

# *Creating Futures*

University of Colorado *Anschutz Medical Campus*



## *Solving the Mysteries of Head and Neck Cancer*

*University of Colorado Cancer Center*

*Head and Neck Cancer Translational Medicine Program*

Antonio Jimeno M.D., F  
Assistant Professor  
Medical Oncology



*Join us in our efforts to dramatically change the lives of head and neck cancer patients and their families.*



# A Distinctive Focus on Head and Neck Cancer

The University of Colorado Cancer Center is changing the outlook on the devastating and inadequately understood cancers of the head and neck. You can join us in our efforts to dramatically change the lives of head and neck cancer patients and their families.

Head and neck cancers (HNC), arising in the mouth, nasal passages, thyroid and throat, are the sixth most common of cancers worldwide. Although they are highly aggressive, often they are not detected before they have spread locally or to other sites. Estimates are that this year in the United States, 55,000 people will be diagnosed with HNC and 13,000 people will die from it.

The survival rate has not improved in 30 years while the incidence, especially among young people, has been increasing significantly (rising by as much as 11 percent in a year). Yet funding for HNC research, already consistently less per patient than for other types of cancer, has recently decreased by 15 percent. Consequently...

- too little is known about the biology of HNC
- there has been little improvement in early diagnosis, and treatment is still mostly limited to “one-size-fits-all,” therefore
- too many patients undergo therapies that are unreasonably intrusive and toxic, resulting in functional impairment (of eating, talking, even breathing), and physical disfigurement that adds to the emotional stress of the disease

It is time to bring HNC treatment into the 21<sup>st</sup> century and **the University of Colorado Cancer Center is the place to do it.** With collaborative efforts from multiple schools/colleges/centers at the University of Colorado, we recently recruited top-notch HNC researchers and oncologists. With this major investment, we have shown our commitment and built the momentum to change the outcome of HNC.

The Cancer Center has a multidisciplinary program of HNC experts who have developed innovative laboratory models that can reveal the biology of these cancers and lead to new approaches to treatment. In the words of one

of our scientists, “We have the ideal team—the right people and the right technology, coming to the campus at the right time. We are leading the way in defining the future management of HNC.”



**Katrina Boykin**, (front cover, above), diagnosed with cancer of the salivary glands, had run out of conventional options. After multiple chemotherapies, she came to the University of Colorado Cancer Center where Antonio Jimeno, MD, PhD, (front cover) put her on a Phase 1 study of a drug that targets cancer stem cells. For nearly a year, she has had no evidence of disease growth and is extremely hopeful for the future.

## *Patient Story: Tommy Stewart*

# The Power of Research

## *Stopping cancer in its tracks by targeting cancer stem cells*



*Tommy Stewart with nurse Janan Church at the Cancer Center.*

Tommy Stewart was diagnosed with thyroid cancer in 2004. Hopeful to find a quick resolution, he sought out the doctors on the University of Colorado Anschutz Medical Campus.

“Anybody I talk to, I refer them to Anschutz. The doctors and staff are caring and knowledgeable. It’s truly the place where you want to get your treatment,” Stewart says.

He immediately underwent surgery to remove a suspected thyroid cancer nodule. The surgeon found that the tumor had metastasized outside the thyroid gland and to a large area of the neck, including vocal cords and lymph nodes.

“The operation lasted around six hours. The surgeon did a total thyroidectomy, and in the process had to cut my left vocal cord in order to remove as much of the cancer as possible. I was subsequently diagnosed with Stage IV Papillary thyroid cancer,” Stewart says.

Following this surgery he underwent multiple treatments, surgeries and procedures, including two radioactive iodine treatments; two more operations (a central neck dissection and a left neck dissection); external beam radiation; and an interventional radiology embolization to block off the veins that were feeding the tumor.

Amazingly, the cancer continued to grow and appeared to be unstoppable.

At this point, the only option left for Stewart was a clinical trial. He enrolled in a Phase 1 study in August 2009 with doctors Antonio Jimeno and Wells Messersmith. He simply takes two pills twice a day. And so far, the results have been stunning.

“We put him on a Phase 1 study of a drug that is designed to target cancer stem cells. He went into remission after a few months, and has no evidence of disease,” says Jimeno.

In just a few months, tests had shown that the cancer had been stabilized and in some areas had disappeared. His endocrinologist, Dr. Arthur Gutierrez-Hartmann, said he’d never seen anything like it before.

Stewart says he has absolutely no side effects and feels great. As long as this continues, he will stay on the trial and the doctors will continue to study him with the hopes of bringing this therapy to others with thyroid cancer.

“I wouldn’t wish cancer on anyone, but all of my experiences at the University of Colorado Cancer Center have been nothing but positive,” Stewart says. “And the more we can support research, the more we can do to create treatments like this that really work.”

# Building on Capabilities

The University of Colorado Cancer Center (UCCC) is one of just 40 in the country—and the only one within a 900-mile radius of Denver—to have earned designation by the National Cancer Institute as a comprehensive center, with expertise in patient care, research, education and prevention.

The quality of our work is demonstrated by the nearly \$1 billion in extramural research funding the UCCC has received since its NCI designation in 1987. The impact is demonstrated by the 21,000 people we have treated since 1987. Key to the performance is an exceptional confluence of resources and commitment.

We are based at the Anschutz Medical Campus, the nation's largest and newest research, clinical and education complex and one of few in the world with the experts and technology capable of determining the genetic events that allow a cell to undergo malignant transformation. Our faculty, representing a broad range of specialties within cancer biology and treatment, work together to advance scientific discovery and apply these discoveries to clinical practice and public education about cancer awareness and prevention.

## We are ideally positioned for breakthroughs in head and neck cancer.

### Imagine a day

- when we will be able to “read” the molecular profiles of HNC tumor cells and use that information
  - for simple screening procedures to detect mutations before the cells multiply and spread
  - to create personalized therapies that are designed specifically to eradicate each patient's particular tumor cells
- when we will better understand the origins of HNC—the environmental or viral triggers—and the processes of metastatic spread, and apply our knowledge to enhanced, more proactive prevention and control

With your help, we will see that day.



# The Synergy of Teamwork

The effectiveness of the Cancer Center's HNC program relies on the talents of our comprehensive team of specialists, representing 14 disciplines, all engaged in advancing what we know and what we can do about this disease.

There are several new issues related to HNC. First, HNC is affecting a much broader population. Historically HNC was most common among older men, but today the incidence among women and individuals under 40 is rising dramatically. Second, HNC was previously associated with tobacco and alcohol use; however, cases linked to human papilloma viruses now threaten to become epidemic.

To address these issues, our HNC team is confronting several inherent challenges:

## **An incomplete understanding of the molecular causes of HNC**

Our scientists have originated two novel models of studying HNC biology: one develops tumors replicating genetic mutations commonly found in HNC, and another grows tumors surgically removed from patients. Together they provide biomarkers

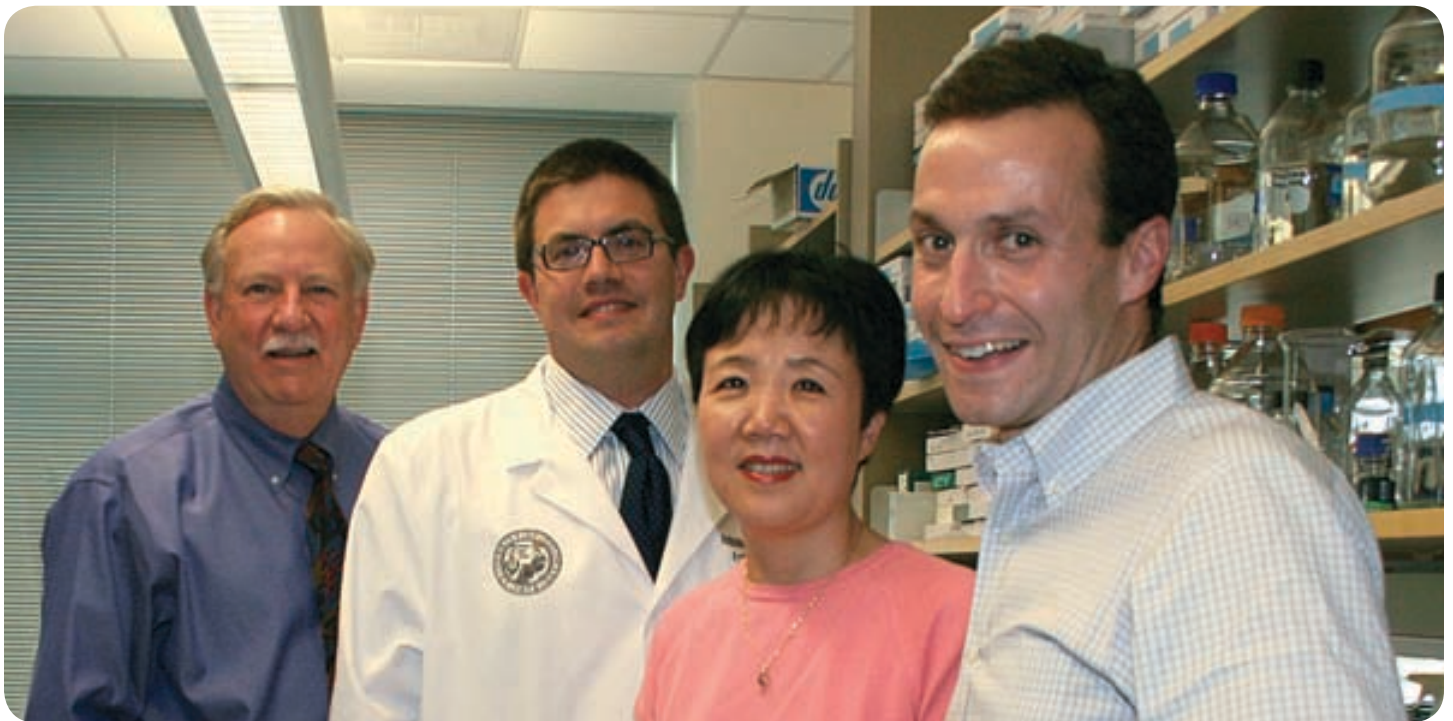
based on cancerous mutations and other molecular changes that indicate pathways to improved diagnosis and treatment. Further, direct testing of new treatments in these models brings real-time optimization treatment courses for our patients.

## **An inadequate method for disabling tumor cells without damaging healthy tissue**

Using information gathered from molecular studies, our scientists are testing new ways of combining therapies: for example, giving one or more new drugs to people undergoing radiation treatments, to assess outcomes and dosage requirements and limits. Their success will immediately help HNC patients in our clinic who will receive more effective and less disabling treatment.

## **A high rate of recurrence of HNC**

Recurrence is due in part to late-stage diagnosis and to the failure of current therapies to destroy cancer stem cells. Our scientists are affiliated with the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology, where studies are underway to identify the properties of these cancer-initiating cells. By learning how to recognize and isolate them, we can learn how to attack them.



*The HNC Stem Cell Research Team: Dennis Roop, PhD; Antonio Jimeno, MD, PhD; Xiao-Jing Wang, MD, PhD; Yosef Refaeli, PhD.*



*A weekly HNC tumor board meeting.*

In all these activities, our scientists collaborate to bring knowledge from the laboratory to the bedside and insights from patient outcomes back to the laboratory. Accelerating the transition from discovery to application, they ensure that our patients have access to the newest treatments.

Leveraging their expertise and productivity, they are resources for other professionals and for the public, influencing science and practice locally, nationally, and internationally.

The linchpin of the program is our multidisciplinary clinic, a leader in reshaping management of HNC care. Medical, surgical and radiation oncologists, dermatologists, otolaryngologists, pathologists, dentists, oncology nurses and nutrition and rehabilitation specialists are in constant partnership and communication to evaluate patients and develop and support personalized treatment plans.



*Xiao-Jing Wang, MD, PhD*

*"I'm a firm believer in being a catalyst. Dr. Dennis Roop's assessment was that Dr. Xiao-Jing Wang was one of the top head and neck cancer researchers, possibly the best in the country. I told him we'd find a way to get her here. When special opportunities come up, you have to grab them. Dr. Wang is a great example of an outstanding scientist."*

**Diane Gates Wallach**

Co-Trustee of the Gates Frontiers Fund, which established the Charles C. Gates Regenerative Medicine and Stem Cell Biology Program with the largest gift ever to the School of Medicine



## Opening the door to the future

With your help, contributions will ensure the personnel, facilities, equipment and supplies to:

### **Speed the progress of basic and translational research**

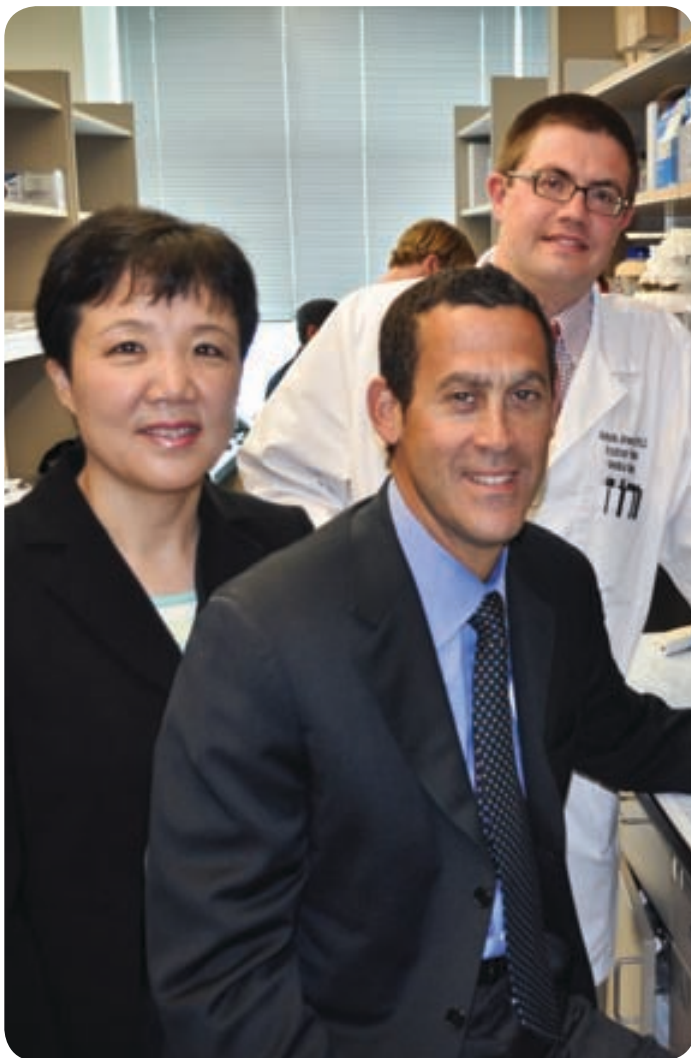
Knowledge about HNC genetics and biology is the foundation for developing innovative approaches for earlier diagnosis, new therapies and the testing of laboratory discoveries in clinical trials.

Investment will enable us to ramp up our research program and more rapidly translate these findings into clinical trials.

### **Improve our capacity to serve patients**

Our image-guided technology delivers some of the most advanced radiation therapy in the region. Our laboratory capabilities have made it possible for us to bring emerging and personalized therapies to our patients (such as analyzing tumor tissue and testing interventions while patients recover from surgery) in real time.

Investment will enable us to acquire new software that further minimizes radiation exposure to normal tissue; increase the collection, cataloging and storage of tumor tissue essential for accurate and efficient delivery of care; and ensure the primary and follow-up support patients and families need to cope with HNC treatment and follow-up care.



*Xiao-Jing Wang, MD, PhD; David Raben, MD;  
Antonio Jimeno, MD, PhD*

# “The Cancer Center Made a Difference for Me.”

“I’ve been really lucky,” says Kevin Getz. “I’m really grateful the Anschutz Medical Campus is around and that they recruited Dr. Song.”

Nine years ago, Getz was diagnosed with an invasive squamous cell carcinoma on his tongue. After having surgery to remove it in a local hospital, he had a recurrence. Friends recommended the University of Colorado Cancer Center. John Song, MD, removed the cancer, and seven years later, Getz is still cancer-free.

“I think the Cancer Center made a difference for me,” said Getz. “Dr. Song has top-of-the-line staff, he’s at a top-of-the-line hospital, and everything I experienced was certainly top-of-the-line and patient-friendly.” And best of all, Getz says that whenever he visits Dr. Song, he always seems very concerned and genuinely interested in his health and recovery.



Kevin Getz

## Reduce the incidence and impact of head and neck cancer

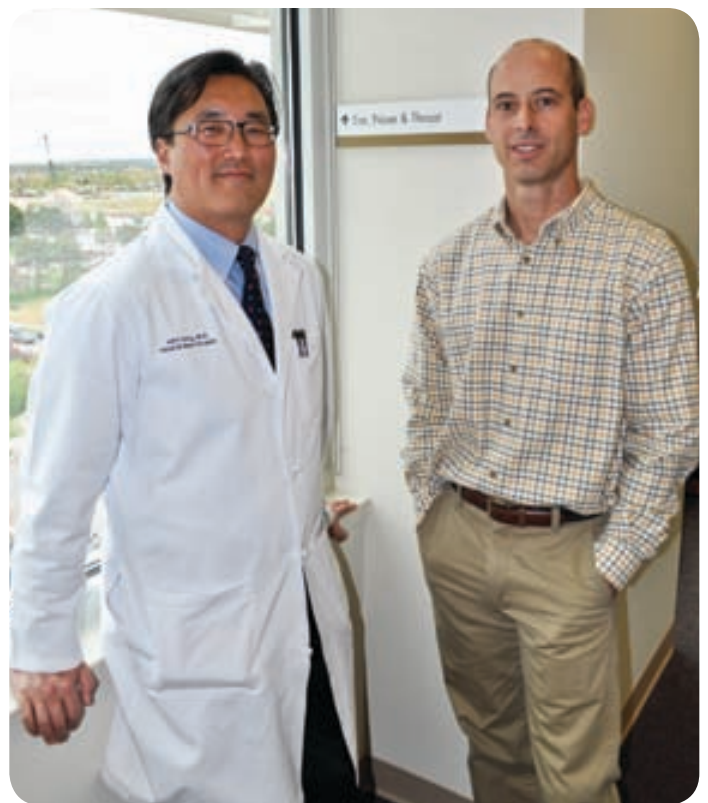
Our research is yielding important insights into better ways to screen people at risk for HNC, diagnose HNC earlier, even prevent the occurrence of HNC.

Investment will enable us to dedicate more resources to these activities and raise community awareness about HNC.

## Educate the next generation of specialists

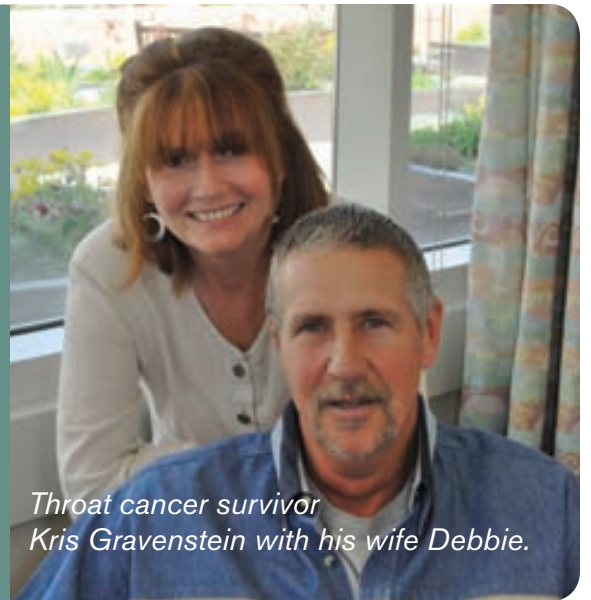
The University of Colorado is noted for its exemplary training of health professionals and basic scientists. The Cancer Center professionals are among the best in the world, and top students dedicated to careers in cancer care and research are attracted by the prospect of learning from them.

Investment will enable us to increase the scholarships and fellowships available to recruit the brightest individuals to be trained as the next generation of HNC researchers and specialists.



John Song, MD, and Kevin Getz

## The return on your investment



*Throat cancer survivor  
Kris Gravenstein with his wife Debbie.*



- We treat patients with all types and stages of head and neck cancer, from all states in the Rocky Mountain region, and frequently on referral from many other states.
- Our faculty members serve on national committees that determine the standards of care for patients throughout the world.

We are poised to take our capacity and capabilities to still higher levels. Your investment at this time, in this place, will make it possible.

The Head and Neck Cancer Program at the University of Colorado is a center of excellence that has impact within and far beyond our community.

- The specialists are nationally and internationally recognized for leadership in basic, translational and clinical science.
- Our HNC and related research has received \$33 million in extramural funding, including two challenge grants of \$1.87 million awarded against intense national competition, and a \$275,000 grant from the Department of Defense. A significant proportion of the research supported by these funds was initiated with \$30,000 in seed funding from a private donor with the goal of developing a model for studying cancer stem cells isolated from a patient's own tumor.



## Vora Brothers Give Back in Honor of Their Father



*Rahool and Kuntal Vora with David Raben, MD*

Kuntal and Rahool Vora saw their father Naren suffer from head and neck cancer for several years, and ultimately succumb to the disease. “We saw the blanket approach to medicine that other hospitals in town used in dad’s treatment, and we watched him deteriorate before our eyes,” says Rahool.

“We believe we got to the University of Colorado Cancer Center a year too late,” says Kuntal. “Chances are, if we had come here from the beginning, our dad would be here today.”

Naren Vora received treatment from several hospitals before coming to UCCC and receiving care from radiation oncologist David Raben, MD. The difference was staggering. As soon as Dr. Raben entered the room, he seemed to know what was bothering Naren, what he had been through, what steps had been taken and what he wanted to do next.

“He exuded an air of confidence that made us feel at ease,” says Rahool.

Besides the advanced, personalized medicine, both men note that it was the little things at the Cancer Center that made a difference to their family. They recall that Dr. Raben remembered small details from past appointments and brought them up at subsequent meetings. They would receive emails from Dr. Raben at 5 a.m. about results of scans and more.

After witnessing the horrible toll the disease took on their father, Kuntal and Rahool have dedicated themselves to eradicating the suffering for others who are struck with this cancer.

“We are very interested in the approach of personalized medicine... now they are able to use DNA markers to identify what might work,” says Rahool.

Their goal is to make sure other people don’t have to suffer like their father. To date, they have pledged \$50,000 to support research and have set a goal to raise much more. Every year, they organize the Heads Up for Head and Neck Cancer Golf Tournament in their father’s name to raise money for research.

The brothers want to see their father’s name live in perpetuity by naming various locations across the Anschutz Medical Campus. They’ve already made a start with a plaque in Naren Vora’s honor in one of the laboratories in the Cancer Center.

“After dad’s treatment, we wanted to be a part of what they are doing here at the Cancer Center,” says Rahool. Kuntal adds, “Dad’s motto was always, ‘Don’t talk, take action,’ and we’re trying to do just that.”



*The HNC Clinical Research Team. At the Cancer Center, researchers, clinicians and caregivers all come together for the best possible patient care and to advance research in head and neck cancer.*

To learn about the many ways you can make a gift:

**Contact:**

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