Cancer Fighters
CU Cancer Center
Leading the Way

A New Heart 6

Teledermatology 22

Astronaut MD 23
CANCER FIGHTERS

Scientists and physicians at the CU Cancer Center are bringing cutting-edge research from laboratories to clinics and maybe someday soon to a store near you. Clockwise from the left: Robert Sclafani, PhD, Virginia Borges, MD, Fred Hirsch, MD, PhD, and Dan Theodorescu, MD, PhD.

Cover photo and left by Glenn Asakawa.

1 Letter from the dean
2 In the news
4 Q&A
6 Clinical Care
8 Research at the CU Cancer Center
10 Virginia Borges runs clinical trial of cancer vaccine
12 Robert Sclafani finds potential in red wine
14 Fred Hirsch developing breath test for lung cancer
16 Community
18 Community
20 Alumni Profile
22 Faculty Profile
23 Alumni profile
24 Alumni corner
26 Peaks
28 Student Profile

Bow Tie Ball celebrates the School
Fulfilling our Mission

The pillars of the University of Colorado School of Medicine’s mission – education, research, clinical care and community service – are each featured in this issue of CU Medicine Today.

The University of Colorado Cancer Center is well-known as the go-to center for state-of-the-art clinical care. The CU Cancer Center has some of the highest survival rates of any center in the Rocky Mountain region, especially for late-stage cancer.

The high quality of care that is available here is rooted in research. In this issue, we are highlighting some examples of that research – testing for gene problems that can be targeted with new therapies, offering clinical trials of emerging treatments, developing cutting-edge cancer screening technologies.

It is from discovery in laboratories that we advance the quality of treatments we offer in the clinics.

Our School’s commitment to serving the state of Colorado and the region are prominently on display each year at the National Western Stock Show, where faculty and students from the Anschutz Medical Campus volunteer to provide free health screenings to attendees. In this issue, we feature a report from the show, where 2,184 adults and 768 children received screenings.

Also in this issue are stories of our students and alumni, who are also making a difference around the globe, and soon, out of this world:

• David Murphy, who is in this year’s graduating MD class, compiled a book with the stories of HIV/AIDS patients in the Dominican Republic he met while working there.
• Greg Higgins, MD ’78, is providing care at an orphanage in Tanzania.
• Kjell Lindgren, MD ’02, is set to become the first University of Colorado School of Medicine-trained astronaut when he heads to the International Space Station.

These are just a few examples showing that the hard work and dedication of our campus community matters. We remain steadfast in our commitment to teaching and learning, testing and discovering, curing and caring, in a never-ending search to improve the quality of life for our patients, our community, our nation and our world.

I want to thank everyone who has made me feel welcome in this vibrant academic community since my arrival in April. I am confident that together we will continue to provide excellence in the classroom, laboratory, clinical settings and our communities.

With warm regards,

John J. Reilly, Jr., MD
Richard D. Krugman Endowed Chair
Dean, School of Medicine
Vice Chancellor for Health Affairs
University of Colorado
Jonathan Pell, MD, assistant professor of medicine, discussed with Reuters news service his research into letting patients see their medical records while they are in the hospital. “The hope is that increased transparency achieved by sharing electronic medical records with patients while they’re in the hospital would make them more engaged in their care, more satisfied, and more likely to ask questions and catch errors,” he said in March.

Eric Coleman, MD, MPH, professor of medicine and an expert in care transitions, commented in a Washington Post article in January that the result of a first round of experiments funded by the Affordable Care Act and designed to reduce hospital readmissions “seems kind of wimpy.”

James O. Hill, PhD, executive director of the Anschutz Health and Wellness Center, told ABC News in January that schools that enforce cupcake bans may be going further than they need to. “We have to have some common sense here,” he said. “If your kid is physically active they can afford a cupcake now and then.”

Huntington Potter, PhD, professor of neurology, in January explained the risk of Alzheimer's disease, which currently affects 5 million Americans, on KWGN, a Denver television station: “If all of us live to 85, half of us will have Alzheimer’s disease.”

In the February issue of Vogue, Stephanie Teal, MD, MPH, professor of obstetrics and gynecology, discussed the increasing use of the IUD as a method of birth control. “There has been a real explosion in interest in IUDs over the past five years,” she said.

Sam Wang, MD, assistant professor of pediatrics, said Children’s Hospital Colorado saw 14 cases of children who ingested marijuana in just eight months in 2014, the same number of cases the hospital had seen in the previous four years. “There’s nothing else that comes in such a palatable, easy-to-overdose form,” he said in The Bulletin of Bend, Ore., in January, describing newly available marijuana-laced edibles sold in Colorado. “This stuff is a problem that I don’t think anyone really anticipated.”

Christopher Filley, MD, professor of neurology, in an article posted on the CBS News website in January, offered a warning about the potential for brain injury for children who play football. “These players who were studied,” he said, “all wore helmets throughout their entire playing careers. But we don’t think helmets have much of an effect on preventing brain injury. The game is inherently violent.”

Edwin Asturias, MD, assistant professor of pediatrics, talked in February with the Denver Post about Colorado’s lowest-in-the-nation rate of measles vaccination. “For almost a decade we have been accumulating people without protection,” he said. “We are like a forest waiting to catch fire.”

Emmy Betz, MD, MPH, assistant professor of emergency medicine, told the Reuters news service in February that physicians need to be involved in conversations with older patients about driving. “Doctors are often called on to help make decisions about driving,” she said, “because they understand a person’s medical conditions and medications and how these affect driving.”

Robert Eckel, MD, professor of medicine, explained a decision by the federal Dietary Guidelines Advisory Committee to no longer consider cholesterol in the diet a “nutrient of concern.” “Looking back at the literature, we just couldn’t see the kind of science that would support dietary restrictions,” Eckel told the Washington Post in February.

James Todd, MD, professor of pediatrics, discussed vaccination rates in Colorado with 5280 magazine in February: “Unvaccinated kids should not be allowed to attend school. If those kids go to school together, all it takes is one kid to introduce one case and a whole bunch of kids are at risk.”

Lisa Meltzer, PhD, assistant professor of family medicine, commented in March on the importance of sleep in a report on the CBS affiliate in Denver. “We are a society that believes sleep is for slackers,” she said. “But every hour counts. Sleep is an essential pillar of health.”
not know what caused it.”

“Doctors are feeling really conflicted because they overwhelmingly think this is the wrong thing to do, and is putting children at risk,” she said, “but at the same time, they want to build trust with their patients and meet people halfway.”

Tai Lockspeiser, MD, MHPE, assistant professor of pediatrics, explained the consequences of physicians agreeing to delay childhood shots at parents’ request in an interview with the Denver affiliate of CBS. “In our clinic, we’re having this conversation 10 to 20 times a day,” she said. “If they’re spreading this out, I think we’re going to start seeing a resurgence of a lot of these vaccine-preventable illnesses.”

Kevin Messacar, MD, assistant professor of pediatrics, told KOAA-TV of Colorado Springs in February that there is an association between a respiratory ailment that affected dozens of children last fall and multiple cases of muscle weakness. He and colleagues at Children’s Hospital Colorado were closely monitoring the cases. “And that’s really the next major question: Is this going to come back?” he said. “And if it does, we want to do everything we can to get ready for it.”

Samuel Dominguez, MD, assistant professor of pediatrics, in a New York Times article in January discussed an unexplained, polio-like paralysis of an arm or leg that affected more than 100 children in 34 states, including a cluster at Children’s Hospital Colorado. “It’s unsatisfying,” he said, “to have an illness and not know what caused it.”

Laura Martin, MD, associate professor of psychiatry, offered insight about athletes and mental health in an article on ESPN’s webpage. “We talk about physical injuries all the time, such as a torn rotator cuff, and know that untreated injury can lead to serious concerns and possible surgery,” she said. “The psychological equivalent would be something like major depression; if left untreated it could lead to more serious symptoms, such as weight loss, impaired concentration, loss of energy and motivation, suicidal ideation or substance use. This requires more intense treatment.”

Matthew Wynia, MD, director of the Center for Bioethics and Humanities, discussed the issues related to physician-assisted suicide in an article for the online publication Vice in February. “The fundamental beliefs that underlie our nation are sometimes in conflict with each other—and these issues get at some of the basic tensions in what we value as Americans,” he said.

Natalia Grindler, MD, fellow in obstetrics and gynecology, discussed her research finding that women who are exposed to certain common chemicals are more likely to experience menopause at a younger age. “This is a whistle-blowing study that’s saying we need to pay more attention to our environment,” she said in the February issue of Prevention magazine.

In a HealthDay report on the CBS News website, Don Gilden, MD, professor of neurology, said his research suggests a link between the virus that causes chicken pox and shingles and a blood vessel condition that can afflict and be deadly for some elderly patients. “You need to treat the virus and the inflammation that goes along with it,” he said. “This is totally new.”

Heidi Wald, MD, MPH, associate professor of medicine, discussed the difficulty of evaluating data regarding medical mistakes and impact on patient lives in an interview with Colorado Public Radio in February. “Not all errors in care end up in adverse events,” she said. “And not all adverse events are caused by medical errors.”

In an article that appeared in February in USA Today about the increase in Colorado middle-school students caught with drugs at school, Christian Thurstone, MD, assistant professor of psychiatry, said: “Middle schoolers are most vulnerable to being confused about marijuana. They think, ‘Well, it’s legal so it must not be a problem.’”

In March, Sean O’Leary, MD, assistant professor of pediatrics, discussed with NBC News research finding that most physicians have been asked by parents to delay vaccinations. “This has been a huge issue for several years,” he said. “The debate is really emotion versus science.”

Mark Deutchman, MD, professor of family medicine and executive director of the Colorado Area Health Education Centers, explained to the Denver Post that medical students gain experience volunteering at the University of Colorado Anschutz Medical Campus booth at the National Western Stock Show in January. “My students get to meet people who they wouldn’t ordinarily meet during the screening and interview process,” he said.
Eric Poeschla, MD, joined the University of Colorado School of Medicine as Head of the Department of Medicine’s Division of Infectious Diseases in August 2014. He holds the Tim Gill Endowed Chair in HIV research.

He is a graduate of Yale Medical School and the University of California at San Francisco internal medicine residency and was a member of the Mayo Clinic Departments of Molecular Medicine and Medicine (Infectious Diseases) from 1999 to 2014.

Why did you pursue a specialty in infectious diseases?

After medical school and residency I did not want to zero in on one organ system. Infectious diseases afflict the whole body, and there are problems of global significance to be solved. I found this area very interesting on many levels, from the gene, to the organism, to the patient. New diseases arise all the time, unlike in other specialties. Viruses are fascinating. Working with them allows us to engage every day with biology’s most important and powerful idea: natural selection (viruses evolve fast). We work daily with the wonders of molecular biology (DNA, genomes, etc), the cell, immunity. Importantly too, I was a first-year medical student when the HIV epidemic broke though it wasn’t till later that I connected the dots on that.

How did you first hear about the HIV epidemic?

I was sitting on the steps of Yale Medical School with two classmates looking at the New England Journal report of unexplained cases of pneumocystis pneumonia in U.S. cities. We were mystified, but I really didn’t think that much about it until I went three years later to the University of California San Francisco (UCSF) to be a medicine resident. I went there because it was a great residency and I wanted to “go west, young man, go west.” And that was 1985 to 1988, the peak years, the big bad years of the HIV epidemic.

You could go down to the ER on a Friday night as an admitting intern and there’d be five or 10 very sick, too thin, and scared young people lined up on gurneys. You’d admit them. Hall might be dead by the following Friday. Real clinical desperation. No one foresaw then that basic scientific research would produce miracle drugs and turn HIV disease into a very manageable condition akin to diabetes. Scientific researchers...
are the central heroes in the story. A central goal for me here: promote ID research, from bench to bedside. It's the raison d'être of an academic medical center.

What did you do at Mayo Clinic?
In 1999 I was recruited to Mayo's Department of Molecular Medicine. I did not have a lab of my own yet. In Rochester, Minnesota, we built and funded one by teaming with great young students, fellows, and other colleagues. We made a discovery about how HIV docks onto chromosomes and inserts its genetic material and that was particularly exciting. It was also a good place to raise our two kids. After a decade or so there, I began to think about opportunities to lead creatively in ID. I entertained four different division chief jobs, but resisted moving, until this job convinced me in 2014.

What convinced you about this job?
Several things. I liked this division and its very talented people, their hunger to have impact and achieve excellence in the clinic, classroom and research laboratory. Second, I was given a real opportunity to build. Third, while it seems that the medical school moving to the Anschutz Campus (AMC) was a bit controversial back in the day, when I interviewed here last year it seemed like a no-brainer (many thanks to Phil Anschutz, whom I've not met but would like to). Beautiful, purpose-built facilities, a lot of opportunity. It's expanding. Vigorous leadership in David Schwartz (Department of Medicine Chair), John Reilly (Dean), Liz Concordia (University of Colorado Health CEO), Scott Arthur (Development). And Steve VanNurden heading up the biotech side. Although there's risk associated with all the changes happening here, it seemed and seems exciting. To use a microbiology metaphor there's a sense of ferment, and freedom.

How big is the division now?
About 45 members total, including half at the AMC, half at a combination of Denver Health, the VA, National Jewish. Strength in diversity. We are now recruiting more scientists and clinicians, with specific goals in mind. It was striking that I arrived the same month that the Ebola crisis came to world attention.

How serious is that crisis?
Very serious in West Africa. Previously, outbreaks were small and could be contained by standard quarantine measures. The West African epidemic opened eyes. More generally, and crucially, emerging infectious agents of many kinds (some, like HIV-1 in 1981, that we can't even imagine now) are and will continue to be major threats.

Do we have the resources and structures in place to make sure that people could be taken care of?
I'm very confident we do. I'm not surprised that there was an index case in Dallas last summer where people didn't quite know what to do. The real concern would be if the nation didn't learn the lessons from that incident. Now, we have in place the upgraded infection-control measures needed. There's been superb campus-wide planning here on exactly what everyone would do. It's been meticulously planned by many including prominently IDs Dr. Michelle Barron. She and many others across the campus have done it really, really well.

What more should be done to help people in West Africa right now?
Two of our division members, Drs. Grace Marx and David Cohn, volunteered in Ebola treatment units in Sierra Leone this winter. They saved lives, with courage and skill, and we admire them very much. Globally right now, it's about the end game in Guinea; governments and NGOs must stay focused since Ebola can spiral back fast.

What can we do here?
A lot. All of these costly emergency reactive measures in the field in West Africa are indispensable now. But it's penny-wise and pound-foolish to only react that way. We've known about Ebola for 30 years. We've known about the threat of pandemic influenza viruses. We've known that viruses like HIV-1, avian influenza pandemics, can and will emerge. Going forward it's not a matter of if, it's a matter of when. We will see new emerging infectious diseases. At some point, barring major research discoveries – you can't predict if it will be next year, or 10 years from now – we will have a pandemic influenza strain that will kill many people. The really wise approach is to invest major funds in fundamental research now.

That's a real mission of the ID division: research on emerging infectious diseases. It's a great challenge because NIH funding is falling and indications are that it won't increase for a good while. That's so tough on scientists who've trained all their lives. So it's really important to think about how to fund the very interesting, fundamental investigations into how infectious agents infect people, how they can be treated, how the immune system reacts, how vaccines and other protections can be developed.

Philanthropy is crucial. I can think of no more attractive target for successful people looking to give back than emerging infectious diseases in terms of protecting the world, helping people who are less fortunate, boosting U.S. national security, and protecting us right here in Denver.
A New Heart

Brian Sherry’s medical odyssey provides hope and health

By Vicki Hildner

Brian Sherry was at home in December 2011 folding laundry when he experienced an unusual electric sensation on the left side of his chest.

He walked upstairs, took a shower, sat down at his computer and searched “heart attack.” Then he dialed 911, beginning a three-year medical odyssey that led to a new heart and a new wife, who has her own story to tell about heart transplants.

At the hospital, surgeons opened Sherry’s chest and discovered a mysterious bacterial growth had invaded his heart. Confident that he couldn’t be seriously ill, Sherry set out to convince the staff to discharge him. But he was dissuaded when a cardiologist visiting from the University of Colorado Hospital (UCH) told him, “If you go home, you’re going to die.” So Sherry moved to UCH.

At UCH, Joseph Cleveland, Jr., MD, professor of surgery, explained Sherry’s condition: “He had developed an infection of the aortic valve. The bacteria had grown into a mass of vegetation. Part of the mass had broken off creating an embolism in the left anterior descending coronary artery. I’m really surprised he survived the initial heart attack.”

As UCH doctors set out to unravel the mystery, they tried to repair Sherry’s aortic valve but his heart had been so weakened, it could no longer keep him alive.

Sherry’s only option was a left ventricular assist device (LVAD) that would be implanted under his skin to help pump blood from the left ventricle of his heart to the rest of his body. The device connected to an external computerized control unit and battery pack through a port in his skin. At night, he could connect to a wall unit. But during his waking hours, he carried the control and batteries everywhere in a messenger bag strung across his chest.

Within weeks after getting the LVAD in January 2012, Sherry, a longtime elementary school teacher, was back in the classroom at Dalton Elementary in Aurora, Colo. He knew he was living on borrowed time and was being kept alive by two batteries that had to be replaced with fresh ones every day at the end of school. But his biggest concern—and a sign of his will to live—was how the device would affect his ability to get a date.

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His only hope for survival would be a heart transplant, but before he could be placed on the transplant list, his physicians needed to be sure that all the Whipple bacteria in his body had been destroyed. That would take one full year of oral antibiotic treatment.

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So Sherry began the waiting game, living with the LVAD, taking his antibiotics and never missing a day of school. That’s when he met Holly, who is mother of one his former students, at a school fundraiser. She had heard about his illness and the LVAD was hard to ignore, so when they bumped into each other, the conversation turned to his precarious medical condition.

“I said, ‘If you need food or company, call me,'” Holly says. “I was just a former parent offering help.”

Sherry asked her to dinner and it was a first date like none other.

Ten years before Holly and Brian started dating, Holly had given birth to her second child, a son she named Jonathan. She had a normal pregnancy, but baby turned blue just hours after his birth. Jonathan had multiple heart defects and his only chance for survival would be a heart transplant.
When he was 12 days old, Jonathan moved to Children’s Hospital Colorado and was placed on the heart transplant list. Holly spent every waking minute in the hospital, watching Jonathan, and waiting for a heart.

“He died waiting for a heart,” she says. “And when the transplant coordinator at Children’s asked us if we wanted to donate his organs, of course we said, ‘Yes.’”

Holly had lived through the loss of a child in need of a heart transplant. Now, she was dating a man who also needed a heart to survive.

“How do you let someone go through that by himself?” Holly says. “Maybe I thought this was my second chance at having things turn out differently, but I just couldn’t walk away. I loved him—that was the bottom line.”

Eighteen months after their first date, Brian and Holly got married on a Friday morning. They bought the ring on Saturday. They told their families on Sunday. They didn’t plan any honeymoon.

“Too many unknowns,” Brian says.

After a year on antibiotics, Sherry underwent 13 biopsies to prove that he had no trace of Whipple’s disease anywhere in his body and he was placed on the transplant list in July 2013.

“With a heart transplant candidate, we want to make sure any type of infection is gone,” Cleveland says. “In this case, we erred on the side of caution because the Whipple was so unusual.”

On April 30, 2014, Sherry was at a school assembly when he was summoned to the hospital. They suspected there was a blood clot in the LVAD—a life-threatening development. Sherry was admitted and never left the hospital. One week later, Cleveland came to him with news of a donated heart.

“He said, ‘This looks like a good one,’” Sherry says. “I looked at him and said, ‘I’m ready.’”

By September 2014, Sherry was back in school in front of his class of fifth-graders. The 12-hour surgery was already receding in his memory as he made plans to play more golf and get into peak physical condition.

Sherry plans to thank his donor by writing a letter to the donor’s family and delivering it to UCH for safekeeping, should the family ever want to contact him.

“I thought it would be nice for them to know where the heart is,” Sherry says. “I want to thank them for such a selfless act.”

“It’s huge what they did,” Holly said. “One person donating organs can save so many lives.”

Below, Holly and Brian Sherry met while he was waiting for a heart transplant. On their first date, he trained her on how to replace the batteries in his left ventricular assist device.
Dan Theodorescu was driving home from work one evening several years ago, going with the flow of traffic across a quiet country road in Virginia, when the idea came to him.

For years Theodorescu, MD, PhD, and his colleagues had been puzzling with how to stall a protein called Ral that is central to cancerous cell growth and a close relative of Ras, one of the most common oncogenes in human cancer. Everybody was looking for a way to hang a compound on Ral that would take away its power. But nothing was working.

“We were doing the same thing over and over again, trying to get a different result,” Theodorescu says. “I thought, ‘Why don’t we try to stop Ral before it gets started?’”

So, Theodorescu, who became director of the CU Cancer Center in 2010, began chasing Ral down a different path. Rather than look for compounds that disrupt the protein after it starts its deadly growth pattern, he started looking for a way to keep it from revving up in the first place.

Theodorescu and his research team examined the structure of the Ral protein in its “inactive” form, looking specifically for changes in its structure as it became “active” and they found that the inactive Ral protein had a cavity that disappears when the protein becomes active.

The trick now was to find a compound that could fit inside that cavity and not slip, slide, or get squeezed out.

Easy right?

Not so fast.

That task requires massive computing power to simulate how each compound interacts with Ral’s transformation from its apparently harmless inactive state into a ravenous agent with a dangerous bite.

Ral-dependent cancers are common. RalA and RalB “are important drivers of the proliferation, survival and metastasis of several human cancers, including skin, lung, pancreatic, colon, prostate, and bladder cancers,” Theodorescu and his colleagues wrote in an article published last September in the journal Nature.

Obviously a breakthrough identifying how to stop Ral in its tracks would be profound. Not only were the researchers looking for specific compounds that would perform the task, they were also proving “the utility of structure-based discovery for the development of therapeutics for Ral-dependent cancers,” they wrote.

Theodorescu and his colleagues tested 500,000 compounds to discover 88 possible candidates that might bind to Ral and prevent its activation. And that’s just the beginning of the journey. At this point, the team had created a map that still had many possible routes.

The next round of research would move from computer models to testing cells in the lab. They evaluated the compounds for their ability to slow the growth of human cancer cells in suspension, which is a proxy for metastasis. The researchers found one molecule that was most successful and from there, they synthesized derivatives of that molecule to find a compound that was effective.

Next, they tested the compound in mice models to determine whether what worked in the dish would work in an animal. In those tests, they discovered that the compound entered the tumor tissue and slowed the
Dan Theodorescu, MD, PhD, director of the CU Cancer Center, is not only leading advances in his laboratory at the Anschutz Medical Campus, he has become one of the leading voices in the national conversation about precision medicine.

Last September Theodorescu was an invited speaker at a roundtable of the “21st Century Cures Initiative” of the U.S. House of Representatives Energy & Commerce Committee. Other speakers at the roundtable included Sylvia Burwell, secretary of the U.S. Department of Health and Human Services, Francis Collins, MD, director of the National Institutes of Health, and Margaret Hamburg, MD, commissioner of the U.S. Food and Drug Administration.

“I think support of the biomedical enterprise represents a defining moment for this country,” Theodorescu told the panel, which has crafted bipartisan legislation to help fund biomedical research.

“The United States...really has built an incredible genomic engine and infrastructure that has resulted in a lot of technology that can really push forward molecular and biotechnology and medicine,” he said. “It would be a shame now to not capitalize that and maintain our national and international leadership in this area.”

Theodorescu, who is a professor of urology and pharmacology at the School of Medicine, is also the developer of the co-expression extrapolation (COXEN) bioinformatics principle of personalized therapy assignment in cancer. COXEN is currently being tested in a national clinical trial through Southwest Oncology Group, a cancer research cooperative, funded through the National Institutes of Health (www.clinicaltrials.gov, NCT02177695). The principal investigator of that trial is Thomas Flaig, MD, associate director of clinical research at the CU Cancer Center.

“I think we’re in the middle of three revolutions: The “omics” revolution – genomics, proteomics, metabolomics,” he said. “We’re also in the big data revolution and a health care revolution.”

Theodorescu pointed out practical issues, such as the daunting 40-page patient-consent forms required for patients to participate in clinical trials, that could have the effect of discouraging research and hurting the patients that research is intended to help.

He urged lawmakers to harness the energy that is shaping the future of medicine and promote collaboration.

“In terms of public and private partnerships, I think we need to enhance the richness and the potential and the attractiveness of the data that the federal government provides to pharmaceutical partnerships by really providing a coalesced data set of all clinical trials that are federally supported,” he told the panel. “That will make mining that data set by companies...and would make cooperation with the federal government a lot more attractive.”
Testing a New Treatment for Breast and Ovarian Cancer

Oncologist Virginia Borges leads study of cancer vaccine

By Todd Neff

University of Colorado Hospital (UCH) is one of just two academic medical centers in the nation that has enrolled breast and ovarian cancer patients to a new clinical trial of a promising cancer vaccine.

The trial focuses on the safety and early test for effectiveness of ONT-10, an immunotherapy made by Seattle, Wash.-based Oncothyreon. It’s designed to stimulate the body’s own immune system to attack cells expressing MUC1, a protein found in a number of cancers, but especially ovarian and breast cancers.

“In an initial phase 1 study in all different types of cancers, we saw an excellent safety profile and also evidence of response in people who had very advanced late-stage cancers,” says Virginia Borges, MD, the University of Colorado School of Medicine medical oncologist who brought the trial to UCH.

U.S. Food and Drug Administration phase 1 studies focus on the dosing and safety of drugs that have shown promise in animal models. Very promising drugs such as ONT-10 can show evidence of effectiveness at this early stage of clinical testing, too. Borges describes the trial being done at UCH as an “enrollment study.” Investigators already have a handle on ONT-10’s dosing. They’ve now added patients with breast or ovarian cancer to further assess the drug’s safety and efficacy, Borges says.

Both breast cancer and ovarian cancer patients at UCH are already taking the vaccine as part of an ongoing trial. A second study, now ramping up, combines ONT-10 with varililumab, an antibody developed by Hampton, N.J.-based Celldex Therapeutics. Varililumab uses a different molecular pathway to stimulate patients’ T cells to work better and help the immune system to attack tumor cells.

Borges estimates that she and CU Cancer Center colleagues, including the recently recruited Jose Mayordomo, MD, a breast oncologist with immunology expertise, and Jennifer Diamond, MD, a phase I clinical trial expert, will treat 15 breast cancer patients and 15 ovarian cancer patients during the ONT-10/varililumab study, with Diamond focusing on the ovarian cases.

Tough case

In both of the current ONT-10 expansion studies at UCH, the women enrolled have advanced cancers that have spread again despite conventional attempts (chemotherapy, hormonal therapy, antibodies, and small molecules) to slow it. Robin Nash was one such woman.

Nash, now 48, is a mother of two in Castle Rock. In early 2012, she was busy with teenagers and running the U.S. distributor of Bobux, which are starter shoes for babies and infants, with husband Troy. She was also a breast cancer survivor, having detected early-stage disease in 2001 and gone through a lumpectomy, chemotherapy, radiation, and hormonal therapy. Through it all, she studied breast cancer and its treatments, amassing materials in a three-ring binder. When she was clear of the disease, the binder ended up under the bed to be forgotten.

The endocrinologist “immediately went pale,” Nash says.

The diagnosis fell on May 4, 2012, two weeks before her daughter Karli’s high school graduation: breast cancer, metastatic, stage 4. She and Troy...
waited until Karli had her diploma before they told her and son Jake. By then Nash had already set the wheels of treatment in motion.

“I crawled under my bed and dug out the bulging three-ring binder with all the records from 11 years prior and set out to find the best treatment plan and assemble my team of health professionals,” she says.

“The fact that I’m on treatment that has no side effects and I’m stable is incredible.”

Taking charge and not just sitting back,” as Nash put it, would be pivotal in her making another leap from breast cancer patient to breast cancer survivor.

Drugs and more drugs

A PET scan found three bone metastases in her spine in addition to the lit-up lymph nodes. Nash started treatment in June 2012, with Faslodex injections and Herceptin infusions, later augmented with Arimidex. The drug combination seemed to keep things in check until February 2013, when her oncologist tried her on a combination of Xeloda and Tykerb. That triggered a bad reaction, which led to a combination of Afinitor and Aromasin. The bone metastases responded; the lymph nodes didn’t.

While Radhika Acharya-Leon, MD, at Mile High Oncology, led Nash’s treatment, Borges was among the doctors Nash had consulted after a referral from a friend. When the question of radiation therapy came up, she met with two metro-Denver radiation oncologists and then checked in with Borges, who referred her to Rachel Rabinovitch, MD, a CU Cancer Center radiation oncologist. Five doses of radiation at the UCHealth/ CU Lone Tree TomoTherapy Center later, the lymph nodes were clear.

That was in February 2014. By June, however, there were new spine metastases that led to a new drug regimens: carboplatin and Gemzar. In the meantime, Nash had gotten wind of the ONT-10 trial. Nash met with Borges, who had recently opened the first ONT-10 expansion study to UCH patients, soon thereafter. Nash told Borges she was concerned with it being a phase 1 trial. Borges, whose work with experimental therapies targeting MUC1 dates back 15 years, clarified that this was an expansion study and that ONT-10 was proving to be safe. Nash enrolled.

On trial

After four weeks of taking no drugs at all (a required wash-out period), she started on ONT-10, which involved taking four injections, one in each major appendage, once a week for eight weeks. Nash noted no side effects, and her immune system annihilated the spine metastases, which had already been diminished by the carboplatin/Gemzar combination.

She is now on a “maintenance program” with the drug. It involves the four injections once every six weeks. She’ll stay on until ONT-10 for as long as it controls her cancer, she says. In the meantime, she’s training for a half marathon.

“The fact that I’m on treatment that has no side effects and I’m stable is incredible,” Nash says.

Borges sees immune-based therapies’ long-awaited delivery on their promise as a big part of the future of cancer treatment. Drugs like ONT-10, she says, are the results of the “hard work” of hundreds of researchers around the world who have each figured out a piece of a complex puzzle. That has led to better understanding of the immune system and how to fight back against the cancer’s ability to use the immune system against the person,” she says.

“We are at a point where cancer vaccines are a reality,” she concludes.

For more information on the ONT-10/varilumab study, contact Anna Nelson at Anna.L.Nelson@UCDenver.edu.

This article originally appeared in the UCHealth Insider.

Endowed chair for research in young women’s breast cancer

In March, the CU Cancer Center celebrated the establishment of the Robert F. and Patricia Young Connor Endowed Chair in Young Women’s Breast Cancer Research in the Division of Oncology at the University of Colorado Anschutz Medical Campus, made possible with generous commitments totaling $1.5 million from Patricia Anne Connor and the John J. Connor & Irene A. Connor Family Foundation.

Associate Professor Virginia Borges, MD, has been appointed the first Robert F. and Patricia Young Connor Chair. With the Connor Family’s support, the CU Cancer Center is able to provide valuable resources to one of the world’s foremost experts in young women’s breast cancer and to improve outcomes for patients and families.

The Connors have longstanding connections with the University of Colorado. Patricia earned a physician’s assistant certificate here in 1982, and served as an assistant professor from 1987 to 1992. The family’s philanthropic connection with CU began with a $20 gift made to the Child Health Associate Program in 1983. By establishing this chair in their parents’ names, the Connors are leaving a powerful and enduring legacy in their honor, and one that will have an impact for years and decades to come.
Red Wine’s Surprising Ingredient
Scientist Robert Sclafani finds grape skins may help prevent cancer

By Mark Couch

It’s not every day that a cancer researcher gets an interview request from Wine Spectator magazine.

But when your research says that red wine contains a substance that might prevent cancer, you can bet that the phone is going to ring.

Robert Sclafani, PhD, received just such a call last fall after an article he wrote in the journal Advances in Experimental Medicine and Biology showed that the chemical resveratrol, found in grape skins and red wine, may help prevent cancer.

The finding was a bit surprising because alcohol use is known to be a major risk factor for head and neck cancer. But it turns out that the resveratrol found in the skin of grapes used to make red wine has the power to counteract some of the cell-damaging effect of alcohol.

“Resveratrol challenges these cells,” says Sclafani, a professor of biochemistry and molecular genetics and an investigator at the CU Cancer Center. “The ones with unrepaired DNA damage are killed, so they can’t go on to cause cancer. Alcohol damages cells and resveratrol kills damaged cells.”

Still, Sclafani is careful to say that alcohol consumption remains a risk factor. While red wine has resveratrol from the grape skins, other liquors do not contain the beneficial agent. And too much alcohol, even red wine, causes irreparable damage to the genes.

“You’re better off without any alcohol at all,” Sclafani says. “Alcohol bombards your genes. Your body has ways to repair this damage, but with enough alcohol eventually some damage isn’t fixed. That’s why excessive alcohol use is a factor in head and neck cancer.”

That resveratrol has a beneficial impact offers some hope for cancer treatments that don’t hit the body as hard as more common therapies, Sclafani says.

Radiation, chemotherapy and surgery are the preferred treatments, but they are like “sledgehammers,” he says. And while they are often successful when treating head and neck cancers, there is a relatively high risk of recurrence and the prognosis for recurrent head and neck cancer is not as hopeful as the first time around.

“We are looking for something to block it, to prevent that second tumor,” Sclafani says. “The bottom line is maybe we can use this compound found in red wine as a natural therapy.”

In the lab, Sclafani and another scientist on the Anschutz Medical Campus, Rajesh Agarwal, PhD, professor of pharmaceutical sciences at the University of Colorado Skaggs School of Pharmacy and Pharmaceutical Sciences and co-leader of the CU Cancer Center’s Cancer Prevention and Control Program, designed experiments to understand whether there are natural compounds that can improve the body’s resistance.

“Raj studies chemoprevention,” Sclafani says. “If you eat this, is it going to prevent cancer? We’re looking at natural compounds, mostly derived from food. We were using a compound found in the skin of grapes – resveratrol. Peanuts have it too. So do lots of legumes.”

The scientists examined this naturally occurring compound for its effect on cancer cells and in experiments with cells grown in the lab found that resveratrol helped remove those with damaged DNA “with little effect on the normal cell,” he says.

While such findings are potentially helpful for people with head and neck cancers, the findings also hold promise for helping people with Fanconi anemia, a rare genetic disorder that affects about 1 in 300,000 newborns.
Some of what is known about how alcohol causes cancer comes from studies of people with Fanconi anemia, who are prone to leukemia and head and neck cancer. Sclafani learned about Fanconi anemia at meetings of the American Association for Cancer Research.

“When I first heard about it, I had to look it up. And then I thought, ‘I can do something with this. I understand it. This is a problem with DNA repair.’”

People with Fanconi anemia are born without the ability to repair DNA cross links that healthy genes can repair. When DNA strands are cross linked, the body has mechanisms to repair that damage. But for some, particularly those with Fanconi anemia, they cannot repair the cross links, so a lack of aldehyde dehydrogenase (ALDH) genes leaves them even more vulnerable.

“With enough alcohol, the body can get behind and end up with a backlog of acetyl aldehyde,” Sclafani says. “Increased exposure to alcohol, loss of the ALDH gene that normally helps the body process alcohol or the loss of the ability to repair DNA cross links all result in increased cancer risk.”

Sclafani met Kenneth Atkinson, MD, a Centennial physician who had two children, Kendall and Taylor, who were born with Fanconi anemia. Kendall was a sophomore in college in 2004 when she had a bone marrow transplant; she died four weeks after receiving her donor marrow. In 2005, Taylor received a bone marrow transplant. He died nine months after transplant.

“It really gets you,” Sclafani says. “His family lost two kids.”

Sclafani has been active in the Kendall and Taylor Atkinson Foundation (KATA), speaking at events and explaining his research, and he has received support for his research from the Fanconi Anemia Research Fund (FARF).

The impact of meeting families who support his research keeps the effort in perspective.

“If we can do this, we can make a difference in their lives,” Sclafani says. “You can get lost with the cells in the lab. This brings it all back and you say, ‘Wow, this is really important. We can help these people.’”

Fellowship program creates next generation of cancer fighters

By Susan Moran

The CU Cancer Center’s Cancer Research Summer Fellowship is designed to inspire and train the next generation of medical scientists. Each summer, the fellowship accepts about 45 students—most of them undergraduates, along with a few high school students and medical students—from a pool of roughly 180 applicants nationwide. It’s as rigorous as it is competitive, and it’s a far cry from the university biology or chemistry classroom.

“They’re doing real science. This is not summer camp,” says John Tentler, PhD, director of the program and an associate professor in the Division of Medical Oncology at CU School of Medicine. “No flip flops, no strolling in at ten o’clock.”

The students join a lab or clinical research program at the University of Colorado Anschutz Medical Campus, the University of Colorado Boulder, or other Denver-area health care institutions. Research topics range from identifying breast cancer subtypes genetically in the lab to developing tests used to match patients with specific Phase I clinical trials.

Grace Sollender remembers her research projects well. Three years ago she attended the fellowship—for the third time. She repeated the fellowship two times after initially attending the program in 2009, after finishing her sophomore year in high school at Saint Mary’s Academy in Denver.

“I was a 16-year-old kid, still in braces, who didn’t know anything about biology, and certainly not cancer research, but I was very eager to learn,” Sollender says.

Too young to be an official fellow, she was a volunteer the first year. Her initial research project examined the effects of hormones on mucinous breast cancer using a three-dimensional model. She and her colleagues wanted to see if the model, called Matrigel, performed the same as real breast tissue. It did, and Sollender earned credit as co-author of a 2013 paper in the journal Breast Cancer Research Treatment describing the findings. “I was thrilled,” Sollender says, noting that her grandparents were so proud they included a copy of the publication in their yearly Christmas newsletter.

In January 2014, Sollender was accepted into Dartmouth’s Geisel School of Medicine, which she’ll start next August. She plans to pursue internal medicine initially, and then specialize after that. “I think oncology will be the right field for me,” she says.

This article is excerpted from an article that originally appeared in the CU Cancer Center’s C3 Magazine.
Creating a New Test for Lung Cancer
Researcher Fred Hirsch is developing a breathalyzer

By Lisa Marshall

Fred Hirsch can already envision it: An at-risk patient—perhaps a former smoker—goes into a grocery store, sits down at a kiosk and exhales a long slow breath into a plastic tube.

In an instant, a tiny sensor embedded within that device begins to “smell” her breath, identifying a unique chemical signature that hints at a brewing cancer within her lung. Within minutes, the test results appear on a computer screen, suggesting she see a doctor for further screening. The cancer is caught early, and a life is saved.

“I know it sounds like a dream, but I don’t think it is entirely unrealistic someday,” says Hirsch, MD, PhD, a researcher and professor in the CU School of Medicine’s Division of Medical Oncology.

Having lost his own father-in-law to the disease just as Hirsch was finishing up medical school back home in Copenhagen, the physician-scientist has spent the last 25 years working to improve the grim odds of surviving the world’s most deadly cancer. Now, as the lead investigator of a new non-invasive, affordable breathalyzer screening test for lung cancer, he predicts that—if all goes well—the game-changing device could be on the market within 5 years. And someday do-it-yourself versions might even be available. “It could make a huge impact on lung cancer mortality,” he says.

The idea of using smell as a harbinger of disease is nothing new. As far back as 2000 BC, ancient Greek and Chinese practitioners used the scent of stool, urine, skin and breath as a key clue in the diagnosis of disease. A distinctly fishy breath odor has long been associated with liver disease, while the smell of acetone hints at diabetes. A recent review in the journal *Sensors* links 50 diseases with distinct aromas.

Scientists have also known for years that long before a cancer is detected, subtle metabolic changes begin to occur throughout the body. These changes, and/or a tumor itself, can alter the make-up of the cocktail of chemicals, or volatile organic compounds (VOC), we emit. In one case, reported in *The Lancet* in 1989, an otherwise healthy dog owner made an appointment to see her dermatologist after her dog began sniffing at a mole on her leg. It turned out to be melanoma. Since then, teams around the globe have shown that animals and insects with keen olfactory systems can distinguish between cancer and non-cancer tissues. “Trained dogs can smell cancer very quickly,” says Hirsch. “But you cannot use that in a clinical practice.”

Enter Hossam Haick, PhD, a chemical engineering professor from the Technion Institute of Technology in Israel. In an attempt to, as he puts it, “imitate the canine olfactory system” via nanotechnology, Haick in 2011 developed a sensor called a NaNose, which can measure VOCs in breath with unprecedented precision.

When Israeli pulmonologist Nir Peled, MD, PhD, traveled to Colorado for a fellowship in Hirsch’s lab, he introduced Haick and Hirsch, and a global research project was born. “Professor Hirsch is a brilliant clinician and researcher who knows the unmet need very sharply,” says Peled, now a thoracic oncologist and professor at Tel Aviv University. “It seems to be a very good collaboration.”

Hirsch and Peled have since collected breath samples of hundreds of patients in the United States and Israel for analysis with the NaNose. Thus far, studies reveal the test may not only be able to determine whether someone has lung cancer or not, but also what stage it is.

“The data are only preliminary but are certainly encouraging,” says
Gregory Masters, MD, an expert spokesperson for the American Society of Clinical Oncologists (ASCO). It could lead to “more widespread distribution of screening and potentially a less costly and more effective manner for finding lung cancer, the leading cause of cancer death in the United States.”

One study, presented by Peled in May 2014 at the ASCO annual meeting, looked at 358 subjects – 213 with diagnosed lung cancer, and 145 without. The breathalyzer was able to distinguish with more than 80 percent accuracy between those with and without cancer and distinguish with 78 percent accuracy between early and late stage cancer.

Another in-vitro study, looking at the “headspace” or contents of the gas above the cell lines in a lab suggested that different subtypes of lung cancer, fueled by different molecular drivers, or “oncogenes,” may emit different VOC fingerprints which could be detected via breath. In recent years, molecularly targeted drugs have been developed—with great success—to treat such subsets. But the current way of identifying which kind a patient has—via DNA sequencing—can be expensive and time-consuming. “Detecting and monitoring the metabolic signature associated with cancer-specific genetic mutations could be faster and easier than conventional gene-profiling methods,” Peled wrote in the study.

Because the unique molecular signature or “smell” of cancer is believed to retreat as a cancer fades, the technology could also potentially be used to determine whether a treatment is working or not.

Haick and his colleagues recently developed a version that plugs into a home computer’s USB port, opening the door to a do-it-yourself application someday.

But for now, oncologists stress, the most exciting prospect is the test’s potential to catch the disease early, when it is still easily treatable.

“The majority of lung cancer patients present with stage 4 metastatic disease,” says Paul Bunn, MD, a distinguished professor in the Division of Medical Oncology, noting that only about one in five catch it when it can still be addressed with surgery. “Until recently there has been no way of diagnosing it early.”

With 224,000 new cases and 160,000 deaths, lung cancer kills more people each year than colon, breast and pancreatic cancer combined. According to the National Institutes of Health, the five-year survival rate is about 16.6 percent, far worse than for colon cancer (64 percent) or breast cancer (89 percent). More than half of people diagnosed with lung cancer die within one year.

In 2011, a study of 53,000 current or former smokers found that screening by low-dose CT scans was more effective than X-rays in catching lung cancer early, and could reduce mortality by 20 percent. But the study also found a high rate of false positives, with 90 percent of the suspicious nodules ending up to be benign when biopsied. “That can be both psychologically and physiologically stressful,” says Hirsch.

Initially, he believes the breathalyzer could be used as an adjunct to the scan, helping to either reduce unnecessary follow-ups or prompt necessary action. It could not, in and of itself, diagnose cancer. More research must be done before the test is ready for prime time. CU recently began enrolling patients for a 600-patient clinical trial. But Hirsch has high hopes.

“This could totally revolutionize lung cancer screening and diagnosis,” he says. “And the fact is: If you diagnose it at a very early stage, lung cancer is curable.”
Wrapped in a Bow
School of Medicine gala celebrates and honors Dean Krugman

The University of Colorado School of Medicine celebrated its history and commitment to education, research and community service at the Bow Tie Ball gala last November.

The event also served a farewell and thank you to Dean Richard D. Krugman, MD, who led the school for nearly 25 years, the longest tenure in the history of the School of Medicine. Krugman stepped down from the deanship on March 31.

“We have been blessed with strong, steady, consistent leadership for over two decades,” said Lilly Marks, vice president for health affairs for the University and executive vice chancellor of the Anschutz Medical Campus.

Several honors were announced at the Bow Tie Ball:

• Marks announced that the Trivisible Room on the Anschutz Medical Campus has been renamed the Richard D. Krugman Conference Hall.
• Colorado Gov. John Hickenlooper issued a proclamation declaring Nov. 15, 2014, as Richard D. Krugman, MD, Day
• Krugman’s wife, Mary, and their sons Scott, Todd, Joshua and Jordan unveiled a specially commissioned portrait of Krugman that will hang in perpetuity at the School of Medicine.

The Bow Tie Ball’s chair was community leader Jamie Angelich. The School is grateful to the community and campus supporters who contributed their time and energy to make the event a success.
The School acknowledges the generous financial support from:

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Carol Rumack, MD, and Barry Rumack, MD
‘You guys saved my life’

Students and faculty volunteer at the National Western

By Tonia Twichell

Around the corner from the University of Colorado Anschutz Medical Campus health screening booth in the cavernous Hall of Education, a trapper sells skunk pelts, beaver skulls and alligator jaws.

Closer in, plus-sized Chevy trucks loom above the crowd, and volunteers for a wildlife rescue group hoist live owls, hawks and other raptors on leather padded arms for the crowd to see.

In the midst of the sensory overload of the National Western Stock Show & Rodeo, a fenced-off corral of students and faculty in white coats welcomes visitors who reflect the diversity of the neighborhood. Tourists, roadies, vendors, urban professionals and suburban home-schooling families join ranchers, farmers and cowboys for the annual livestock show and rodeo in Denver each January.

Many are on their way to watch rodeo events when they bump into the CU Area Health Education Center (AHEC) booth, which has been serving stock show crowds for eight years. Others are return visitors stopping by for an annual checkup to compensate for lack of health insurance.

This year, students and faculty from medicine, physical therapy, physician assistant, nursing, dental, public health and pharmacy helped 3,000 adults and children. They took blood pressure, measured cholesterol, body mass index and blood sugar levels, gave flu shots, checked for vision problems and advised how to improve health.

In return, visitors helped students learn basic clinical skills and gave them experience on how to interview and counsel a wide variety of patients.

For some visitors, this is their only health care exam of the year.

“We had one guy whose (cholesterol) HDL was less than 15,” says Jennifer Hellier, PhD, associate director of programs and director of Colorado Health Professions Development with AHEC. Anything less than 40 is considered at risk. “I’ve never seen that before.”

“He has four kids, and I told him, ‘Look, you have a beautiful family and you need to take care of this and see your health care provider or you are not going to live very long.’”

She knows that some people listen.

“We had a guy who came in last year and said, ‘You guys saved my life.’ We’d tested his cholesterol the year before, and it was too high. He went back to see his health care provider. He lost weight and was feeling so much better. He said ‘I’m going to come back every year.’”

Lyn White, 61, dropped in for a full run up and learned she probably needed a tetanus shot because the last one she had was in high school. She got a good laugh when Keli Sherman, a first year physician assistant student, shouting over the wild bird presentation next door, asked if she used marijuana or could be pregnant.

But she did admit to not faithfully eating her vegetables and avoiding...
exercise in the winter.

“I really came to have my blood sugar checked because I eat a lot of sorbet and ice cream,” she says. “It’s hard to know how you’re doing if you don’t have good health care. You have to look things up on the Internet. Right now I have good health insurance through the state but I missed a year because my husband retired.”

Her husband, however, was not participating in a screening.

“I told him, ‘You’re 70, and you need to see the doctor and take vitamins.’ But he won’t do it.”

Hellier remembers one couple who stopped by for the wife’s health. They were cooks who traveled from show to show often living in a camper. Neither had health insurance. She is diabetic and has high blood pressure and was confused about her medication.

“We told her ‘Come the next weekend because there’s going to be a clinical pharmacist here that day, and he can go over the medications and tell you what each one does and why you should take them at certain times.’”

She insisted that her overweight husband have some tests, too. He was reluctant, but agreed. “He saves all his money so she can have her medications for diabetes,” Hellier says. “He wasn’t taking care of himself.”

Vendor Edwin Rodriguez came by because stock show paramedics had told him earlier in the day to go the hospital for extremely high blood pressure. Rodriguez was pretty sure that wasn’t necessary.

“I’m from Allentown, Penn., and this altitude made my heart and pulse react. Plus, I’d just eaten two 7-11 burritos.”

CU students and faculty took his blood pressure again (it was lower that time) but encouraged him to see a doctor as soon as possible. Rodriguez got a flu shot, too.

“I did it because I want Latinos to know that it’s OK to get flu shots. A lot of them don’t.”

Motivating people to make changes is an important part of what the students learn at the stock show. It can be as simple as encouraging a walk after dinner every night, wearing a seatbelt regularly or switching from 2 percent milk to 1 percent, and as difficult as encouraging someone to get an HIV test or a colonoscopy or advising a pregnant woman to stop drinking alcohol.

“I asked an elderly woman about screening tests, but she wanted to know if it was even worth it to get them done,” says Sherman, the first-year physician assistant student. “She said she wouldn’t do anything if she knew she was sick, so what was the benefit of it? I told her it is always better to find out because there are things we can do to help, but ultimately she has to make the decision herself.”

Sarah Stein, a first-year physician assistant student, said kids usually admit to spending more time playing computer games than playing outside. “I usually ask them to reverse that.”

Medical student Emilee Sandsmark had last volunteered at the health screening exhibit in 2011. Now in her fourth year, she felt more at home.

“It’s more fun this year. I’m more confident asking people questions. The first year I didn’t feel like it was my place to say anything or to give advice. It’s an amazing transformation.”
An Accomplished Mission
Alumnus Greg Higgins finds purpose in a Tanzanian orphanage

By Jenny Deam

Greg Higgins, MD ’78, thinks he may have at last found his place in the world 31 years after he graduated from the CU School of Medicine.

In 2009 in a rural orphanage under the shadow of Kilimanjaro in Tanzania, Africa, where Higgins had just become its doctor, a little girl named Neema was suffering from impetigo, a bacterial skin condition. For such a small child, Neema put up a mighty fight as Higgins held her down to clean and tend to her sores.

With treatment complete, the little girl climbed into Higgins’ lap, snuggled against his shoulder and fell promptly asleep. “She forgave me,” he remembers and that’s when he knew.

Today, at age 66, he feels he has finally found home and a calling that is countless frequent flier miles from where he started as a young medical student in Colorado.

“If you have some vague idea you are going to save the world, you’re in trouble,” he says. “The world isn’t interested in being saved. But on any given day you can accomplish something. You have to commit to the microcosm.”

He sees now that the personal touch is enough.

Higgins grew up in Akron, Ohio, where found inspiration in Thomas Dooley III, a U.S. Navy physician and humanitarian who devoted his life to helping the poor and the sick in Southeast Asia. “It planted a seed,” Higgins recalls.

Drafted during the Vietnam War, Higgins was sent by the U.S. Air Force to Japan and Alaska where he caught the mountain-climbing bug. He attended college in Alaska and thought he might want to be a nurse until an advisor said he should consider medical school.

Higgins made his way to the University of Colorado School of Medicine, graduating in 1978. Around that time, during a trekking vacation to Nepal he was struck by the terrible need for medical care in that part of the world. For six months he worked as the chief medical officer at the Dalai Lama’s hospital in India.

He returned to Alaska—in time to catch the climbing season—and began work at a small family practice in Seward.

Then it was off to California where he continued to practice family medicine, but something didn’t feel quite right. “I was looking for my niche,” he says, “Emotionally I wasn’t the right person to do that because I couldn’t let go. I lived at the hospital.”

Higgins worked for Valley Emergency Physicians for 15 years, helping to set up emergency rooms for small hospitals in California. He moved into management. “I liked the mission. There were a lot of hospitals who would not have an ER without our company.”

But he kept wondering if there was something more, something different waiting. “I wanted to do other things but I just didn’t know what. You begin to realize you don’t want more money. You want more time.”

So he retired in 2003 and eventually moved back to Alaska. From there he began to do volunteer medical trips in Africa. In 2007 he was asked by his town’s high school to take a group of students on a climbing
expedition to Mount Kilimanjaro. On that trip he met a guide who was running a preschool in Tanzania. There was also an orphanage: 30 kids, five rooms, no water, no electricity, open sewers.

Something clicked. For two years he kept returning until finally he could not stay away. “I went home and sold or put into storage all my stuff and moved to Africa,” he remembers.

There are now 60 kids at Kilimanjaro Orphanage Centre in Moshi, Tanzania, and 20 more in its daycare. Higgins, known as “Grandfather,” also helps manage two preschools with more than 200 children attending.

One of his first orders of business was to instill simple habits such as good hand washing. He jokes that his job was that of a sanitary engineer as he oversaw the installation of toilets and septic systems. All of the children attend private Catholic school. “For the majority of these children the answer for their future is education,” he says.

In Tanzania today one-third of the country’s 46 million people are under 16. The AIDS epidemic has wiped out an entire generation, leaving a gaping hole in the demographics. Higgins hopes to help re-establish intergenerational bonds, linking parentless children with childless grandparents.

“We are trying to create a big family,” says Higgins, who met his wife, Shannon Ward, on another medical mission in 2011 in Uganda. The couple married in 2013 and now work together at the orphanage in Tanzania.

He knows he has led an unusual life. But it suits him. He figures we are all a sum of our parts. “I think this is my final chapter.”
Taking Selfies to Solve Skin Conditions

April Armstrong leads the emerging practice of teledermatology

By Mark Couch

April Armstrong’s office on the Anschutz Medical Campus is unblemished: No stray papers scattered around, no piles of books on shelves, no computer on the desk, nothing hanging on the walls.

She shrugs off questions about it with a simple answer.

“Everything I need is in here,” she says, pulling a laptop out of the bag she totes around campus. The response is apropos for a physician who is quickly becoming a leading expert in the practice of teledermatology.

Armstrong, MD, joined the School of Medicine in 2013 as associate professor and vice chair of clinical research in the Department of Dermatology, and she has quickly made her mark with two high-profile research studies published in JAMA Dermatology.

The first tallied the annual cost of psoriasis in the United States, estimating it to be between $112 billion per year and $135 billion per year.

The other research study evaluated the use of email and online communications in treating patients with eczema, finding that online consultations for ongoing care were just as effective as in-person visits. That report quickly captured media attention with reporters hailing the “selfie” solution to a condition that affects millions of people.

The use of telemedicine is particularly crucial in locales where a shortage of physicians requires long trips for what are otherwise routine visits to the doctor’s office.

“Patients often report having to drive long distances and take time away from work and school to care for their skin,” Armstrong says.

That’s more than an inconvenience. It’s a cost to the patient and a cost to the community, so Armstrong designed a study to figure out whether digital images transmitted online would serve patients as well as regular in-office visits.

“We’re never going to give up face-to-face interactions,” Armstrong says. “It’s valuable to be in the same room, to touch. What we’re doing is diversifying the way we practice. I don’t advocate replacing the human touch.”

To compare the effectiveness of online treatment with in-office visits, Armstrong and her fellow researchers recruited 156 adults and children with eczema who lived near Sacramento, Calif., and who had access to the Internet, computers and digital cameras.

All patients saw their dermatologists in person for the initial visit. Then half of them received follow-up care in office visits while the other half sent photographs of their eczema to the dermatologist, who then recommended treatments and prescribed medications electronically.

Both groups measured the severity of eczema through a standard patient questionnaire. Higher scores indicated greater severity with a maximum possible score of 28. After a year, the patients in the online group had dropped an average of 5.1 points and the in-person group declined an average of 4.9 points.

Further, the study team assessed the photographs to determine the severity of the eczema, with scores of 0 for “clear” up to 5 for “very severe.” The team determined that 38.4 percent of the online group achieved scores of 0 or 1, compared with 43.6 percent for the in-person group.

Based on those scoring systems, the differences between the online and in-person consultations after one year were so small, they were considered nonexistent. While the patient outcomes were remarkably similar, the impact of treatment for the patients is significant.

“Skin diseases are not as well publicized as others,” Armstrong says. “It won’t kill you, but it can ruin your life.”
Preparation for Space Mission

Alumnus Kjell Lindgren on crew that launches in May

By Mark Couch

This May, Kjell Lindgren, MD '02, is set to become the only University of Colorado School of Medicine-trained astronaut in space when his mission to the International Space Station launches from Kazakhstan.

But he doesn't plan to be first-and-foremost a physician in space.

"Not every expedition has a physician as part of the crew," Lindgren says. "But all crew members are trained as 'crew medical officers' to be effective physician extenders for the flight surgeon on console in Mission Control. If there were a medical issue during my expedition, we would still work with the ground team, but I would be able to bring an additional level of expertise to the situation."

That's not to say the skills he learned in medical training won't be handy.

"I will be able to utilize my procedural skills in some human research studies—where we are the subjects—that use venipuncture, ultrasound and ocular diagnostics," Lindgren says.

Lindgren has been training since 2009 when he was selected by NASA to become an astronaut and in recent months has been focused on this specific mission.

"I was part of the backup crew in November, so from a knowledge and skills perspective, I had to be ready to fly back then," Lindgren says. "That means I'm technically proficient and qualified on all the essential duties of a space station crew member. I am ready to fly the robotic arm, be part of a spacewalk team, conduct research in our payload facilities or maintain or fix space station hardware.

"Now that I have just a few months until launch, I spend a lot of time training on the specific scientific payloads I will be working with during my mission," he says. "Every day is different. It is an intellectually and physically invigorating and challenging schedule."

Lindgren says he dreamed as a child of being an astronaut, but he also understood that few have the right stuff. To get into the two-year training program, Lindgren competed with 3,565 initial applicants. Only 113 of them got an interview and only 48 became finalists. Of those, NASA allowed only nine to enroll in training.

"While I realized that the odds were not in my favor, I kept that dream in the back of my mind as I pursued fields of study and a more down-to-Earth career that I had a passion for," Lindgren says. "I felt that medicine, particularly emergency medicine, was a great fit for me and I feel very blessed to have started that journey at the University of Colorado."

The mission launches from Baikonur Cosmodrome, Kazakhstan, on May 26th at 1:46 p.m. MDT and Lindgren expects to spend six months on the station. He will be part of the 44th and 45th missions to the space station, according to Norma Jennifer Knotts, public affairs specialist for NASA.

The time away from home for training has probably been the most difficult part of the training, Lindgren says.

"My family is amazing," he says. "This has been an incredible journey for all of us and I'm grateful that they are getting to share in all of the excitement and fun. We are all a little anxious about six months of separation, but looking forward to the adventure ahead. I'm deeply grateful for the love and support I've gotten from my family. I couldn't have done this without them."

Lindgren also credits CU with helping prepare him for his upcoming mission.

"This amazing opportunity has very little to do with what I have accomplished, but speaks volumes of the family and friends, mentors and instructors who have invested in me over the years," he says. "The professors, instructors, office staff, classmates, friends and patients I worked with at CU have helped me get where I am today."
Join your classmates for the 2015 School of Medicine Alumni Reunion, May 21-23, 2015! This year we celebrate class years ending in 0 and 5. Sit in with medical students at our medical school experience, celebrate at the Silver & Gold Banquet, and have breakfast and a tour of the growing Anschutz Medical Campus. The schedule of events can be found below. For full descriptions and to register, please visit www.medschool.ucdenver.edu/reunion.

### Thursday, May 21

**Welcome Breakfast**  
8:30 am–10 am  
Anschutz Medical Campus  
Fulginiti Pavilion for Bioethics

**Classroom Experience:**  
Renal Pathophysiology with First Year Medical Students  
10 am–11:45 am  
Anschutz Medical Campus  
Education Building 1

**1883 Society Luncheon**  
Featuring Bruce Paton, MD, “Charles Darwin: The World’s Most Productive Invalid”  
12 noon–2:30 pm  
Anschutz Medical Campus  
Health Science Library Reading Room

**Silver & Gold Banquet:**  
Honoring the Classes of 1965 and 2015  
5 pm–9 pm  
Denver Art Museum  
North Building | Ponti Hall  
5 pm Cocktail Reception  
6:30 pm Dinner and Program

### Friday, May 22

**Class of 1965 Continental Breakfast and School of Medicine Hooding and Oath Ceremony**  
8:30 am–noon  
Anschutz Medical Campus  
Education Building 2 North, Room 2301  
8:30 am–9:30 am Breakfast  
9:30 am–12 noon Hooding and Oath Ceremony

**History and Tea: A Conversation with “Dr. Colorado” and the History of the School of Medicine**  
11 am–1 pm  
Brown Palace Hotel

**Dinner and Dialogue: Cocktail Reception and Class Dinner**  
6 pm–10 pm  
Denver Country Club  
6 pm Cocktail Reception  
7 pm Dinner

### Saturday, May 23

**The Dean’s Reunion Breakfast**  
8 am–10:30 am  
Anschutz Medical Campus  
Research Complex 2, Krugman Conference Hall

**Tour of the Anschutz Medical Campus**  
10:30 am–1:30 pm  
Anschutz Medical Campus  
Research Complex 2, Krugman Conference Hall

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**BECOME A MEMBER OF THE MEDICAL ALUMNI ASSOCIATION**

The purpose of the Medical Alumni Association is to help advance and influence the interest of our alma mater, to support current medical students on their journey to becoming physicians, to provide programs and opportunities for alumni to connect with each other and the School of Medicine, and to develop a lifelong alumni experience.

We could not accomplish this mission without the generous support of our distinguished alumni.

Become a member today. Visit medschool.ucdenver.edu/alumni to support the Medical Alumni Association.

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New Medical Alumni Association Board Members

Sarah Milliken-Glabe, MD ’08

Sarah Milliken-Glabe, MD, was born and raised in Colorado Springs. After completing a degree in Marine Biology from the University of North Carolina Wilmington, she pursued a medical degree from the University of Colorado School of Medicine and graduated in 2008. Currently, she is in her seventh post-graduate year of training as a Pediatric Anesthesia Fellow at Children’s Hospital Colorado.

Linda Williams MD ’84

Linda Williams, MD received a BA in Biology and Chemistry from the University of Denver in 1981, and completed a Medical Degree in 1984 and a Family Medicine residency at the University of Colorado School of Medicine in 1989. She practiced primary care medicine in the Denver area for 20 years and was an assistant clinical professor of family medicine. Williams recently completed a second residency in psychiatry in 2011 at Harvard Medical School/Massachusetts General Hospital/McLean Psychiatric Hospital in Boston. She currently practices exclusively in the field of psychiatry and is in private practice in Highlands Ranch.

Gina Nelson, MD ’94

Gina Nelson, MD, PhD, is a Colorado native who grew up in Arvada. She graduated from the University of Colorado School of Medicine in 1994. She also was one of the first students in the Neuroscience Program and received a PhD. Her residency was at the University of Iowa and she did a fellowship in neuropathology at the University of Alabama at Birmingham. In 2009, she and her youngest son returned to the Denver area where she is a general practitioner doing mostly urgent care. She currently lives in Parker.

Nelson Prager, MD ’84

Nelson Prager, MD, is a Colorado native. He attended the University of Colorado-Boulder and received degrees in chemical engineering and biochemistry. He then went to medical school at the University of Colorado and received a medical degree in 1984. In 1993, he joined Aurora Denver Cardiology Associates. While at Aurora Denver Cardiology Associates, he was head of cardiology and chief of medicine at The Medical Center of Aurora. He also served as president and managing partner of Aurora Denver Cardiology Associates. He started cardiac electrophysiology programs in Aurora and Ft. Collins. In 2014, he joined Vail Valley Medical Center to create a new cardiac electrophysiology program. Prager currently practices in Denver, Vail and southwestern Nebraska.

Sarah B. VanScoy, MD ’89

Sarah VanScoy is a 1989 graduate of the University of Colorado School of Medicine. She completed her pediatric residency at the University of Rochester, Strong Memorial Hospital, in Rochester, NY. Upon returning to Colorado, she worked in private practice in Littleton for 13 years before moving to Kaiser Permanente in 2006. She currently practices at the Smoky Hill Medical Office where she is the Medical Office Chief.

Medical Alumni Association Adopts New Governance Structure

The Medical Alumni Association Board of Directors last fall unanimously adopted a new bylaws. The following are a few highlights:

• New goals were developed that will serve as a framework for the overall objectives of the association, including an emphasis on student programming and support, promoting a diverse, inclusive academic environment, and serving as steadfast ambassadors for the School of Medicine.

• Provisions that will allow the board to bestow honorary memberships to deserving individuals.

• Emphasis on leadership pipeline development by creating a set of officer positions—President, Vice President, and a Secretary/Treasurer with established responsibilities.

• Establishing an operational calendar with budget development, officer elections, and programmatic activities that align with the functions of the School of Medicine.

The Medical Alumni Association thanks committee members Jan Kief, MD ’82, Dennis Battock, MD ’64, Mickey Mandel, MD ’65, and William Maniatis, MD ’65, president of the alumni association.
Faculty Honored by the Institute of Medicine

Two School of Medicine faculty members have been elected to the Institute of Medicine (IOM) and another faculty member was recognized for distinguished leadership.

Dan Theodorescu, MD, PhD, director of the University of Colorado Cancer Center, and James O. Hill, executive director of the Anschutz Health and Wellness Center, were elected in October 2014.

Richard B. Johnston Jr., MD, associate dean for research development and professor of pediatrics, received the David Rall Medal honoring his leadership in vaccine safety activities on the Board of Health Promotion and Disease Prevention.

Election to the IOM is one of the highest honors in health and medicine and recognizes individuals for their outstanding professional achievements and commitment to service. New IOM members are elected by current active members through a selective process that recognizes individuals who have made major contributions to the advancement of the medical sciences, health care, and public health.

Theodorescu was recently the senior author on a paper in the journal Nature that identified Ral protein activation as a new target in the growth and spread of cancer and developed drug candidates to block its activation. This new class of drugs could have applications in lung, colon and pancreatic cancers.

Theodorescu is also the Paul Bunn Professor at the CU Cancer Center and professor of surgery and pharmacology and attending urologic oncologist at the School of Medicine.

Hill is the author of more than 500 scientific articles and book chapters in the area of obesity. Hill and Holly Wyatt, MD, were recently the authors of “State of Slim: Fix Your Metabolism and Drop 20 Pounds in 8 Weeks on the Colorado Diet,” and have been conducting State of Slim group classes at the Anschutz Health and Wellness Center.

Hill is also Anschutz Professor of Pediatrics and Medicine at the School of Medicine, and Director of the Colorado Nutrition Obesity Research Center.

Anschutz Medical Campus Economic Impact

The University of Colorado Anschutz Medical Campus continues to be a major engine of economic growth in the state, creating thousands of jobs, attracting millions in research dollars and directly contributing $2.6 billion to the Colorado economy in fiscal year 2012-13.

The university's latest economic impact reports, released last summer, showed significant growth. The Anschutz Medical Campus had a direct impact of $2.6 billion in fiscal year 2012-13, up from $2.05 billion in 2009-10. The campus also supported 21,954 jobs, compared with 17,800 jobs in 2009-10.

The campus remains a research leader. In FY 2012-13, 27 patents were granted, 114 inventions unveiled and four start-up companies launched. Last year, more than half of all licenses for campus-invented technology were given to companies in Colorado.

“The story of this university is one of perseverance, dedication and continued growth,” said Don Elliman, chancellor of the University of Colorado Anschutz Medical Campus. “We have a profound impact on our state. Our medical researchers pioneer countless new treatments, our professors are sought after experts on everything from commodities to Alzheimer’s disease and our students receive outstanding value for their tuition dollar.”

New Geriatric Center Created by Veterans Affairs

The U.S. Department of Veterans Affairs announced in October that it has awarded a Geriatrics Research, Education and Clinical Center (GRECC) to Colorado, the first such award in more than 20 years.

The GRECC will provide up to $1 million to establish programs and add 12 new staff who will improve care for the country’s veterans. The centers were started by the VA in the late 1970s, but the department has not opened a new facility devoted to research and education for aging veterans since the late 1980s.

Robert Schwartz, MD, director of the Center on Aging on the Anschutz Medical Campus and head of the Division of Geriatric Medicine at the School of Medicine, coordinated the application effort.

The research and education center will include 6,000 square feet of lab space and 800 square feet of office space inside the new VA hospital currently under construction on land adjacent to the Anschutz Medical Campus. The center will include a team of 12 researchers and staff who will conduct work on two specialized fields: gender-related healthcare and the consequences of obesity in aging adults.
“If you look at the population overall, there’s going to be a doubling of the people 65 and older between 2010 and 2030,” Schwartz told the Denver Post. “That’s a real opportunity to develop new research and clinical methods to take care of them in a resource-wise way.”

Remembering Marion Downs

Marion Downs, a longtime member of the School of Medicine faculty who was lauded as the “mother of pediatric audiology,” died in November at the age of 100.

Downs, who became CU School of Medicine’s first director of audiology in 1959, is credited with helping establish the first infant hearing screening program in the United States. Downs and her coworkers had been putting hearing aids on children as young as 1 and 2 years old in the 1960s, challenging existing assumptions about brain development.

In 1997, a study by CU Boulder researcher Christine Yoshinaga-Itano, PhD, backed up the premise that early testing helps children develop language normally and Downs’ once-radical notions became acceptable.

Downs became an audiologist almost by accident. In 1947, her three children were growing older so she decided one afternoon to sign up for classes at University of Denver. When she arrived on campus, she found line upon line filled with returning GIs from World War II. Knowing she had to be home when her children returned from school, she selected the shortest line: the new field of audiology.


Student-Run Clinic Serving Aurora Opens

The DAWN (Dedicated to Aurora’s Wellness and Needs) Clinic, a student-run free clinic that serves uninsured adults from the Aurora community every Tuesday evening, opened this spring. The clinic is offering free medical, physical therapy, and dental services. Every week, Anschutz students from the School of Medicine, Skaggs School of Pharmacy and Pharmaceutical Sciences, Colorado School of Public Health, College of Nursing, and School of Dental Medicine band together to serve their Aurora neighbors.

The clinic is housed in the Dayton Street Opportunity Center, a community resource providing education, job training, counseling, and health care resources. Both the Opportunity Center and the clinic have been a collaborative effort, created by the Fields Foundation and Primary Care Progress with partners like the Mosaic Church of Aurora.

Joseph Johnson, MD, a chief resident in internal medicine with the School of Medicine and medical director for the DAWN Clinic, says this community needs more than medication and a quick office visit.

“We’re trying to create as much opportunity in as confined an area as possible,” Johnson says. “We’re trying to give patients the skills to navigate the system and be successful in the future. We won’t just say, ‘Sorry you’re homeless, here’s some insulin that will spoil since you can’t refrigerate it.’ We can do more. In addition to addressing their immediate medical needs, we can provide housing navigation, provide healthy eating education, and establish lasting relationships that will change lives.”

Just as the clinic is run on volunteer’s time, all of the clinic’s equipment was donated by the community. Everything, from the wheelchairs and exam tables to the plastic gloves and thermometers, was donated by other primary care clinics, local physicians, and organizations like Advocates for World Health. The various schools on the Anschutz Medical Campus collectively contributed $20,000 to enable the clinic to acquire the Advocates for World Health shipment, valued at $147,000, and one local physician donated approximately $15,000 worth of equipment that could have been sold elsewhere.

Gates Biomanufacturing Facility Holds Grand Opening

In April, the Gates Center for Regenerative Medicine celebrated the grand opening of the Gates Biomanufacturing Facility, which will serve academic, clinical and commercial investigators looking to translate their laboratory discoveries into clinical-grade protein and cell-based products suitable for investigational use in humans.

The Gates Biomanufacturing Facility will be the only site within a 500-mile radius that complies with the U.S. Food and Drug Administration’s manufacturing regulations, creating a significant resource to researchers on the Anschutz Medical Campus.

The facility is an important investment in our faculty by a partnership that includes the Gates Center, the Anschutz Medical Campus, the School of Medicine, University of Colorado Health, Children’s Hospital Colorado and the Gates Frontier Fund. Diane Gates Wallach, a board member of the Gates Frontier Fund, described the fund’s support as “venture philanthropy,” a commitment of resources that seeks to spur significant growth in our community.

Dennis Roop, PhD, director of the Gates Center and professor of dermatology, says having a “Good Manufacturing Practice” site—the designation granted by the Food and Drug Administration for a manufacturing site that meets its rigid standards—is a competitive advantage for the Anschutz Medical Campus.

“Some of our young faculty who literally have developed new techniques for cell expansion—that no one else in the world has been able to do—would be lost to other institutions, because they’re driven to get (those technologies) into the clinic,” Roop explained to the Aurora Sentinel. “If we hadn’t had the promise of this facility, some of the new recruits that we’ve invested in, we would have lost.”
Listening to the Voices from the Bateyes

Student David Murphy publishes book about HIV in the Dominican Republic

By Mark Couch

In the year before David Murphy entered University of Colorado School of Medicine, he was a Fulbright Scholar in the Dominican Republic where he worked with people with HIV/AIDS.

This spring, as a fourth-year medical student with an eye on a residency in emergency medicine, he is publishing a book about the lives of the people he met while in the Dominican Republic. After Match Day in March, he returned to the Dominican Republic with 200 copies of the book to distribute at clinics where he worked and to the participants featured in the book.

The Spanish-language book, *Voices from the Bateyes: Personal histories of Persons living with HIV/AIDS (PLWHA) in the Dominican Republic*, is a compilation of oral histories from the people he met while there.

“Traditionally, a batey is a rural, company town or village housing sugar cane workers,” Murphy says. “When the sugar industry collapsed in the late 1990s, it was devastating. These are communities that were marginalized to begin with and had a tenuous grasp on social services before they lost their livelihood.”

The voices in the book are haunting. They tell stories of abuse and fear, redemption and hope.

Tami talks about leaving home at 14 and being forced to work as a prostitute, eventually becoming infected with HIV through unprotected sex. She describes returning to see a 21-year-old man who she thinks may have infected her.

“He apologized and asked me to forgive him because he was HIV positive back when he had told me it was something else,” she says. “And I had never seen such a death before, in which a person is reduced to nothing more than teeth with all their hair out and everything.”

Tami has survived and now works as an HIV community health worker. “I have many people in my care, and I have helped lift up everyone—young and old alike,” she says. “I tell people that they can retire from the street life and take care of themselves.”

“The stories are amazing, powerful, unique and provide another perspective about living with HIV,” says Therese Jones, PhD, associate director of the Center for Bioethics and Humanities. The Center’s Arts and Humanities in Healthcare Program is providing a scholarship to Murphy to help fund his publication.

The goal of the book is to reach people with HIV and AIDS to help them through the psychological process of acceptance, which is a fundamental step to successful medical treatment. There are an estimated 1,200 persons living with HIV in the Dominican province of Monte Plata, yet just 650 receive care in the province’s four HIV Units.

Murphy plans to distribute the books to clinics and health staff in the Dominican Republic, to the Provincial Ministry of Health, and the larger community, including the United Nations HIV office.

While in medical school, Murphy has continued to work internationally. Between his first and second year, Murphy spent six weeks in a public emergency department in Cape Town, South Africa, as part of the South African Emergency Medicine Foundation, led by David Richards, MD, an assistant professor of emergency medicine who practices at Denver Health. While there, Murphy delivered a baby in the field and helped treat cases of meningitis, tuberculosis, HIV/AIDS. He says he also witnessed innumerable trauma and community assault causes that “left an indelible impression of daily physical and social struggle in the townships.”

Murphy says he wants to pursue emergency medicine because it is “a field that turns no one in need away.”

“The profound relationships that I formed while conducting these interviews in the Dominican Republic taught me that the duration and frequency of interaction is less important than being fully present, caring, and cultivating trust in every encounter.”

David Murphy, who graduates from the School of Medicine in May, published a book of interviews with people he met in the Dominican Republic.

*Photo courtesy of David Murphy.*
Nurture an idea with care and perseverance and there’s no telling how it will flourish.

Fifty years ago, two professors at the then-University of Colorado Health Sciences Campus pioneered an idea for improved health care delivery to underserved communities. The educators, Loretta Ford and Henry Silver, called this new kind of nurse a “pediatric nurse practitioner.”

The profession has since blossomed and branched out to all corners of health care. In fact, according to Colorado Health Careers, nurse practitioner/clinical nurse specialist will be among the nation’s 10 fastest-growing occupations in the next decade.

When CU’s nurse practitioner (NP) program launched in 1965, Time magazine dubbed the students a “new breed of nurse.” Back then, nurse practitioners were on the front lines of health care in rural areas and gritty urban neighborhoods. They checked on babies’ health and provided vaccinations, health counseling and other disease prevention services in far-flung and underserved communities that struggled to attract physicians.

“You were the lone ranger out there,” Ford says. “You were the sanitarian, epidemiologist, the vital statistics office—everything. That was the basis for this (program). It was based on prevention and health promotion.”

Henry Kempe, MD, then-chairman of the CU School of Medicine’s pediatrics department, saw complementary skill sets in the pair of educators, as well as strong determination that would be needed to establish their innovative idea of empowering and expanding the role of nurses.

“What we were doing mainly was advancing the public health nurses’ depth and breadth in well-child care,” Ford says. “We used to run well-baby clinics all over with combinations of physicians and nurses. It was obvious there were a lot of things that nurses could or would do, and it would be satisfactory for them to run these clinics by themselves. Quite wrongly, people said we got into (the NP program) because of a shortage of physicians. It was true we didn’t have enough physicians to attend those clinics, but mainly because of the lack of physicians who were interested in working there.”

CU’s effort to extend and improve health care to all corners of Colorado got a big splash in summer 1966 when Time published a story about Susan Stearly, a graduate of the first-of-its-kind program, who was a smashing success in the small town of Trinidad as the nation’s first nurse practitioner. “Sue did a tremendous job of demonstrating the model and then, of course, we began to take in classes of nurse practitioners,” Ford says.

By 1973, more than 65 NP programs existed in the United States. Currently, according to the American Association of Nurse Practitioners, the nation has more than 192,000 NPs with specialties that include maternity, child health, geriatric, family, surgical, psychiatric and community nursing. Acute care nurse practitioner and NP roles dedicated to navigating the complex health care system are also in high demand.

In the mid-1960s, Judith Igoe was a public health graduate student at the University of Minnesota when she read the Time article about CU’s ground-breaking NP program. Igoe had already put in a stint as a public health nurse in Iowa, so she knew how valuable nurses were to rural communities. She marvels at how Silver trained Stearly to diagnose and treat basic health issues as well as provide preventative care. “It was unbelievable, because the notion that anyone but MDs doing diagnosis and treatment was not something people thought was legal.”

Igoe came to CU and enrolled in one of the first NP classes, and she immediately took to the Socratic teaching method. “We’d go to class with Dr. Silver for several hours and ask him questions, and out of that they’d figure out what kind of additional clinical experience we’d need,” she says. “Then we’d go to Denver General or other city hospitals and have mentors there.”

Silver, who went on to serve as the medical school’s longtime dean of admissions, died in 1991. Ford now lives in Florida and speaks at NP conferences. Igoe, a College of Nursing professor emeritus, went on to help develop the college’s school nurse practitioner program, teaching NP classes for 17 years before retiring in 2008.

While Igoe recalls how some negative pockets of faculty “gave Ford ulcers” in the program’s early days, “here’s where Silver and Ford excelled—the two of them are the most incredible ambassadors for new ideas that I have ever seen,” Igoe says. “They helped get physicians and faculty to realize that this new role for nurses would be great.”

Celebrating the History of Nurse Practitioners
By Chris Casey
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