Duke Comprehensive Cancer Center

notes

A Comprehensive
Cancer Center
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National Cancer Institute

SUMMER/FALL 2009

Tisch Family Adds $4M to Initial $10 Million Gift to Fund Brain Tumor Research

Fund to support work at Duke Comprehensive Cancer Center and Preston Robert Tisch Brain Tumor Center

The family of Preston Robert Tisch continued its commitment to the Duke Comprehensive Cancer Center and The Preston Robert Tisch Brain Tumor Center at Duke with an additional $4 million gift. This is the second multi-million dollar gift from the Tisch family, who provided a donation of $10 million in 2005 to honor him. Tisch, who was chairman of Loews Corporation and co-owner of the New York Giants, was treated for a brain tumor at Duke. He passed away in late 2005.

The $10 million donation was the single largest gift ever received by the Duke Comprehensive Cancer Center. In recognition of the gift, the Brain Tumor Center at Duke was renamed The Preston Robert Tisch Brain Tumor Center at Duke.

Preston Robert Tisch's children (left to right) Jonathan, Steven, and Laurie join Henry Friedman, MD, deputy director of The Preston Robert Tisch Brain Tumor Center, and their mother Joan at the dedication of The Preston Robert Tisch Brain Tumor Center in 2005.

"The ongoing support from the Tisch family has been absolutely essential in our efforts to continue our search for a cure for this devastating disease," says Darell Bigner, MD, PhD, director of The Preston Robert Tisch Brain Tumor Center. "There is a relatively small market for brain tumor drugs, so many pharmaceutical companies are not interested in supporting the development of treatments for the disease unless they know the treatments are effective. Similarly, it's difficult to obtain federal funding to support our research until we have shown new therapies are effective. At Duke, we have and continue to make great progress because of support for innovative research from the Tisch family and so many others."

> "At Duke, we have and continue to make great progress because of support for innovative research from the Tisch family and so many others."
>
> — **Darell Bigner, MD, PhD**

A portion of the initial $10 million gift was used by Duke researcher John Sampson, MD, PhD, to support his work developing a vaccine which has proven initially successful at staving off recurrence of glioblastoma multiforme (GBM) tumors and has more than doubled survival in GBM patients compared to historic controls. A phase III clinical trial of the vaccine is now open at more than 20 sites nationwide, led by Sampson.

Duke researchers also used Tisch funds to support preclinical research to study the drug Avastin for use in brain tumor patients. Avastin has already been proven successful in treating colon cancer. In a Duke-led multi-institutional clinical trial, researchers James Vredenburgh, MD, and Henry Friedman, MD, showed that Avastin is also effective for the treatment of brain tumors. In May 2009, Avastin was approved by the FDA for the treatment of glioblastoma. It is the first new treatment approved for the

continued on page **2**

U.S.News & World Report
usnews.com
America's Best Hospitals
2009-10

Duke Ranks Among Best in Cancer Care

Duke University Hospital has been named one of the top 10 hospitals in the nation for cancer care by *U.S.News & World Report*. More than 900 hospitals were included in the survey. In the 2009-10 report released in July, Duke ranked ninth nationally and number one among hospitals in the Southeast. Duke is the only hospital in North Carolina ranked in the top 10 for cancer care.

In addition, Duke Hospital tied for 10th place among all hospitals nationally and ranked among the top 10 in eight of the 16 specialties measured, including cancer. Rankings for individual specialties follow:

Cancer	#9
Endocrinology	#22
Gastroenterology	#17
Geriatrics	#5
Gynecology	#4
Heart/Heart Surgery	#8
Kidney Disease	#11
Neurology and Neurosurgery	#18
Ophthalmology	#7
Orthopaedics	#6
Psychiatry	#13
Respiratory Disease/Pulmonary	#6
Rheumatology	#17
Urology	#6

Duke Comprehensive Cancer Center

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from the director

Duke's Commitment to Cancer Research and Care Never Stronger

Dear Friends,

The commitment to cancer research and care has never been stronger at Duke. Leaders from the Duke University Health System and the School of Medicine have demonstrated that cancer is a top priority. Commitments of resources and support have been made to ensure that the Duke Comprehensive Cancer Center continues to be one of the premier cancer centers in the world.

At Duke, we have been encouraged by emerging scientific advances and the increasing pace of development of novel cancer therapies. We have taken steps to optimize the alignment of cancer research and care to ensure that every patient receives the most advanced treatment possible.

There continues to be a dramatic increase in new knowledge. Genomics, genomic profiling, and personalized medicine have opened up new opportunities. Scientists at Duke have significant expertise in these important areas and have and continue to build on these strengths for the future.

The commitment to multidisciplinary and integrated approaches to research and patient care at Duke is evident. As an entity with a broad diversity of members whose interests cut across many disciplines, the Cancer Center is positioned to support and expand these multidisciplinary approaches. At Duke, we are working to ensure that there are strong links among basic research, clinical research, and clinical care.

With the change in federal government administration has come an increased focus on science and support for research. It is anticipated that government support for research will be increased and resources will grow over the next several years. At the same time, however, the current economic situation places stress on universities and other institutions. The ability to attract and support research funding, both public and private, will continue to be of critical importance to the Cancer Center.

This is an unprecedented time of growth and progress in cancer research and care at Duke, and I want to thank each of you for your ongoing commitment to our success and for your support of our endeavors.

Sincerely,

H. Kim Lyerly, MD
Director, Duke Comprehensive Cancer Center

TISCH

Continued from Page **1**

treatment of glioblastoma in more than a decade.

In addition, Duke has used Tisch funds to recruit outstanding young researchers like Chay Kuo, MD, PhD. Kuo was honored this year with numerous awards including the Director's New Innovator Award from the National Institutes of Health and the Distinguished Scientist Award from the Sontag Foundation for his research of stem cells and their role in brain tumors.

The Tisch family's most recent $4 million donation will be equally divided between clinical and laboratory research initiatives focusing on new treatments for brain tumors.

Duke plans to invest a portion of this most recent gift in genomics research aimed at developing individualized approaches to treating brain tumors using a patient's genomic signatures. Duke is a world leader in using genomic profiling to administer personalized care to patients and is already conducting clinical trials for patients with breast, lung, and prostate cancers using this innovative approach to treatment.

The Preston Robert Tisch Brain Tumor Center at Duke

at Duke . . . there is Hope

FAST FACTS

- The Preston Robert Tisch Brain Tumor Center at Duke, established in 1937, is one of the longest-standing brain tumor research and clinical programs in the United States.
- At Duke, more than 250 physicians, scientists, health care providers, and researchers are dedicated solely to researching and treating people with brain tumors.
- The Preston Robert Tisch Brain Tumor Center at Duke is recognized by the National Institutes of Health as a leader in the research and treatment of brain tumors.
- The progress of more than 2,000 Duke patients with brain tumors all over the world are followed by physicians at The Preston Robert Tisch Brain Tumor Center.
- At The Preston Robert Tisch Brain Tumor Center at Duke, more than 66 percent of adult brain tumor patients participate in a clinical trial. Fewer than 8 percent of adult brain tumor patients nationwide are enrolled in clinical trials. Seventy-five percent of Duke's pediatric patients are enrolled in clinical trials.
- Duke is one of the 10 medical centers involved in the National Cancer Institute (NCI) Pediatric Brain Tumor Consortium, which evaluates promising new treatments to help speed the development of innovative, technically challenging therapies.
- Patients at The Preston Robert Tisch Brain Tumor Center can use hands-on learning tools for all ages at the nationally acclaimed Learning Center to help understand diagnosis, treatment, and related issues.

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Newly Discovered Gene Could Be Prime Target in the Most Lethal Brain Cancer

Scientists at Duke University Medical Center and Johns Hopkins University have discovered mutations in two genes that could become immediate diagnostic markers and potential therapeutic targets in malignant glioma, a dangerous class of brain tumors.

"I can say this is one of the most important and surprising discoveries in genetic studies on malignant gliomas in the past 10 years," says Hai Yan, MD, PhD, lead author and member of the Duke Comprehensive Cancer Center.

As a most prevalent and specific alteration, isocitrate dehydrogenase 1 (IDH) genetic mutations are possible targets for molecular therapies, says Yan. The findings were published in the *New England Journal of Medicine*.

The researchers found the IDH genetic mutation in several different stages of glioma development. "The results suggested that the IDH mutations are the earliest genetic changes that start glioma progression," says Darell Bigner, MD, PhD, a co-author and director of The Preston Robert Tisch Brain Tumor Center at Duke.

"All glioblastoma multiformes (GBMs) are basically considered the same and are treated in the same way," Yan says. "Our studies clearly demonstrate that we need to start thinking about them as different. It is entirely possible that treatments that work for the IDH-mutation subtype would not work for the rest of GBMs, or vice versa." Knowing the tumor subtype has significant implications for how we plan future clinical trials for patients with GBMs, he added.

Hai Yan, MD, PhD

Funding came from the Pediatric Brain Tumor Foundation Institute, a Damon Runyon Foundation Scholar Award, a grant from the Southeastern Brain Tumor Foundation, Alex's Lemonade Stand Foundation, a grant from The V Foundation for Cancer Research, the Virginia and D.K. Ludwig Fund for Cancer Research, the Pew Charitable Trusts, the American Brain Tumor Association, the Brain Tumor Research Fund at Johns Hopkins, grants from Beckman Coulter, grants from the Accelerate Brain Cancer Cure Foundation, and several National Institutes of Health grants.

Researchers Fight Pancreatic Cancer at the Most Basic Level

Duke researcher Gerry Blobe, MD, PhD, and his team of researchers have made a novel connection between bone morphogenetic proteins (BMPs) and pancreatic cancer. This discovery may lead researchers to create therapies that target BMP. "If we can inhibit the activity of this pathway, we may be able to treat patients with pancreatic cancer more effectively," says Blobe.

This research was published in the journal *Carcinogenesis*.

BMPs belong to a family of proteins known as the transforming growth factor beta (TGF-β) superfamily. TGF-β superfamily members have both tumor-suppressing and tumor-promoting functions. In addition, they function through different mechanisms in different human cancers. For example, although the BMP pathway is sometimes inactivated in colon cancer, Blobe and his team found that this pathway was overly active in pancreatic cancer. Blobe and his team are investigating how TGF-β superfamily members carry out these disparate functions with the hope that this knowledge will increase their ability to target these pathways.

Blobe also has begun work with Duke researchers Herb Hurwitz, MD, and Andrew Nixon, PhD, to study the blood of pancreatic cancer patients for components of TGF-β superfamily signaling pathways. They hope to create early diagnostic or prognostic tools that are currently lacking for pancreatic cancer.

> "If we can inhibit the activity of this pathway, we may be able to treat the patients with pancreatic cancer more effectively."
>
> — **Gerry Blobe, MD, PhD**

These physician-scientists are collecting blood specimens and plan to review, among other factors, the TGF-β and BMP levels in the plasma of patients both before and after their treatments to determine if there is a correlation between these levels and the aggressiveness of their disease or their chances of responding to therapy. The team received a $2.7 million grant from the National Cancer Institute to conduct this research. Their hope is that by studying pancreatic cancer in the lab, in animal models, and using specimens from human patients with the disease, they will gain the insights needed to make progress in the prevention, early detection, and more effective therapy for pancreatic cancer.

Hope at Duke

By Carolyn Haines
Colon Cancer Patient

When I was 26, doctors told me I wouldn't be able to have children due to endometriosis. But now at age 38, I have two beautiful, healthy daughters: Olivia and Isabell, ages six and four.

In August 2008, I was diagnosed with stage IV colon cancer that had metastasized to my liver. The five-year survival rate at this stage is less than 8 percent. There are, however, survivors, and there is no reason I can't prove medicine wrong again.

The month before I was diagnosed, I had extreme cramping in my abdomen. I went to my general practitioner two times. After many tests, my physician still couldn't tell me the cause.

I decided to go to a gastroenterologist. After getting a CT scan, the doctor called me to tell me the news. I was completely speechless. I knew I had some medical problem, but I didn't think I would have stage IV cancer!

My first reaction was to think about my children. Would I be able to raise them? I have an incredible husband, Stephen, and friends and family who can help raise my girls, but I want to be there too.

I asked my gastroenterologist to refer me to Duke because of its national reputation for cancer research and treatment. I am now treated by Dr. Hope Uronis. Her name is appropriate—she certainly has given me hope.

Dr. Uronis started me on a standard chemotherapy regimen in September 2008. I drive nearly an hour every other Monday from my home in Holly Springs, North Carolina, to receive chemo. Several other days a week, I go to Duke Integrative Medicine which is just down the road from the clinics, for among other things, accupuncture, yoga, and nutritional counseling. I really believe that traditional, Western medicine needs to be combined with complementary medicine to fully heal the mind, body, and spirit.

Before getting treatment, there were several tumors on my liver that were around eight centimeters, and my liver was twice its normal size. Now, the largest tumor is one centimeter, and my liver is back to the normal size. In the beginning, my carcinoembryonic antigen (CEA)—a tumor marker—was 8,100. My CEA is now down to seven, just above the normal range. It's so inspiring to see the scans and how much the tumors have been reduced.


Isabell, Stephen, Olivia, and Carolyn Haines with Hope Uronis, MD, MHS.

I am very hopeful. I'm doing so well with the first-line treatment, and even if this stops working, I know there are other types of chemo and targeted treatments that may help.

Dr. Uronis is amazing. She is so easy to communicate with. And she has gone out of her way to help me.

I have an incredibly supportive family too. Family members come from out of town to help out with the children and the house during the week that I'm on chemo. I'm fortunate to have them, especially since they have to leave their own families to help out. And Stephen, who works from 6 a.m. to 6 p.m., always has the energy to get the children ready for bed and then do whatever housework is needed.

During the chemo weeks, I can be very tired and am not hungry. That's why I'm so grateful for all the help I get. We have been candid with our children about the disease as they can clearly see that their lives are different. But, as they are young, they obviously do not understand a lot of what's going on.

An important piece of advice for any cancer patient is to learn as much as you can about the disease. I've spent a lot of time understanding colon cancer and see that there's a lot of great research going on at Duke and elsewhere. The research has made me very optimistic. My hope is that the next generation will not worry much about cancer because of vaccines that may prevent the disease and treatments that will keep them at bay.

Before being diagnosed, I had a small private psychology practice. I've had to go on disability since I am not able to give my patients the care they deserve right now. However, I'm still reading the psychology journals and want to go back to work.

While I have lost weight, I have not lost my hair. I do not look sick and people are surprised to learn about my disease. I also do not have pain anymore. On non-chemo weeks, I feel almost normal. We plan to go on vacation this summer to the Outer Banks of North Carolina with our extended families, something I did not think I would be able to do even a few months ago.

I have a great family and a great life. I'm still madly in love with Stephen, whom I have been with for 17 years. Despite this diagnosis, I still feel incredibly fortunate.

AT DUKE

By Hope Uronis, MD, MHS
Medical Oncologist

While in college at the State University of New York–Fredonia, I was definitely a "library rat." I would get up at 6:00 in the morning and go to the library to study.

I was interested in science but was not sure if I wanted to go the PhD route and become a researcher or get an MD to work with patients. I started volunteering in the pediatric oncology wing of a local cancer center, which was an amazing experience for me and one of the reasons I decided to apply to medical school.

At the University at Buffalo School of Medicine, I was even more focused, this time waking up around 5:00 a.m. Nonetheless, I almost quit medical school after my second year because I was tired of being in the classroom. I wanted to work with patients.

Once I began clinical rotations visiting patients, I loved my work. I enjoyed working with all of the patients and even volunteered to do extra assignments with patients.

Carolyn Haines during a routine examination with her oncologist Hope Uronis, MD, MHS.

During my hematology rotation, I had a great mentor who showed me the importance of proper communication with patients and how much of an impact that can have. In addition, I witnessed firsthand the type of relationship an oncologist can have with patients and their families.

After medical school, I completed my residency and fellowship at Duke. I worked with Dr. Amy Abernethy on palliative care research projects that focused on pain, nausea, and other problems that can be caused by cancer or its treatments. During this time, I learned how important it is to treat not just the cancer—the disease—but the whole patient and his or her emotional and spiritual needs as well.

I want to defeat the cancer, but I don't want the patient to suffer during the process. Sometimes it's not easy, but I work with each patient to try and accomplish this.

My goal is to balance controlling the disease while ensuring the patient has a good quality of life.

When I began my fellowship, I still didn't know exactly what type of oncology I wanted to practice. At first, liquid tumors seemed interesting. I spoke with Dr. Johanna Bendell, a former Duke oncologist specializing in gastrointestinal (GI) cancers such as cancers of the colon, rectum, stomach, and pancreas, and spent time working with her. I realized that I was interested in treating GI cancers.

Today, I work with Duke's gastrointestinal multidisciplinary team. Our team is composed of medical oncologists, surgeons, radiation oncologists, physician assistants, nurse practitioners, and nurses.

My time is divided between seeing patients and conducting research.

My favorite part of being an oncologist is taking care of patients. I love learning about patients and their families, and feel privileged to become part of their lives. I have a motto: I work on "one speed—as long as it takes to see the patient." I try not to look at my watch, and I spend as much time as needed with each patient and family.

I also spend a lot of my time working on different clinical trials, including phase I trials for all types of cancer and several phase II trials on new drugs or new combinations of drugs for GI cancers.

I spend my free time with my husband and our nearly four-year-old daughter and one-year-old son. Our daughter already talks about wanting to be a doctor!

> "Once I began clinical rotations visiting patients, I loved my work. I enjoyed working with all of the patients and even volunteered to do extra assignments with patients."
>
> — **Hope Uronis, MD, MHS**

Cancer survivors Carolyn Koncal (left) and Rebecca Jester (right), along with social worker Laurie Howlett, MSW

New Group Offers Support for Young Adult Cancer Survivors

Twenty-year-old Rebecca Jester is a student at the University of North Carolina and a care provider for a nonprofit organization that helps individuals with developmental disabilities. She is also a cancer survivor.

Jester was diagnosed with leukemia in 2003 and completed treatment nearly four years ago. In addition to the physical toll that cancer brings, there is also an emotional toll, explains Jester. Unfortunately, while there are a number of support groups for adult patients and some for children, there is little in the way of helping patients in between.

In September 2008, with funding from Kids Care—part of the Children's Miracle Network—Jennifer Walker, MD, a pediatric hematology-oncology fellow, and Laurie Howlett, MSW, a social worker, created a monthly support group at Duke for cancer patients and survivors ages 15-30.

"The group helped me work through pent-up anger that I had towards some of my family members as well as resentment that I felt for some of my friends," says Jester. "It also helped me realize that I was not the only one who had these feelings and they are completely normal."

Howlett says that one of the important aspects of the program is to show the survivors that they are not alone—that others are going through similar situations.

Both Walker and Howlett are happy that the young adults feel comfortable sharing their stories. During the meetings, the young adults talk to their peers about their experiences with cancer. Guest speakers, such as Seema Desai, a Duke nutritionist, talk to the group as well.

> "The group helped me work through pent-up anger that I had towards some of my family members as well as resentment that I felt for some of my friends."
>
> — Rebecca Jester

Carolyn Koncal, at age 29, is one of the older members of the group. Diagnosed with leukemia 15 years ago, she acts as a mentor to the younger patients.

There are very few support programs of this kind available, so patients have come from all over North Carolina as well as parts of Virginia and South Carolina to attend. "This transitional age group is one that's often overlooked, and Dr. Walker and Ms. Howlett's efforts to support this group of individuals fills a significant void," says Dan Wechsler, MD, PhD, chief of pediatric hematology-oncology at Duke.

Often the parents of some of the group members would sit in the lobby while the support group was taking place. Now, a new support group for those parents has been created by Anne Kosem, MSW, and takes place at the same time.

Both groups meet the first Thursday of each month at Duke Children's Hospital. For more information, call 919-684-3401.

Resource Center in New Convenient Location; Offers More Resources for Patients

A new Cancer Patient and Family Resource Center has opened at Duke and is now conveniently located just inside the Morris Cancer Clinic entrance. The center offers a comfortable place for reading, a work area with a small meeting space, and a computer for patient use. Patients and family members can find information on cancer prevention, early detection, disease-specific cancers, treatments, side effects, nutrition, research and clinical trials, complementary therapies, support, emotional care, children's concerns, and end-of-life care.

The Resource Center is very easy to find, and is open 8 a.m. to 4 p.m., Monday through Friday. "Our mission is to provide comprehensive information for patients and family members throughout their cancer journey," explains Holly D'Addurno, who was named the resource center's director in 2008. "We have increased our collection of resources that are available for patients and their families."

Trained volunteers are available to help patients locate the information they need, including online resources. "We believe informed patients can better participate in their care," D'Addurno says. "We have also expanded our collection of information for Spanish-speaking patients.

The Duke Cancer Support Program's Self-Image Boutique is also located within the center. The boutique offers wigs, hats, turbans, and other self-image items at no charge to patients going through treatment. Specially trained volunteers are on hand to assist patients with self-image products.

At the Patient Resource Center, volunteers and staff can help you:

- Find information about a specific cancer
- Learn about new treatments and clinical trials
- Get information to help you manage your side effects
- Use reference materials to answer your questions
- Connect with support groups or counseling services
- Find services to meet your needs
- Check out educational books and audio and video tapes
- Find community resources where you live

Volunteering: The resource center is staffed by volunteers. For more information about becoming a resource center volunteer, contact:

Holly D'Addurno, MLS
919-613-6275
holly.daddurno@duke.edu

A Fund Is Created to Honor a Final Wish and Fulfill a Vision

In January of 2003, Ketan R. Bulsara, MD, then chief resident in the division of neurosurgery at Duke University Medical Center, received a phone call from his father. The news was not good. The results of an MRI indicated that his brother, Vinesh, needed immediate medical care. Vinesh had been diagnosed with osteosarcoma—a rare cancer of the bones. "There was no doubt in my mind that Duke had the best possible team to treat my brother," says Dr. Bulsara.

Vinesh Ramanlal Bulsara was born on July 15, 1974, to Ramanlal and Kanchan Bulsara. He immigrated to the United States from Zambia in 1983. At a young age, he demonstrated an amazing focus and work ethic, leading him to be the youngest graduate of the Charlotte-Mecklenburg school system at age 15. Vinesh received a bachelor of science degree from UNC Charlotte. At the young age of 34, he was on track to become one of the youngest, if not the youngest, partners at PricewaterhouseCoopers.

Then came the diagnosis of cancer. Vinesh began treatment at Duke in 2003 under the care of medical oncologist Jon Gockerman, MD, and surgeon Brian Brigman, MD, PhD. His pneumonectomies (surgical removal of lung) were performed by surgical oncologist Tommy D'Amico, MD. Throughout his treatment, Vinesh continued to work at PricewaterhouseCoopers, reaching significant career milestones. Despite a valiant five-year battle, Vinesh died on December 30, 2008.

"Vinesh fought his disease with the fundamental qualities with which he lived life," says Dr. Bulsara, now the attending neurovascular and skull-base neurosurgeon at Yale-New Haven Medical Center. "He never gave up his relentless passion for doing the right thing, no matter what the consequences. He never let his disease control his life but rather led life with passion pulling his disease along with him."

Knowing the odds were against him in his final days, Vinesh wanted to ensure that his fight against osteosarcoma, like that of others he had come to know, would continue without wavering. To that extent, Vinesh entrusted his family with his resources and desire for a better tomorrow for those who would face diseases like his in the future. To fulfill his wish, his family established the Vinesh Ramanlal Bulsara Sarcoma Research Fund to support Duke researchers and oncologists. An annual Vinesh Ramanlal Bulsara lecture is also being established.

"If my mind can conceive it, and my heart can believe it, I know I can achieve it."

— **Vinesh Ramanlal Bulsara**

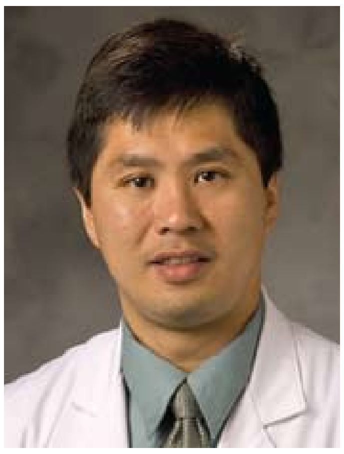
"If you walk around any hospital, you realize that the status quo isn't good enough. We need to know more about so many devastating diseases," says Dr. Bulsara. "My brother always looked to the future. He never accepted the status quo and truly believed that the day to come could be better than the day past. The vision of this fund is to provide researchers at Duke with the support they need to explore innovative ideas to challenge the status quo, in hopes that they will make breakthroughs—in particular in sarcoma treatment."

"We are extremely grateful to Ketan and his family for their generosity," says Kevin Sowers, chief executive officer of Duke University Hospital. "This fund in honor of Vinesh will be a wonderful legacy and will enable our researchers and clinicians at Duke to continue to push the boundaries in order to develop and provide new therapies and outstanding care to each and every patient."

Golfers Against Cancer Supports Duke Researchers

During its first four years of existence, the Triad North Carolina chapter of Golfers Against Cancer (GAC) has donated $214,000 to support cancer research at Duke.

"One of our goals is to provide seed money that will help the scientists obtain additional, larger grants from the NIH (National Institutes of Health)," says Gordon Cole, a member of the board of directors for the Triad GAC chapter. Cole is a nearly six-year survivor of metastatic stage IV colorectal cancer and a Duke patient.



S. David Hsu, MD, PhD

"One of our goals is to provide seed money that will help the scientists obtain additional, larger grants from the NIH."

— **Gordon Cole, GAC Member**

Duke physician-researcher S. David Hsu, MD, PhD, received funding from the organization in 2008 and most recently in 2009 to support his study of the biology of metastatic colorectal cancer using genomics. Hsu's goal is to develop new therapies to treat colorectal cancer. The GAC has requested Hsu's support in 2009 be recognized as the Charles Scott Research Fund to honor Scott, whose family has been very supportive of the GAC and who was a Duke patient.

Also receiving funding in 2009 was Tannishtha Reya, PhD, for her research on chronic myelogenous leukemia.

Rob Wechsler-Reya, PhD, received funding in 2007 and 2008 to support his research related to cancer stem cells and a type of brain tumor called medulloblastoma. Wechsler-Reya found that a stem cell marker known as CD15+, when placed in mice, causes a brain tumor. With other Duke researchers, he plans to test therapies that target CD15+. Wechsler-Reya published his discoveries in the journal *Cancer Cell*, and used the findings to secure a major grant from the National Cancer Institute.

Michael Morse, MD, was one of the first researchers at Duke to benefit from GAC funding. In 2006, he received funds that allowed him to expand a clinical trial testing two vaccines for colorectal cancer. "This funding was crucial to our work. This study is providing data to support our application for additional funding from the NIH," says Morse. Other Duke researchers are using GAC funds to study leukemia and intestinal cancer.

The Triad chapter (which includes the areas surrounding Greensboro and Winston-Salem) is part of a national GAC group which has been raising funds for cancer research since 1997. The GAC raises these funds through an annual dinner and auction in Greensboro. This year's event takes place September 20-21. For more information about the GAC go to **triadgac.org.**

ask the expert

Rex Bentley, MD

REX BENTLEY, MD, PATHOLOGIST

Pathology is the "study and diagnosis of disease through examination of organs, tissues, bodily fluids, and whole bodies" – a medical discipline that many people have heard of, but most may not clearly understand. Unlike most other doctors, pathologists rarely deal directly with patients. Nonetheless, their work has an enormous impact on patients and their subsequent treatment. We spoke with Duke pathologist Rex Bentley, MD, to learn more about pathology and its impact on cancer.

What do pathologists do?

Dr. Bentley: In its broadest sense, pathologists study human disease. We examine tissue and body fluid specimens removed from patients and determine the diagnosis. We can also perform autopsies. In smaller hospitals, pathologists may cover a broad range of procedures, while at large medical centers like Duke, pathologists are specialized in a specific area. I'm an anatomic pathologist, and I specialize in cancers of the breast and ovaries.

It is my job to determine if a tumor is malignant (cancerous) or benign. If the tumor is malignant, I will provide the physician with important details about the tumor, including its grade, stage, how aggressive it is, and how likely it will respond to particular therapies. For example, with breast cancer, I test for estrogen receptors. This will determine if estrogen treatment will likely be effective. Also, I can determine if the tumor is HER2+ or HER2-. That distinction will help the physician choose the best course of treatment for the patient.

How do physicians get the tumor samples from the patient?

Dr. Bentley: There are a number of ways we receive samples to study. With cancers of the blood, we obviously use blood tests. For bladder cancer, we can often study the urine. For cervical cancer, we use results from a Pap smear. For other cancers, we take cells from the tumor with a needle that we can then study. Surgeons can also remove all or part of the tumor, which can then be studied.

How are samples analyzed? How long does it take?

Dr. Bentley: Sometimes we receive a specimen to study while the patient is still in surgery, thus we need to move quickly. In these cases, we will freeze the tissue first, and then a very small section of the tissue is taken, placed on a slide, and stained so it can be viewed under a microscope. The surgeon can receive a diagnosis within 15 minutes after removing the specimen. This enables the surgeon to make critical decisions during surgery, including how much of the tumor to remove and if he or she has removed the entire tumor.

When an immediate diagnosis isn't required, the turn around time is usually 24 hours. We take the tissue, put it in formalin fixative to preserve it, and then organic solvents to remove the water from the tissue. The sample is then placed in hot melted wax. After it cools, we have a tissue embedded in wax and cut a very thin section of it. We stain it and put it on a slide. This method provides a much higher-quality microscopic section than the freezing method and has the added advantage of preserving the tissue so we can go back and obtain additional sections if we later need to do any special tests.

The microscope is the absolute core piece of equipment. I use it day in and day out. The standard tool is the H&E (hematoxylin and eosin) stained slide, which has been used since the late 1800s. I would guess that 90 percent of my diagnoses are made using a microscope and slide.

How can you tell if a tumor is cancerous?

Dr. Bentley: I know what normal, healthy tissues look like under a microscope. There are predictable patterns in the cells. When the tumor is malignant, it looks very different. With breast cancer, the cells are not organized well. I can see changes going on in individual cells. In normal cells, the nuclei are the same size. In cancer cells, they vary in size. I can also physically see cells dividing very quickly. I determine the stage by how far advanced the tumor is: how big it is and how far it has spread.

What is special about pathology at Duke?

Dr. Bentley: Pathology at Duke is unique because of the broad range of subspecialty experts we have in the department, and the large number of specialized tests that we have available (molecular genetic tests, for example). Most pathology departments don't have this kind of expertise, and it is a real advantage for our patients.

To contact Duke Comprehensive Cancer Center's Office of Development, call **919-667-2600** or visit **cancer.duke.edu/gift**

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