



SUMMER 2009
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C3: Collaborating to Conquer Cancer
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The University of Colorado Cancer Center is the Rocky Mountain region's only National Cancer Institute-designated comprehensive cancer center. Headquartered on the University of Colorado Denver Anschutz Medical Campus in Aurora, UCCC is a consortium of three universities and five institutions that are dedicated to cancer care, research, education and prevention and control.

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COLLABORATING TO CONQUER CANCER



A Newsletter for the University of Colorado Cancer Center | Anschutz Medical Campus

SUMMER 2009



DIRECTOR'S MESSAGE

"Change" and "hope" were key words for last year's national election. We now find ourselves in a summer boiling with hopeful change for our healthcare system. As Congress debates across divergent views about which particular changes will be helpful or harmful, and which will be affordable or too expensive, this seems like an opportune time to reflect on how the coming changes might affect our cancer mission.

A coalition of cancer organizations led by the American Cancer Society has teamed with other groups such as AARP to advocate for broader access to health care. Most members of Congress now seem to agree with the American public that the problem of limited access to affordable healthcare needs to be fixed. For whatever specific remedy Congress chooses, if one outcome is better access to both cancer prevention and screening services and to state-of-the-art cancer therapy, we will have won an important battle. Broader access to prevention and treatment will greatly remedy the poorer cancer outcomes we now see in America among people of color and among those of lower socioeconomic status.

Cost and cost-efficiency are huge questions for the healthcare reform remedies now under debate. For cancer, some of these decisions are easy. Providing mammograms, colonoscopies and effective smoking cessation interventions for all Americans at age 50 or earlier would be an easy way to both prevent suffering and lessen the costs of diseases among people who will some day be in Medicare. Providing more universal access to proven treatments for cancer, such as routine post-surgery radiation or chemotherapy for risk-defined subgroups of patients, are also relatively easy choices.

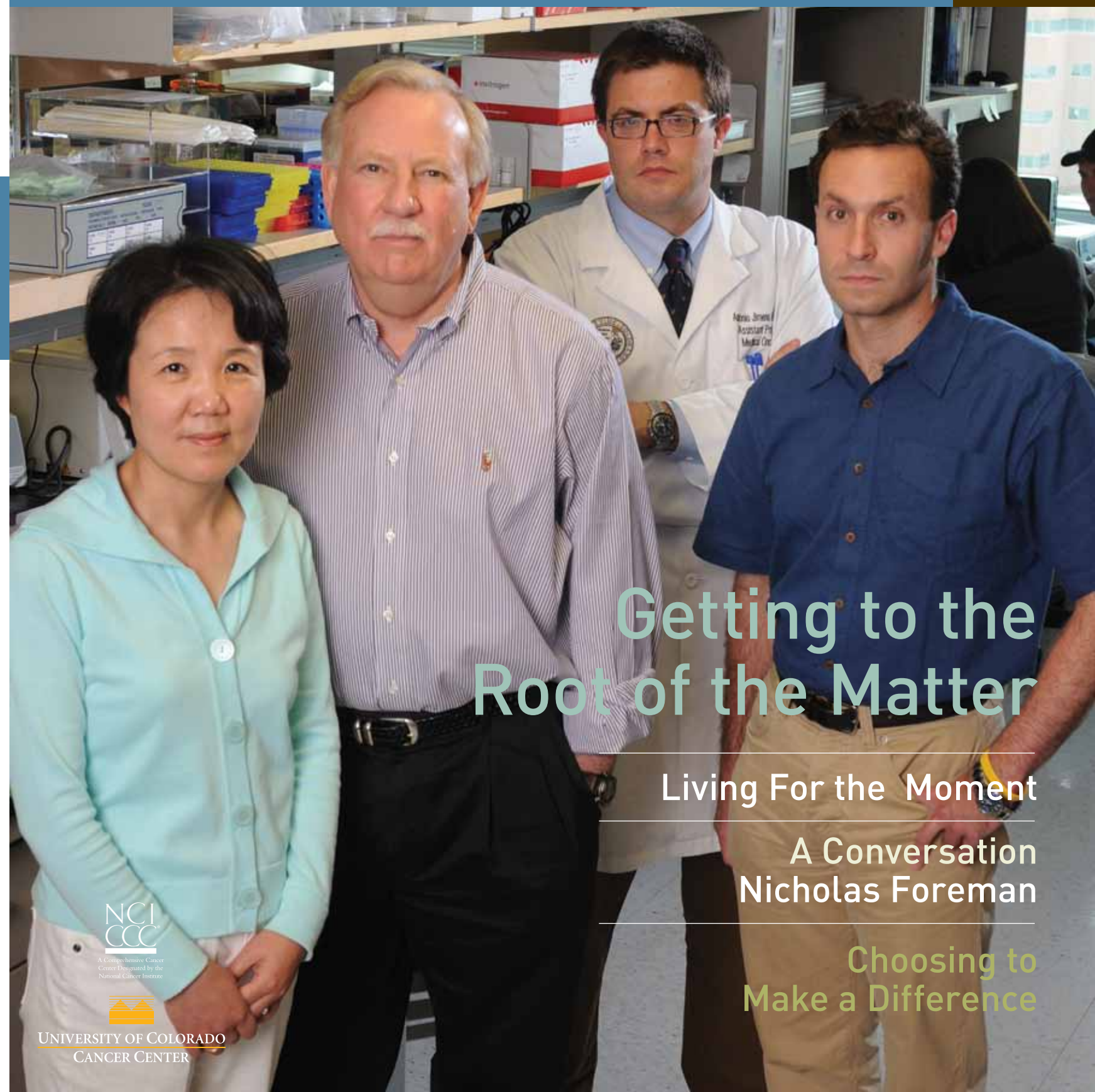
Tougher decisions will ensue for questions about who should get expensive treatments on oncology's cutting edge. Covering costly targeted therapies will be controversial because of their high cost for what is sometimes a small benefit, or because their benefits are uncertain as oncologists sometimes prescribe them based on logical biologic links to a patient's tumor profile rather than direct evidence from large randomized controlled trials. Financing and controlling this "new oncology" in an open access healthcare setting will involve many hard choices that are likely

to be framed in the Congressional debate as rational regulation versus rationing.

Many of us will view healthcare reform through the cancer lens. Looking through that lens, I see both easy choices and hard choices to come. This is an exciting time of hope for change in our healthcare system. System improvements can substantially accelerate the tremendous progress we are now seeing in cancer prevention and treatment in America. It is the role of academic cancer centers such as UCCC to not only become engaged in the development of new therapies, but also to become engaged in the types of research and informed advocacy that can optimize their use. Let's all try to find ways to become engaged in this important matter.

Sincerely,

Tim Byers, MD, MPH
Interim Director
University of Colorado Cancer Center
Grohne Chair in Cancer Prevention and Control



Getting to the Root of the Matter

Living For the Moment

A Conversation
Nicholas Foreman

Choosing to
Make a Difference





Leong Macy Kieft Espinosa Spillman Tyler

Dinarello shares Royal Swedish Academy of Sciences Prize

Dr. Charles Dinarello, professor of infectious diseases at the University of Colorado Denver, shared the Royal Swedish Academy of Sciences' \$500,000 Crafoord Prize with a pair of Japanese researchers. The three were honored for their examination of polyarthritis and other autoimmune diseases, leading to the development of drugs to treat these conditions. He has received several international awards for his work with cytokines, which are increasingly of interest as agents driving increased risk and/or promotion of cancer.

Leong, Macy are new Calabresi Scholars

Dr. Stephen Leong and Dr. Meg Macy are the newest Paul Calabresi Clinical Oncology Research Scholars. Calabresi Scholars are recipients of a K12 award that provides five years of mentored support leading to becoming translational researchers. Read more: www.uccc.info.

Kieft, Espinosa named HHMI Early Cancer Scientists

Two UCCC members have been selected as Howard Hughes Medical Institute Early Cancer Scientists. This honor brings with it a six-year appointment to the Institute, full salary support, and \$1.5 million in research support awarded over the six years.

Dr. Jeff Kieft, associate professor of biochemistry and molecular genetics at UC Denver, is a structural biologist who is interested in RNAs from the hepatitis C virus, which causes 100,000 cases of hepatocellular carcinoma each year. He aims to identify targets that might be used to develop new therapies against hepatitis C and other viruses.

Dr. Joaquin Espinosa, associate professor of molecular, cellular and developmental biology at the University of Colorado at Boulder, aims to be the first scientist to map all the effects of the tumor suppressor protein p53. He says his goal is to redraw

the p53 gene network from scratch by employing new genomics and proteomics technology that will enable a fresh, unbiased look at this important tumor suppressor gene.

Spillman receives award for ovarian cancer research

Dr. Monique Spillman has received the Liz Tilberis Scholars award from the Ovarian Cancer Research Foundation. This highly competitive award, given to early-career researchers who are developing techniques for early diagnosis and improved care for women with ovarian cancer, comes with a \$450,000, three-year grant.

Her project builds on her recent success showing that ovarian cancer cells with estrogen receptors grow faster than estrogen-negative cells when estrogen is present. Spillman is assistant professor of obstetrics and gynecology at UC Denver.

Ahn shares \$1.2 M collaborative grant

Dr. Natalie Ahn, professor of chemistry and biochemistry at the University of Colorado Boulder, is one of eight collaborators sharing a \$1.2 million grant from the W.M. Keck Foundation for work that may identify all proteins present in a single cell type.

This knowledge could help scientists understand the complex changes within a cell that are triggered by disease, food or other means, and could

accelerate development of targeted therapies for cancer, heart disease and other diseases.

Tyler honored with Friend Lectureship

Dr. Jessica Tyler, UCCC Molecular Oncology Program Leader, was selected for the 12th Annual AACR-Women in Cancer Research Charlotte Friend Memorial Lectureship. Dr. Tyler presented a lecture and received her award at the 100th meeting of the American Association for Cancer Research in May.

UCCC adds TomoTherapy™ services

In mid-August, the University of Colorado Cancer Center's Radiation Oncology program will open a TomoTherapy™ center near Park Meadows Mall in the south Denver suburbs. It will be just the second such center in Colorado and the only in the Denver-metro area.

TomoTherapy is a radiation therapy machine that takes 3D images that let doctors position patients precisely at each treatment session so radiation beams hit tumors as they shrink and change shape with therapy instead of healthy surrounding tissue. The machine then delivers radiation in a 360-degree rotation and in modulated doses. The end goal is accurate treatment with fewer side effects. For more information, call 720-848-0100.

More News
Visit www.uccc.info/c3. **C3**

A Conversation With
Nicholas Foreman, MD

Nicholas Foreman, MD, is director of pediatric neuro-oncology at The Children's Hospital and one of only 35 pediatric neuro-oncologists in the United States. He holds the \$2 million Seebaum/Tschetter Chair in Pediatric Neuro-oncology and is co-chair of the national Children's Oncology Group/Pediatric Oncology Group Ependymoma Sub-committee, which is working to develop new national protocols for studying the biological underpinnings of childhood brain tumors.

C3: What is the primary focus of your research?

Foreman: Along with Rajeev Vibhakar, I run a lab working to develop new therapies for resistant brain tumors in children. We'll often do small trials internally ourselves; then those are taken to the Pediatric Oncology Experimental Trials Consortium, which comprises eight institutions. We're looking at the role of micro-RNAs [ribonucleic acid] in brain tumor activity. Micro-RNAs are recently discovered small molecules that regulate activity within the cell.

C3: Are there major differences between the brain tumors in children and those in adults?

Foreman: In adults, brain tumors are most often spread from somewhere else in the body, whereas in children the tumor is primary in the brain. There are types of tumors in children that are incredibly rare in adults and conversely, adult tumors that are rare in children. As we and others have shown, in pediatric brain tumors there are genes that are "turned on" that should have been shut off in the womb or shortly after birth. These genes drive the tumor growth. If we can reduce the tumor burden, often the child's innate control of growth can aid in cure. This is not an advantage that adults have.

C3: Why aren't there more pediatric neuro-oncologists in practice?

Foreman: It's partly because pediatric brain tumors are relatively rare, affecting only three in 100,000 children per year.

It's also difficult to recruit people because few doctors are trained in both neurology and oncology. The problem is getting people who are not trained in both disciplines to be comfortable working in management of both. We're one of a limited number of centers that offer a final-year fellowship in neuro-oncology.

Another challenge is the treatment. If you cure a child with leukemia, the child is cured. In neuro-oncology, you can cure the disease, but the treatment can cause hurt. Many changes in therapies are as much directed at reducing the hurt as they are in actually increasing survival.

C3: What changes in therapies are helping to mitigate the hurt that accompanies the cure?

Foreman: Jenny Madden in our group is leading a study to reduce radiation doses to those with medulloblastoma and Meg Macy, also in our group, is leading an exciting new effort to reduce radiation injury when it occurs.

C3: So not all brain tumors in children are terminal?

Foreman: Right. The cure rate has actually come up quite a bit. We actually cure about two-thirds of the children we see at the Cancer Center, which is actually a doubling of the survival over the 25 years I've been doing this. The cure rates in children are significantly higher than in adults.

C3: What is a current challenge in your field?

Foreman: I'm trying to persuade the FDA to reverse its standard for biopsying a tumor of the brain stem called diffuse pontine glioma, which is 100 percent fatal. The current standard is not to biopsy the tumor, which makes up 10 percent of childhood brain tumors. There have been hundreds of Phase I trials where we literally have to guess what therapy might be effective because we have no information about the biology of the tumor. However, all these trials have failed. We can only really make progress with actual biological knowledge. Our laboratory has helped develop new techniques so we can obtain a large amount of biological information on very small biopsies. In conjunction with Michael Handler in neurosurgery, we're attempting to have the American Society of Neurosurgery join us in reversing this outdated standard.

C3: What does a \$2 million endowed chair enable you to do?

Foreman: Thanks to a group of concerned families affected by the disease, I can explore new therapies without having to secure funding. We've explored new therapies in four children with radiation injury and showed that a new therapy could reverse the damage. **C3**



Nicholas Foreman, MD: Professor of Pediatrics, University of Colorado Denver School of Medicine
Seebaum/Tschetter Chair in Pediatric Neuro-Oncology
Director of Pediatric Neuro-Oncology, The Children's Hospital

3rd Annual
— COLORADO —
CANCER DAY

Join us on Sat., Sept. 26 on the Anschutz Medical Campus in Aurora to learn about the latest advances in detecting, treating and surviving:

Breast Cancer | Colorectal Cancer
Lung Cancer | Prostate Cancer

Free public track. CME available for medical professionals.
Lunch is included. Register today at www.coloradocancerday.com

THE ROOT OF THE MATTER

DO CANCER STEM CELLS DRIVE CANCER RECURRENCE? AND HOW DO YOU KILL THEM? UCCC SCIENTISTS ARE COLLABORATING ON CRUCIAL STUDIES TO FIND OUT.

Ask cancer survivors what their greatest fear is, and chances are they'll reply: "The cancer coming back." Recurrence rates can vary widely, from 5 to 95 percent depending on how far the original tumor had spread, its particular molecular characteristics and other clinical factors. But what makes cancer come back?

One answer may get to the root of the cancer problem: cancer stem cells (CSCs).

CSCs can be thought of as generals in a war. There aren't very many of them, they hang at the back, and send in the troops to invade. They build the armies.

Many scientists believe that CSCs keep tumors growing, invading and spreading into new places. Traditional cancer treatments—chemotherapy and radiation—target fast-dividing cells. CSCs divide slowly. Chemo and radiation don't kill them, and they live on to make new tumors in close-by and distant places. CSCs also may make up less than 0.1 percent, or one in 1,000 cells, of a solid tumor's bulk.

"It might take just one cell to start a new tumor," said Dr. Xiao-Jing Wang, director of the University of Colorado Cancer Center Head and Neck Cancer Program and professor of Pathology and John S. Gates Chair of Head and Neck Cancer Research at University of Colorado Denver School of Medicine (UCD SOM). "That has been shown in a leukemia experimental system. If you see a complete destruction of a tumor but have one or two surviving cancer stem cells, you would have risk of recurrence."

In fact, Dr. Kathryn Horwitz, a UCCC breast cancer researcher and distinguished professor at UCD SOM, recently showed that a single breast cancer stem cell can give rise to mammary tumors in mice.

"Until we identify what makes cancer stem cells survive, we won't be able to cure solid tumors," said Dr. Antonio Jimeno, assistant professor of medical oncology at UCD SOM.

Drs. Xiao-Jing Wang, Dennis Roop, Antonio Jimeno and Yosef Refaeli are part of a growing group of cancer stem cell researchers at UCCC.

"MORE COMPLEX THAN WE THOUGHT."

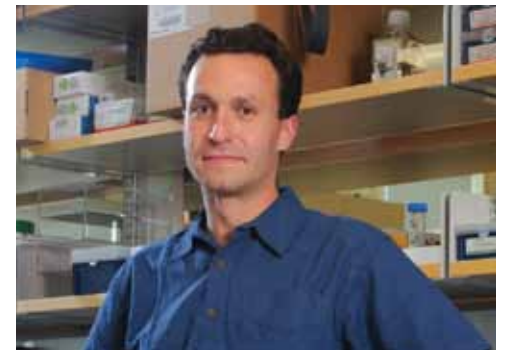
In 2007, the University of Colorado Denver established the Charles C. Gates Regenerative Medicine and Stem Cell Biology Program with a \$6 million gift from the Gates Frontiers Fund. Cancer stem cell research, the donors said, was to be a key focus of the program. Dr. Dennis Roop, a national expert in stem cell biology with a focus on skin cells, was recruited to lead the program. Its focus is broad, covering everything from cancer and heart disease to Parkinson's disease, strokes and paralysis.

"We have to understand normal stem cells, normal development of organisms and tissues, and many of the normal pathways of maintaining a state of equilibrium, because we know if mutations occur in these pathways, they can cause cancer," said Roop, professor of dermatology at UCD SOM. "You can't separate cancer away from normal cell biology."

Adult epithelial stem cells—which keep tissues like skin and the lining of the oral cavity, colon, lungs and other organs regenerating and therefore alive—divide slowly and live long. They may accumulate genetic damage from carcinogens we're exposed to in air, water and food. With enough genetic damage, they give rise to what we call cancer—cells that divide very quickly and out of control.

"Normal cells check how they are doing," Jimeno explained. "If there are too many gene alterations, they commit suicide. Cancer cells don't look at DNA damage. They keep dividing despite mutation after mutation, which in turn is advantageous because it gives them new abilities to evade our current treatments."

Where normal epithelial adult stem cells divide evenly, making one daughter cell and one stem cell, CSCs may divide unevenly, creating multiple damaged daughters and CSCs, a theory some scientists say explains rapid solid tumor growth. Combine this with the idea that CSCs can change hats midstream and lie dormant for years before rearing up again, and you might begin to fathom why people still die from solid tumors like breast, lung and prostate cancer 38 years after President Nixon declared war on cancer.



"You have no need for genetic matching with concurrent stem cell transplants... The blood will already be educated on the organ." — Dr. Yosef Refaeli

"Cancer is so much more complex than we thought 30 years ago," Jimeno said. "It has been a tough opponent because it is tremendously complex and it has a phenomenal ability to adapt. It can shut down and weather the storm."

CANCER STEM CELLS: MYTH OR FACT?

Two papers published in the past year question the rarity of cancer stem cells and the claim that only CSCs give rise to tumors—two tenants pro-CSC scientists hold as key to identifying them. In both studies, cells were transplanted into mice with wiped-out immune systems. A melanoma experiment in these mice showed as many as one-quarter of cells could start tumors, which conflicts with the idea the CSCs are rare. But the results could have been skewed by the mice's level of immune compromise, UCCC researchers said.

"The question is in a human patient, not a mouse patient," Wang said. "Do human patients ever get to that stage of immune compromise outside of stem cell transplant patients?"

Wang is the creator of the world's first genetically modified mouse model for head and neck cancer. The mice have intact immune systems, but have genes altered to give rise to specific tumors. She is then able to study the tumors' molecular makeup, genes and proteins in action.

“Our preliminary data suggest that, at least in head and neck cancer, new tumor development follows the cancer stem cell theory,” Wang said. “Certain tumors may not be initiated by cancer stem cells. It’s also possible that non-stem cells can acquire ‘stem-like’ properties. We just need to be open minded.”

Roop said solid data exists pointing to cancer stem cell populations in nearly every major tumor type, but adds that many questions remain to be answered.

“It’s possible that not all cancer stem cells are the same,” he said. “Some could be closer to a normal adult stem cell and may be more susceptible to traditional therapy, which would explain why some cancers do not recur. Perhaps if the cancer stem cell has many gene mutations, it makes the tumor less susceptible.”

Roop and Dr. Mayumi Fujita have developed techniques to isolate and characterize cancer stem cells in melanoma. Dr. Fujita’s experiments show a correlation between the number of cells expressing gene mutations that are linked to chemotherapy resistance and more aggressive melanoma tumors. She has also shown that as few as 10 of these mutated cells can give rise to a new tumor in mouse models. Roop is also partnering with Wang on experiments to see if they can sort stem cells in skin and head and neck cancer.

“If we can prove we can sort the cells, we can ask is this cancer development really stem-cell driven?” Wang said. “We can transplant the cells into the mouse models, then go back and see how many cells do we really need to give rise to a tumor.”



“We have to understand normal stem cells, because we know if mutations occur in these pathways, they can cause cancer.” – Dr. Dennis Roop

THE ULTIMATE EXPERIMENT

Cancer science is molecular science, said Dr. Yosef Refaeli, assistant professor of dermatology at UCD SOM, and new technology is making cancer science pick up speed.

“The big question is what is the molecular basis of cancer stem cells?” he said. “Then the question is how do you distinguish them? Then how do you poison them? We all have our own approach. In a year, it will be mindboggling what people can do. There are always multiple minds at play.”

Refaeli has developed a tool for screening old drugs against leukemia stem cells that has proven fruitful. Three of 80 drugs he tested—drugs that had been given up as useless by the National Cancer Institute—have killed leukemia stem cells.

“He has data to suggest he can do the same for skin cancer, for squamous cell cancer, and we are hopeful that this approach will work for lung, head and neck cancer and melanoma,” Roop said.

Refaeli’s technology can be used to isolate stem cells, make more of them and elicit antibodies that successfully attack them.

“In the future, doctors would likely debulk the tumor first using surgery, traditional chemotherapy and radiation, then use these antibodies to go after any residual cancer stem cells, which we think are responsible for tumors recurring,” Roop said.

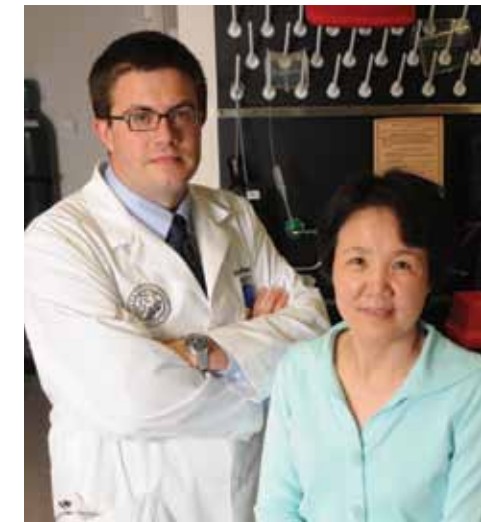
Refaeli also stumbled upon a way to retain cells’ “stemness” without any genetic modification, and he’s using the technology to develop a universal stem cell line.

“That will mean you have no need for genetic matching with bone marrow transplants, or with organ transplants with concurrent stem cell transplants,” he said. “The blood will already be educated on the organ. The new immune system emerges and does not see the difference between itself and the recipient, which will end the problem of organ rejection.”

Refaeli’s technologies are complementary to Jimeno’s novel animal system: a xenograft model of head and neck cancer involving transplanting tumors from human patients into mice to make more tumors, then studying what drives that particular tumor and how to stop it. It’s the only model of its kind in the world.

“We have the potential of using Yosef’s technology to make a humanized mouse model that contains the same immune system as the patient where the tumor arose,” Roop said. “In my opinion, that is the ultimate experiment, and we’re in the position to do that.”

Jimeno is the only group member who treats human patients. A key member of the UCCC Phase I Clinical Trials Program, he takes care of people in the morning, then his animal “patients” in the afternoon.



“Normal cells check how they are doing... If there are too many gene alterations, they commit suicide.” – Dr. Antonio Jimeno (pictured with Dr. Xiao-Jing Wang)

“The beauty of the xenograft model is when I put a patient’s tumor in a mouse, I know what it is,” he said. “And I know it contains human CSCs. I see the patient every-other week in clinic and the mice twice a week.”

I can treat the mice with the same drug that the patient has received as part of his standard care. I can see how they compare, and learn.”

Jimeno is bringing to the Phase I Program drugs that have shown promise in controlling CSCs, derived from his experience with a group at Johns Hopkins that tested some of the first anti-CSC drugs. His just received positive results from an inhibitor of a cancer pathway he suspects head and neck cancer stem cells use, which he tested both in first-in-man clinical trials and in animal models of head and neck cancer in his laboratory.

“This is a true example of the potential and integration of our preclinical and clinical programs,” he said. “Only by narrowing the bench-to-bedside gap will we ultimately impact the care to our patients.”

“We want to answer the questions: Are cancer stem cells generating cancer, driving it or sustaining it? It’s likely that not all cancer stem cells are the same.”

Jimeno said he believes the Colorado program is experiencing a perfect storm of the right

people and technology together in the same place at the right time.

“We have the perfect team,” he said. “We have complementary animal models. We have clinicians that understand the lab and lab scientists who understand what clinicians need to improve the curability of cancer.”

Roop recalled that in August, 2006, when he agreed to accept his current position, “I bravely stood up at a press conference and said we will make this a first-rate center, but I honestly had no idea how we would do it.”

The field has moved so fast, he said. With 35 independent investigators and 300 people engaged in collaborative stem cell research at the Anschutz Medical Campus, National Jewish Health and University of Colorado Boulder, the UC Denver Stem Cell Program is keeping pace.

“The young talent we have is amazing,” Roop said. “In the near future, people on the East and West coasts will say, ‘Where did these people come from?’” **C3**

Cancer Stem Cells: ARE WE MISSING THE TARGET?

Traditional cancer therapies kill rapidly dividing cells. Stem cells divide infrequently. Therefore, they are resistant to traditional therapies and eventually give rise to a new tumor. An improved understanding of tumor stem cells could result in novel therapeutic strategies that specifically target stem cells for destruction and prevent tumor recurrence.

Therapies directed against rapidly dividing cells



Tumor with stem cells

Cancer stem cells survive

Tumors recur

Therapies directed against cancer stem cells



Tumor with stem cells

Cancer stem cells killed

Tumors regress and never recur

WE CAN HELP OVARIAN CANCER PATIENTS SEE THEIR
CHILDREN GROW, GRADUATE, HAVE A WEDDING—

experience important life moments.

BY MARY LEMMA

Dr. Monique Spillman is the gynecologist you never want to have to meet.

She is one of just eight gynecological oncologists in Colorado and about 900 nationwide. GYN oncologists are required to complete three to four years of regulated fellowship after their residencies and take two additional board-certification tests. Throughout their advanced training, they must prove themselves not only as researchers but also as clinical care providers and surgeons, with a specified amount of time devoted to cervical and endometrial cancers. Unlike other cancer specialists who might only handle chemotherapy or do surgery, GYN oncologists do both.

"We take care of patients from diagnosis through their survival or death," said Spillman, assistant professor of obstetrics and gynecology at the University of Colorado Denver School of Medicine. "We're with them through the whole process."

Spillman has devoted her career to identifying the biological underpinnings of ovarian cancer, once referred to as the "silent killer." The disease was thought not to have symptoms and could therefore go undetected until it had advanced.

This year Spillman received the Liz Tilberis Scholars Award from the Ovarian Cancer Research Foundation. The competitive award, a \$450,000 three-year grant, is given to early-career researchers who are developing techniques for early diagnosis and improved care for women with ovarian cancer.

Away from the lab, surgery suite and bedside, Spillman advocates for women on a national level, as vice-chair of the government relations committee of the Society of Gynecological Oncologists. SGO was one of the key sponsors of the 1997 Johanna's Law. The law, spearheaded by the surviving sister of fashion editor Johanna Silver Gordon, sets up federal funding for an ovarian cancer awareness campaign.

Last September, Spillman and her committee presented an educational program to Congressional staffers who, largely due to their young

age, "had very little exposure to the disease. They didn't realize how much research had been done and how much could be done. It was astounding."

Within days, Congress doubled appropriations for ovarian cancer research.

Spillman became interested in ovarian cancer because she was "in awe" of the enormity of the disease and the way it presents.

"We have pounds of tumor," she said, describing how the disease can float in the abdomen rather than being attached to specific organs like other cancers. "It has free rein."

Ovarian cancer patients today have more hope than ever for longer life after diagnosis. Drugs have improved. Aggressive treatment such as interperitoneal chemotherapy is used in appropriate patients, like survivor Elizabeth Corless (see next page). Five recent clinical trials have shown that this treatment, in which a mixture of chemotherapy drugs and saline injected into a woman's pelvic cavity and abdomen, at least doubles the time women survive after diagnosis.

"Survivor' is a good word," Spillman said, adding that ovarian cancer "can almost be managed as chronic disease. We may not be able to cure patients, but we can help them see their children grow, graduate, have a wedding—experience important life moments." **C3**

Ovarian Cancer Symptoms

Ovarian cancer has been called the "silent killer," because doctors didn't think the disease had symptoms. But in 2007, the American Cancer Society, the Gynecologic Cancer Foundation and the Society for Gynecologic Oncologists issued a consensus statement based on medical studies that show symptoms do exist, even in early stages, including:

- bloating
- pelvic or abdominal pain
- trouble eating or feeling full quickly
- urinary symptoms, such as urgent or frequent feelings of needing to go

These symptoms can also be caused by non-cancerous diseases. In ovarian cancer, the symptoms are generally a change from normal or are more severe than usual. Women who have these symptoms daily over several weeks should consult a doctor who specializes in women's health, if possible.

Monique Spillman, MD, PhD

Specialty: Gynecologic cancers

Research interests: Biology of ovarian cancer, ovarian cancer clinical trials

"Survivor' is a good word."

—Dr. Monique Spillman



ELIZABETH CORLESS

Diagnosis:
Ovarian Cancer

Physicians:
Dr. Monique Spillman

By Mary Lemma

OVARIAN CANCER DOESN'T STOP 29-YEAR-OLD FROM Living for the Moment

It's fitting—and sweetly ironic—that Elizabeth Corless has made a career helping others. In college in North Carolina she majored in human services; she now helps young single mothers set new direction in their lives.

Elizabeth, who is 29, was diagnosed with Stage IV ovarian cancer in June 2008. She cried then, but laughs now as she describes her attitude.

"I'm a walking cliché! I live for the moment. I don't take things for granted. I'm doing things I want to do, not that I have to do."

One of the things she wants to do is work, which she does at Hope House of Colorado. She's the learning lab GED coordinator, teaching prep courses in math, reading and social science, and day-to-day life skills such as how to balance a checkbook.

"I love the girls. They don't have to be there," she said. "They're just single moms working really hard to make something of themselves." Elizabeth always wanted to teach, "but not in a mainstream school."

Before her diagnosis, Elizabeth went to the ER near her home, "looking five months pregnant." She was told it was probably irritable bowel syndrome, so she tried to remedy herself by adjusting her diet. When that didn't help, she underwent a CT scan and an ultrasound, and was referred to the University of Colorado Cancer Center, where she met Dr. Monique Spillman, who diagnosed and treated her.

"She was amazing," Elizabeth recalled. "When she told me I had cancer, she sat on my bed and held my hand. She was always honest but positive. She said, 'I treat all my patients as individuals, not as research experiments.' She knows what she's doing."

"She was amazing... When she told me I had cancer, she sat on my bed and held my hand. She was always honest but positive."

Elizabeth underwent surgery and withstood many grueling rounds of chemotherapy. Five recent clinical trials have showed that ovarian cancer patients have better outcomes with "belly wash" chemotherapy, also known as interperitoneal chemotherapy. Instead of injecting chemotherapy into Elizabeth's bloodstream, Spillman injected a mixture of drugs and saline through a port into her abdominal cavity.

"The idea is that the medicine gets to all the nooks and crannies where microscopic cancer cells may be hiding," Spillman said.

Dr. Spillman and Elizabeth also made the decision to leave her uterus behind—an unusual move, but one that will allow the young woman to carry a child conceived using donor eggs in the future.

"We usually see advanced ovarian cancer in post-menopausal women, so fertility

isn't an issue for them," Spillman said. "Because Elizabeth is so young, we wanted to do everything we could to keep pregnancy in her future. And that meant saving her uterus."

After sporting a collection of various bandanas, Elizabeth is enjoying remission, curly hair and a return to activity.

"For some people exercise is a chore, but it's something I really enjoy," she said. Her slew of outdoor activities includes running, hiking, which she does with her beloved German Shepherd, Ruby, and snowshoeing—"anything outside."

She feels "extremely blessed" with parents who are still married. Her brother, whom she describes as "an amazing man" and one of her best friends, and sister-in-law shaved their heads when she was undergoing treatment. "Even though the treatment was unbearable," she said, "Dr. Spillman saved my life."

While family, friends and physical activity sustain Elizabeth's positive outlook, so too, she said, does spirituality. "I pray a lot, I go to church. I went a lot when I was young, and it recently became a way of life for me. God and being positive are important in my recovery." **C3**



THELISSA ZOLLINGER

Areas of Support:
Lung Cancer Early
Detection Research

Thelissa, with late husband Gary
Photo: Monty Nuss Photography

I choose to MAKE A DIFFERENCE

As Gary Zollinger sat in his bed at University of Colorado Hospital in May 2006, he said to his wife Thelissa, “Honey, we are going to do something about this. We are going to make a difference. This disease has gone too far with no early diagnosis test.”

Gary’s 2004 diagnosis of stage IV bronchioalveolar carcinoma (BAC) showed cancer in both lungs with no options for surgical treatment. He had little response to drugs, so he pursued a double lung transplant, a procedure that had been performed in only a handful of BAC cases. On May 19, 2005—Thelissa’s 55th birthday—a life-preserving transplant became reality.

“He told me, ‘We’re going to set up this endowment,’” Thelissa says. “When he told me the dollar amount, my jaw dropped. He wanted to give enough that was substantial.”

Gary’s \$2 million goal meant making a substantial personal gift and raising money. They planned a 5k run, recruiting friends and family members to help organize it. Gary orchestrated it from the family room couch.

“He refused—just *refused*—to let cancer take down his ability to be a force for good,” Thelissa says. “We called the race the Gift of Life and Breath, because that’s what Gary was given, for 16 months. A gift.”

Gary became a deep admirer of his transplant surgeon Dr. Michael Weyant, associate professor of surgery at the University of



Dr. Michael Weyant talks at the 2009 race.

Colorado Denver School of Medicine. The two men often talked of the problem of lung cancer early detection. Dr. Weyant became the endowment’s beneficiary.

The first race, held at Cherry Creek State Park on May 19, 2006, drew 377 runners and raised \$93,750. Gary, who was becoming more ill, miraculously made it to the event. Four months later, he succumbed to his illness. Thelissa knew she had to keep the race going in Gary’s memory.

“You have a choice, whatever cards you’re given in life,” she says. “You can make the best of what you’ve been given, and as Gary said, be a force for good. I choose to make a difference.”

In 2007, 600 runners participated in the second annual 5k event. In May 2009, the

race moved to the Anschutz Medical Campus and 732 runners finished the race.

“To be able to stand at that start line and there is the cancer center where Gary was diagnosed, there is the infusion center where he was treated, there is the hospital where he passed away, and the research tower where we will help find an early detection test—it was full circle for me,” Thelissa says. “This whole idea, this dream, this goal that he wanted, to be there in the cradle of where it started was a wonderful thing.”

The Gift of Life and Breath 5k has raised almost \$400,000 to date allowing Dr. Weyant to collaborate with Dr. Kim O’Neill of Brigham University on a promising new test for detecting cancer cells early in lung sputum.

“Lung cancer research received less than 5 percent of the National Cancer Institute’s budget in 2007, but it causes a third of cancer-related deaths,” Thelissa, now a lung cancer research advocate, reports. “Lung cancer kills almost twice as many women as breast cancer and more than three times more men than prostate cancer. Early detection is absolutely essential in fighting this disease, and research funding is critical.”

Learn about the 2010 race at www.thegiftoflifeandbreath.com.
Read about Thelissa’s trip to Washington to lobby for the Lung Cancer Mortality Reduction Act at www.uccc.info/c3. **C3**

Support UCCC research: Join CancerCure



Carolyn Fancher and Midge Wallace

In 1996, cancer survivors Midge Wallace and Carolyn Fancher decided to make an impact against the disease. They started CancerCure, a membership group for donors who support cancer research at the University of Colorado

Cancer Center. In just a dozen years, CancerCure members have raised \$1 million through individual gifts.

CancerCure funding has contributed to seed pilot grants for young researchers, summer student cancer fellowships in dozens of research labs and faculty postgraduate fellowships. It has purchased critical research equipment, such as that for UCCC’s DNA and genomic studies, funded a cancer cell biology student and helped support a special melanoma research group. UCCC’s director and associate directors suggest ways to spend the money, and CancerCure approves it.

In fiscal year 2009-2010, CancerCure had 75 patron members and 45 regular members who have given a collective \$147,685. UCCC showed appreciation to these donors at an annual dinner at Barolo Grill in June.

Want to become a CancerCure member? Patron memberships require donations of \$750 or more, and regular membership donations of \$100 to \$749.

For more information, please contact Libby Printz, 303-724-3156, libby.printz@cufund.org.

Meet Nancy Stewart, VP of Community Relations



Nancy Stewart has joined AMC Cancer Research Center as vice president of community relations. Nancy’s focus will be to diversify AMC’s fundraising and community outreach efforts by implementing fundraising events and corporate partnerships and expanding volunteer opportunities.

“AMC has a rich history of creative and innovative cancer prevention and control research,” Stewart said. “We are now dedicated to being a creative and donor centric fundraising partner of the University of Colorado Cancer Center. I am looking forward to helping to build awareness about UCCC in our community.”

Nancy comes to AMC from the March of Dimes, where she oversaw fundraising, special events and volunteer leadership as Denver division director. She was previously director of resource development for Water for People. She said she looks forward to working with staff and volunteers at AMC, UCCC and its member institutions as we focus on building a world without cancer.

More AMC News

- AMC Cancer Research Center is pleased to host the 2009 National Volunteer Organization Leadership at a retreat Aug. 13-15. NVO members from around the country will learn about the latest research being conducted by UCCC scientists and gear up for another year of fun and engaging fundraising activities in their communities.

- The 36th Annual Men’s Event committee is meeting in June to begin planning the 2009 event. Spearheaded by several very prominent community co-chairs, the Men’s Event hopes to raise \$100,000 for prostate cancer research and survivorship. The event will be held at Morton’s Steakhouse on Nov. 16, 2009.

Safeway raises \$425,000 for UCCC breast cancer research at checkout

Breast cancer research at the University of Colorado Cancer Center received new funding thanks to a generous gift from Safeway. The grocer presented a \$425,000 check to the University of Colorado Cancer Center as part of a giving program that raised more than \$1 million in Safeway’s five state operating areas. Last year, Safeway gave \$200,000 for breast cancer research.

UCCC will use the grant to develop the infrastructure to support very sophisticated breast cancer tissue studies. The studies will be part of collaborative research with a consortium of comprehensive cancer centers to help us learn why some tumors respond to various therapies and others do not.

Anthony Elias, MD, associate director for clinical research at UCCC, accepted the gift and said, “We will be using this generous gift not only to help support our efforts in this consortium, but also to pay for the planning and seed grants necessary to develop multiple collaborative clinical/basic grants including a SPORE (Specialized Programs of Research Excellence) in breast cancer.”

UCCC also will use the grant money to conduct therapeutic clinical trials with women with locally advanced breast cancer.

“The Safeway donation is raised only a few cents at a time at the grocery store’s check-out stand,” said UCCC interim director Tim Byers, MD, PhD. “Shoppers in five states have been asked their willingness to support breast cancer research by ‘rounding up’ their bill to the next dollar. We are incredibly grateful to Safeway and to Safeway’s thousands of generous patrons for this support.” **C3**