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City of Hope | 100 YEARS OF CARE AND DISCOVERY

CityNews

A SEMIANNUAL PUBLICATION OF CITY OF HOPE

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Researchers are harnessing that power to destroy cancer

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Moving Forward Into Our Second Century

We have much to be proud of here at City of Hope. Our physicians, nurses and social workers consistently deliver the best in compassionate, patient-centered care, even as our translational researchers push the boundaries of science in their quest for better treatments. At the same time, our strong network of philanthropic support helps create the margin of excellence for which our institution is known nationwide.

As highlighted in this edition of *City News*, the work conducted here has shaped, and will continue to shape, medical care in profound ways. Our hematology researchers are searching for therapies that harness the body's own immune system; our solid tumors experts are improving treatment options for patients of all ages; and our diabetes researchers are exploring ways to fundamentally change the face of the disease. Our expertise in nursing and social support is widely respected as well, setting the standard for how patients and their families should be treated and shaping care around the world.

But our pride in our accomplishments comes with a responsibility. Health-care reform is threatening to limit access to the high-quality cancer care for which City of Hope is known; fiscal constraints are limiting some institutions' ability to break new scientific ground; and increasing cancer rates are creating a growing need for the humanitarian services that we provide. City of Hope's responsibility is to expand access to the unique model that we've created and, in doing so, change the future for more patients and more families.

We are uniquely positioned to accept this challenge or, rather, this opportunity.

Already, we're expanding our ability to change the way cancer care is delivered within the community. Our opening of City of Hope|Antelope Valley will expand access to our clinical expertise to a much broader geographical area, and our partnership discussions with Providence Health & Services will create a new, integrated model for oncology, one with the potential to reshape how health care is delivered. At the same time, the hiring of our first provost and scientific officer will ensure that our translational research has even greater impact.

With our centennial year drawing to a close, we acknowledge our accomplishments and the impact that they've had. We also pay respect to the work of those who helped us achieve them, notably Michael A. Friedman, City of Hope's chief executive officer, and Sheri Biller, chair of our board of directors. But we also look ahead, to the new research, treatments and approaches described in these pages.

City of Hope has arrived at a transformative point in time, one for which we're well-positioned to change the future for patients, for families and for cancer care.

Robert Stone
President
City of Hope

City of Hope™
100 | YEARS OF CARE AND DISCOVERY

City of Hope is transforming the future of health. Every day we turn science into practical benefit. We turn hope into reality. We accomplish this through exquisite care, innovative research and vital education focused on eliminating cancer and diabetes.

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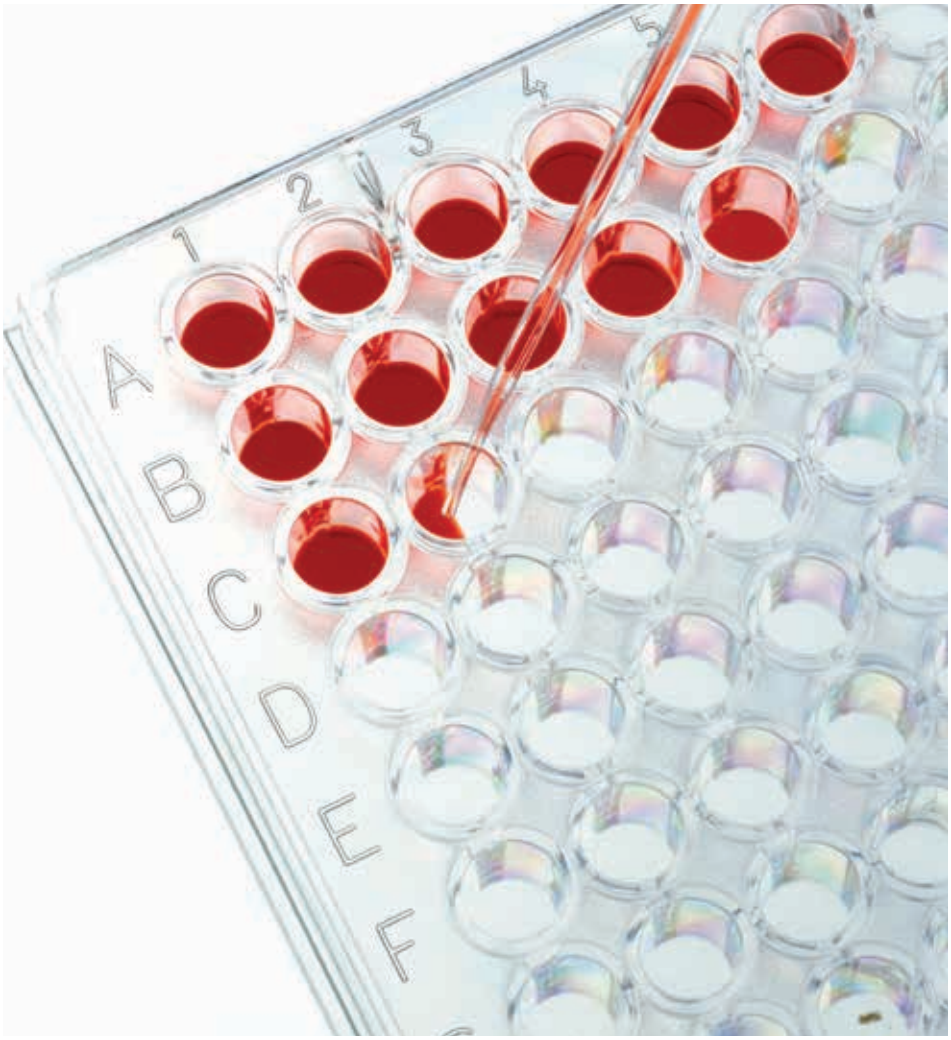

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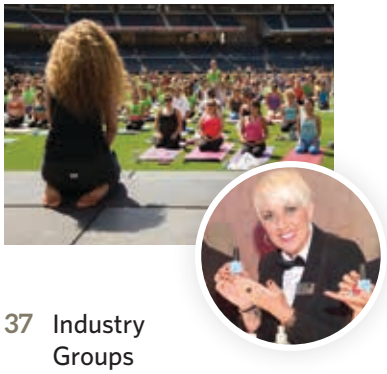


Industry Groups Launch Centennial Campaign

Challenge Aims to Secure City of Hope's Future

"I'm committed to doing everything I can, personally and professionally, to advance the cause of ending cancer."

—Tony Markel, Chair, Industry Centennial Challenge

Led by Power of Hope Campaign Chair Tony Markel (above), City of Hope's industry executives have launched the Industry Centennial Challenge, a campaign to help fund City of Hope's next 100 years of care and discovery.

The Industry Centennial Challenge is an effort to secure estate commitments — gifts by bequest in a will or trust, or by beneficiary designation — from the men and women of City of Hope's industry groups. Most gifts cost you nothing now and there is no minimum contribution required. Contact City of Hope at **800-232-3314** or **industrychallenge@coh.org** to discuss giving options that meet your personal objectives.

Those agreeing to lead the challenge along with Markel include (from upper left) Hodges and Joe Carroll, National Home Furnishings Industry; Sarah, Jeff, Lindsay and Tyler Howard, National Office Products Industry; Betsy and Jeff Kapor, Fashion & Retail Group; Tracy and Doug Lape, Food Industries Circle; Bruce and Marielena Merino, Hardware/Homebuilding Industry; and Dick and Carole Spezzano, Food Industries Circle.

City of Hope™

RESEARCH · TREATMENT · CURES

JOIN THE INDUSTRY CENTENNIAL CHALLENGE!

TARGET: DIABETES

Diabetes stems from the body's inability to produce or properly use the hormone insulin. This causes a buildup of the sugar glucose, leading to life-threatening complications such as organ and nerve damage. Until the late 1970s, diabetes patients were forced to use insulin from animals, which brought the risk of allergic reactions and drug shortages.

CITY OF HOPE TAKES AIM

In 1978, City of Hope and Genentech scientists developed a way to produce human insulin in bacteria. This gave rise to a virtually endless source of this vital hormone for patients with diabetes.

It also proved that biotechnology could produce important and effective new medicines, thereby launching a new industry that now employs hundreds of thousands of U.S. citizens.

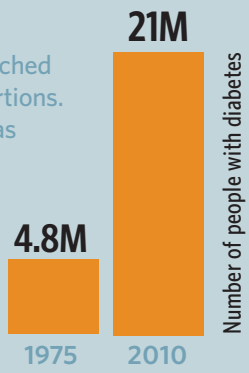
THRIVING INDUSTRY
206,000+
Employees in U.S. biotech as of 2010

Diabetes: A Staggering Global Impact

- 366 MILLION WITH DIABETES → 552 MILLION BY 2030
- 183 MILLION UNDIAGNOSED
- 4.6 MILLION DEATHS PER YEAR
- $465 BILLION IN HEALTH-CARE COSTS ANNUALLY
- AGE RANGE: MOSTLY 40 TO 50
- TYPE 1 DIABETES: 78,000 CHILDREN DIAGNOSED EACH YEAR

An expanding crisis

Diabetes has reached pandemic proportions. The U.S. alone has seen a near fivefold increase in the past four decades.

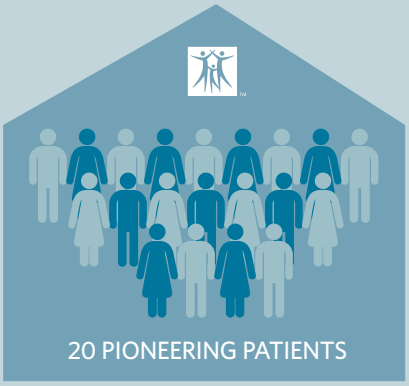


OUR GOAL: A PERMANENT CURE

HALT
Using bone marrow transplant technology, City of Hope scientists are working to stop the autoimmune attack that causes type 1 diabetes and restore the body's natural ability to make insulin.

LIBERATE
City of Hope researchers are working to combine an insulin pump with a blood glucose monitor to create, in effect, an artificial pancreas that can maintain healthy blood sugar levels automatically.

RESTORE
Islet transplantation provides diabetes patients with healthy islet cells that produce insulin and return blood glucose levels to normal — but the supply is severely limited. City of Hope researchers are working to develop an unlimited source of these precious cells.



City of Hope
Islet Cell Transplants

(Source: U.S. Centers for Disease Control)
www.cdc.gov/diabetes/statistics/slides/long_term_trends.pdf

Get Healthy: Take the Challenge

BY NICOLE WHITE

Exercise and a healthy lifestyle reduce the risks of cancer and diabetes. City of Hope and other top centers have uncovered the evidence and shared it in scientific publications.

Now, City of Hope is working with neighboring cities to put that knowledge into action through the Foothill Fitness Challenge. Teams from cities throughout the San Gabriel Valley — one team per city, all competing against each other — are setting fitness goals, tracking their progress for three months and monitoring the results along the way. They'll reconvene in January to tally the final results and determine which team has racked up the most healthy habits.

The program rests on three simple principles: eat more healthfully, move more, live fully.

The challenge kicked off at City of Hope on Saturday, Oct. 5, with participants able to choose their own goals. Some chose to lose weight or lower their body mass index by a certain percentage. Others vowed to eat more vegetables, lower their blood pressure or exercise more. Each received a pedometer, plus a tracker to record their goals and monitor their progress.

City of Hope will hold other events along the way — all part of an effort to motivate neighboring communities to reduce their risk of cancer and diabetes.

Cities already committed to the challenge include Arcadia, Azusa, Baldwin Park, Duarte, Glendora, Irwindale, Monrovia and Temple City. The Boys & Girls Club of the Foothills and City of Hope also will have their own teams. Team members will receive

FOOTHILL FITNESS CHALLENGE

a T-shirt, a lanyard and a team card.

City of Hope is proud of its proven ability to nimbly take a discovery in the laboratory and translate it to real-world patient treatments.

Now, the center begins its second century by applying that practice on a larger scale — partnering with neighboring communities to translate knowledge into action. The goal: better health for all.

1


2

GROWING AND EVOLVING

As City of Hope moves into its second century, there will be plenty of physical changes on its main campus and community-practice sites to better serve patients and the community. Here are some of the upcoming developments in store for the next few months:

1 **CITY OF HOPE | ANTELOPE VALLEY**
Opening in November 2013, this free-standing cancer center in Lancaster, Calif., will bring state-of-the-art technology and City of Hope expertise to the Antelope Valley. The 26,469-square-foot facility will include computerized tomography and linear accelerator machines; 17 infusion stations and two private infusion rooms; exam rooms and office space for surgical, radiation and medical oncologists; and a community education center that can be used for seminars and events.

2 **KAPLAN FAMILY PAVILION**
Slated for completion in January 2014 on the Duarte campus, the approximately 8,000-square-foot, multipurpose pavilion will include indoor and outdoor space for welcoming visitors, displaying exhibits, holding receptions and hosting conferences. The pavilion will be located adjacent to the current Visitor Center and near the La Kretz House of Hope, Cooper Auditorium and Platt Conference Center, all integral to City of Hope's connection with its community.

WING ONE RENOVATION
To accommodate the growing demand for City of Hope care, Wing One in the Main Medical Building is scheduled for renovation in late 2013 and early 2014, followed by cosmetic improvements in Units A and B. This will ultimately add 25 staffed beds, increasing our total bed count to 217. – *H. Chung So*

CINDY DEMESA

From the Classroom to the Clinic

CALIFORNIA TEACHERS MAY HOLD THE KEY TO FUTURE CANCER TESTS AND TREATMENTS

BY H. CHUNG SO

Educators in California may spend their day teaching the three Rs, but for almost two decades they have also contributed to a very crucial fourth "R": research on cancer risk and outcomes.

The California Teachers Study is one of the most powerful, ongoing epidemiological studies in cancer, culling data from questionnaires and medical histories of more than 133,000 participants. Since its inception in 1995, researchers involved in this study have published nearly 100 articles on the relationships between various behaviors and cancer risk. Factors that have been studied include smoking, use of oral contraceptives and hormone replacement therapy, lack of physical activity, dietary patterns, alcohol intake and exposure to environmental pollutants. All are now known to increase the risk of certain types of cancers.

JAMES V. LACEY JR.

Now, City of Hope is leading the effort to take this study one step further by going beyond surveys, medical histories and statistical data to collect biological samples from participants. The goal? To locate biomarkers tied to cancer risk.

James V. Lacey Jr., Ph.D., associate professor at City of Hope's Division of Cancer Etiology, is the principal investigator of a National Cancer Institute-funded project to collect more than 21,000 blood and saliva samples for the California Teachers Study.

"The California Teachers Study is a classic example of power in numbers," Lacey said. "We know some biomarkers or genetic differences linked to cancers are rare; the only way to find them is to have a big study population to draw from."

These biomarkers can be hormones, proteins, antibodies, inflammation markers, circulating tumor cells and other biochemicals, Lacey said.

Lacey and his team are currently beginning the sample collection process, and expect to have the first results from this new data by 2017.

Research reported in this post was supported by the National Cancer Institute of the National Institutes of Health under grant number 1UM1CA164917. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

PATRICK CUNNINGHAM

WHERE WISHES ARE MADE

ROSE PARADE ENTRY DRAWS INSPIRATION FROM REAL-LIFE TREES — AND THEIR "LEAVES"

BY FRAN RIZZI

For more than four decades, City of Hope has celebrated the new year with an entry in the annual Tournament of Roses Parade. The 2014 parade theme, "Dreams Come True," sets the stage for City of Hope's entry, "Turning Hope and Dreams into Reality," which will feature riders whose dreams have been made possible by the team at City of Hope.

Inspired by the wishing trees that line the entrance to City of Hope's campus, the float will feature trees crafted entirely of flowers and natural materials, as required by parade tradition. The real-life trees welcome City of Hope patients as they make their way to the main entrance. The trees are adorned with colorful, fluttering leaves of paper that serve as canvases where visitors, patients, staff and friends can share their personal wishes and hopes.

City of Hope recently commemorated the one-year anniversary of its trees with a ceremony calling attention to some of the individual wishes. Those sentiments were so moving and so heartfelt that the float organizers wanted to give more people the opportunity to make a wish.

One of the wishes on the real trees bears a poem written by City of Hope researcher Gerald Wuenschell, Ph.D., manager of the biomarker identification core laboratory:

"Imagine, we will soon fulfill
A future we can touch
and see
When moved by patients'
strength of will
Through healers' art
and scientists' skill
Of illness grim we will be free
And this fair City need no
longer be ..."

Supporting the float trees doesn't require a talent for verse, but it does require a wish to help make our float riders' dreams of being part of the Rose Parade come true. Virtual wishes begin at $25, and wishes that will be placed on the Rose Parade entry begin at $125. Visit cityofhope.org/floatwishes to find out more.

CANCER CELL SLAYERS:

Fighting by Memory

IMAGINE FIGHTING CANCER WITH MEMORY. OUR BODIES ARE ALREADY EQUIPPED TO DO THIS — we survive common illnesses like influenza because our bodies remember how to fight that particular virus. Now imagine being diagnosed with cancer and given a treatment that makes your body not only target those cancer cells and eliminate them — but also remembers those cells and knows how to respond to those invaders if they should ever develop again.

BY RACHEL J. HALL

At City of Hope, researchers led by Stephen Forman, M.D., the Francis & Kathleen McNamara Distinguished Chair in Hematology and Hematopoietic Cell Transplantation, are creating therapies that do exactly that — harness the power of the human immune system to target and destroy cancer now and forever.

In this approach, T cells are isolated from a patient's blood sample and genetically engineered to seek out and attack cancer. Researchers then grow billions of the engineered T cells and reinfuse them into the patient, where the new cells go to work eliminating cancer.

City of Hope is one of the national leaders in T cell immunotherapy research. In fact, City of Hope researchers performed the first-ever Food and Drug Administration-authorized clinical trials utilizing T cell therapy for patients with lymphoma, neuroblastoma and glioma.

Right now, Forman, Leslie Popplewell, M.D., and Christine Brown, Ph.D., and others in their research group are genetically modifying subpopulations of T cells, central memory T cells, which have a unique capacity for self renewal, proliferation and persistence (i.e., a long life span). Popplewell is an associate clinical professor in the Department of Hematology & Hematopoietic Cell Transplantation; Brown is the associate director of the T Cell Immunotherapy Research Laboratory in Beckman Research Insitute of City of Hope.

Forman's team has recently developed technology that can select, genetically alter and expand T cells. Using clinical grade reagents and a closed (i.e., sterile) system of production, technology will allow researchers and clinicians to engineer T cells and then, directly utilize them in treating patients with lymphoma, acute lymphoblastic leukemia and brain cancers. Researchers hope that the use of central memory T cells helps overcome the limited efficacy previously observed with earlier T cell therapy strategies and have plans for trials in acute myelogenous leukemia, breast cancer and prostate cancer.

STEPHEN FORMAN

Forman and his team recently began a phase I clinical trial using T cell immunotherapy in patients with ovarian cancer, one of the deadliest forms of cancer — and one which lacks powerful, lifesaving treatments.

LESLIE POPPLEWELL

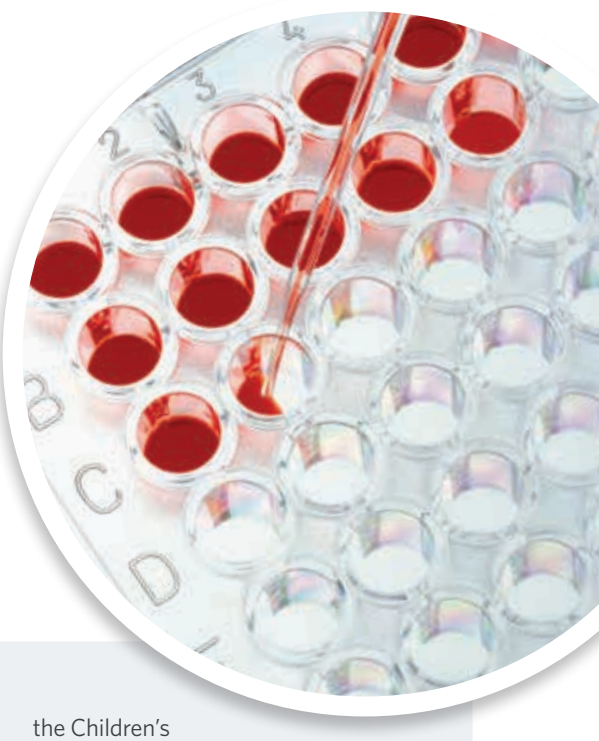
Collaborating with Mihaela Cristea, M.D., in the Department of Medical Oncology & Therapeutics Research and others in the City of Hope gynecologic cancer group, they are employing a strategy that involves the genetic engineering of a patient's T cells with a new T cell receptor that recognize proteins displayed by ovarian cancer cells in certain patients. Once the T cells are reintroduced to patients, it is hoped that those T cells will also hunt down and attack the cancer cells. This same strategy is now being used by Myo Htut, M.D., in the Department of Hematology & Hematopoietic Cell Transplantation to now treat patients with multiple myeloma.

CHRISTINE BROWN

"These are big trials, not necessarily in size, but in its implications and significance," Forman says. "Developing a successful immunotherapeutic

PATRICK CUNNINGHAM, WALTER URIE

The immune system is a powerful, largely untapped force for fighting tumors. City of Hope scientists have developed a number of revolutionary therapies that harness immune cells to block the growth of cancers.



treatment opens up a field of immunotherapy in treating women with ovarian cancer and people with myeloma that were not there before — and in diseases that need effective treatments now."

Forman believes that through creative, fast-paced translational research, immunotherapy offers promise — and that patients with even the most aggressive cancers can be treated to survive and thrive once treatment ends.

BLOOD WORK

Important Advances in City of Hope's Hematological Malignancies Program

- In efforts to prevent relapse in patients diagnosed with chronic myelogenous leukemia, Ravi Bhatia, M.D., and WenYong Chen, Ph.D., are studying mutations in a gene called BCR-ABL. BCR-ABL is an abnormal gene formed when genes from two different chromosomes mistakenly join together in a bone marrow cell. The cancer drug Gleevec disables the BCR-ABL protein. Over time, though, the BCR-ABL gene changes and mutates, which alters the protein so that Gleevec no longer recognizes it. That leads to disease that resists the drug. Bhatia and Chen aim to uncover more details about the underlying processes leading to drug resistance with the aim of boosting treatment with Gleevec and similar drugs.

- City of Hope scientists have developed a number of revolutionary therapies that harness immune cells to block the growth and proliferation of cancers. Hua Eleanor Yu, Ph.D., associate chair of cancer immunotherapeutics and tumor immunology, along with Marcin Kortylewski, Ph.D., and John Rossi, Ph.D., Lidow Family Research Chair, have devised a novel biologic-based drug called CpG-STAT3 siRNA that blocks the growth of tumor cells directly, and activates surrounding immune cells to mount an anti-tumor response. In preclinical studies, CpG-STAT3 siRNA effectively stymies growth of aggressive lymphomas and the brain cancer glioma, two deadly cancers with no current viable therapies. A clinical grade CpG-STAT3 siRNA is scheduled to begin production at City of Hope's facilities in 2013, with first-in-human clinical trials within two years.

- John Rossi recently completed a first-in-human clinical trial of an innovative therapy for AIDS-related lymphoma, which has the potential to both cure this cancer and make cells impervious to HIV. In the team's strategy, a patient's own blood stem cells are harvested and genetically engineered with three RNA-based anti-HIV therapeutics. These therapeutics block HIV from infecting immune cells and multiplying within them. Once cancerous immune cells are destroyed, the healthy, engineered blood stem cells are reintroduced into the patient, where they multiply and mature into immune cells that resist HIV.

- Smita Bhatia, M.D., M.P.H., Ruth Ziegler Chair in Population Sciences, is collaborating with 121 institutions of the Children's Oncology Group to overcome complications that childhood cancer survivors develop due to treatment. Researchers have identified a genotype that signals increased risk for cardiomyopathy (deterioration of the heart muscle) in children who were treated with a common cancer drug called anthracyclines. Bhatia and her team are now developing tests physicians can use to either prescribe different drug regimens to children at high risk, or give children additional drugs to protect the heart — drastically improving the quality of life for children and helping them thrive after cancer treatment.

- Based on a 2012 report from the Center for International Blood and Marrow Transplant Research (CIBMTR), City of Hope is the only transplant program in the country to achieve eight consecutive reporting years of "over performance" in one-year overall patient survival. The CIBMTR collects demographic and outcomes data on all hematopoietic cell transplantations performed in the 169 transplant centers in the United States. This organization also performs center-specific patient survival analyses. CN

Recipient Joseph Mandel, left, and donor Nevo Segal, right, meet at the 37th annual Bone Marrow Transplant Reunion.

'He Had My Back'

Son of Holocaust survivors meets his bone marrow donor, a young, former Israeli solider

BY ROBERTA NICHOLS

THE FIRST MEETING BETWEEN A BONE MARROW RECIPIENT AND HIS OR HER LIFESAVING DONOR IS INEVITABLY MOVING. A reunion at this year's 37th annual Bone Marrow Transplant Reunion had extra meaning. Joseph Mandel, the 63-year-old son of Holocaust survivors, met his donor, a young former Israeli soldier, for the first time. Nevo Segal had enrolled in the international Jewish bone marrow registry in 2006 as a new recruit in the Israeli army. In 2010, after returning to civilian life, he became a bone marrow donor for a man he had never met. At the reunion, Mandel embraced Segal. "Israelis always have each other's back, no matter what," Mandel said at the event. "He had my back."

Here are their stories.

RECIPIENT: JOSEPH MANDEL, age 63, Woodland Hills, Calif.

'You just did a lot of praying that they would eventually find somebody.'

It takes cancer survivor Joseph Mandel a while to open his Woodland Hills front door because he's on crutches. But his leg injury has nothing to do with disease — Mandel hurt himself skiing. Mandel, who underwent a stem cell transplant from an unrelated donor in 2010, is back to his old passions like sailing down slopes and white-water rafting, and he's even courting new loves — like sky diving.

The son of Holocaust survivors, Mandel pushed himself through treatment and recovery just as he has driven himself during his successful career in the competitive world of information technology.

In December 2009, following a visit to a doctor treating him for rheumatoid arthritis, Mandel was astonished to learn that the bruises and fatigue he'd noticed were traced to acute myelogenous leukemia. He came to City of Hope in 2010 under the care of Auayporn Nademanee, M.D., the Jan & Mace Siegel Professor in Hematology & Hematopoietic Cell Transplantation and medical director of the Matched Unrelated Donor Program at City of Hope. "They laid it out straight," recalled Mandel. If a donor could not be found for him, he probably would die within a year.

When no matches were found within his family, his name was added to the National Marrow Donor Program's "Be the Match" registry. "You just did a lot of praying that they would eventually find somebody," Mandel said of the uncertain time. His family, including daughter Falicia and sisters Sara, Monica and Sharon, mobilized, working with Be the Match to stage community drives to find a donor.

A perfect donor eventually was identified through the registry. The transplant took place

THOMAS BROWN

Mandel's carpe diem spirit is underscored by his deep gratitude to the young man who saved his life.

at City of Hope in April 2010. Early on, Mandel knew only that his stem cell benefactor was a 22-year-old man.

Mandel's illness was torturous on his family, especially his mother (now 94), whose arm still bears the numbers tattooed during her imprisonment at Auschwitz. Ann Mandel, who had lost her husband and daughter to cancer, faithfully traveled with her daughters to City of Hope to visit her son. Mandel's wife, Rachel, who is from Israel, said donors should realize they're not only helping recipients, but entire families.

"You're not only saving the recipient's life," she said, "you're also saving the lives of the family."

How has the transplant transformed Mandel? "I don't put a lot of thought into these huge, philosophical-type questions. I just wanted to do these things I did before." His illness prevented a trip to Israel to celebrate their 30th anniversary in 2010, so he and Rachel made the pilgrimage the following year. "My big message is 'don't let cancer run your life.'"

He has noticed that since his transplant, "You start doing things you might not have done before …. It makes you less afraid to take chances and do things." The Mandels' children, Marc, 30, and Falicia, 25, are "highly adventurous, too," and accompany their parents in sports like sky diving, whitewater rafting and snow skiing.

Mandel's carpe diem spirit is underscored by his deep gratitude to the young man who saved his life. "The old cliché, 'life's pretty short' is true," he says. "I could have been dead at 61. Thank God for my donor and may God bless him."

DONOR: NEVO SEGAL,
age 25, of Ramat Hasharon, Israel

'I think that one cannot refuse an offer to help save someone's life.'

Nevo Segal and his younger sister, Mol, were driving to a Passover celebration in their native Israel, when she received a cell phone call from the bone marrow registry.

Weeks before, she was told that her bone marrow seemed to be a suitable match for a patient awaiting a transplant. Now, however, she learned there appeared to be an even closer match: her brother. "She passed me the phone," Nevo Segal recalls with a smile.

Both siblings enrolled in the donor registry while in the Israel army. Enlisting as a donor is not required, but military service is mandatory. Since the army joined ranks with Ezer Mezion, the Israel Health Support Organization that includes the world's largest Jewish Bone Marrow Donor Registry, donor enlistment has grown, says Segal.

He signed up for the registry in 2006 when he enlisted in the Israel Defense Force at age 18, serving three years in its intelligence division. When, at age 22, he received the call to donate, "there was no hesitation," he said. "I think that one cannot refuse an offer to help save someone's life."

His sister initially was disappointed that she could not be the donor, yet quickly was swept up in the family's pride over her brother's donation.

After Segal underwent thorough testing in a hospital close to his home in Ramat Hasharon, near Tel Aviv, his bone marrow stem cells were harvested and transported to City of Hope.

Following military service, Segal traveled around the world providing technical support for a firm specializing in digital mapping. Now 25, he lives in England, working on a "music computing" degree at the University of London.

Segal resists the notion that he is some sort of hero for being a donor. "I think that what I did was just a small part of the chain organized by medical centers around the world," he said. "I believe that the people working in these medical centers like City of Hope deserve all the credit."

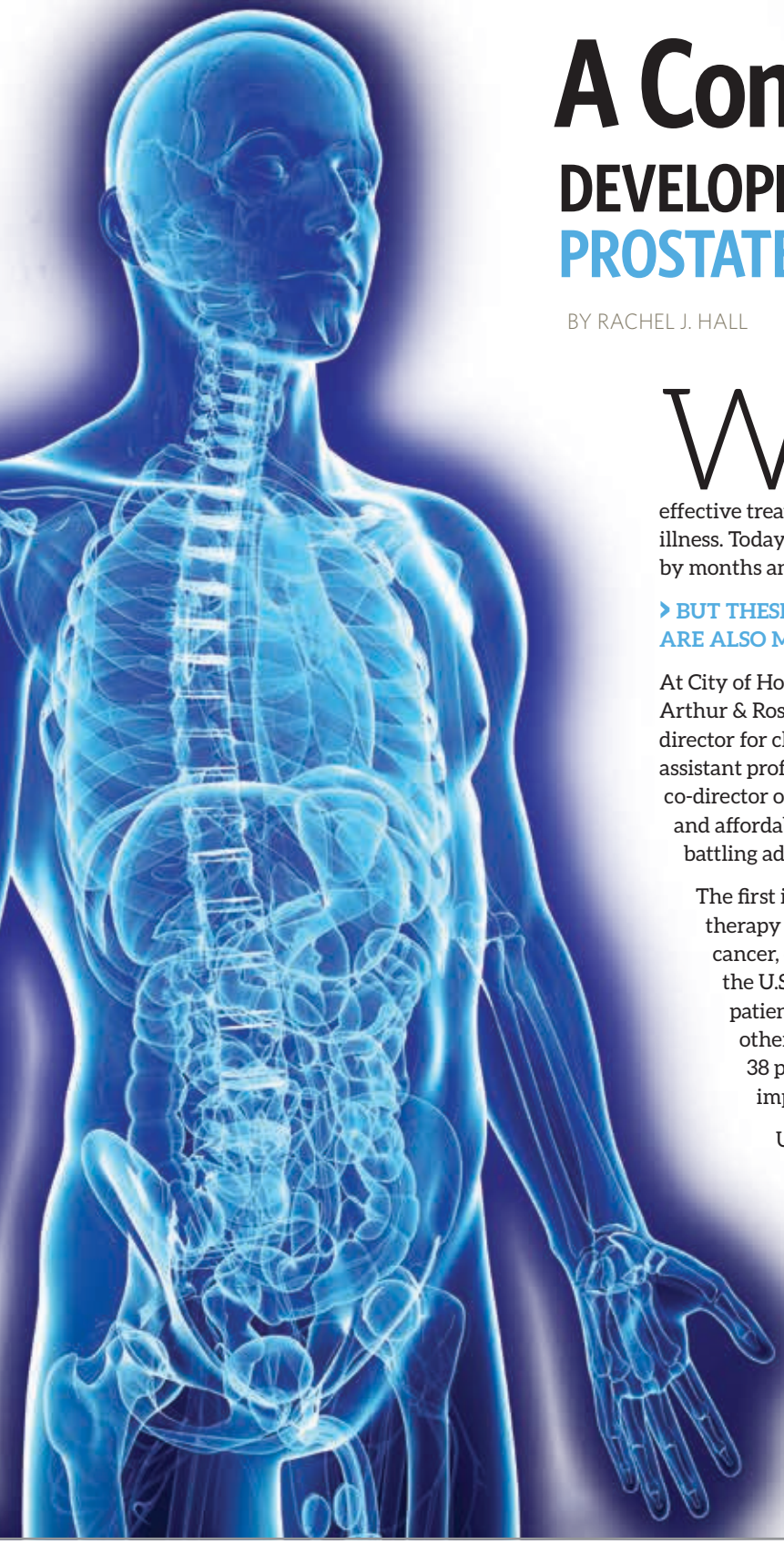
Still, he admits, "Knowing that even in the slightest way you helped save a life is a great feeling."

After the donation, Segal often thought of the patient whose body was fueled by his blood, and wondered whether the recipient had conquered his disease. He was relieved when he learned that Mandel was thriving, and thrilled after meeting the recipient. The night of the reunion, Mandel's family invited Segal and his parents over for Sabbath dinner. Both families expect the relationship to continue.

Segal still treasures the letter of gratitude he received from Mandel and his family. "It said I'm in their prayers every day." CN

ABOUT THE REUNION

The annual Bone Marrow Transplant Reunion celebrates new lives made possible through transplant. It highlights the pioneering work of the doctors at City of Hope, as well as the unparalleled success of their hematopoietic cell transplantation program, which has performed more than 11,000 blood and marrow stem cell transplants.



A Combo for All:

DEVELOPING AFFORDABLE PROSTATE CANCER THERAPY

BY RACHEL J. HALL

What good is a lifesaving treatment if a patient can't afford it? Over the past decade, the landscape of therapy for advanced prostate cancer has changed dramatically, with scientists developing stronger, more effective treatments for men diagnosed with the often-devastating illness. Today, patients have more options that can extend their lives by months and even years.

› BUT THESE NEW CHEMOTHERAPIES AND VACCINE THERAPIES ARE ALSO MORE EXPENSIVE.

At City of Hope, researchers aim to change this. Cy Stein, M.D., Ph.D., Arthur & Rosalie Kaplan Chair in Medical Oncology and deputy director for clinical research, has teamed with Sumanta Pal, M.D., assistant professor of medical oncology and therapeutics research and co-director of the Kidney Cancer Program, to develop a powerful — and affordable — drug combination that may save the lives of men battling advanced prostate cancer.

The first in this combination is the drug Provenge, a vaccine-based therapy that uses a patient's white blood cells to target prostate cancer, eliciting an immune response against the disease. In 2010, the U.S. Food & Drug Administration approved Provenge for patients with advanced, metastatic tumors that have resisted other hormonal treatments. In nationwide clinical studies, 38 percent of patients given Provenge experienced an improved three-year survival.

Unfortunately, the standard dosage regimen of Provenge costs upward of $96,000. The cost of taking this drug alone, or even combining it with other cancer therapies, can be exorbitant.

Stein and Pal propose to use smaller — and less expensive — amounts of Provenge and combine it with a second anti-prostate agent: high-dose ketoconazole (HDK), with hydrocortisone. This second agent works by preventing the adrenal glands from making the male hormones known as androgens. Research

Both clinical researchers hope that the goal of this investigation will be met — not only decreasing the costs ... but also providing patients with a more effective therapy ..."

has shown that androgens promote the growth and spread of prostate cancer. Not only does HDK show efficacy against prostate cancer, it costs just a few dollars a month.

In this proposed clinical trial, Stein and Pal will study the efficacy and safety of this Provenge-HDK combination. At the same time, they will identify blood-based biomarkers (molecules found in a patient's blood that can be measured to indicate disease as well as the body's response to a cancer treatment) and advance additional research studies of circulating tumor cells. These cells break off from the primary source of cancer (in this case, the prostate) and metastasize, or spread, to other sites around the body. If the Provenge-HDK regimen is shown to be safe, Stein and Pal will then seek to test the combination in larger trials.

CY STEIN

SUMANTA PAL

Both clinical researchers hope that the goal of this investigation will be met — not only decreasing the costs associated with Provenge but also providing patients with a more effective therapy for their cancer.

"You're not going to have penicillin for this [disease] — it's not going to happen," Stein said. "If you get another and another [life-extending drug], and you start to piece them together, you're going to add years to people's lives — good years."

SOLVING THE PROSTATE CANCER PROBLEM:

Urology researchers explore new imaging tools and therapies

■ Surgery can be an effective treatment tool for patients with operable tumors — but removing all of the cancer can be challenging. Andrew Raubitschek, M.D., chief of radiology, has a potential solution. He's developing intraoperative optical imaging (IOOI), a tumor-mapping technique that can visualize tumors to subcellular resolution. Prior to undergoing robotic surgery, patients are given an optically tagged antibody that fluoresces and is engineered to target the tumor. The antibody attaches to all cancerous cells and fluoresces to "color" the tumor. Then, specially designed lasers and optics attached to the surgical robot illuminate the glowing cells. This shows the surgeon exactly what to take out — allowing the removal of any residual disease and decreasing a patient's risk of relapse.

■ City of Hope researchers are conducting several clinical trials to identify novel therapies and imaging techniques for men with prostate and other genitourinary cancers. In one of those trials, Przemyslaw Twardowski, M.D., clinical professor of medical oncology, is collaborating with Shiuan Chen, Ph.D., chair of cancer biology, in testing a supplement derived from white button mushrooms. The supplement is being tested in men whose prostate cancer recurred soon after surgery or radiation therapy. They've found that 36 percent of men treated with this compound demonstrated declining levels of PSA (a protein used to screen for prostate cancer) after several months of treatment. The team believes that the supplement could help prevent cancer from returning.

■ Physician Alex Jung, M.D., and a team of radiologists are using advanced imaging technology called 3 Tesla prostate MRI before surgery for men who are at intermediate and high risk of prostate cancer recurrence. This type of imaging is more effective than other commonly used technologies in helping doctors detect and characterize tumors — in fact, it helps surgeons to determine how much of the tissue and nerves surrounding the prostate can be spared, allowing them to remove all cancer while also preserving a man's potency and continence. Through MRI, physicians identify areas to target with biopsies that might otherwise be missed with a standard ultrasound.

■ The two standard tests used for prostate cancer screening — prostate specific antigen (PSA) measurement and digital rectal examination — help to detect cancer in early stages. However, these tests sometimes produce false positives, meaning that many men needlessly endure invasive biopsies to confirm their diagnoses. Steve Smith, Ph.D., professor of molecular science, recently compared standard screening measures (PSA levels and biopsy outcomes) with levels of the gene TMPRSS2:ERG found in expressed prostatic secretions. Smith determined that testing for this marker helped predict the results of biopsies. Confident that testing for TMPRSS2:ERG and could help avoid unnecessary biopsies, Smith is now studying the best way to collect TMPRSS2:ERG from patients and is working with community clinics to recruit men for a study." CN

PATRICK CUNNINGHAM

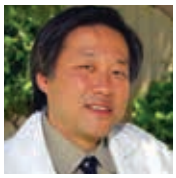
Looking to Nature for a Cure

Women's cancers have some powerful new, and very old, foes

BY BETSY STEWART

The concept is as old as humanity itself: To heal the body, consult nature. For centuries, practitioners of alternative medicine have looked for natural, gentler methods to heal. Now, scientists at City of Hope are taking a cue from these approaches by studying natural products and traditional Chinese medicine for further clues about how to treat — and cure — women's cancers.

One promising natural compound is being developed into a treatment by City of Hope researcher-clinician John H. Yim, M.D., associate professor of surgery.



JOHN H. YIM

The compound, called baicalein, is derived from a root called Huang Qin, an extract used in traditional Chinese medicine that has already been shown to decrease chemotherapy side effects. Yim found that baicalein enhances the activity of a protein that suppresses tumor growth by making cancer cells more vulnerable to the immune system.

In lab tests, baicalein inhibited cancer-cell growth and showed no toxicity, making it a promising and appealing compound for therapy. In animal trials, baicalein's effectiveness in shrinking breast tumors and prolonging survival in mice was particularly potent when used in combination with the common chemotherapy drug cisplatin.

Yim believes baicalein may help overcome a hurdle in treating women with ovarian cancer, many of whom develop resistance to medicines used in conventional chemotherapy, like carboplatin. His studies have found that baicalein is more than 10 times more effective than carboplatin in killing platinum-resistant cells. And because the therapy is being developed from a natural product, Yim predicts that the doses of baicalein required for this cancer-killing activity should be much gentler for patients than medicines used in conventional chemotherapy.

Another key finding in preclinical studies is that baicalein inhibits the PI3K pathway. This signaling pathway is often overactive in cancerous cells, which means that cells continue proliferating

THOMAS BROWN

SCIENCE WITH PURPOSE

Physicians and researchers explore better ways to heal and treat cancer

■ Women with late-stage breast cancers often receive neoadjuvant chemotherapy, which is administered before surgery to reduce the size and spread of cancer — but it isn't always effective. Emily Wang, Ph.D., assistant professor of cancer biology, is seeking a molecular "signature" that will help predict a response to neoadjuvant chemotherapy. In her research on microRNAs, she identified two that regulate genes related to chemotherapy resistance. Wang published these results in the journal *Oncogene and Molecular Cancer Research*.

■ Peter P. Lee, M.D., is pursuing a novel model of therapy called integrated immunotherapy. This concept involves using immune-boosting drugs and treatments in a sequence that fortifies the immune system's natural response against cancer. This response is launched in three distinct phases: immune cells recognize cancer, expand and surround cancer, and then kill cancerous cells. Lee believes the types of drugs and how they are administered can help the immune system to coordinate all three stages against cancer. He is pursuing this research with a prestigious and highly selective $3.1 million grant from the U.S. Department of Defense's Era of Hope Scholar Award.

■ With prophylactic mastectomies gaining more public attention, addressing access to and quality of reconstruction after surgery is vital. Laura Kruper, M.D., director of the Rita Cooper Finkel and J. William Finkel Women's Health Center at City of Hope and head of breast surgery service, has led several studies evaluating inequalities in reconstruction procedures after mastectomy. She found that a woman's insurance, ethnicity and where she receives care are all important factors that impact her decision whether to receive breast reconstruction. Kruper is actively sharing results from her research around the nation, and her overarching aim is to recommend changes in health-care policy to provide equal care to all breast cancer patients.

■ Linda Malkas, Ph.D., professor of molecular and cellular biology and deputy director of basic research, wants to enhance the effectiveness of cancer treatments by making them more specifically directed to cancer cells. She has found a target in cancer cells, called cancer-associated proliferating cell nuclear antigen (caPCNA), that plays a role in DNA repair and helps cancer survive and proliferate. She and her team have developed a synthetic peptide that blocks caPCNA from repairing DNA — causing cancer cells to die. And because the compound is specific to caPCNA, it will impact only cancer cells. Malkas is pursing these peptides as the basis for new, more effective anti-cancer chemotherapeutics.

■ The Breast Cancer Survivorship Program empowers women to make informed decisions about their care during treatment and well into the future. Breast cancer patients are enrolled in this program from diagnosis. After treatment, each woman meets with a nurse practitioner to review an individualized "survivorship care plan" that addresses physical and emotional needs as well as the possible ramifications for her daughters and granddaughters. Women also attend follow-up appointments to monitor potential medical complications. Of special note, the program contributes to City of Hope's pioneering research on survivorship.

instead of dying. Targeting P13K with baicalein will slow or stop cancer cell development. Because the P13K pathway is a popular target for pharmaceutical companies, this finding is significant for drug development.

Yim's development of baicalein is a vital part of City of Hope's ambitious new Natural Therapies Program. Established to produce novel cancer therapies using natural products, this program applies the fast-paced translation of science into new therapies that cure cancer while preserving the quality of patients' lives.

This leading-edge model of natural drug development will enable Yim to fully optimize baicalein's benefit as a cancer-fighting compound. His next steps include further preclinical work, including safety and mechanistic testing of the drug in mouse models of ovarian cancer, as well as production of the drug. Scientists will also look for improvements in side effects when compared to chemotherapy, for possible drug interactions, and for biomarkers that will reveal how the treatment is working on its intended targets.

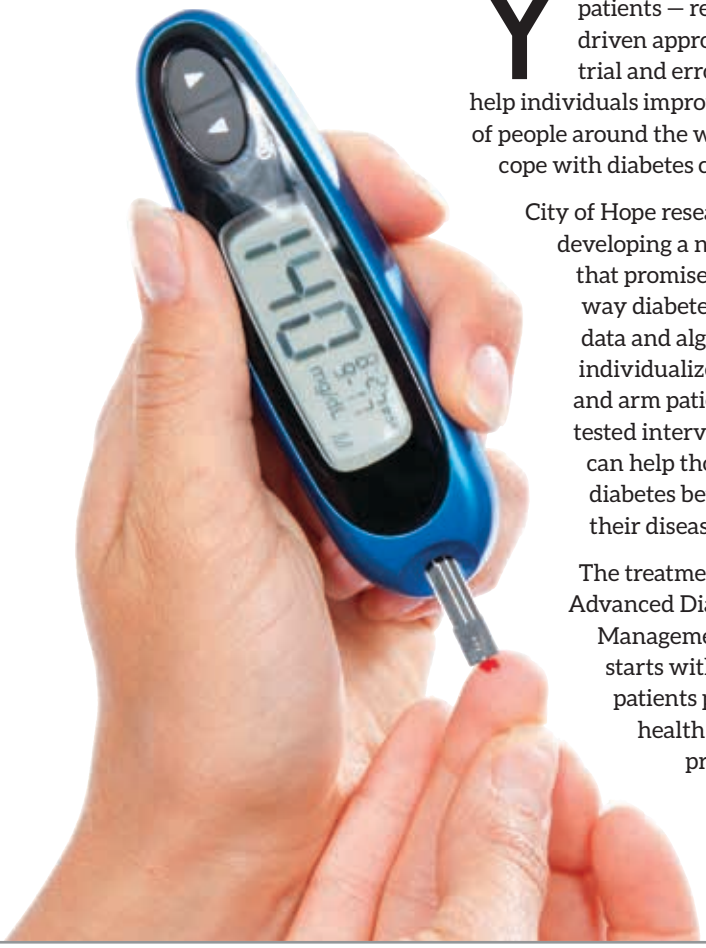
Phase 1 trials in women battling metastatic breast and recurrent ovarian cancer will follow. These trials will help investigators determine the safety of the drug, as well as the most effective way to administer it to women — giving women one more reason to hope. CN

HIGH-TECH TOOL USES **DATA AND ALGORITHMS** TO CREATE INDIVIDUALIZED TREATMENT PLANS

BY BETSY STEWART

Leading Change IN Diabetes CARE

TREATING DIABETES ISN'T A ONCE-AND-DONE ENDEAVOR. It's a daily, often burdensome affair that requires medication, repeated blood-glucose testing, attention to diet and exercise, and regular communication with a physician.



Yet current methods of treating patients — reactive, physician-driven approaches that rely on trial and error — don't always help individuals improve. And the number of people around the world struggling to cope with diabetes continues to grow.

City of Hope researchers are developing a novel, high-tech tool that promises to revolutionize the way diabetes is treated. By using data and algorithms to develop individualized treatment plans and arm patients with computer-tested interventions, this system can help those living with diabetes better manage their disease.

The treatment platform, called Advanced Diabetes Algorithm Management System (ADAMS), starts with information patients provide on their health as well as treatment preferences and cultural factors.

The computer system can then predict how the patient's body uses blood glucose and provide an individualized, comprehensive treatment plan with continued feedback on diet, exercise and medication.

Fouad Kandeel, M.D., Ph.D., director of the Division of Diabetes, Endocrinology & Metabolism, who is leading this project, believes that ADAMS will improve daily metabolic control and reduce long-term complications for diabetes patients. Kandeel foresees the program vastly improving the longtime clinical outcomes for large populations of diabetic patients across the globe.

FOUAD KANDEEL

ADAMS comprises several components. The first is a questionnaire, developed by Kandeel and his collaborators, on which patients are queried to provide information including blood-glucose measurements and logs of physical activity, food intake and medication.

WALTER URIE

This data is processed through algorithms that model how a patient's body is using glucose. This component was developed over the last 20 years by a collaborating group of researchers in Europe and can run simulations that will show an intervention's likely impact on an individual patient's metabolic footprint.

This means that every treatment recommendation that the ADAMS program generates will be fully tested via computer simulation before it is presented to the patient — a radical departure from the antiquated and costly trial-and-error method of treatment.

The ADAMS program provides medical interventions on a rated scale, prioritizing recommendations based on efficacy, availability and cost, as well as culturally relevant and limiting factors for each patient. This could improve patient outcomes by providing evidence-based treatment and increasing compliance.

The global impact of this program could be enormous. By streamlining treatment, patients will achieve optimal health sooner, which means less frequent and shorter follow up appointments with their doctors. And making this program available around the world will bypass the shortage of skilled diabetologists, because patients will have continued access to support through the computer program.

One ancillary but crucial eventual outcome from this program is a new electronic global registry of diabetes patients. A global registry will improve our understanding of diabetes and its treatment so that researchers can continue to create the very best models of care — and lessen the burden of the disease for people here and around the world.

Changing the Future

FROM THE FRONT LINES OF DIABETES RESEARCH

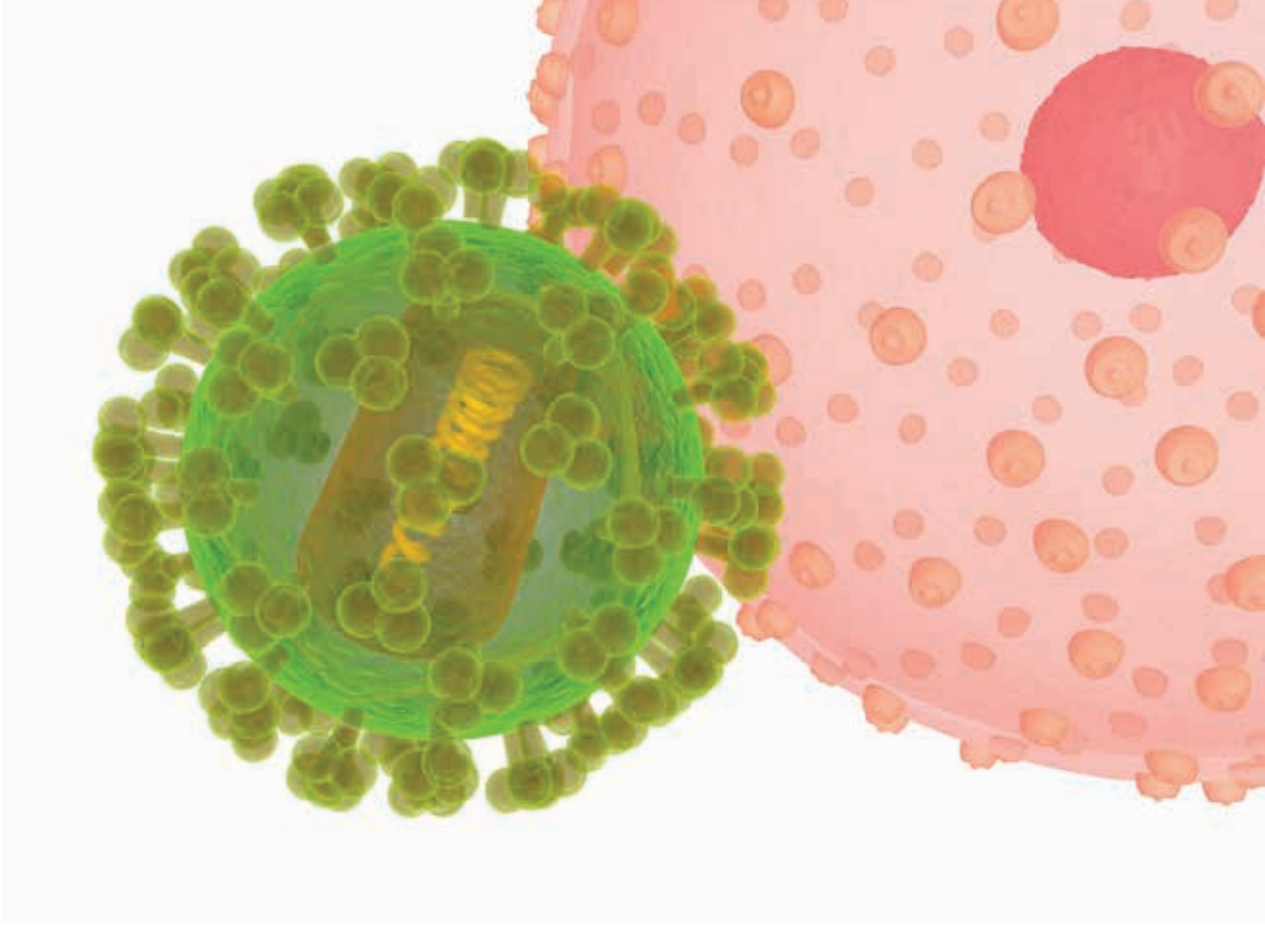
■ Chih-Pin Liu, Ph.D., professor of diabetes and metabolic research, is developing a new method to correct immune imbalance by taking a patient's own regulatory T cells, which help to maintain balance in the immune system, and expanding them in the laboratory. He's then readministering the cells to the patient. Liu's promising research has already shown that Treg cells fortified in this way are as potent as normal Treg cells in suppressing the immune imbalance that leads to a patient's inability to produce insulin.

■ Rama Natarajan, Ph.D., National Office Products Industry Professor in Diabetes Research, is leading examinations into genetic variations that make some people more susceptible to obesity and metabolic disease. Using a novel genomic resource known as the hybrid mouse diversity panel, she is mapping specific chromosomal regions that become active when mice consume a diet high in fat and sugar. The goal is to discover unique genes and develop therapies to turn them on or off to give a patient the same genetic protection that some members of the general population have against obesity, regardless of diet.

■ Hua Yu, Ph.D., associate chair of cancer immunotherapeutics and tumor immunology, is a pioneer in research involving a gene called STAT3 and the role it plays in the dysregulation of the immune system. Yu has also been exploring the connection between STAT3 and the development of diabetes. Her findings suggest that STAT3 is common to both cancer and diabetes and that anti-STAT3 therapies, which have thus far been considered primarily for cancer, might also be effective against type 2 and perhaps type 1 diabetes.

■ Doctors at City of Hope have performed 45 islet transplantations in 20 type 1 diabetic patients. In addition, City of Hope coordinates the Integrated Islet Distribution Program (IIDP), which recently earned a $15 million grant from the National Institutes of Health. The initiative has placed more than 429 million islets with researchers and clinicians, and more than 360 peer-reviewed articles have been published as a result — making a global impact on islet cells research.

■ Stem cell expert H. Teresa Ku, Ph.D., assistant professor in the Department of Diabetes and Metabolic Diseases Research, is optimizing technologies to differentiate stem cells (both embryonic and adult) into pancreatic cells suitable for transplant. This would circumvent the need for donor pancreatic tissue, which is limited in supply. CN



TO FIGHT HIV, RESEARCHERS TAKE 'DIFFERENT' APPROACH — CREATING AN HIV-RESISTANT IMMUNE SYSTEM

TWO METHODS OF **GENETICALLY MANIPULATING AIDS PATIENTS' BLOOD STEM CELLS** HOLD GREAT POTENTIAL

BY NICOLE WHITE

In the last year, headlines about HIV and AIDS have been alternately exciting and heartbreaking, with news both of "cured" patients and of vaccine trials being abandoned.

Against a backdrop of rapidly changing approaches to how AIDS might be treated, prevented and cured, such headlines give City of Hope researchers both hope and determination, especially as research here has evolved to focus on blood stem cells, also referred to as hematopoietic stem cells or progenitor cells.

JOHN ZAIA

"That's what's different about our work," said John Zaia, M.D., the Aaron D. and Edith Miller Chair in Gene Therapy and chair of the Department of Virology. "How do you get a stem cell to engraft in an AIDS patient? What kind of gene do you put in there so its progeny will survive?"

For many in the United States, medical treatments have helped evolve HIV infection to more of a chronic condition, with patients living longer and healthier lives than three decades ago, when the first cases were diagnosed. But the disease continues to be a serious health threat. In 2010, more than 1.1 million people in the U.S. were living with HIV, according to Centers for Disease Control and Prevention estimates. Worldwide, the toll has been devastating.

Efforts to develop a vaccine to combat the disease have proved disappointing, with the National Institutes of Health recently halting a major trial testing a two-vaccine strategy to boost the immune system and the immune response. The trial did not prevent HIV infection or even reduce viral loads.

WALTER URIE

Better news has come from Timothy Ray Brown — known as the "Berlin Patient" — who effectively had his HIV "cured" as a result of his treatment for leukemia in 2007. During that treatment, he received a bone marrow transplant with blood stem cells from a donor who had a specific genetic mutation rendering his cells resistant to HIV infection.

That critical mutation was in a gene called CCR5, which makes a protein required for HIV to enter cells. With outgrowth of blood cells having this genetic mutation combined with the anticipated leukemia eradication by a process called graft-versus-host reaction — or GVHR — HIV wasn't able to infect the new immune cells in the "Berlin Patient," allowing him to stop his medications and dropping his viral load to undetectable levels.

The unknown question is whether the HIV cure was due to the CCR5 mutation or to a GVHR attack on Brown's reservoir of HIV-infected cells. In this regard, two AIDS patients have been treated in Boston for leukemia with blood stem cell transplantation from donors with natural CCR5 genes; both appear to be HIV-free some months after they stopped taking HIV medication. This raises the possibility that an HIV cure might occur solely with allogeneic bone marrow transplantation.

City of Hope research is directed at both of these approaches to an HIV cure. Regarding the CCR5 mutation, there simply aren't enough people with the mutation to serve as transplant donors for all existing HIV infections. Instead, scientists are looking for a way to create new CCR5 mutations in an AIDS patients' own blood cells.


JOSEPH ALVARNAS

To explore whether the GVHR is the curative factor, City of Hope investigators led by Joseph Alvarnas, M.D., associate clinical professor, are heading a national effort to evaluate the effects of stem cell transplants in AIDS patients who also have a blood malignancy. To date, several AIDS patients — including two from City of Hope — have been treated in this way.

Researchers at City of Hope are exploring two different methods of genetically manipulating AIDS patients' own blood stem cells to produce an HIV-resistant immune system.

The first method was uncovered by John Rossi, Ph.D, and used ribonucleic acid, or RNA, to block the CCR5-producing gene and added two other genes that block HIV infection. In this ongoing trial, overseen by Amrita Krishnan, M.D., director of the Multiple Myeloma Program, patients with treated AIDS lymphoma undergo blood stem cell transplants in which their own cells are collected and engineered with these 3 anti-HIV RNA molecules to determine if the progeny of these cells develop having HIV resistance markers.


JOHN ROSSI


AMRITA KRISHNAN

The second trial uses zinc finger nuclease, orZFN, to knock out CCR5. ZFN is a "designer enzyme" developed by Sangamo BioSciences that serves as molecular scissors, snipping a precise spot on the CCR5 gene and creating an immune system impervious to most HIV infection. Through a Disease Team grant from the California Institute for Regenerative Medicine, David DiGiusto, Ph.D., director of the Hematopoietic Cell Therapies Laboratory at City of Hope, and Zaia are collaborating with colleagues at the USC Keck School of Medicine and Sangamo BioSciences to develop ZFN treatment. The researchers are trying to circumvent the need to find a transplant donor who would be a match to the patient and carry the rare protective gene mutation.


DAVID DIGIUSTO

There's been big news relating to AIDS in the last year, especially the announcement that two new patients appear to have been cured of HIV-1 infection by hematopoietic stem/progenitor cell transplantation ...

A clinical trial for this approach will be recruiting patients in coming months. Participants must have not only AIDS, but also an inadequate immune recovery following otherwise successful control of the HIV with oral medications. As part of the trial, they'll first have their blood stem cells isolated and modified using the ZFN. Those stem cells will then be reinfused into the patient in an effort to restore an immune system that is resistant to HIV. This study, combining City of Hope expertise in transplantation with that in molecular biology, is the first attempt here to use gene therapy to treat AIDS patients who have no cancer. If successful, this has the potential for application to a wider population of HIV patients.

"There's been big news relating to AIDS in the last year, especially the announcement that two new patients appear to have been cured of HIV-1 infection by hematopoietic stem/progenitor cell transplantation," Zaia said. "This spurs activity at City of Hope relating to the use of this kind of transplantation in AIDS patients." CN

WALTER URIE; FRED LEE

On Surgery's Front Lines

BY ROBERTA NICHOLS

ON ANY GIVEN DAY in operating suites at City of Hope, surgeons may be excising a malignant tumor from a young woman with breast cancer, a grandfather with lung cancer, a kindergartner with brain cancer or a teenager with bone cancer.

Surgeons have a crucial role in stopping cancer. In their quest for "naked-eye clearance," they'll remove all visible tumors and nodules. They'll also excise the normal tissue immediately surrounding the malignancies, leaving "clear margins," so growths have less chance of returning.

"Our objective is offering patients quality of life with longevity with the intent of a possible cure," says Gagandeep Singh, M.D., interim director of the Division of Surgical Oncology and head of Hepatobiliary & Pancreatic Surgery.

Asking Singh to identify the most novel work being done in his department is a little like asking a parent to choose a favorite child. "I oversee eight divisions, and each of them is doing cutting-edge work," he says.

Within the Department of Surgery are the divisions of Neurosurgery, Otalaryngology/Head and Neck Surgery, Thoracic Surgery, Urology and Urologic Oncology, Gynecologic Oncology, Plastic Surgery, Orthopaedic Surgery and Surgical Oncology, which includes breast surgery, upper gastrointestinal and mixed tumor surgery (melanoma and sarcoma), hepatobiliary and pancreatic surgery, and colorectal surgery.

ROBOTIC-ASSISTED SURGERY

The operating-room arsenal for oncologic surgeons has gotten considerably more sophisticated over the years, particularly with the introduction of the surgical robot. City of Hope surgeons use the newest iteration of this device — the da Vinci Si. Singh likens using it to driving a Maserati — an apt analogy, since surgeons sit at a console near the patient, driving the operation themselves or overseeing the training of new physicians sitting in an adjacent console.

Peering into the high-definition 3-D screen that enhances their view of the surgical site, surgeons control instruments that bend and rotate with greater dexterity than their own wrists.

Timothy Wilson, M.D., the Pauline & Martin Collins Family Chair in Urology and director of the Prostate Cancer Program, and his team use the robot for a variety of procedures, from prostate and bladder cancer to complex kidney cancer operations.

The robot also has become indispensable to City of Hope's colorectal surgeons. Because the tumors are located deep in the pelvis, surgeons often had no option but to remove the rectum, anal canal and sphincter, consigning patients to a colostomy. With the robot, they can remove only the tumor, then reconnect patients' intestines, sparing them from life-altering colostomies.

Head and neck surgeons also have expanded the robot's potential, using it to perform a new procedure called Transoral Robotic Surgery. Using the procedure, Ellie Maghami, M.D., chief of Head and Neck Surgery, and her team can remove early— and mid-stage tumors of the mouth, tonsils, tongue and throat by going through the patient's mouth rather than through a large incision in the jaw and throat.

WOMEN'S CANCERS

For patients in the earlier stages of breast cancer, surgeons are using a new approach called intraoperative radiation therapy. Once the malignant breast tumor is removed, doctors deliver a single concentrated dose of radiation directly into the former tumor's site to decrease the likelihood of recurrence. This way, women can receive the surgery and radiation the same day, rather than stretching radiation treatments over six weeks.

PHOTOGRAPH BY JULIUS SHULMAN AND JUERGEN NOGAI

Meanwhile, City of Hope's gynecologic surgeons are finding new ways to successfully treat ovarian, endometrial and cervical cancer. Under the direction of Mark Wakabayashi, M.D., M.P.H., chief of gynecologic oncology, the division recently was ranked among *U.S.News & World Report*'s top gynecologic oncology programs.

One of the team's successful approaches — used primarily for ovarian cancer — is called maximal cytoreduction, and City of Hope is now a dominant force for cytoreduction on the West Coast, according to Singh.

Standard practice once dictated removing the tumor, affected ovary and, if necessary, the uterus and fallopian tubes and then following up with chemotherapy. Yet, in some cases, hundreds of "satellite nodules" remained.

Now, with cytoreduction, colleagues from other divisions scrub in during the same surgery, allowing, for example, the hepatobiliary team to remove tumors on the liver and the diaphragmatic surfaces, or the colorectal team to remove part of the intestine and/or visible nodules.

Once all their visible tumors are excised, some patients will undergo intraperitoneal chemotherapy for four to six weeks. In this treatment, overseen by Robert Morgan, M.D., co-director of Gynecological Oncology/Peritoneal Malignancy Program, or one of his colleagues in the Department of Medical Oncology & Therapeutics Research, chemotherapy is delivered directly into the belly to ensure that residual cancer cells are killed.

Such collaborations have paid off, dramatically improving a woman's odds of surviving ovarian cancer.

NEUROSURGERY

When cancer metastasizes, it often spreads to the brain and the spine — with devastating consequences.

City of Hope's neurosurgeons specialize in these delicate, complex operations, removing brain and spinal tumors to help restore patients' quality of life.

Sometimes, the growths originate in the brain, like gliomas, a group of aggressive tumors that accounts for an estimated 30 percent of all brain tumors A new phase I clinical trial now underway at City of Hope will offer a promising experimental gene therapy to patients with recurrent high-grade gliomas who already have undergone surgery, radiation therapy and chemotherapy.

Now, using new surgical techniques in combination with chemotherapy and radiation surgery, City of Hope's orthopaedic surgeons can remove the cancer and reconstruct the limb to maintain the patient's quality of life.

Guided by MRI imaging, Behnam Badie, M.D., chief of neurosurgery and director of the Brain Tumor Program, will inject a virus called Toca 511 into the tumors. Designed to infect only the brain tumor cells without harming normal cells, the virus will add a gene that acts like an enzyme that selectively converts an antibiotic drug (Toca FC) into a toxic chemotherapy (5-FU) inside the tumor.

Then there's a pioneering new technique for the surgical treatment of lumbar metastases. In a paper published in the *Journal of Neurosurgery: Spine* in July, surgeons Mike Chen, M.D., Ph.D., and Rahul Jandial, M.D., Ph.D., both assistant professors in neurosurgery, describe their experience in minimizing the invasiveness of lumbar spine tumor operations. Normally, tumor excision in this difficult location requires surgery through the back and the abdomen. Jandial and Chen have developed techniques to remove these tumors using a single incision in the back, potentially shortening recovery time and diminishing complications.

ORTHOPAEDIC SURGERY

Sarcomas, primary cancers of the bone and connective tissues, are rare tumors that annually account for less than 3 percent of all cancers in the United States. Approximately 11,000 soft-tissue sarcomas and 3,000 bone sarcomas will be diagnosed this year, according to the National Cancer Institute.

Patients with sarcomas once faced certain amputation. Now, using new surgical techniques in combination with chemotherapy and radiation surgery, City of Hope's orthopaedic surgeons can remove the cancer and reconstruct the limb to maintain the patient's quality of life.

Dominic Femino, M.D., chief of orthopaedic surgery and associate director of the Musculoskeletal Tumor Program, and George Calvert, M.D., M.B.A., assistant clinical professor, remove sarcomas of the bone and soft tissue and use advanced reconstructive technology to rebuild limbs, replacing the cancerous bones and joints with large metal endoprostheses.

For children with sarcomas, City of Hope surgeons have pioneered the use of noninvasive "growing" prostheses that have the ability to expand and accommodate for a child's continued growth — without an invasive surgery.

COLORECTAL/LIVER CANCER

Colon and rectal cancer represents the third-largest killer in men and women, and nearly half of these patients also have metastases to the liver.

"Due to the increasing complexity of resections, we utilize our interventional radiology colleagues to downstage tumors using radioembolization or transarterial chemoembolization," said Singh. These procedures block a tumor's blood supply, shrinking it before surgery to increase surgeons' success in removing all the cancer.

Doctors also utilize portal vein embolization before surgery to increase the volume of the liver, enabling it to withstand long, complicated surgeries.

Further, City of Hope surgeons work closely with interventional radiologists to develop leading-edge strategies for tumors situated close to critical blood vessels. One such approach involves vaporizing the tumor with electricity delivered by a new device called the Nanoknife.

No matter what their age or circumstance when they receive a devastating cancer diagnosis requiring surgery, patients cannot find themselves in more capable hands than those of the surgeons at City of Hope. CN

Shubbir Ahmed and John Williams in the lab.

BECKMAN RESEARCH INSTITUTE

Like a Lock and Key

Researchers find a hole in a monoclonal antibody — and a molecule that fits into it. The treatment potential is enormous

BY DARRIN S. JOY AND NICOLE WHITE

Scientists at Beckman Research Institute of City of Hope are never satisfied. They don't want simply to discover new therapeutic approaches, they want to understand the "why" behind potential new approaches — and how to make them better.

Take the notion of using the body's own immune system to fight disease. The idea has been around since at least 1900, becoming one of medicine's most sought-after goals.

Already, City of Hope researchers have made significant inroads in this arena, especially with proteins called monoclonal antibodies. The body naturally produces antibodies to alert the immune system to clear out invading bacteria and viruses, and City of Hope researchers developed technology to produce monoclonal antibodies that can be targeted against cancers. This breakthrough led to some of the top anti-cancer drugs currently available including Herceptin, Avastin, Rituxan and Erbitux.

Now City of Hope scientists are building on that work, and it may lead to even more effective therapies.

The researchers discovered a hole in the middle of the monoclonal antibody and a peptide molecule that fits neatly into it, like a lock and a key. The discovery could allow the antibody to become a guided system for delivering drugs directly to cells affected by disease.

"Think of a tractor and a trailer," said John Williams, Ph.D., associate professor in the Department of Molecular Medicine at City of Hope, who discovered the "lock and key" interaction and named it a meditope. "Previously, you would have to weld the trailer to the truck, and it could only deliver one kind of cargo. The meditope interaction is like a hitch, and with this specific hitch, you can take any tractor and hook up any trailer, effectively allowing you to mix-and-match the appropriate equipment for a specific job."

The potential is enormous. In fact, the W.M. Keck Foundation recently awarded City of Hope a three-year, $1 million grant to continue its study of meditopes.

Meditopes have the potential to fight not only cancer, but numerous other diseases including rheumatoid arthritis, Crohn's disease

THOMAS BROWN

> ... the discovery has the potential to dramatically change oncology, radiology and many other disciplines.

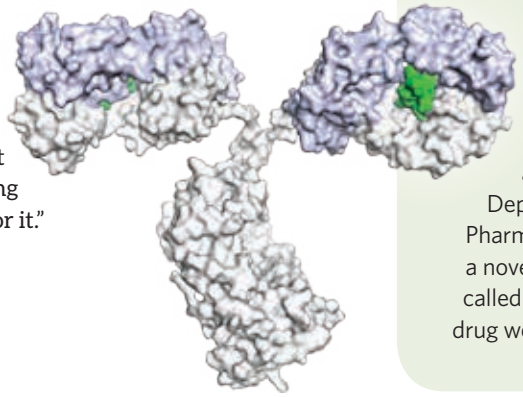
and macular degeneration. They also have biodefense applications. Further, meditopes could be an important tool for imaging, allowing radioactive molecules to be delivered directly to tumor sites, which would give clinicians a way of identifying and treating smaller tumors while protecting healthy tissue.

Williams, an expert in biophysics and structural biology, leads the research team, which includes David Horne, Ph.D., interim director of Beckman Research Institute of City of Hope and chair of the Department of Molecular Medicine. Horne will direct synthesis of novel meditope compounds, the trailers that will hook up to the hitch.

Also on the team are Tijana Jovanovic-Talisman, Ph.D., an advanced molecular imaging expert, and Jinha Park, M.D., Ph.D., assistant professor in the Department of Diagnostic Radiology. Park specializes in antibody-related diagnostic imaging and image-guided therapy.

Williams said the discovery has the potential to dramatically change oncology, radiology and many other disciplines. The peptide can be linked to drugs, but also to other meditopes, to create a chain of antibodies and medicines that can be delivered to the surface of cells — an approach already known to be effective.

"We have this hole, and we have the hitch," he said. "We don't know what all the applications are yet, but it's like the iPhone. We know there's this great device, and there are great ways of making applications for it."



JOSHUA DONALDSON, PHD, CINDY ZER, KENDRA AVERY AND KRZYSZTOF BZYMEK

BECKMAN BREAKTHROUGHS

■ OVARIAN ERRORS

Linda Malkas, Ph.D., deputy director of basic research at City of Hope, and colleagues at Indiana University shed some light on the genetic instability of ovarian cancer. They found that the machinery that duplicates DNA in ovarian cancer cells is prone to errors, leading to a high rate of mutation. The findings could help researchers understand how the disease develops.

■ OBESITY PROTEIN

Sanjay Awasthi, M.D., professor of diabetes, endocrinology and metabolism and of medical oncology, and his research team found that the protein RLIP76 plays a major role in obesity. Mice lacking the protein resisted weight gain while on a high-fat diet. The scientists also discovered a chemical in orange rind that might block the protein. They're currently charting a course toward clinical trials.

■ DIABETES DIAGNOSTIC

Raynald Samoa, M.D., assistant professor in the Department of Clinical Diabetes, Endocrinology & Metabolism, and colleagues found that a commonly used diabetes diagnostic test does not detect the disease in most patients. They found that the HbA1C blood test only catches about 25 percent of cases. The researchers found that other tests, though more time-consuming and inconvenient, were more reliable.

■ PROSTATE DRUG

Jeremy Jones, Ph.D., assistant professor in the Department of Molecular Pharmacology, led a study of a novel prostate cancer drug called pyrvinium pamoate. The drug works by shutting down a key protein, called an androgen receptor, that when activated can spur prostate cancer. The new therapy could one day knock down aggressive prostate cancers that are resistant to standard treatments.

■ MEMORY REGULATION

Yanhong Shi, Ph.D., associate professor in the departments of Neurosciences and Radiation Biology, and colleagues found that a protein called Wnt7a is essential to brain stem cell maintenance and development. Because Wnt7a acts in the hippocampus, a brain region that is critical for learning and memory, the findings may provide insights into how learning and memory are regulated and may lead to new tools to enhance our learning and memory.

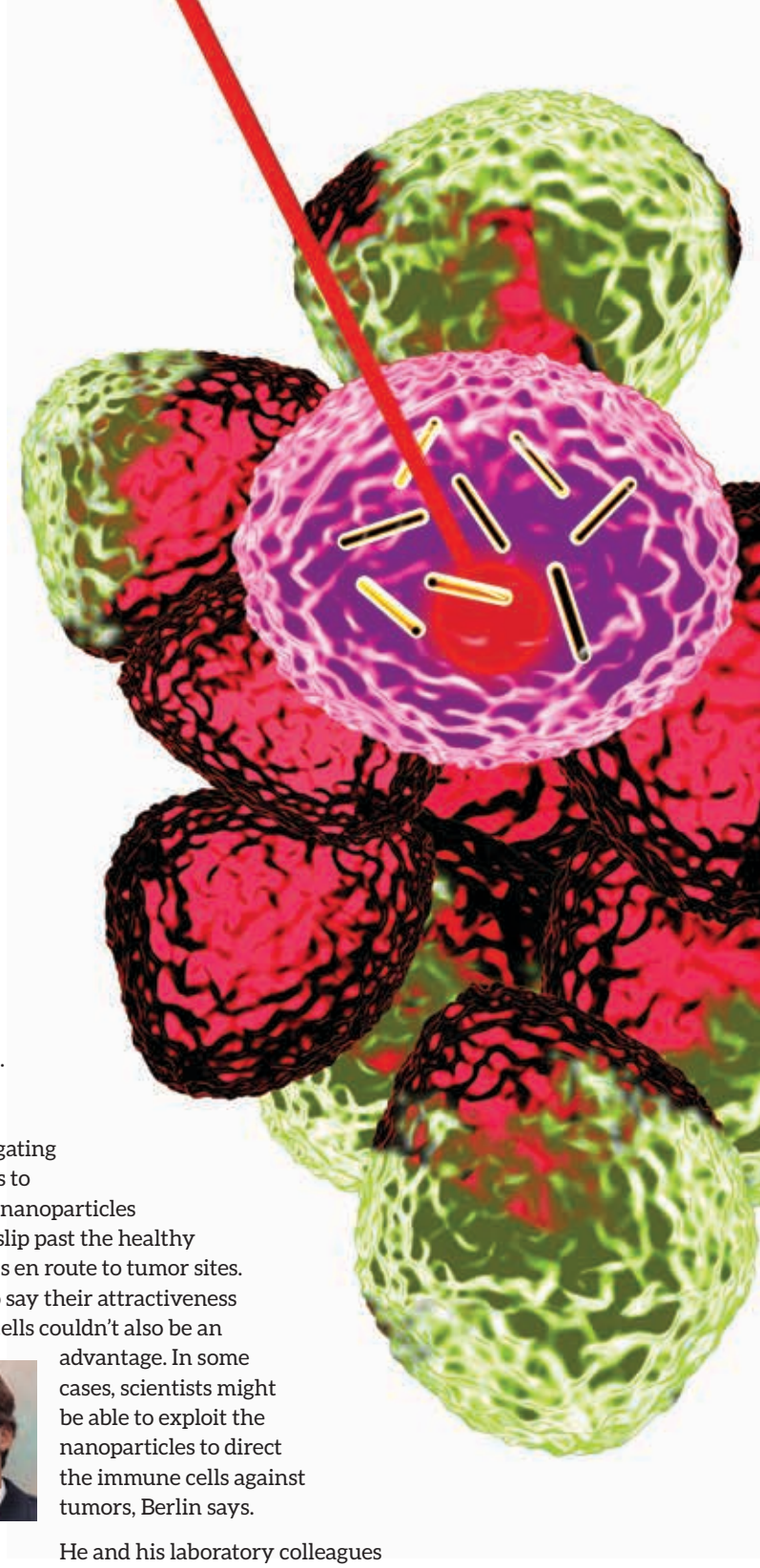
■ DNA REPAIR

David K. Ann, Ph.D., professor in the Department of Molecular Pharmacology, and his team showed that the protein HP1 aids the repair of certain breaks in DNA leading to breast cancer. The researchers believe HP1 could act as a biomarker for some breast cancer patients and might offer a potential target for personalized therapies for these patients.

■ CHRONIC RELIEF

Defu Zeng, M.D., associate professor in the Department of Hematology & Hematopoietic Cell Transplantation, uncovered clues to chronic graft-versus-host disease (GVHD), a common and often life-threatening complication of bone marrow transplantation. The researchers showed that two types of immune system T cells conspire to cause the long-term complication. Their study could lead to methods of preventing chronic GVHD, saving more lives.

For up-to-date information about City of Hope research, be sure to visit our Breakthrough blog at breakthroughs.cityofhope.org. CN



Nano Power

ULTRA TINY PARTICLES PACK POWERFUL PUNCH

BY NICOLE WHITE

In his City of Hope laboratory, Jacob Berlin, Ph.D., tackles some of the world's biggest health problems using some of its tiniest tools: nanoparticles.

These tiny packages made of gold, carbon, silica and other materials have the potential to be a key component in treating many diseases. Berlin and his team have paired nanoparticles with neural stem cells to deliver payloads of drugs directly to breast tumor metastases, used them as agents for targeting thermal ablation precisely to tumor sites, and harnessed them to incite the immune system to attack and destroy brain tumors.

"We have lots of ways of killing cancer cells — radiation, chemotherapy drugs — but the trick is not damaging the rest of the body in the process," Berlin said. "We'd like nanoparticles to be like mail trucks. They carry around their drug, get to the right address, then drop it off. It spares the healthy tissue and allows you to better eradicate the tumor."

Nanoparticles are similar in size to viruses and bacteria. As a result, immune cells easily gobble them up, creating a challenge in getting them to their targets. Berlin and his team are now investigating precise ways to disguise the nanoparticles so they can slip past the healthy immune cells en route to tumor sites. That's not to say their attractiveness to immune cells couldn't also be an advantage. In some cases, scientists might be able to exploit the nanoparticles to direct the immune cells against tumors, Berlin says.

JACOB BERLIN

He and his laboratory colleagues have collaborated with numerous scientists and physicians at City of Hope to identify ways to wield nanoparticles in the fight against cancer. In their work to use nanoparticles to deliver chemotherapy selectively to tumors, Berlin and his team are working on making "smart" nanoparticles. One method involves a coating that masks the particles

PATRICK CUNNINGHAM

WALTER URIE

from healthy cells, essentially rendering the particles invisible to those cells. The coating is chipped away by molecules present only in the tumor microenvironment and, once it's stripped away, the particles and their payload are revealed. The tumor then ingests the particles, which release their drugs once inside, like tiny Trojan horses.

Another approach partners nanoparticles with a different cell type, namely neural stem cells.

Karen Aboody, M.D., associate professor of neurosurgery and neurosciences, established in her research that neural stem cells naturally home in on tumor sites. Now she is working with Berlin to attach nanoparticles to the stem cells, so that the stem cells can carry the nanoparticles into the tumor and the nanoparticles can be used to kill the cancer cells. The researchers have used this strategy to deliver payloads of cancer drugs to breast cancer metastases.

KAREN ABOODY

In yet another study, Berlin's team used nanoparticles to transport gold nanorods, which are inert until exposed to a specific type of laser. The laser doesn't harm tissue, but causes the nanorods to act as tiny antennae and heat up. In a mouse model of breast cancer, the researchers showed that this allows them to selectively "burn" away the tumor while sparing healthy tissue.

BEHNAM BADIE

In other potential treatments, nanoparticles deliver cargo to the immune cells themselves.

In partnership with Behnam Badie, M.D., professor in the Department of Surgery and chief of neurosurgery at City of Hope, Berlin and his team are testing how nanoparticles may help harness the body's own immune system to fight tumors. A century ago, physicians

Stem cells are provided with a nanoparticle cargo that can be used to kill surrounding tumor cells once the stem cells arrive at the tumor. In this case, the nanoparticles are small gold rods that function like tiny antennae and convert light energy into heat. The nanoparticles are inert and safe while migrating to the tumor. That changes at the tumor site. Once the nanoparticles are in place, a nonharmful laser is applied to the area. That makes the nanoparticles respond by rapidly heating the area around them, killing the cancer cells.

In short, nanoparticles — 10,000 times smaller than the width of a single human hair — have massive potential to aid treatment of cancer ...

observed that some cancer patients who became ill with common infections, which stimulated the immune system, were able to fight both the infection and the tumor. Berlin and Badie believe that nanoparticles might be able to elicit a similar response.

One agent for triggering the immune system is fragments of DNA known as CpG, which resemble bacterial DNA. When immune cells ingest the fragments, they initiate a rapid and local killing response, attacking the surrounding cells. If these fragments could be confined to the tumors, they could be used to kill its cells. This is where nanoparticles can help, Berlin said.

In a promising study, packaging the DNA fragments in carbon nanotubes dramatically enhanced the activity of the CpG. Early results suggest this may be because the nanotubes packed with CpG are rapidly consumed by the immune cells at the tumor site. Because the CPG can reach healthy tissue, the immune response becomes focused on the tumor. The study, conducted in mice, showed that a single injection was sufficient to eliminate the majority of brain tumors; surviving mice remained tumor-free even when injected with new brain cancer cells.

Early results combining nanoparticles with CpG are so promising, in fact, that researchers are trying to move this discovery from the lab to patients as quickly as possible. In the coming year, scientists will be working with the Food and Drug Administration to determine what steps should be taken before testing the drug with patients. Such a trial would be the first human clinical trial for a carbon nanotube-based therapy.

In short, nanoparticles — 10,000 times smaller than the width of a single human hair — have massive potential to aid treatment of cancer, both in targeting chemotherapy and in focusing radiation therapy.

Berlin's team is now blazing new ground in testing the different materials used to make nanoparticles, analyzing how the composition of the particles affects their therapeutic usefulness. This not only advances work already being done at City of Hope, it could provide important data on nanoparticle research throughout the medical field. CN

BREAKTHROUGHS BEGIN WITH RESEARCHERS; RESEARCHERS BEGIN AT CITY OF HOPE

Graduate school marks 20 years of fueling the future of research

BY DARRIN S. JOY

Businesses invest enormous resources into developing a strong pipeline of products. For research institutes and biotech companies, those pipelines usually aim to deliver new therapies to the world. Without well-trained scientists, those pipelines would soon dry up.

City of Hope fuels the talent pipeline with skilled new researchers through its Irell & Manella Graduate School of Biological Sciences. The school is celebrating its 20th anniversary this year, and for a small, independent institution, the reach is impressive — and growing. The school has ushered more than 90 students into careers in academia and industry throughout the U.S. at institutions such as Genentech Inc., the Burnham Institute in La Jolla, Calif., Howard Hughes Medical Institute at the University of California, San Francisco, and New England Biolabs Inc.

Two graduates in particular have extended City of Hope's legacy to the global stage. One is a research scientist at biotech firm BioDura Inc. in China; the other holds a position at Chonnam National University in South Korea. And two graduates have used their foundation in biomedical research to pursue medicine. One is a physician at Kaiser Permanente and the other at Stanford University. Other graduates are now delving into biology's intricacies in labs nationwide.

"These kinds of accomplishments are the fulfillment of a shared dream at the graduate school," said Steven Novak, associate dean of the school and director of professional education at City of Hope. "We knew when we launched the graduate school that we could, in some very real way, change the world. We have done, and continue to do, just that."

The latest batch of graduates received their Ph.D. degrees in June during the school's 15th commencement ceremony, accepting positions at the UCLA School of Dentistry, Genoptix Medical Laboratory in San Diego and Duke University — and extending City of Hope's reach.

Swati Kadam, Ph.D., landed a paid internship at Illumina Inc. in Hayward, Calif. She feels the

AMY CANTRELL

biotech industry is where she can make the biggest impact.

"For me, at least, I think it's where I best fit. I love biology, and the point is how I can apply what I know," she said.

Kadam found her path when she enrolled in the Bioscience Management certificate program at Keck Graduate Institute of Applied Life Sciences in Claremont, Calif.; City of Hope helped Keck launch the program in 2008 to broaden learning and career opportunities for students.

"I enrolled in a course just to see if I liked it," Kadam said. She did, finding that the course opened up a new path for her research ambitions.

Supriya Deshpande, Ph.D., who is putting the final touches on her experiments, echoed Kadam's interest in an industry job. "In the near future, I also want to gain some research experience in the industry, as I want to get a perspective in both academia and industry to get an idea of how research is conducted in these settings," she said.

City of Hope CEO Michael A. Friedman presented entrepreneur and philanthropist Bernard "Bernie" Marcus with an honorary Doctor of Science degree during the 15th commencement ceremony of City of Hope's Irell & Manella Graduate School of Biological Sciences.

For Patrick Perrigue, Ph.D., who currently is applying for jobs, academia is the setting of choice. When asked if he has a preferred institution to launch his career, his answer proved to embody the attitudes of most of his fellow students. "Anywhere," he said. "I just love doing science."

That type of attitude is where tomorrow's breakthroughs begin. CN

SHAPING THE WORLD: 2013 GRADUATES AND THEIR THESES

- **Krist Azizian** "Global MicroRNA Expression Status of Human Hematopoietic Stem-Progenitor Cells Modulates Myelopoiesis"
- **Caroline Clark** "PARP Inhibitor and Platinum Drug Combination Therapies in BRCA1 and BRCA2 Isogenic Models"
- **Supriya Deshpande** "Transforming Growth Factor-ß Induced Cross Talk Between p53 and microRNA-192 in the Pathogenesis of Diabetic Nephropathy"
- **Wen Jin** "Identification of Novel Angiotensin II Regulated Gene Networks in Vascular Smooth Muscle Cells"
- **Swati Kadam** "Global Landscape of DNA Methylation and Gene Expression in Hematopoiesis and Monocytic Differentiation"
- **Julie Kanjanapangka** "Sequential Post-translational Modifications Determine the Fate of FEN1 During Cell Cycle Progression"
- **Ching-Ying (Jenny) Kuo** "Crosstalk Between Post-translational Modifications Regulates KAP1 Function in DNA Damage Signaling Pathway"
- **Stephanie Nay** "Alkbh2 and Alkbh3 Are Anti-Mutagenic DNA Repair Proteins"
- **Patrick Perrigue** "The Histone H3K27 Demethylase JMJD3 Promotes a Pseudosenescent State in Glioma Cells and Regulates Aging-associated Inflammatory Cytokine Production"
- **Jeremy Racine** "Induction of Mixed Chimerism for Reversal of Autoimmunity in NOD Mice"
- **Nicholas Snead** "Parallel Assessment of Mode of Action of siRNA Variants"
- **Diana Tran** "Effects of Endocrine Disrupting Chemicals on Germline Epigenetic Remodeling"
- **Karina Vega** "Macrophage Chitinase and Lipoprotein Uptake Responses to Chitin, a Structural Component of the Fungal Cell Wall: Diagnostic and Biomedical Implications"
- **Xizhe Zhang** "The Role of Long Noncoding RNAs in Small RNA Triggered Transcriptional Gene Activation in Human Cells"

PHILANTHROPISTS AS GRADUATES

Joining the graduates at the commencement ceremony was entrepreneur and philanthropist **Bernard "Bernie" Marcus**. Perhaps best known as co-founder of The Home Depot, Marcus is a longtime supporter of City of Hope. He took his place on stage as a graduate as well, receiving an honorary Doctor of Science degree.

Marcus joins an exceptional group of philanthropists who also have received honorary doctorates from City of Hope:

- **Patrick Soon-Shiong, M.D.**, surgeon, researcher, professor, entrepreneur, chair of the Chan Soon-Shiong Family Foundation and chair and CEO of the Chan Soon-Shiong Institute for Advanced Health
- **Sherry Lansing**, former actress and entertainment executive and co-founder of STOP CANCER and Stand Up To Cancer
- **Morgan Chu, J.D., Ph.D.**, partner at legal firm Irell & Manella LLP
- **Norman Payson, M.D.**, health-care executive
- **Michael Kaplan**, co-partner of real estate management firm ARKA Properties Group
- **Richard S. Ziman**, founding chair and CEO of Arden Realty Inc.
- **Gil Schwartzberg**, former City of Hope president, CEO and board chair
- **Stephen B. Kass**, chair and CEO of national debt-buying company Credit Max LLC
- **Meyer E. Hersch**, founder and general partner of Hersch and Company

AMY CANTRELL

CHANGE NURSING, CHANGE THE WORLD

CITY OF HOPE CREATES A **FOUNDATION OF CARE** BASED ON PATIENTS' NEEDS

BY WAYNE LEWIS

Betty Ferrell can still remember watching as the van chugged up and the nurses spilled out.

The Romanian travelers had driven across half of Europe to attend a conference in Austria on palliative care led by Ferrell, Ph.D., R.N., professor and director of nursing research and education. They had opted to travel by road rather than air so they could stretch their funding to train nine nurses rather than two.

That was in 2008, and as Ferrell put it, when it came to palliative care, this group was "starting with nothing."

"They had no confidence, but what we saw were these passionate, wonderful people," she said.

The nurses were determined to develop their own program in Romania and they did exactly that, guided by City of Hope senior research specialist Rose Virani, R.N., M.H.A., O.C.N., F.P.C.N. Just five years after that van pulled up, their program has been designated a leadership center for Eastern Europe.

Such stories — and there are many — illustrate the enormous impact of City of Hope's Division of Nursing Research and Education, an impact that today reverberates through the world of health care.

For 30 years, City of Hope has been a wellspring for quality-of-life research in cancer.

Then, Geraldine V. Padilla, Ph.D., and Marcia Grant, D.N.Sc., R.N., now a distinguished professor in the Division of Nursing Research and Education, set out to understand the patient concerns that extended beyond cancer treatment.

With their surveys, they established a template for how to assess patients' concerns. That work resulted in a quality-of-life index — an early tool in what is now a major area of nursing research.

PIONEERING PAST

"I remember very clearly about 25 years ago — just before I came to City of Hope — when I began to hear the term 'quality of life.' It really was a new term," said Ferrell, who succeeded Grant as director of the Division of Nursing Research and Education in January.

Betty Ferrell, Virginia Sun and Rose Virani are pushing the boundaries of nursing.

THOMAS BROWN

"One of the things that drew me here was working with the people who were trying to develop this concept in a way that it could be understood and measured."

Assessing — and improving — quality of life involves much more than gauging a patient's disease and related pain. It requires nurses and other health-care workers to plumb numerous mental and physical effects of disease and its treatment such as pervasive fatigue, anxiety and depression. Their task begins with listening to patients.

"That's really what our work has been about: to go to the person and listen to their stories," said Ferrell. "We listen to them tell us what quality of life means to them, and what is unique about their quality of life as someone with cancer."

The City of Hope nursing researchers identified four basic dimensions of quality of life: physical, psychological, social and spiritual. They developed ways to evaluate each dimension and its composite parts. Building from this base, they looked deeper into quality of life in specific populations — breast and ovarian cancer patients, patients who received blood stem cell transplants, family caregivers and others.

The research instruments that resulted are now used nationally and internationally by nursing researchers, as well as physicians, social workers, psychologists and chaplains.

"Our tools, literally every day, are being accessed by investigators all over the world," said Ferrell.

HOW A LEGACY BEGINS

Ferrell began working with Grant and other nursing colleagues on this effort in 1989. Over the years, she also earned a reputation as an international leader in the closely related areas of pain management and end-of-life care.

With cancer often characterized largely as a battle to be won, the needs of terminal patients can be overlooked, Ferrell said.

"The natural inclination is to avoid this discussion. But to do so is really to deny people the optimum care they need. Cancer care is not just a success-or-failure proposition. It's about the quality of life of every human being for as long as they live."

More than investigating problems and searching for solutions, Ferrell and her team have focused on disseminating knowledge to impact care around the world — where the "research" and "education" in the division name meet.

> "Cancer care is not just a success-or-failure proposition. It's about the quality of life of every human being for as long as they live.

Ferrell and City of Hope joined with the American Association of Colleges of Nursing in 2000 to create the End-of-Life Nursing Education Consortium (ELNEC), a program providing mentorship and support to nurses and other health-care workers such as physicians, social workers, psychologists and chaplains. The need was serious; at the time, the most widely used books in nursing-school curricula devoted only 2 percent of their content to tending to terminal patients.

Since then, ELNEC has trained more than 16,000 nurses and health-care professionals from every U.S. state and 77 countries around the world.

Ferrell called this kind of initiative "the ultimate aim of a comprehensive cancer center like City of Hope."

"Not only are we charged to do great things for our patients and families, but we're really charged to share with other cancer programs around the country. It's all very much about impacting care."

A VIBRANT PRESENT

The drive to investigate and improve quality of life for cancer patients and their families remains the prime engine for today's nursing research and education at City of Hope.

- An $11 million grant from the National Cancer Institute (NCI) supports a three-pronged study of lung cancer, led by Ferrell, examining palliative care in early-stage patients; palliative care in late-stage patients; and palliative-care education for family caregivers.

- The American Cancer Society is funding a five-year project on patients' loved ones, studying quality of life in low-income family caregivers.

"It's tough enough to be a family caregiver in cancer," Ferrell said. "If you also are someone who has real economic challenges, then the impact on you and your family is going to be even worse."

- Virginia Sun, Ph.D., M.S.N., R.N., an assistant professor of nursing research and education, is investigating specific issues affecting quality of life during and after cancer. Her studies of patients facing pancreatic and ovarian cancer build on the NCI-funded lung cancer program project.

- Other research, also by Sun, centers on survivors of early-stage lung and colon cancers and seeks to improve how health-care professionals prepare patients for life when treatment is done.

"People who survive cancer don't necessarily return to perfect, healthy lives with no problems" Ferrell said. "They have a lot of ongoing symptoms. And it's our obligation — even now that they've had a great outcome and we hope they're cured from their original tumor — to maintain a real commitment to their quality of life."

- An initiative led by Grant aims to translate research results into a better-prepared workforce. Her project will prepare oncology nurses to work in survivorship care and on clinical trials.

Such boundary-bending studies have laid down a solid foundation to understand patients' quality of life. On the horizon is more and more research dedicated to developing and evaluating interventions. CN

It's About The Patient

In supportive care, treatment shouldn't stop with medicine

BY WAYNE LEWIS

When visitors first enter the Sheri & Les Biller Patient and Family Resource Center, they encounter a brightly lit library area filled with books and pamphlets about how to cope with cancer. To the side are activity rooms and a peaceful atrium.

Ahead, a staff member stands behind a desk ready to greet them. Beyond are computers allowing them to access and print more in-depth information. In the back lie rooms reserved for patient and family meetings, able to connect them with loved ones far from Southern California.

"That physical structure is a metaphor for the rest of the department," said the center's administrative director, Matthew J. Loscalzo, L.C.S.W.

The most public space stands in for the variety of classes held there for patients and others, covering topics from yoga to nutrition. The second level, where patients pick up tailored resources, embodies the center's role as "the connective tissue" that links patients to what they need on campus. And the farthest, private spaces symbolize the personalized care delivered to patients and families by the members of the Department of Supportive Care Medicine.


MATTHEW J. LOSCALZO

For many patients, the Biller Patient and Family Resource Center is their first point of contact with the department, and it reflects the greater department's philosophy. Describing the department's activities, Loscalzo uses one term over and over: "patient- and family-centered." The unwavering focus on the experience of patients and their loved ones drives his team to deliver a comprehensive — and uniquely integrated — slate of services.

Increasingly, that focus is making the center a role model for other programs across the country.

WALTER URIE; PATRICK CUNNINGHAM

> “The power of *SupportScreen* is saying to another human being, ‘You are the expert on you. I am the expert on cancer. Let’s join together.’
> ~ *Matthew J. Loscalzo*

The Biller Patient and Family Resource Center library, above, and *SupportScreen*, left, help City of Hope patients in both traditional and more modern ways. The goal, however, is the same: support.

BREAKING DOWN PROFESSIONAL BARRIERS

“Health care is silo-ed. It’s profession-centric,” said Loscalzo, the Liliane Elkins Endowed Professor in Supportive Care Programs. “We made a small revolution here by integrating what was 11 or 12 different departments into one, to break down silos and make it patient- and family-centered. There are very few places in the world that could do that.”

The department encompasses 65 members — for example pain and palliative care physicians and nurses, psychologists, psychiatrists, clinical social workers, child-life educators, patient navigators and spiritual counselors.

City of Hope brought together this array of experts to increase communication and coordination. “All of those professions are under the same umbrella. They’re talking to each other. They live with each other.”

To further that communication, the supportive care team is harnessing technology.

5 YEARS OF IMPACT — AND COUNTING

Five years is a milestone for many cancer patients. At the Biller Patient and Family Resource Center, it’s a milestone for the entire community.

Now celebrating its fifth anniversary, the Biller Patient and Family Resource Center is a unique partnership between philanthropists and City of Hope. The mission of that partnership: Develop the best program of supportive care services in the world.

Founded in 2008 through a gift from Sheri Biller, currently chair of City of Hope’s board of directors, along with her husband, Les, the center offers many services at no cost to patients and their families.

Loscalzo and program manager Karen Clark, M.S., along with the information technology team, developed a tablet computer application called *SupportScreen*. The touch-screen questionnaire — developed with guidance from former patients and family members — prompts patients to think about a variety of issues that can affect their lives during cancer care. The questions run the gamut, including concerns about physical symptoms, side effects, finances and feelings of anxiety or depression.

As a way to assess patients’ worries and needs, the computer provides an advantage over one-on-one questions. Loscalzo cited research consistently showing that patients will provide more information — and more accurate information — to a simple piece of technology compared to speaking with another person.

How a patient answers will open the door to the information and help needed. Health-care professionals at City of Hope instantly receive emails alerting them to the patient’s concerns. And the physician leading the patient’s care receives a report about who is doing what.

“The power of *SupportScreen* is saying to another human being, ‘You are the expert on you. I am the expert on cancer. Let’s join together,’” Loscalzo said.

This strategy not only connects the patient with just the right people, but also frees up the doctor to concentrate more fully on the patient’s medical care, making “the clinical encounter … purer, more patient- and family-centered,” in Loscalzo’s words.

SPREADING A MESSAGE OF SUPPORT

Outpatients in the breast cancer and medical oncology clinics currently use *SupportScreen*, as do some patients in the surgery and hematology departments. Loscalzo also plans to expand the program to more outpatients and to inpatients as well.

Meanwhile, *SupportScreen*’s impact is growing beyond the Duarte campus.

Four medical centers around the country have now licensed the technology. And demonstrations of *SupportScreen* are part of a City of Hope screening workshop for health-care providers nationwide. That workshop is supported by a $1.5 million National Cancer Institute grant — one of a pair of prestigious NCI training grants recently awarded to the Biller Patient and Family Resource Center.

The future of the supportive care department will feature a greater focus on research. Loscalzo aims to recruit physician-scientists who lead investigations that help personalize supportive care. One line of study would seek to tie the effectiveness of interventions such as pain medication to specific biological signs, or biomarkers, in a patient’s body. Another would focus on the Latino- and Chinese-American population in search of new insights into how best to serve these patients and families.

“For me, the most exciting thing that we are doing is the science of caring,” he said. “We’re making sure the caring brings value — that it not only is cost effective but helps the patient, and tailoring that to know, ‘Does a person need meditation or do they need medication?’” CN

MY CANCER DIAGNOSIS: What I Wish I'd Known

THE BEST ADVICE COMES FROM PEOPLE WHO'VE BEEN THERE

Understanding this, City of Hope recently launched a new series titled "My Cancer Diagnosis: What I Wish I'd Known." In it, we ask former patients to look back at their diagnoses and ask themselves what they know now that they wish they'd known then. What wisdom, soothing words, practical tips or just old-fashioned advice would they give their newly diagnosed selves? Here are a few of their stories, and some of their advice.

Alexandria Cervantes

STUDENT, SAN GABRIEL

Alexandria Cervantes was in cheerleading practice in 2007 when the excruciating stomach pains began. The 15-year-old was rushed to a hospital near her San Gabriel home for what surgeons believed would be a routine appendectomy. Instead, they found a ruptured ovarian cyst that turned out to be a malignant germ cell tumor. Removing the growths and an ovary, they called the treatment complete.

That, however, was just the beginning.

Cervantes later learned the disease had spread. She underwent surgery at another hospital to remove stomach tumors. She finally arrived at City of Hope in October 2007. There, she met pediatric oncologist Clarke Anderson, M.D., "He was the first one who gave me hope," Cervantes recalled. "He said, 'You're going to live to be a little old lady.'"

She also came under the care of Mark Wakabayashi, M.D., M.P.H., chief of the Division of Gynecologic Oncology. Over the years, he removed benign tumors and cysts from her abdomen, diaphragm, liver and remaining ovary.

> **HER ADVICE ...**
> Embrace your baldness. Please! Looking back, that's the one thing I wish I would have done. I always hid beneath my caps, and I wish I hadn't. It only shows your ultimate strength, especially for all you young women out there. People will admire you, and those who do not understand are not worth your presence anyway.

These days, a busy, 21-year-old Cervantes returns to City of Hope for regular check-ups, works part-time at a local mall and is studying to become a certified makeup artist.

Read more of Cervantes' story — and her advice at:

http://breakthroughs.cityofhope.org/tag/my-cancer-diagnosis

– Roberta Nichols

ALEXANDRIA CERVANTES

Bill Brutocao

ATTORNEY, LA CAÑADA

Soon after beginning treatment for prostate cancer at City of Hope in 2008, La Cañada attorney Bill Brutocao received even more disturbing news: He had Hodgkin lymphoma.

Under the supervision of physicians Kevin Chan, M.D., clinical assistant professor of surgery in the Division of Urology and Urologic Oncology, and Leslie Popplewell, M.D., clinical associate professor in the Department of Hematology & Hematopoietic Cell Transplantation, Brutocao suspended prostate cancer treatment and began 12 rounds of chemotherapy to battle the lymphoma.

En route to treatment one day, Brutocao noticed signs for a creative writing class at the hospital. He was intrigued, but didn't sign up. Though he thought the process might be therapeutic, he says, "The last thing I wanted to do was write about my illness."

Yet, as he began to feel better, he reconsidered writing. He tackled a new genre — children's literature — and wrote "The Basking Shark Rescue Team." His fanciful characters — Beulah the basking shark, Sam the seagull, Rocky the otter and Corky the cormorant — may have rescued their creator from the vortex of illness.

Brutocao, 62, hopes to retire from his law practice soon so he can devote more time to his family and to his other love: creative writing.

Read more of Brutaco's story — and his advice at: http://breakthroughs.cityofhope.org/tag/my-cancer-diagnosis – *Roberta Nichols*

HIS ADVICE ...

Do not be a prima donna. Treat your spouse and family members with utmost love and respect. It is a life-changing experience for them, too. They are trying to help you through it. They do not have the escape hatch of having cancer. They are constantly alert and on their best behavior, and they feel they cannot do or say anything to upset you. Do not use your condition as an excuse to make their lives any more difficult.

BILL BRUTOCAO

Ben Teller

STUDENT, WEST HILLS

Just as he was starting college five years ago, Ben Teller received a diagnosis of Hodgkin lymphoma.

The West Hills resident's immediate response was to set up an emotional shield. Then 18, Teller leaned on his family, particularly his mother. He didn't want to know too much at first, so he came to view cancer as a series of tasks, something to be overcome "because it was in my way and I didn't have a choice."

His journey brought some disheartening lows. Although the lymphoma went into remission within six months thanks to chemotherapy, Teller faced a pair of recurrences. Each was countered by a blood stem cell transplant at City of Hope and required weeks in the hospital.

Teller also experienced redeeming high points. He calls the day he got the news that he was cancer free "the best day of my life."

Teller recently graduated from the University of California, Irvine. Now he wants to continue with his life as if cancer never happened — although he's grateful for the hard-fought wisdom he gained along the way. The path was difficult, but he's filled with hope for the future.

"I'm a testament to, 'It does get better,'" he says. "We're about eight months since my transplant and I feel fantastic."

Read more of Ben's story, his advice — and listen to a podcast of his experience at: http://breakthroughs.cityofhope.org/tag/my-cancer-diagnosis – *Wayne Lewis*

> **HIS ADVICE ...**
> The nurses are there for you. When you're in the hospital, don't be afraid to ask for the nurses' help. There were times when I felt as though I was calling them in too many times in an hour. But you can't ever really burden those nurses. If they've just seen you for five minutes, don't be afraid to call them 10 minutes later to tell them you're not feeling well. They really do care about you and your well-being. And life can even be better in some ways. I wish I had understood that sooner.

Kurt Deetz

HELICOPTER PILOT, BURBANK

Like many who face a cancer diagnosis, Kurt Deetz struggled at first with isolation, fear and depression.

Told in 2009 that a malignant lump on his tonsil had spread to a lymph node, the Burbank resident worried about all that he would lose. Would he get to see his son, 7 years old at the time, grow to be a young man? Would he be able to continue his career as a helicopter pilot?

His outlook changed when he arrived at City of Hope. He knew that in Ellie Maghami, M.D., he was under the care of a top head-and-neck cancer doctor. Deetz resolved to never give up, to fight the disease with all that he had.

Deetz says his positive attitude saw him through treatment — "the hardest thing I have ever done in my life." Chemotherapy and an intensive course of targeted radiation at City of Hope drove his disease into remission. Today, he is cancer-free, back at the controls of a chopper and enjoying life with his family.

Read more of Deetz's story, his advice — and listen to a podcast of his experience at: http://breakthroughs.cityofhope.org/tag/my-cancer-diagnosis – *Wayne Lewis*

> **HIS ADVICE ...**
> Laugh as much as you can. I found humor in everything. Even when it took me almost three hours to drink an 8-ounce Ensure, I laughed. It hurt like crazy, but you have to make fun of it. It's only temporary. ... Cancer hates positive people. I think this mindset goes hand-in-hand with not giving in and laughing at everything. I truly feel that I am cancer-free today because of my positive attitude.

BEN TELLER; KURT DEETZ

HER ADVICE ...
My body parts do not define me as a person or a woman. The thought of having my breast removed was a big pill to swallow; however, the thought of keeping it with my days numbered was not an option. I quickly realized that life is more precious than my breast.

Kommah McDowell

Kommah McDowell was confidently on track in her personal and professional life. At 28, she was engaged to be married, prospered in the competitive financial services industry, and relieved stress through kickboxing.

Then she found the lump in her right breast.

Her doctors assured her it was a benign cyst because she was "too young" to have cancer. Meanwhile, the symptoms mounted: Her nipple inverted as her right breast began swelling and became inflamed and painful. McDowell insisted that her doctors remove the growth. That's when they finally confirmed what she already knew. In July 2005, she transferred her care to City of Hope, where she had temped during college. She was diagnosed with late-stage inflammatory breast cancer — a particularly aggressive variety — and became a patient of George Somlo, M.D., professor of breast oncology.

Many cancer patients are given survival rate projections for five years; McDowell was told she had a 5 percent chance of surviving two years.

Given the impending bombardment of treatment, she also learned she'd probably never bear a child — and would have to wait at least two years after radiation before even trying to conceive. She and her fiancé, Charles, decided they would likely adopt and focused instead on getting her safely through treatment. In between chemotherapy appointments, recounts McDowell, they even squeezed in their wedding — with her "bald head and all."

Months after recovering from a radical mastectomy on her right side, McDowell found lumps on her left breast. After they were excised, she underwent bilateral reconstructive surgery.

Exactly two years after her final radiation treatment, McDowell heard more astonishing medical news: She was pregnant.

Her little boy, Christian, is now 4 years old.

"Considering the type of cancer I had and how aggressive it was, I know he's a miracle," said McDowell.

Read more of her story — and her advice at: http://breakthroughs.cityofhope.org/tag/my-cancer-diagnosis – *Roberta Nichols* **CN**

THOMAS BROWN

Confronting the reality of a battle that can't be won is never easy. But the legacy process can help

When Grieving Is the 'Greatest Gift'

BY ROBERTA NICHOLS

At City of Hope, doctors, nurses and social workers are committed to fighting with, and for, patients in their battle against cancer. That commitment doesn't fade even if a patient's battle ultimately is lost.

Because control over the end of life can make an enormous difference to patients, as well as those left behind, City of Hope works hard to give patients that control, leading them through a process of discovery, of reflection, of legacy.

Such an approach is, in itself, a breakthrough.

"It's really easy to avoid talking about death," says Jeanelle Folbrecht, Ph.D., interim director of psychology at the Sheri & Les Biller Patient and Family Resource Center.

JEANELLE FOLBRECHT

Even when the patient, his or her medical team and all of the family members agree that the goal has shifted from aggressively pursuing treatment to controlling pain, "it's still so hard to say we're at the end of life, that treatment is not going to work," says Folbrecht. "Patients, families and sometimes even health-care professionals don't want to upset people or say that a miracle is not going to happen or that a treatment is not going to be successful. It's almost as if, if you talk about it, it might happen."

Because family members are especially protective of each other's emotions, they can make it harder to acknowledge the truth.

"Parents don't want to make the kids cry; the kids don't want to make the parents cry," Folbrecht says. "They don't realize that walking through these emotions and grieving together can be the greatest gift they will ever give each other."

At City of Hope, supportive-care professionals such as clinical social workers, child life specialists and psychologists help patients deal with the emotional aspects of the impending final passage. They help patients regain control over their lives by finding value in their struggle with cancer and sharing their worries, memories and hopes with family and friends.

Through this work, patients are able to confront practical considerations such as their finances and who will care for their children. They also consider — as they explore the meaning of their lives — what messages and mementos they'd like to leave behind. They receive tools such as workbooks to draw out this meaning through questions that prompt sharing about their favorite memories and final wishes.

An important part of the process is a project that helps dying people memorialize what is important to them and leave something behind that says who they were.

"It's very important for the person who's leaving to know they will be remembered," says Folbrecht.

PATRICK CUNNINGHAM

Saying Good-bye

As she had for the past four years, Wendy Wilkins asked her City of Hope doctors to "just get me through the holidays" so she could spend one more Christmas with her husband and four sons. And for another year, they succeeded.

Diagnosed with breast cancer in 2008, Wilkins underwent a double mastectomy, and the disease temporarily retreated. Yet it returned, reappearing in her bones, lungs, liver and, most recently, her brain. Earlier this year, Wilkins said that the time for aggressive, grueling treatments was over. "We're trying to keep me out of pain and make the time I have left more special for my boys."

Through City of Hope, a team of social workers, child life specialists and psychologists helped the 37-year-old Apple Valley resident and her family deal with the emotional side of her illness. "They helped me to know what to say to the kids and how to say it."

That support enabled her to stop and reflect on the meaning of her life and what she wanted to leave behind. It also helped bring order to a chaotic time.

"I was going in a bunch of different directions," she recalled, explaining that she was simultaneously dealing with sadness and grief while telling herself she had to get through this. "Putting all that together with them, sorting it out, understanding each phase of it, made a big difference."

She was given workbooks that asked questions about her past — growing up, marriage, favorite vacations — "things I wouldn't think to tell my children," Wilkins said. For instance, the questions prompted a memory of her grandmother using a rubber scraper to make sure every drop was emptied from a jar. Writing down memories like this "waste not, want not" lesson could help her sons connect to the past and guide their future, Wilkins believed.

> "I want them to have a piece of me — to understand and to think back on how important they were to me and to live their lives based on 'what would Mom say and do.'

Wendy Wilkins stands with her husband, Brent, and from left, her sons Trent (now 15), Trey (now 7), Carson (now 11) and Austin (now 20) in 2010. The legacy process helped her talk to her sons about her illness — and prepare them for life without her.

She and her boys even made "comfort pillows." Child life specialists collected painted handprints from Wilkins and each of her boys that were imprinted onto four pillows, along with her personalized messages to them.

Wilkins also received a bag for each of her children filled with workbooks and personal items that she has put away for them. After she's gone, she said, they would be given the bags "to help them get through the hard time," said Wilkins.

"Unfortunately, I'm not going to make it through this process, but that doesn't mean I can't leave behind things for the children and my husband to let them know how important they were to me. I want them to have a piece of me — to understand and to think back on how important they were to me and to live their lives based on 'what would Mom say and do.' "

Wendy Wilkins died shortly after this story was written. City of Hope honors the brave work she did for her family's sake. CN

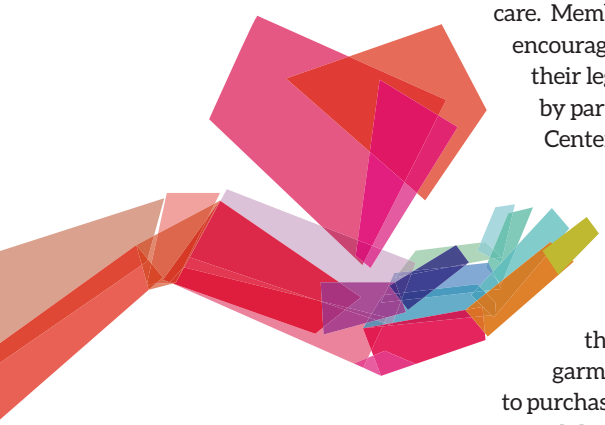
PHOTO COURTESY OF WILKINS FAMILY

INDUSTRY GROUPS ASK:

What's Your Legacy?

BY DOMINIQUE GRIGNETTI

IT MAY NOT BE SOMETHING YOU'VE THOUGHT ABOUT LATELY — OR EVER. But Joe and Hodges Carroll have, as have Dick and Carole Spezzano. Both couples recently planned their estates, ensuring that their assets will be used for the greater good when they're gone. Part of that "greater good" is City of Hope.



Various individuals and couples have long included City of Hope as a beneficiary in their estates, entwining their legacies with that of the institution. But City of Hope's industry groups now want more people to know about this option to support breakthrough research, leading-edge treatments and exceptional care. Members of those groups are encouraging their colleagues to solidify their legacy in the fight against cancer by participating in the Industry Centennial Challenge, a peer-to-peer campaign to recruit 400 new legacy supporters.

Industry groups have been at the heart of City of Hope's success from the beginning. Volunteers in the garment industry gathered funds to purchase the first 10 acres of land for City of Hope, and that legacy gave rise to today's industry partnerships, composed of companies and supporters within specific industries.

The Industry Centennial Challenge marks the first time that City of Hope's industry groups have participated in a coordinated effort to encourage planned giving. "Our industry supporters have always been dedicated to ensuring City of Hope has the resources it needs to actively pursue treatments and cures for cancer and diabetes," said Sharon Joyce, vice president of industry philanthropy at City of Hope. "By participating in this campaign to leave a legacy, they ensure that in the decades ahead, City of Hope will be there leading innovation in the pursuit of great outcomes for those struck by devastating disease."

The challenge's first and foremost goal is to support City of Hope, but industry members also want to ensure that their colleagues are thinking about estate planning for their own benefit. City of Hope's planned giving department is making resources and information on estate planning available on various industry "microsites." A microsite is a stand-alone webpage that emphasizes one direct message — and such sites are quickly becoming one of the most effective ways to communicate for philanthropic endeavors.

"Industry fundraising has always been a win-win," said Tony Markel, chair of the Industry Centennial Challenge. "Through this effort, we are not only encouraging legacy giving, but also offering industry members tools and information that can help them make well-informed decisions about providing for their families and well-deserving causes like City of Hope."

Dick and Carole Spezzano, both members of the Food Industries Circle, are leading the Industry Centennial Challenge efforts in Southern California. A food industry microsite allows them to speak directly to their peers about the importance of legacy giving in a context that also offers industry members the resources they need. Bridging networks and sharing information is the essence of the challenge.

Both the campaign page and the industry-specific microsites greet users with pictures of friendly faces, such as those of donors Tracy and Doug Lape, and explanations of why those industry members found it important to join the challenge. Every personal story and relationship with City of Hope is unique:

- The Lapes said they see their future gift to City of Hope as a way to build their legacy beyond their lifetime.
- Tony Markel lost his wife, Sue, to cancer in 2008 and decided to participate as a way to honor her memory.

Whether memorializing a loved one or building a personal legacy, planned gifts ensure another 100 years of lifesaving research, treatment and cures. CN

FOR MORE INFORMATION

about the Industry Centennial Challenge or about including City of Hope in your estate plan, please contact Amy Goldman, vice president of planned giving, at 800-232-3314 or agoldman@coh.org. myplanwithcoh.org

22ND ANNUAL SOUTHWEST FOOD INDUSTRIES CIRCLE

EVERYTHING'S BETTER WITH ICE CREAM. Nestle DSD understands this — and offered an ice cream social at the 22nd annual Southwest Food Industries Circle's Spirit of Hope Golf Tournament and Celebration Beach Ball. The event has raised more than $12 million over the years for treatment, research and education in cancer and diabetes at City of Hope, making this industry alliance one of the premier fundraising groups in the region. Plans for next year's events are already underway; requests for information can be sent to phoenix@coh.org.

CHICAGO CONSTRUCTION AND REAL ESTATE COUNCIL FUTURE LEADERS BOARD

PEOPLE IN CHICAGO DO THINGS A LITTLE DIFFERENTLY — and with plenty of enthusiasm — at least if they're members of the Chicago Construction and Real Estate Council Future Leaders Board. That board hosted two events in 2013, raising more than $60,000 in the process. The most recent event, presented by Fifield, drew more than 350 attendees. As you can see, it was not your average suit-and-tie party.

NATIONAL PROFESSIONAL SALON INDUSTRY

Honoree Reuben Carranza (left) accepts The *Spirit of Life*® Award from his brother Richard Carranza. Creative Nail Design hosts a "Blue Nail Bar" at the event in honor of the Hope Is In Style signature color blue.

Hope is in Style

THE FIGHT AGAINST DIABETES IS GIVEN A FRESH FACE

BY KATHLEEN TALBOT

The National Professional Salon Industry, a longtime volunteer group for City of Hope, has given the fight against diabetes a fresh face with its Hope Is In Style campaign. Through Hope Is In Style, Reuben Carranza, CEO of Wella, the Salon Professional Division of Proctor & Gamble, has been able to engage the entire salon industry — from retail stores, beauty schools and stylists to trade magazines — to rally around the diabetes cause and raise funds for City of Hope's search for a cure. For his work, Carranza is the 2013 *Spirit of Life*® honoree. Coming from a family ravaged by this chronic disease, Carranza has seen the impact diabetes had on his mother and his aunt, both hairdressers, as they struggled to continue working behind the chair. On July 13, at the opening night of the North American Cosmoprof trade show in Las Vegas, Carranza received The *Spirit of Life*® Award from his identical twin, Richard Carranza. Richard, a San Francisco schools superintendent, spoke of their childhood sweeping hair in their mother's salon and how she was eventually taken from the world, and them, because of diabetes. Upon acceptance of the award, Reuben shared, "The relationship and partnership between the salon industry and City of Hope proves that possibilities are endless when it comes to supporting the lifesaving work of researchers and physicians. Hope Is In Style has us thinking that anything is possible with hope."

The salon industry has a history of supporting diabetes. Most recently, in 2012, George Schaeffer of OPI raised $5 million to support innovation in diabetes research at City of Hope.

For more details on Hope Is In Style, please visit www.cityofhope.org/hopeisinstyle.

mushroom burger?

Mushrooms have been shown to contain compounds that can fight various cancers, particularly breast and prostate cancers, because they block the hormones that fuel their growth.

GERBER + SCARPELLI

REAL ESTATE

Building Support To 'Benefit Us All'

SPIRIT OF LIFE® AWARD BOTH HONORS AND HUMBLES CRAIG ALLISON

BY HEATHER OLINTO

Some awards carry more meaning than others. Just ask Craig Allison, co-general partner of Plant Construction Company.

In April, members of City of Hope's Northern California Real Estate & Construction Council (REC) honored Allison with The *Spirit of Life*® Award, the organization's highest philanthropic honor.

CRAIG ALLISON

"It is a great honor to receive The *Spirit of Life* Award; recognition from a peer group is rare and humbling. It is an even greater honor to help support City of Hope," Allison said. "Recently my wife, Susan, and I were able to visit their campus and meet several of the researchers and clinicians. I was prepared to be impressed but the quality of the people, the technology and the pervasive dedication to improving peoples' lives was beyond anything I imagined. They deserve our thanks, and all of the support we can provide, because the work they are doing will benefit us all."

The REC *Spirit of Life* Award is presented annually to an industry leader who has demonstrated outstanding business and philanthropic achievement. Allison more than qualifies. Under his leadership, the *Spirit of Life* fundraiser brought in more than $730,000 — a record since the REC's inception in 1986.

The April 30 *Spirit of Life* Award celebration, held at the historic Fairmont Hotel, featured a silent auction, a live auction and a fund appeal in which guests helped purchase an oligo synthesizer that will further cancer research at City of Hope. The critically acclaimed Freddy Clark provided music for the event.

Craig Allison embodies all that The *Spirit of Life* Award represents," said Richard Watkins of TMG Partners and the 2012-2013 REC board president.

Over the years, the REC has raised more than $6 million to benefit City of Hope's research, treatment and education.

MUSIC & ENTERTAINMENT INDUSTRY SUMMER OF HOPE

LET THERE BE LIGHT! Rob Light, head of music for Creative Artists Agency (CAA) and the Music & Entertainment Industry group's 2013 *Sprit of Life*® honoree, stands with City of Hope Chief Executive Officer Michael A. Friedman at the *Spirit of Life* Gala on Sept. 19 at the Hercules campus in Playa Vista, Calif. They are accompanied by members of the industry group board. Together with Light and CAA, the *Spirit of Life* campaign raised over $6 million for City of Hope.

PACIFIC NORTHWEST

FORE!

GOLF AND FUNDRAISING FOR CITY OF HOPE JUST SEEM TO GO TOGETHER — AND MANY IN THE PACIFIC NORTHWEST WOULD AGREE

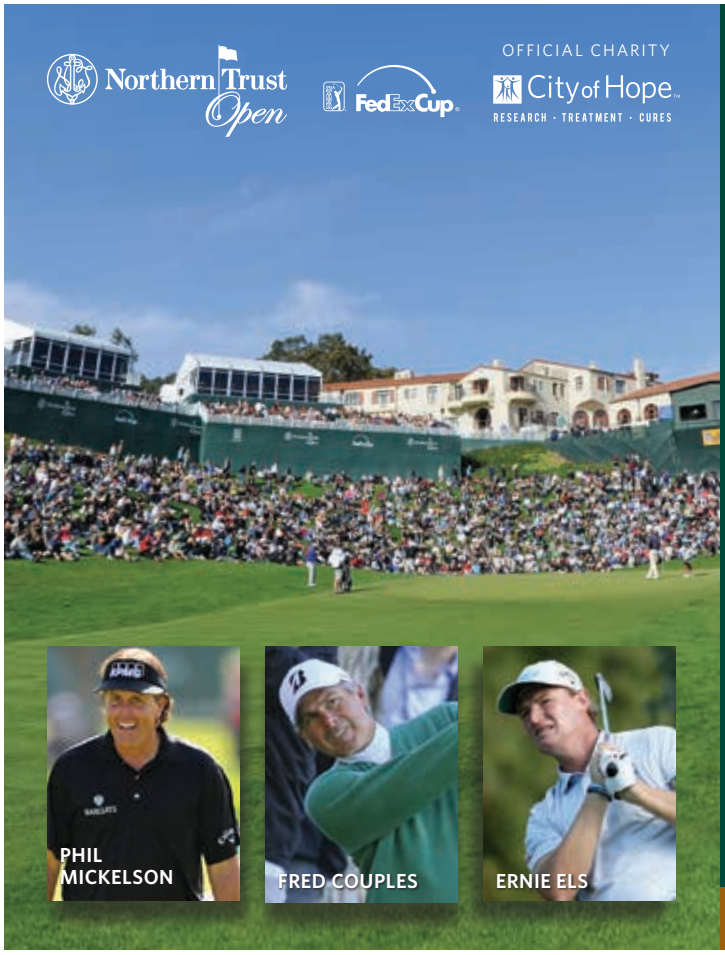
BY NORMA MORRIS

Darigold's 21st Golf Tournament to benefit City of Hope was held June 19 at Newcastle Golf Course in Bellevue, Wash., with retailers from major store chains and Darigold vendors in attendance. With more than 180 golfers, the event reached new heights by raising more than $200,000.

The Pacific Northwest Food Industries Circle, Oregon board, held its 18th annual Golf Tournament and Benefit Auction on July 23 and 24 at Columbia Edgewater Country Club in Portland, Ore. The sold-out event had support from major Northwest retailers and vendors and raised more than $170,000.

Both events are part of the Pacific Northwest Food Industries Circle's campaign, which will culminate at the Nov. 2 Harvest Celebration Ball at the Westin Hotel in Seattle.

LESTER COHEN; TINA FORD



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Your ticket purchase can help save lives.

As the official charity of the Northern Trust Open, City of Hope joins Northern Trust and the PGA TOUR to bring hope to even more people facing life-threatening illnesses.

When you buy tickets through the link below, 100 percent of the net proceeds will benefit City of Hope.

Buy tickets at northerntrustopentfc.com/cityofhope or call 800-266-7920.

BIRDIES for CHARITY

Enter this fun, competitive pledge program and raise funds for City of Hope.

Make a pledge, guess how many birdies will be made at this year's tournament and you could be eligible for a grand prize: a trip for two to the New York metro area and The Barclays tournament at Ridgewood Country Club.

2013 Northern Trust Open Champion John Merrick

And your pledge will go even further: The PGA TOUR and Northern Trust will match 50 percent of new pledges (up to $250,000).

Enter at cityofhope.org/birdiesforcharity

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RIVIERA COUNTRY CLUB • FEBRUARY 12 – 16, 2014

SOUTHERN CALIFORNIA

Bigger and Better at Bighorn

GOLF CLUB EVENT SETS RECORD — AND NOT JUST FOR SCENERY

BY AL OLSEN

Bighorn Country Club's spectacular mountain terrain and history-making tournament play have made it one of the most acclaimed golfing venues in the world. And City of Hope's connection to the club is stronger than ever.

The beautiful and private golf club in Palm Desert, Calif., features a spectacular clubhouse and world-class spa, all nestled in one of Southern California's most beautiful neighborhoods. The club has hosted the Skins Game, U.S. Senior Match Play Challenge, Battle at Bighorn events and the LPGA's Samsung World Championships, with many Hall of Fame greats taking part. Among them have been Arnold Palmer, Jack Nicklaus, Tiger Woods, Annika Sorenstam and Lorena Ochoa to name a few.

City of Hope's connection to the venue began in 2002, when Bruce Merino, then president of The Home Depot Western Division, asked Chuck Sweetman of the Hardware/Home Improvement Industry Group if he would sponsor a golf tournament and dinner to support City of Hope. Sweetman, already a member of the club, agreed. That first event brought out 100 industry leaders and raised more than $200,000.

Merino, Sweetman and Joe McFarland, current Depot West Division president, now serve as co-chairs of the event. In 2011, they decided to expand the event to two days and two full flights of golfers, with a reception and dinner in between the two days of golf. This year, more than 280 golfers and 350 people attended. Over the course of the event, the golf and dinner registrations, silent and live auctions, special donations and other special fundraising activities raised more than $600,000, a record for this event.

In the 12 years since the Bighorn event was founded, it's raised $4 million for City of Hope. The 2014 event is already on the calendar for May 5 and 6, and the expectation is that it will be even bigger and better.

LASSY PHOTO/DESIGN

Nearly a century ago, small groups of women and men united to help City of Hope bring care and dignity to people suffering from tuberculosis. These first local chapters reached out nationwide to like-minded people in their effort to support City of Hope in the fight against disease. Today, chapters — dedicated groups of individual volunteers who raise millions of dollars to advance innovative research, treatment and education programs — remain a critical part of City of Hope's fundraising efforts.

SAN DIEGO

Brownies Offer Comfort

BOXES FILLED WITH SNACKS, CDS, BOOKS — THEY'RE JUST WHAT YOUNG PATIENTS NEED

BY ROBYN HIMA

Now there's another reason to love Brownies. As if the "admit kits" they put together for newly diagnosed pediatric patients at City of Hope weren't enough, the Brownies of San Diego's Troop 1750 also encouraged Yoga for Hope participants to write notes to patients.

The group of 12 Brownies made the kits for girls between the ages of 12 and 14. The kits, given to young patients when they're admitted for care, are meant to offer comfort and entertainment during what can only be called a scary time. The Brownies decorated shoe-box-sized plastic containers then filled them with nail polish, stationery, CDs, popular books, stickers and healthy snacks. The troop then topped the boxes off with heartfelt notes of inspiration and support.

Once their work on the boxes was completed, the young philanthropists staffed a booth at Yoga for Hope, encouraging participants to write "notes of hope" to patients in treatment at City of Hope. As a result, more than 250 notes were delivered to the Sheri & Les Biller Patient and Family Resource Center. When patients and family members need a few words of support and comfort, they can read one of the "notes of hope." That's two times the inspiration from Brownie Troop 1750.

NORTHWEST

CELEBRATING GENERATIONS OF HOPE

BY NORMA MORRIS

On May 5, more than 300 friends of City of Hope, some from families representing more than three generations of donors and supporters, came together at the Glendale Country Club in Bellevue, Wash. The luncheon, "Celebrating Generations of Hope," commemorated 100 years of hope and healing but it also underscored the longevity and accomplishments of three local chapters: Seattle Chapter's 62 years, Donnez Nous Chapter's 50 years and Circle of Hope Chapter's 12 years. Bobbie Stern (City of Hope's Board of Regents) and Claudia Marks Larkin were luncheon co-chairs.

Beyond Stern's and Larkin's tributes to the chapter founders and presidents, the luncheon also featured a locally produced video of a chapter member narrating important milestones in the life of the chapter. David Horne, Ph.D., interim director of Beckman Research Institute of City of Hope, made an appearance, as well — receiving a tremendous ovation for providing an excellent presentation of his research.

From left, Bobbie Stern and Claudia Marks Larkin

"Celebrating Generations of Hope" raised over $92,000. In addition to the co-chairs, the luncheon committee consisted of Darlene Siegel and Madeline Angel, Seattle Chapter; Michael Raineri, Circle of Hope Chapter; and Janice Brumer and Joan Perry, Donnez Nous Chapter.

exercise to fight cancer

Anything is better than nothing. Research has shown that even an hour of exercise a week, less than 10 minutes a day, can extend your lifespan by almost two years.

EPIC PHOTO JOURNALISM; TEAM PHOTOGENIC

A little of your time could mean a lifetime for her.

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City of Hope needs your blood to save lives. By becoming a donor, you can help men, women and children as young as 3 years old win their fight against cancer. Take a little time, save a little life.

Make an appointment today at iDonateBlood4Hope.org or call 626-471-7171.

City of Hope™
100 YEARS OF CARE AND DISCOVERY

SAN DIEGO

Yoga for Hope:

ONE EVENT, TWO POWERFUL FORCES

SAN DIEGO EVENT OFFERS PARTICIPANTS A CHANCE TO FIND PERSONAL MEANING

BY ROBYN HIMA

"Yoga for Hope is just not another fundraiser. It's an experience — an experience that unites the power of hope with the power of yoga.'" That's how Robyn Hima, regional director of development for City of Hope, describes what has quickly become the largest yoga fundraiser in Southern California.

In only three years, Yoga for Hope has united more than 2,000 yogis and dozens of studio partners, raising more than $215,000 to benefit research, treatment and education programs at City of Hope, and expanding awareness of the importance of the mind-body connection when battling cancer, diabetes and HIV/AIDS. This year's event, held May 18 in the centerfield grass area of the San Diego Padres' Petco Park, proved just how powerful the mind-body connection can be in philanthropy.

"Our intention is for everyone to find personal meaning within their Yoga for Hope experience that reflects the event's tag line of 'Connect. Inspire. Renew. Cure.' We know how powerful these four words are, and putting the energy of our yoga community behind them is what has lead to our fundraising successes," Hima said. "We are proud of this event, which aligns so well with our mission of transforming the future of health and turning hope into reality."

EPIC PHOTO JOURNALISM

Centennial Convention:
A CELEBRATION OF VOLUNTEERS

BY TAMI DENNIS

In only 100 years, City of Hope transformed itself from a small tuberculosis sanatorium into a world-renowned biomedical research treatment and education center. Recently, it celebrated those who helped make all this possible — volunteers.

From June 21 through 23, almost 600 volunteer fundraisers from around the country visited City of Hope to take part in a celebration of the institution, its centennial and, most important, their own contributions.

City of Hope's chapters, and their volunteer members, have worked long and tirelessly for an institution that is, to many, on the opposite side of the country simply because they understand its impact. Lifesaving research and care may begin here, but they certainly don't end here. City of Hope's breakthrough compounds have become lifesaving drugs; its leading-edge treatments have evolved into the gold standards of care; and its patient care has become the model on which other programs are based.

The volunteers know this better than anyone. And during a celebration known as Centennial Convention, they heard firsthand testimony from the researchers, doctors and patients whom their work has benefited.

Among the presentations:

- **Neuroscience:** From lab to clinical trial
- **Chemical synthesis:** Turning compounds into treatments
- **Women's cancers:** Treatment and progress
- **Urology:** Treatment and progress
- **Supportive services for patients:** A unique approach

Participants took part in activities not just on campus, but at the Langham Huntington in Pasadena, Calif., an iconic landmark hotel that predates City of Hope by only a few years. Entertainers at the event included "American Idol" runner-up Jessica Sanchez, the All-American Boys Chorus and jazz musician Steve Tyrell.

For three days, the supporters were celebrated for their work on behalf of City of Hope. Their events — galas, fashion shows, walks and more — have been a cornerstone of the institution's philanthropic efforts.

Such a gathering of chapter members was last held in 2007, but this commemoration had the added significance, and symbolism, of City of Hope's centennial. Founded 100 years ago, City of Hope owes its very existence to volunteers. Those early visionaries raised funds for the 10 acres of land purchased in 1913 in Duarte, Calif., for a tuberculosis sanatorium. That sanatorium became City of Hope.

Volunteers at the Centennial Convention reflected not just on the progress they've fueled — through the transformative power of philanthropy — but also on the next 100 years.

GIFT FROM AUSTRIAN-AMERICAN COUNCIL WEST BOOSTS

Supportive Care for Kids

FUNDING SUPPORTS HEALING ARTS PROGRAMS FOR PEDIATRIC PATIENTS

BY WAYNE LEWIS

When the Austrian-American Council West received an endowment from the trust of a former member, it wanted to ensure that the funds would make a difference in children's lives. And so it turned to City of Hope.

A $250,000 gift from the Austrian-American Council West will support pediatric initiatives, including healing arts programs, at the Sheri & Les Biller Patient and Family Resource Center. In recognition, an activity room has been named in the council's honor.

"The philosophy of City of Hope impressed us so much with the idea that you don't concentrate just on curing the body, but on the full person," said Veronika Reinelt, the council's president.

The Austrian-American Council West is a not-for-profit organization that fosters goodwill and better understanding between the people of Austria and the United States. The council's board began organizing annual events to support children's charities more than 15 years ago.

"We always felt children are the most vulnerable people in our society, and our contributions can make the most difference in their lives," Reinelt said.

From left, Joseph Rosenthal accepts a generous donation from the Austrian-American Council West's Winnie Reitnouer, Veronika Reinelt, Robert Morefield, Fred R. Reinelt, Dennis Fredricks, Esq., and Lilliana Popov-Alexander.

KARINA PIRES; THOMAS BROWN

SHOP4GOOD

GIVING TO CITY OF HOPE DOESN'T NEED A SPECIAL OCCASION. THESE PARTNERSHIPS GIVE BACK EVERY TIME YOU SHOP.

3M 3M continues its support for City of Hope by donating between 30 cents and $2 for purchases of a plethora of pink products, including 3M Scotch tape dispensers shaped like a stiletto heel or a pebble, both created by renowned designer Karim Rashid. And don't forget pink multipurpose scissors and Post-It pop-up note dispensers in the shape of a heart; those purchases also benefit City of Hope. The products are available at quill.com and at Staples, Office Depot and other office product retailers.

ACCO BRANDS USA Get organized and support lifesaving breast cancer research with specially marked pink planners, calendars, notebooks and more from ACCO Brands USA. Mead, an ACCO brand and a longtime supporter of City of Hope, has donated more than $2 million to date for breast cancer research, treatment and education. Specially marked ACCO, AT-A-GLANCE, Cambridge, Quartet and Swingline products can be purchased online at mead.com and quill.com, as well as at Staples and Office Depot.

CE SUPPLY Carry hope with you, with stylish cases from CE Supply's Making the Case for Hope product line, which includes phone armband carriers and iPad folios. For each case sold, CE Supply will donate $2 to City of Hope for cancer research. Products are available at cesupplystore.com and amazon.com.

GEORGIA-PACIFIC Georgia-Pacific is supporting City of Hope's quest for innovative research and treatments with donations from its office and cleaning products, and it is donating $225,000 from sales of its Signature paper towels and GP multipurpose paper through December 2013. Available online at quill.com.

JOSIE MARAN COSMETICS Spread the love with Josie Maran Cosmetics' "Get One Give One" (GOGO) promotion. After a successful launch, in which 5,000 mascaras were given to female City of Hope patients, supermodel Josie Maran has extended the promotion. For each GOGO mascara purchased, the company will donate $1 to City of Hope for women's cancers research, treatment and education. Available at josiemarancosmetics.com and sephora.com.

LINEA PELLE Linea Pelle, which offers casual luxury handbags, belts and other leather goods, is launching a program to benefit City of Hope's breast cancer research, treatment and education programs. On Thursdays between Oct. 1, 2013, and Sept. 30, 2014, Linea Pelle will donate 5 percent of all purchases to City of Hope. Linea Pelle will also include the option for its customers to add an additional donation at checkout. Go to lineapelle.com to see its entire collection.

LIQUID FENCE Liquid Fence, maker of natural animal repellents, is donating 25 cents from every sale of Deer and Rabbit Repellent Quart Ready-to-Use to support City of Hope's fight against breast cancer. Available at liquidfence.com and Home Depot.

MURAD Look good and feel good with Murad's Hydrate for Hope, a limited edition, specially marked moisturizer duo that comes in a pink polka dot cosmetic bag. Murad donates 10 percent from the sale of each set for City of Hope's women's cancers research, treatment and education programs. Hydrate for Hope will be available at Massage Envy, Sephora.com (online only), SiJCP, Beauty Brands, Army and Air Force Exchange Service, and independent spas and salons.

NEWELL RUBBERMAID Newell Rubbermaid is donating to City of Hope with each purchase of a Pink@Work product, including specially marked PaperMate, Parker and Uni-ball pens, Expo and Sharpie markers, Liquid Paper and various Rolodex products. The donations for breast cancer research, treatment and education range from 10 cents to $1, with information on the product packaging. More information is at pinkatwork.com. Products are available from CVS/pharmacy, Staples, OfficeMax and other office products retailers.

PRAVANA INTERNATIONAL Pravana International has created NEVO, a gluten-free and vegan hair-care line with no sulfates, parabens or phthalates. Pravana is donating 5 percent of NEVO product sales to City of Hope for cancer research, treatment and education. Available at specialty salon supply shops.

REDKEN Through October, Redken is joining City of Hope in the fight against breast cancer with specially marked "mini-kits" featuring travel sizes of three of their bestselling hair care lines: All Soft, Color Extend and Extreme. Redken has made a one-time donation to support breast cancer research, treatment and education at City of Hope. Products are available at SalonCentric.com and beauty stores nationwide.

STAPLES Turn your office pink with Staples' pink ribbon staplers and tape dispensers. The company is donating 50 cents from the sale of each item, up to $200,000, through December 31, 2013. Available at staples.com and Staples stores nationwide.

UNIVERSAL COMPANIES Universal Companies, a leading salon distributer, is supporting City of Hope breast cancer research, treatment and education by donating $1 for each box of pink gloves purchased and $2 for each package of pink compressed sponges. Available at universalcompanies.com.

CITY OF HOPE IS CELEBRATING ITS 100TH ANNIVERSARY IN 2013. To commemorate the occasion, photos and stories from the City of Hope Archives reflect the institution's rich history, showcasing its scientific achievements, compassionate patient care and philanthropic achievements from the past century.

Wish 'Em Well:
RAISING FUNDS TO FIGHT CANCER

BY SUSAN DOUGLASS YATES

Before million-dollar grants and a public that could donate with the click of a mouse, fundraising goals in the early days of City of Hope were accomplished in simpler ways: with coin banks and telethons. But even those methods were new once.

For City of Hope, that new era began in 1949 when the Jewish Consumptive Relief Association officially changed its name to City of Hope. No longer a sanatorium treating only tuberculosis patients, the revamped institution claimed a new mission: becoming a national medical center treating life-threatening diseases, including cancer. In 1951, the institution opened a new cancer hospital, followed by a cancer research program in 1952.

These changes coincided with new opportunities to raise funds for treatment and research. After World War II, television networks expanded and TV sets became affordable. Milton Berle hosted the first telethon in 1949. City of Hope held its first telethon in 1951.

Top celebrities participated to help raise funds for the treatment of cancer. City of Hope's 1953 All Star Telethon held in Los Angeles aired on television station KTLA. Red Skelton, Lucille Ball and Desi Arnaz, Art Linkletter, Abbott and Costello, Jack Benny and others entertained the audience during the 17-hour program. Kids played a big role, too, emptying cans of money collected during the program and going house-to-house asking for cash donations. Even California Gov. Goodwin Knight made an appearance, appealing for funds at the beginning and at the end of the show. At one point, he auctioned his tie, bringing in a pledge of $5,000. The telethon raised $322,000, the equivalent of just over 2 million of today's dollars.

Although the telethon could bring in large amounts of money in a short amount of time, the coin bank represented a more personal way of raising funds. The banks seen here were of blue plastic and modeled after the main building of the then-new medical center. Introduced in 1950, the banks could hold $20 in nickels and dimes, enough to pay for the care and treatment of a patient for almost a day and a half.

Coin banks and telethons may be a thing of the past, but the goal to fight cancer continues as we move into our second 100 years. Text to give, anyone?

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800-423-7119

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(for patient-referral inquiries)
800-826-4673

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800-667-5310

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800-344-8169

Northwest Region
San Francisco Regional Headquarters
800-732-7140

Seattle Office
800-934-9196

Southeast Region
Florida Regional Headquarters
(Fort Lauderdale)
800-584-6709

Southwest Region
Los Angeles Development Headquarters
800-544-3541

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