blending clinical expertise with a knack for basic research that is described as nothing short of exceptional by colleagues.

Before arriving at UC Davis in 1999, Lam was an associate professor of medicine, microbiology and immunology at the Arizona Cancer Center at the University of Arizona. It was there, in 1991, that he created a chemical library containing more than one million different peptides – the short stretches of proteins responsible for the work of a cell. Each peptide was housed on a different plastic bead with a diameter similar to that of a human hair. The beads allowed laboratory scientists to run millions of

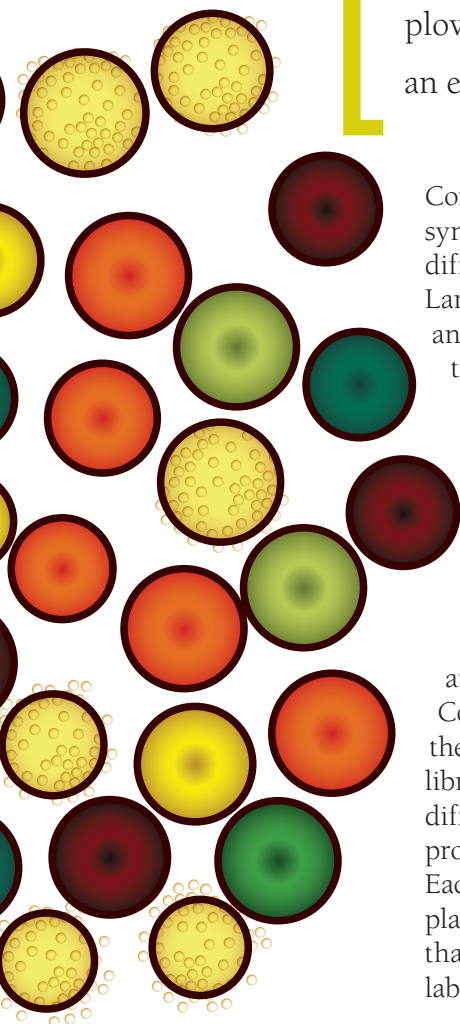
chemical reactions simultaneously, a huge time-saver in the hunt for more effective and less toxic cancer drugs.

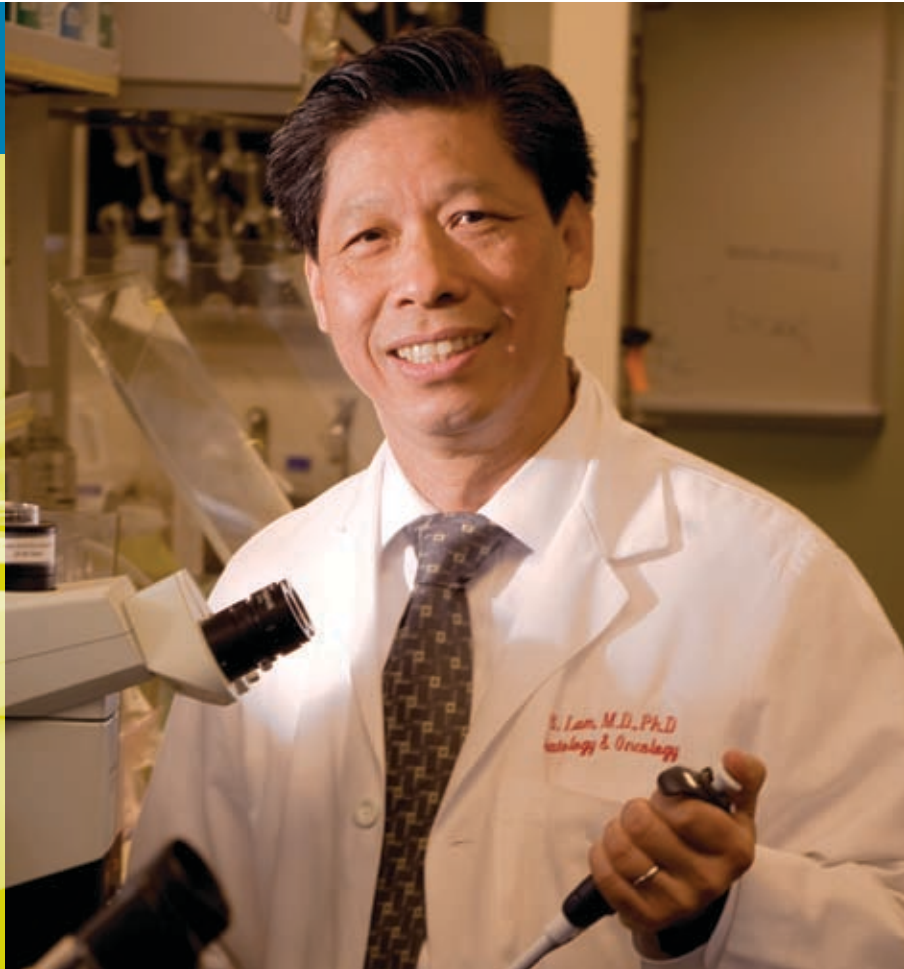
Recently, Lam added another important tool to the combinatorial chemist's research kit. In an April article published in the *Journal of Combinatorial Chemistry*, Lam revealed a new technique that involves color-coding those polystyrene beads, creating an array he calls “rainbow beads.”

To create this kaleidoscope, Lam stained the beads with oil-based organic dyes that function as a sort of color-coded labeling system. The dyes, trapped inside the bead, do not affect cell binding to the bead's surface and are insoluble in water.

## Simple, but powerful

Seemingly simple, the method substantially accelerates screening because the color-coding allows for small samples from multiple chemical libraries to be simultaneously screened against live cells





**Lam's work is part of broad revolution that is radically changing cancer research.**

“in one pot.” This, Lam says, allows the binding of cells to these different libraries to be compared directly.

Another major advantage is that scientists need only an ordinary inverted microscope to conduct the analysis, as opposed to a more sophisticated – and expensive – fluorescent microscope or flow cytometer.

The technique also allows researchers to color-code beads displaying known cancer-targeting molecules.

“If I take cancer cells from a patient named John and put them in a dish with 10 different colored beads, I can look and see which bead the cancer cells bind to,” Lam says. “Each bead has a different chemical molecule, so immediately I can make a diagnostic connection about John's cancer, and maybe even use the specific molecule as a

vehicle to deliver drugs to John's cancer while sparing his normal cells. And, instead of doing 10 separate experiments to get this information, I can do this in just one.”

Lam's work is part of broad revolution that is radically changing cancer research and how drugs are developed. Traditionally, oncologists have drawn on natural materials to create cancer drugs that are nonspecific and often carry significant side effects for patients.

But, using sophisticated chemistry, scientists have increased their understanding of the molecular biology of cancer and are creating millions of new compounds in the laboratory. This paves the way for the development of drugs that can target cancer cells more precisely and effectively.

**“ Many of Dr. Lam's inventions have been used extensively by cancer scientists. My work has benefited tremendously from his findings.”**

**~ Chong-xian Pan**

## In translation >>

**“ Dr. Lam is unique in the fierce intelligence and commitment he brings to his work. I have met many oncologists and investigators during my career. He is one of a handful who I believe will cure a cancer during my lifetime.”**

**~ Fred Meyers**

### **Leading the way toward individualized treatment**


For now, Lam says, the rainbow beads are mostly useful in the laboratory. Ultimately, however, he hopes the system might be used as a bedside diagnostic test, a sort of “dip stick,” he said, that could yield quick results and help cancer specialists provide individualized patient therapy.

“Many of Dr. Lam’s inventions have been used extensively by cancer scientists,” says Chong-xian Pan, assistant professor of hematology and oncology. “My work has benefited tremendously from his findings. His rainbow bead-coding system, for instance, has greatly accelerated the process of identifying bladder cancer-specific cells that can now be targeted for new treatments.”

Lam received his bachelor’s degree from the University of Texas at Austin, his Ph.D. from the University of Wisconsin and his medical degree from Stanford University. His interest in cancer took root when he was a graduate student at the McArdle Laboratory for Cancer Research at the University of Wisconsin. It intensified later, when he was at Stanford, after his father contracted lymphoma and ultimately died from the disease.

Last year, he and four other researchers developed an efficient, high-yield method for the synthesis of flavonoids, cancer-fighting molecules that occur naturally in fruits and vegetables. That work, outlined in a January 2007 article in the *Journal of Combinatorial Chemistry*, comes at a time of increasing interest in the design of synthetic anticancer compounds that mimic natural products and can be less toxic than current medications.

In addition to cancer-drug development, Lam is also interested in signal transduction, molecular immunology, chemical microarray, proteomics and Alzheimer’s disease. He combines his passion for research with valuable clinical experience, a winning combination that brought him to the attention of UC Davis Cancer Center in the late 1990s, in particular the chair of internal medicine – Fred Meyers – who recruited Lam.

“Dr. Lam is unique in the fierce intelligence and commitment he brings to his work,” says Meyers. “I have met many oncologists and investigators during my career. He is one of a handful who I believe will cure a cancer during my lifetime.” 

In the world of **identifying the cellular features of cancer**, Kit Lam is unique in showing just how **specific those discoveries** can be. He is driven to pave the way for the **safest and most-effective treatments** possible.

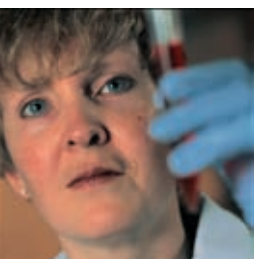




## Bugs and Daffy help celebrate new partnership

Daffy Duck and Bugs Bunny lifted the spirits of children receiving treatments at the UC Davis pediatric infusion center and welcomed the cancer center to Cure Kids Cancer, a nonprofit organization dedicated to raising funds for pediatric cancer programs. The Looney Tunes characters are often seen entertaining children at Six Flags theme parks, one of the first Cure Kids Cancer sponsors. The organization is a nationwide alliance of premier hospitals that offer diagnosis, treatment, research and education programs for children with cancer.

## Why tumor cells resist popular breast cancer drug



Researchers have discovered a likely reason why some tumor cells are inherently resistant — or become resistant over time — to the breast cancer drug Herceptin. Led by Colleen Sweeney, the team found that

activating the MET and HER2 genes together substantially increased tumor-cell proliferation. They went on to show that inhibiting or depleting MET makes HER2-positive breast cancer cells more susceptible to Herceptin, while activating MET reduces the drug's effectiveness.

## Disturbing trend in recurrent breast cancer treatment

Study results showed that 24 percent of women whose breast cancer recurs in the same breast are treated with a second lumpectomy rather than a mastectomy, defying

current treatment recommendations and cutting the number of years those women survive in half. Steven Chen and Steve Martinez found that women who had mastectomies had a 78 percent survival rate after five years, while those who had second lumpectomies had a 67 percent survival rate. The 10-year survival rates were 62 percent for mastectomies and 57 percent for second lumpectomies. They also found that, at any given time, there will be half as many survivors in the lumpectomy group versus the mastectomy group.

## Going bald helps kids fighting cancer

Sharon Raimundo wanted to do something to recognize what her son, Joey, who was 3 years old at the time of his diagnosis, went through during leukemia treatments. She and her friends formed the "Bald Chicks" team and participated in the March St. Baldrick's Foundation head-shaving event at UC Davis Cancer Center, where more than 100 people voluntarily lost their hair to raise funds for pediatric cancer research. Since 2004, more than \$280,000 from St. Baldrick's, through the Keaton Raphael Memorial, has supported UC Davis pediatric cancer programs, including clinical trials of a new drug, new diagnostic tools and a fellowship program.

## Readily available, rapid diagnostic techniques could eliminate some surgeries

Simple and quick diagnostic techniques during breast cancer surgery can spare most women from a second surgery to remove affected lymph nodes. According to Richard Bold, results of a lymph node biopsy — the current standard for identifying metastatic disease — can take up to two weeks and lead to a second surgery if results are positive. However, two procedures known as touch prep and frozen section analyses can take place during the initial surgery and detect in the majority of cases whether or not lymph nodes should be removed at the same time.



## Greeting cards for sale featuring children's art

The first Art Therapy Course for Children Dealing with Cancer was held this year and culminated with a special exhibit for family and friends. Participants learned to convey their feelings with creative projects such as worry dolls, "cancer monster" drawings, "X-ray" self portraits and happy memento boxes. Greeting cards featuring some of the art are now for sale — \$10 per package of eight — and available by calling (916) 734-0823. Proceeds benefit the art course and similar programs.

For more news stories, visit [www.ucdmc.ucdavis.edu/cancer](http://www.ucdmc.ucdavis.edu/cancer), click on "newsroom."



## Exposure to Agent Orange linked to prostate cancer

Vietnam War veterans exposed to Agent Orange have greatly increased risks of prostate cancer and even greater risks of getting the most aggressive form of the disease as compared to those who were not exposed. Karim Chamie, lead author for the study, noted that, unlike previous studies that were either too small or conducted on men who were too young, patients in the current study were entering their prime years for developing prostate cancer. The study was also conducted during the era of prostate-specific antigen screening, a powerful tool for early diagnosis and tracking of prostate cancer.

## Disparities among patients with extremity soft-tissue sarcomas

In the first study to address disparities in extremity soft-tissue sarcomas, researchers revealed significant racial and ethnic differences in adult patients who were diagnosed and treated between 1988 and 2003. Steve Martinez noted that the most striking outcome was that blacks diagnosed with soft-tissue sarcomas in an arm or leg were much less likely than other populations to receive limb-sparing treatments and their overall survival was poorer. When compared with whites, blacks had a 39 percent higher death rate related to their disease.

## Multimedia used to increase colorectal cancer screening among Hispanics

An interactive multimedia computer program that provides personally tailored education in the user's preferred language will be tested to see if it increases the number of Hispanic patients who receive colorectal cancer screening. New funding will be used to refine and evaluate the program, which is designed to increase readiness and confidence for and reduce perceived barriers to cancer screening. Physicians Anthony Jerant and Peter Franks were inspired to develop the program after noticing that typical print approaches to encouraging cancer screening do not always work well.

## Fundraising leader recognized as "extraordinary woman"



Carol Garcia, chair of the South Placer UCD Breast Cancer Endowment, was announced as a winner of Nabisco 100 Calorie Packs' "Celebrating Extraordinary Women"

contest, which searched for women who have made significant contributions to friends, family, community and society. As a breast cancer survivor and activist, Garcia is a role model for other cancer victims and survivors. She founded the endowment to raise \$1.5 million by 2010 to endow the breast cancer research chair at UC Davis Cancer Center. To date, over \$500,000 has been raised from individual donations and special events held throughout the community.

## Ovarian cancer group funds biomarker research

The Sacramento Chapter of the National Ovarian Cancer Coalition gave a check for \$14,000 to UC Davis Cancer Center physician Gary Leiserowitz and the team of scientists and clinicians working to identify a reliable diagnostic biomarker for ovarian cancer. The donation is the chapter's first for a research endeavor. Previous research from Leiserowitz and colleagues identified specific changes in sugars attached to cellular proteins that were only found in the blood of ovarian cancer patients. The outcome fueled hope that the pattern could be indicative of the disease in its earliest stages.



(Left to right) Suzanne Miyamoto, Gary Leiserowitz, Sacramento NOCC president Gina Dayton and Kit Lam.

## Treatment for incurable prostate cancer

In searching for new treatments for castration-resistant prostate cancer, Christopher Evans and team revealed that a promising new drug – referred to as AZD0530 – can help by blocking a signaling protein called Src (pronounced “sarck”). The protein specializes in messages that control the growth and spread of cells. Currently, the effectiveness of prostate cancer medications is determined in part by decreases in prostate-specific antigen (PSA) levels; however, PSA levels were not significantly affected by AZD0530, leading the scientists to recommend broadening the indicators of treatment success.

## American Cancer Society leaders on access, screening issues

The 2008 UC Davis Cancer Center Research Symposium featured keynote addresses by American Cancer Society leaders. President Elmer E. Huerta spoke on “Access to Cancer Care as a Means of Reducing Cancer Health Disparities,” focusing on what needs to be done to ensure all Americans have access to quality cancer services. Chief Medical Officer and Executive Vice President Otis W. Brawley addressed “Cancer Screening as a Public Health Intervention,” highlighting the importance of rigorous evaluation and discipline in the use of screening in order to increase cancer survival and avoid unnecessary costs.

## New fruit and vegetable guidelines may not be feasible

New guidelines for fruit and vegetable consumption come with a bigger price tag: Low-income families would spend between 40 percent and 70 percent of their food-at-home budgets to purchase the additional servings. Study author Diana Cassady said, “The new dietary guidelines, which include more dark green vegetables, orange vegetables and legumes, are based on solid science and have the potential to help protect Americans from some of the leading causes of death, including stroke, heart disease and diet-related cancers. But we need to take the next step to ensure that all consumers can actually afford to follow the guidelines.”



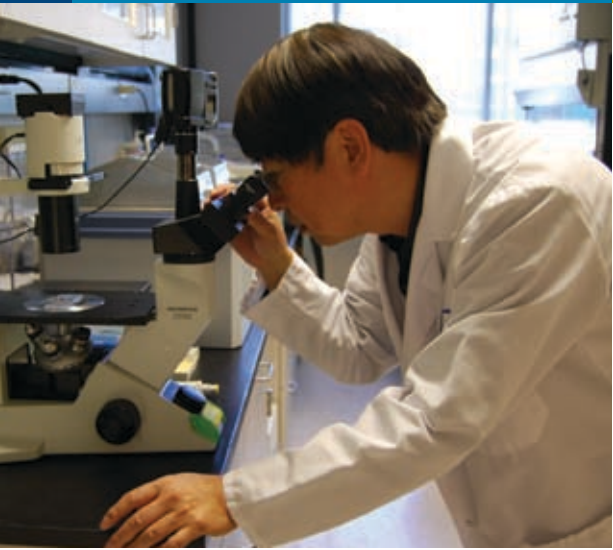
## Survivors kick off breast cancer symposium

The 2008 UC Davis Cancer Center Breast Cancer Research Symposium speaker lineup included three survivors who shared touching stories of frustration and hope during diagnosis and treatment along with inspiration for the research community. Sharing their stories were Teri Munger, a former high-tech industry executive who now leads the nonprofit organization Peace for Families; Tammie Denyse, an ordained minister and president of Carrie’s TOUCH, empowering women to make informed choices about breast cancer; and Anel Vizcarra, an advocate who was diagnosed with breast cancer at 28 years of age.

## Powerful wide-field light microscope

Scientists at the UC Davis Center for Biophotonics Science and Technology installed the first commercial version of the world’s highest resolution wide-field light microscope. Called OMX for Optical Microscopy eXperimental, the microscope allows cellular processes to be viewed at the smallest possible levels and as they occur, providing significant advantages to researchers seeking to understand and treat disease. Researchers at UC Davis Cancer Center will utilize the OMX to closely evaluate cell changes that support the growth of malignancies.





## **New drug target for inflammatory disease**

Researchers have defined a cellular process that promotes inflammation involved in diseases such as sepsis, rheumatoid arthritis, cardiovascular disease and some cancers. Protein PLA2-IIA binds to two integrins labeled alpha-V-beta-3 and alpha-4-beta-1, causing them to multiply and boosting an immune system response already awry due to disease. Study author Yoshikazu Takada said, "The potential impact of the finding on our ability to block inflammation and stop the disease process in its tracks is enormous."

## **Achilles' heel in pancreatic cancer**

Results of a study led by Richard Bold indicate that pancreatic cancer cells cannot produce the amino acid arginine, which plays an essential role in cell division, immune function and hormone regulation. By depleting arginine levels in human cell cultures and animal models, Bold was able to significantly reduce pancreatic cancer-cell proliferation. The discovery offers hope for new treatments that can extend the life expectancies of those with the disease.

## **Blacks, Hispanics and Asians less likely to get cancer screening**

A national study revealed that blacks, Asians and Hispanics are less likely to undergo colorectal cancer screening than whites. Among blacks and Hispanics, the disparity appears to be due to socioeconomic, health-care access and language barriers, which can be overcome with prevention outreach. These same barriers,

however, do not fully explain screening disparities of Asians, leading study author Anthony Jerant to recommend a more thorough exploration of the cultural factors that could drive lack of participation in screening for this population.

## **Researchers identify cellular pathway that makes prostate cancer fatal**

Expanding evidence that tiny strands of RNA – called microRNAs – play big roles in the progress of some cancers, Ralph deVere White and his research team have identified one that jump-starts prostate cancer midway through the disease process, eventually causing it to become fatal. Using high-resolution analysis, they found five microRNAs to be differentially expressed. One – miR-125b – caught their attention because of its presence at high levels in both androgen-dependent and androgen-independent prostate cancer cells. The discovery is an important link to finding treatments targeting this cellular function.

## **Synthesis is published by UC Davis Cancer Center.**

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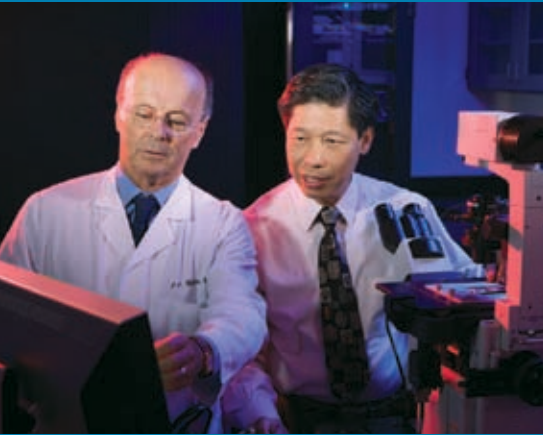
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**Seasons Restaurant in Davis will also donate \$1 of every glass of ZD Wines** sold in the restaurant during

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visit [www.seasonsDavis.com](http://www.seasonsDavis.com).





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# Synthesis

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

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