

Memorial Sloan-Kettering Cancer Center
2008 ANNUAL REPORT



Two patients.
Two treatment teams.
Two unique conversations.

The vital contribution that basic science research makes to the improvement of treatment for people with cancer is at the heart of Memorial Sloan-Kettering's mission.

In our 2008 Annual Report you are invited to sit in on two unique conversations. In one, a patient—and in the other, the parents of a pediatric patient—participate in roundtable discussions with the scientists whose laboratory investigations led to the development of agents that made significant contributions to each patient's survival. These roundtables also included the patients' MSKCC treatment teams.

Both patients endured arduous and complex treatment journeys—and both benefited from the innovative research conducted at MSKCC as well as from the expertise, creativity, and dedication of their physicians and nurses.

The occasion of our Annual Report provided an opportunity for these exceptional gatherings, allowing us to give you a glimpse into the collaborative and novel work being done every day at the Center and into the lives of two extraordinary people—**Emily Wang** and **James Creaby**.



Charles Sklar
 PEDIATRIC ENDOCRINOLOGIST,
 DIRECTOR, LONG-TERM FOLLOW-UP
 PROGRAM, MEMORIAL HOSPITAL

Brian Kushner
 PEDIATRIC ONCOLOGIST,
 MEMORIAL HOSPITAL

Kim Kramer
 PEDIATRIC ONCOLOGIST,
 MEMORIAL HOSPITAL

Suzanne Wolden
 RADIATION ONCOLOGIST,
 MEMORIAL HOSPITAL

Nai-Kong Cheung
 PEDIATRIC ONCOLOGIST,
 HEAD, NEUROBLASTOMA
 PROGRAM,
 MEMORIAL HOSPITAL

Emily
 Wang

A roundtable conversation with
 Emily Wang's parents and
 her neuroblastoma treatment team

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Mark Souweidane
 PEDIATRIC
 NEUROSURGEON,
 MEMORIAL HOSPITAL

Michael La Quaglia
 CHIEF, PEDIATRIC
 SURGICAL SERVICE,
 MEMORIAL HOSPITAL

Shakeel Modak
 PEDIATRIC ONCOLOGIST,
 MEMORIAL HOSPITAL

Richard Wang
 EMILY'S FATHER

Emily Wang
 PATIENT

Tina Wang
 EMILY'S MOTHER

From left to right:

Yi-Chih Lin
 NURSE PRACTITIONER,
 MEMORIAL HOSPITAL

Ursula Tomlinson
 NURSE PRACTITIONER,
 MEMORIAL HOSPITAL

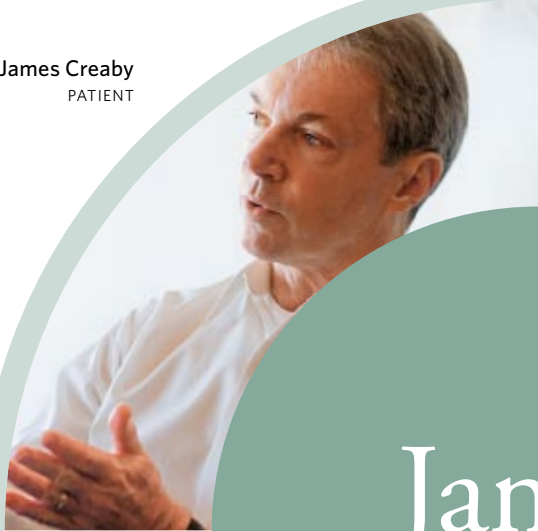
Catherine Enero
 CLINICAL RESEARCH NURSE,
 MEMORIAL HOSPITAL

Ester Dantis
 NURSE PRACTITIONER,
 MEMORIAL HOSPITAL

Diane Iannuzzi
 SOCIAL WORKER,
 MEMORIAL HOSPITAL

Linda D'Andrea
 NURSE PRACTITIONER,
 MEMORIAL HOSPITAL

James Creaby
PATIENT



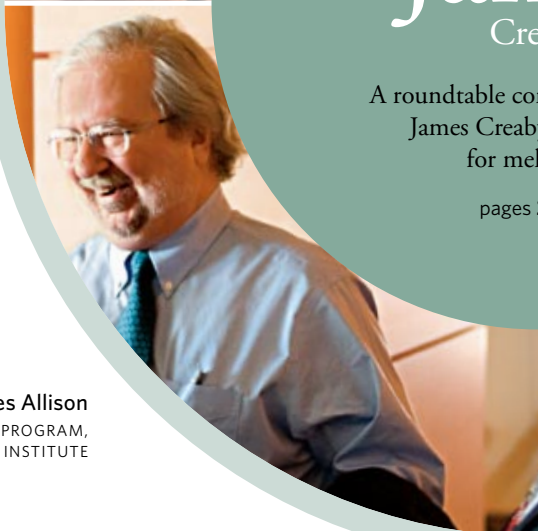
Jianda Yuan
IMMUNOLOGIST,
HEAD, IMMUNE MONITORING
CORE FACILITY



James Creaby

A roundtable conversation about
James Creaby's treatment
for melanoma

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James Allison
CHAIR, IMMUNOLOGY PROGRAM,
SLOAN-KETTERING INSTITUTE



Jedd Wolchok
MEDICAL ONCOLOGIST,
MEMORIAL HOSPITAL

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Message from the Chairman and the President

While the economic crisis that has affected our nation has also had effects on Memorial Sloan-Kettering Cancer Center, 2008 was nevertheless a year in which we continued to excel in all three of our missions—clinical care, research, and training. Although obliged to anticipate additional effects of the economic downturn in 2009 and beyond, years of strategic planning along with disciplined financial and operational management have put us in good stead for the future.

Before going into detail about how MSKCC is faring now—and how we will address the challenges sure to confront us in the coming years—we want to share some highlights from our continuing record of accomplishment:

- We received high scores and a healthy budgetary increase during the competitive renewal of our Comprehensive Cancer Center grant from the National Cancer Institute.
- The Joint Commission renewed our hospital accreditation with a remarkably small number of recommendations, a tribute to the quality of our clinical staff and its operations.
- Enrollment continued to grow in our graduate training programs, including the new Gerstner Sloan-Kettering Graduate School of Biomedical Sciences—which has now been officially accredited by New York State.
- At a time of limited support from the National Institutes of Health, our philanthropically based research efforts—the Geoffrey Beene Cancer Research Center, the Starr Cancer Consortium, the Experimental Therapeutics Center, the Brain Tumor Center, and others—have flourished.
- Our laboratory and clinical investigators put in especially strong performances and received several notable honors.
- And we successfully recruited outstanding new people to our administrative, clinical, and laboratory staffs.

Programs and Initiatives

Ensuring exceptional care for our patients is a primary goal at Memorial Sloan-Kettering. The staff of Memorial Hospital maintained their extraordinary commitment to service, teamwork, and overall excellence throughout 2008.

Our research enterprise remained strong throughout 2008, and we continued to produce new knowledge about the causes of cancer, to strengthen ties between basic science and clinical applications, and to recruit outstanding research faculty members.

In May, the Geoffrey Beene Cancer Research Center sponsored a two-day retreat that brought together members of MSKCC's Cancer Biology and Genetics Program and its Human Oncology and Pathogenesis Program. Panels featured a variety of topics including cancer metastasis, signaling pathways, and novel targets for cancer therapeutics. In addition, poster sessions allowed graduate students and postdoctoral fellows the opportunity to present and discuss their latest research projects.

In September, 40 Memorial Sloan-Kettering researchers gathered with scientists from four other institutions for a two-day retreat to present and discuss projects funded by the Starr Cancer Consortium. The Consortium, funded by a \$100 million gift from the Starr Foundation, is a collaboration among MSKCC, the Broad Institute of MIT and Harvard, Cold Spring Harbor Laboratory, The Rockefeller University, and Weill Cornell Medical College. It provides a framework for joint projects that harness the complementary strengths of the five institutions to improve the understanding, diagnosis, and treatment of cancer.

The creation in 2008 of the Cell Therapy and Cell Engineering Facility provides support to MSKCC investigators conducting early-stage clinical trials that require biological materials for immunotherapies, vaccines, and stem-cell-based therapies.

At Memorial Sloan-Kettering, we seek to educate and inspire future scientists and clinicians by fostering an enthusiasm for



Douglas A. Warner III
CHAIRMAN
BOARDS OF OVERSEERS AND
MANAGERS



Harold Varmus
PRESIDENT

science and medicine. Our third annual *Major Trends in Modern Cancer Research* seminar drew approximately 460 high school students from about 60 schools in the New York City area to hear three leading MSKCC scientists present their work and explain how developments in their areas of expertise are contributing to a better understanding of cancer.

Our second annual Postdoctoral Research Symposium gave MSKCC's postdoctoral fellows an opportunity to share their latest findings with Center colleagues, mentors, and members of the Tri-Institutional community, which also includes The Rockefeller University and Weill Cornell Medical College. More than 80 scientific projects were described through oral presentations and poster discussions at the daylong event.

Finally, we were honored to have New York State Governor David A. Paterson address our 29th annual Academic Convocation.

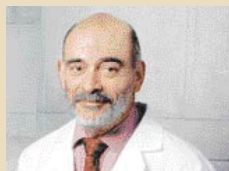
Honors

In 2008, three of MSKCC's most distinguished scientists were elected members of the Institute of Medicine (IOM) of the National Academies: Kathryn V. Anderson, Chair the Developmental Biology Program in the Sloan-Kettering Institute; Charles L. Sawyers, Chair of the Human Oncology and Pathogenesis Program within Memorial Hospital; and James P. Allison, Chair of SKI's Immunology Program. Membership in the IOM is considered one of the highest honors in the fields of health and medicine.

In addition, Sloan-Kettering Institute Director Thomas J. Kelly was named a member of the Advisory Committee to the Director (ACD) at the National Institutes of Health. The ACD was created in 1966 to advise the NIH director on policy and planning issues important to the NIH mission.



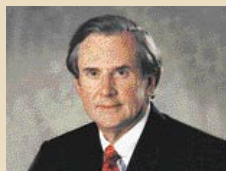
John R. Gunn
EXECUTIVE VICE
PRESIDENT



Robert E. Wittes
PHYSICIAN-IN-CHIEF
MEMORIAL HOSPITAL



Thomas J. Kelly
DIRECTOR
SLOAN-KETTERING
INSTITUTE



James D. Robinson III
HONORARY CHAIRMAN
BOARDS OF OVERSEERS
AND MANAGERS

Philanthropy

It was another strong year for the Campaign for Memorial Sloan-Kettering, which has generated more than \$1.82 billion in gifts and pledges over the past seven years and is closing in on its \$2 billion goal. Despite mounting economic uncertainty during the course of 2008, the Center had the best fundraising year in its history, recording a total of \$315.4 million in philanthropic income. We expect 2009 to be a challenging year and are intensifying efforts to attract the gift support that has become so important.

Under the leadership of Society President Leslie Jones, the members of The Society of MSKCC continue to work to help Center patients, raise funds, and increase public awareness of cancer. *(To learn more about the activities of The Society of MSKCC, please see page 80.)*

Current Economic Realities, Future Effects

Naturally, we are troubled by the current economic crisis. But we are responding to it vigorously and are confident that the Center will remain strong and weather the storm.

We are proud to have operated the institution well, and in a fiscally responsible manner; as a result, our performance in 2008 was strong. Our clinical volumes met our expectations, income from operations was slightly improved when compared to 2007, and the Center continues to generate operating revenues in excess of its expenses.

However, the crisis in the financial markets has had an adverse impact on our long-term investments. Although we do not yet have final results for our non-marketable securities, we expect the total loss for the entire portfolio will be approximately 28 percent.

Consequently, our ability to use income from our investments to support our operating and capital needs will be less than it has been in the past. While that income represents a relatively small percentage of the Center's overall revenue, budgets will need to be adjusted accordingly in the future until our endowment regrows.

In addition, our major source of revenue, payments for health care, may be less reliable in the coming year, due to the general downturn in the economy. For example, we anticipate several million dollars less in Medicaid reimbursements and, with many more people unable to pay their bills, we can expect to deliver a higher level of charity care than usual. Moreover, we cannot predict whether demands for our services will remain at their current high level. And we will face challenges in securing philanthropic support.

To manage this financial situation, Center leadership is redoing future plans for capital expenditures and moderating expense growth. We are looking in all areas of the institution to reduce expenses.

We have modified some of our construction plans for the coming year. Our new 16-story Breast and Imaging Center on Second Avenue between 65th and 66th Streets, which contains the expanded Evelyn H. Lauder Breast Center, will open to receive outpatients in the fall of 2009. While we will finish 11 floors, we will slow the completion of the remaining five floors, which are planned to be used as academic space at a later time. The second phase of the Mortimer B. Zuckerman Research Center (ZRC)—a seven-story structure on East 68th Street that will complete the ZRC complex—advanced steadily throughout 2008. Installation of the exterior building walls began in November and will continue through late spring of 2009. We will then defer finishing the interior and will resume the project when economic conditions improve.

We will maintain our recruitment efforts but will exercise restraint, particularly when considering empty positions not deemed critically important; and, while institutional funds will continue to be used to support laboratory and clinical research activities so that these will move forward with minimal disruption, we will—as we always have—focus on optimizing our resources and scrupulously controlling costs. By taking these steps, we expect to remain in a comparatively favorable fiscal condition.

Memorial Sloan-Kettering represents the best our society can offer to those who suffer from cancer. Over the next year or two, we may move ahead more slowly than any of us would like toward the goal of building a still-better institution. However, we will proceed with our commitments to clinical care, research, and training not simply intact, but robust and thriving.

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MSKCC's achievements are made possible by many people. Our success as an institution is due in great measure to the expertise of our remarkable staff. We are grateful to them for their work, and know that they will continue to serve our patients and this institution with energy, dedication, and imagination through these difficult times. MSKCC's Executive Vice President John R. Gunn and Senior Vice President of Finance Michael P. Gutnick play key roles in maintaining the Center's financial stability. Memorial Hospital Physician-in-Chief Robert E. Wittes and Senior Vice President and Hospital Administrator Kathryn Martin are vital in guiding our clinical programs, maintaining a high level of patient satisfaction, and fostering constant improvements. Director of the Sloan-Kettering Institute Thomas J. Kelly continues to lead our research programs with intelligence and skill.

We also note with sorrow the death of surgical and molecular pathologist William L. Gerald. As Director of the Pathology Research Core Facility, Dr. Gerald built one of the largest research tumor banks in the nation. He was one of the founding members of the Center's Human Oncology and Pathogenesis Program and made major contributions to the understanding of cancer, in particular, prostate and breast cancer, the desmoplastic small round cell tumor, and neuroblastoma. His insight and intelligence are profoundly missed.

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In this year's report we invite you to sit in on two exceptional roundtable discussions. In one, a patient—and in the other, the parents of a patient—talk with the scientists whose research led to the development of agents that made a significant contribution to each patient's survival. These discussions, which also include members of the MSKCC teams that treated these two patients, offer a compelling look at the innovative work being done every day at Memorial Sloan-Kettering. We hope that they will describe to you the pride we take in this institution and our unwavering commitment to excellence.



Douglas A. Warner III
CHAIRMAN, BOARDS OF
OVERSEERS AND MANAGERS



Harold Varmus
PRESIDENT

Emily Wang
PATIENT

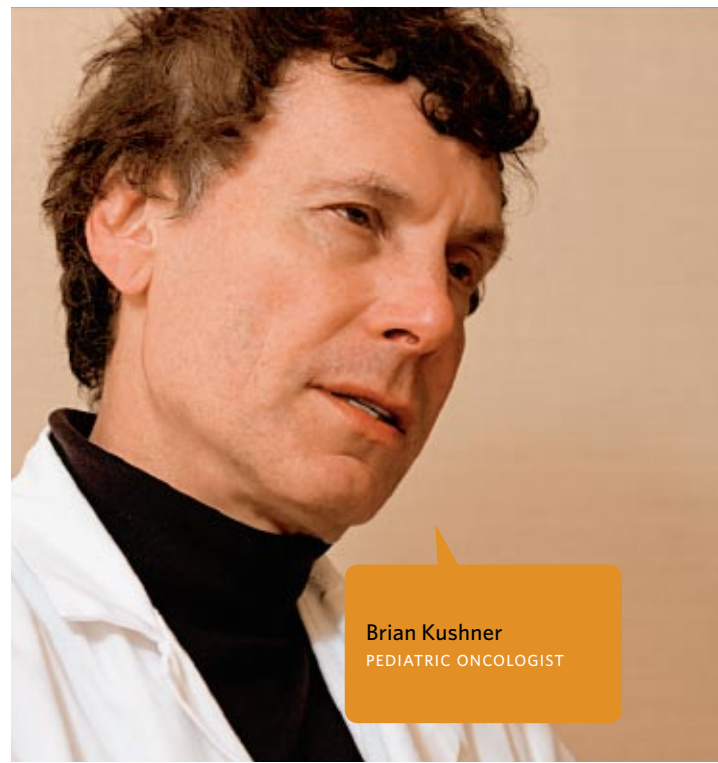




In 2003, just before her second birthday, Emily Wang was diagnosed with a rare pediatric cancer called neuroblastoma. Approximately 750 children a year in the United States are diagnosed with the disease—a cancer of the sympathetic nervous system. Emily’s treatment extended over several years and included two novel immunotherapies conceived and developed by pediatric oncologist Nai-Kong Cheung, head of MSKCC’s neuroblastoma program, and his colleagues in the neuroblastoma laboratory. What follows is a conversation between Emily’s parents and the members of the neuroblastoma treatment team.



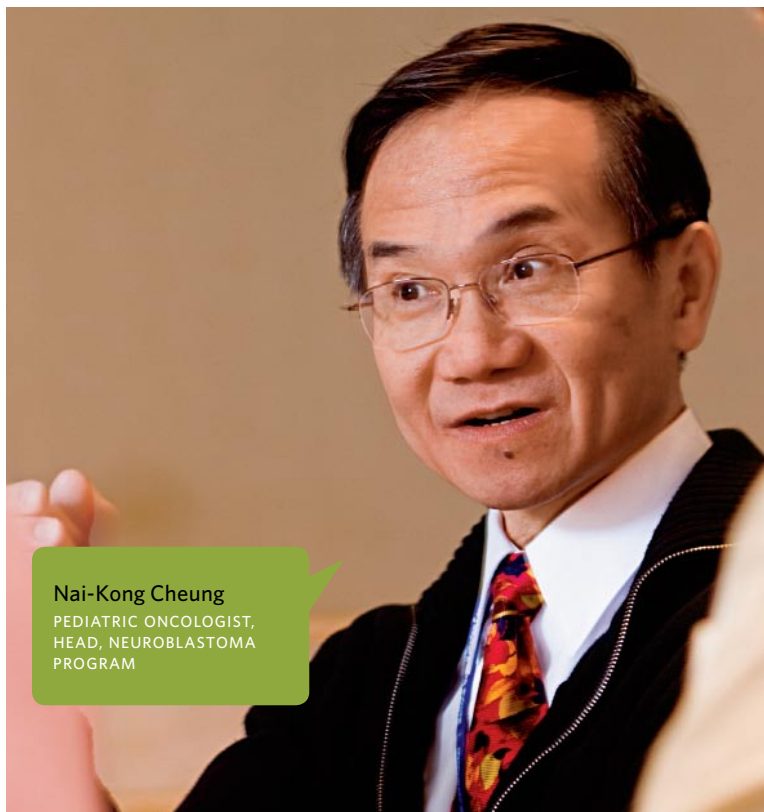
Shakeel Modak
PEDIATRIC ONCOLOGIST



Brian Kushner
PEDIATRIC ONCOLOGIST



From left to right:
Catherine Enero
CLINICAL RESEARCH NURSE
Ursula Tomlinson
NURSE PRACTITIONER
Ester Dantis
NURSE PRACTITIONER
Yi-Chih Lin
NURSE PRACTITIONER
Diane Iannuzzi
SOCIAL WORKER
Linda D'Andrea
NURSE PRACTITIONER



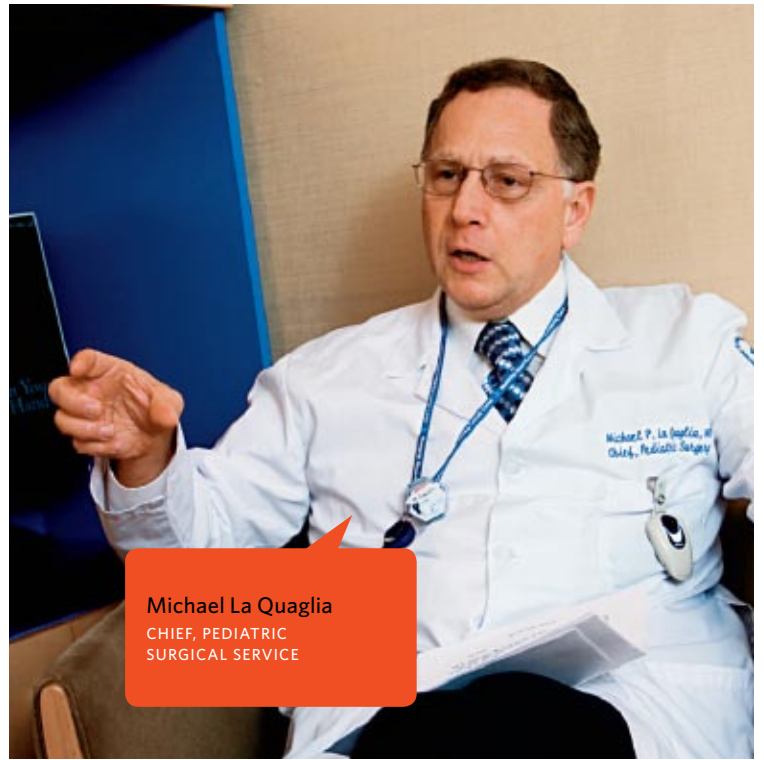
Nai-Kong Cheung
PEDIATRIC ONCOLOGIST,
HEAD, NEUROBLASTOMA
PROGRAM



Suzanne Wolden
RADIATION ONCOLOGIST



Kim Kramer
PEDIATRIC ONCOLOGIST



Michael La Quaglia
CHIEF, PEDIATRIC
SURGICAL SERVICE



Mark Souweidane
PEDIATRIC NEUROSURGEON



Charles Sklar
PEDIATRIC ENDOCRINOLOGIST,
DIRECTOR, LONG-TERM
FOLLOW-UP PROGRAM



Tina and Richard Wang,
Emily and her brother, Ryan
PATIENT'S FAMILY

■ TINA WANG

It was the end of June, and my mom was the first to notice that Emily's stomach was distended. But two-year-olds have potbellies so I didn't think much of it. Then she started running a low-grade fever, and on the July Fourth weekend she got very cranky.

■ RICHARD WANG

We had a little backyard pool for the kids, and Emily loved it. But suddenly she wouldn't go near the water.



The blood work came back, and she was extremely anemic. The pediatrician reexamined her — this time he brought in his partner. Even then, we were hoping it was something minor.

MR. WANG

One of the keys to survival in Stage 4 neuroblastoma is that the tumor must be completely removed. Otherwise, it's going to come back.

DR. CHEUNG



- MRS. WANG She just wanted me to hold her.
- MR. WANG We recognized something was really wrong.
- MRS. WANG That Monday we took her to the pediatrician. He examined her and said she was constipated — but I knew she wasn't. So he did some blood work.
- MR. WANG The blood work came back, and she was extremely anemic. The pediatrician reexamined her — this time he brought in his partner.
- MRS. WANG They told us they felt something in her abdomen and said, "You need to bring her to the ER right away for a sonogram."
- MR. WANG Even then, we were hoping it was something minor.
- MRS. WANG But in the ER the technician asked me, "Does she have a mass on her kidney?" and I said, "No, she wasn't born with any mass on her kidney." And he said, "Well, she has one now."
- MR. WANG The doctors told us it was most likely Wilms' tumor [the most common cancer of the kidneys found in children].
- MRS. WANG But I saw in their eyes, Rich, that it was probably something even worse. It was the most horrible day of our lives.

- SHAKEEL MODAK We went through the plan of action — and there are several things that are unique here. First, we have a highly experienced surgeon, Michael La Quaglia, who does lots of neuroblastoma surgeries.
- NAI-KONG CHEUNG One of the keys to survival in Stage 4 neuroblastoma is that all the visible tumor must be completely removed.
- DR. MODAK We also have a very strong program in immunotherapy. Using antibodies, we try to maintain remissions in children.

As part of what is called the N8 protocol — which includes chemotherapy, surgery, radiation, a stem cell transplant, and treatment with a monoclonal antibody — Emily first underwent induction. Induction is chemotherapy designed to stop the growth of the cancer and shrink the tumor so that surgery can be more safely performed.

- DR. CHEUNG Emily had five rounds of induction chemotherapy on the N8 protocol. Historically, six or seven rounds have been used, but our research shows that the outcome is as good with five rounds — and we think we can cut back even more. There are patients who will go into remission sooner and probably don't need that fifth cycle. By cutting back, you hope to minimize the long-term side effects. Dose intensity is critical — meaning that you give the same total dose but over three months instead of six, and you get a much better result.

Two days later, the Wangs transferred Emily to Morgan Stanley Children's Hospital of New York-Presbyterian/ Columbia University Medical Center. A biopsy revealed that the mass was not Wilms' but Stage 4 neuroblastoma. Shortly thereafter, the Wangs scheduled an appointment at MSKCC. The first member of the neuroblastoma team they met with was Shakeel Modak.

NAI-KONG CHEUNG
Pediatric Oncologist,
Head, Neuroblastoma
Program

MICHAEL LA QUAGLIA
Chief, Pediatric
Surgical Service

SHAKEEL MODAK
Pediatric Oncologist

TINA WANG
Mother of
Emily Wang

SUZANNE WOLDEN
Radiation Oncologist

DR. MODAK

There's nothing new about the drugs we use. It's the way we tailor the therapy that makes the difference.

DR. CHEUNG

We don't give all these drugs at the same time. We alternate them — so we give three in the first cycle, another two in the second, and so on. The idea is by alternating the therapy we're preventing the tumor from becoming resistant.

MICHAEL
LA QUAGLIA

If you try to do surgery before chemotherapy you can get a lot of bleeding. There's good data showing that overall survival is the same if you delay surgery until after giving chemotherapy. The drugs shrink the tumor and also make it less vascular to allow for much more complete removal with fewer complications.

Two seminal events followed Emily's third cycle of chemotherapy: Physicians collected her stem cells for use in a stem cell transplant she would later have as part of the N8 protocol, and Dr. La Quaglia performed surgery. Emily's tumor arose primarily from her right adrenal gland. It involved the right kidney, the blood vessels supplying that kidney, and the top surface of the kidney.

DR. LA QUAGLIA

There are several challenges in removing these tumors. First, they usually grow close to the big blood vessels of the body — the aorta and the vena cava. So even though the tumor itself may be less vascular, you still need to control bleeding. We also don't routinely sacrifice a kidney; rather, we're very aggressive in trying to save the kidney. Over time, we've developed techniques to deal with both of these issues. We're able to successfully remove more than 95 percent of these tumors, and our mortality rate is well below 5 percent — and this is extremely serious surgery.

In Emily's case, Dr. La Quaglia removed the outer and inner linings of the kidney to expose the blood vessels.

DR. LA QUAGLIA

The tumor involved the artery and the veins in Emily's kidney, so we had to remove the tumor from around them. It was really a vascular dissection. A surgical oncologist who does this kind of operation needs to have expertise in many surgical specialties because the techniques we use run the gamut — from vascular to chest to abdominal surgery.

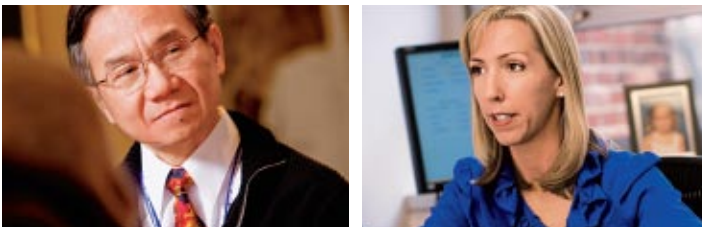


If you try to do surgery before chemotherapy you can get a lot of bleeding. There's good data showing that overall survival is the same if you delay surgery until after giving chemotherapy.

DR. LA QUAGLIA

There's nothing new about the drugs we use. It's the way we tailor the therapy that makes the difference.

DR. MODAK



A vital component of pediatric cancer surgery is the contribution of the anesthesiologist.

DR. LA QUAGLIA We have excellent anesthesiologists at Memorial. They understand how to manage kids getting big tumor operations. A child's physiology can cause his or her blood pressure to drop quickly and suddenly. You need an anesthesiologist expert in recognizing when and how to replace blood and fluids. In all ways, what we do here is a team effort. It doesn't happen just because of surgery or radiation or chemotherapy. It happens because we put it all together.

SUZANNE WOLDEN Emily was next referred to me for radiation therapy. We've learned that giving low-dose radiation after surgery to the site of the primary tumor and the lymph nodes in the abdomen decreases the chance of a relapse to approximately 10 percent. We used three-dimensional CT planning to design treatment fields that minimized the dose to her healthy tissues, including her kidneys and liver, and to avoid her ovaries.

DR. MODAK

We give radiation two times a day, in the morning and the afternoon.

DR. WOLDEN

By giving radiation twice a day, we can use lower doses. It also means that treatment can be accomplished quickly — over seven to ten days. But it is impossible for these very young children to stay perfectly still for our high-precision radiation treatment, so we need to anesthetize them. Again, we couldn't do this if we didn't have an anesthesia team experienced in giving sleep medication to children during radiation.

MRS. WANG

The hardest part of it was that because of the anesthesia, Emily couldn't eat or drink until later in the day, after the second treatment.

DR. WOLDEN

There's no question that while it's only a week and a half it's difficult for the child and the parents.

NAI-KONG CHEUNG
Pediatric Oncologist,
Head, Neuroblastoma
Program

KIM KRAMER
Pediatric Oncologist

BRIAN KUSHNER
Pediatric Oncologist

SHAKEEL MODAK
Pediatric Oncologist

RICHARD WANG
Father of
Emily Wang

SUZANNE WOLDEN
Radiation Oncologist

We've learned that giving low-dose radiation after surgery to the site of the primary tumor and the lymph nodes in the abdomen decreases the chance of a relapse to approximately 10 percent.

DR. WOLDEN



We provide every resource we can to help children use what is within them to deal with the stress of this illness and its treatment. We're concerned with the entire child, not just the disease.

DR. CHEUNG

Two decades ago you wanted to cure just one kid, and you couldn't. And today, if we don't achieve a cure we ask, "What went wrong?" That's a huge evolution.

DR. KUSHNER



NAI-KONG CHEUNG
Pediatric Oncologist,
Head, Neuroblastoma
Program

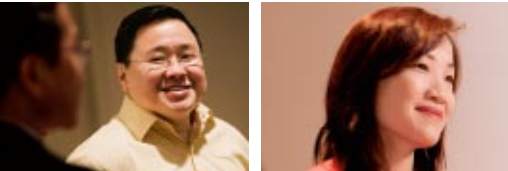
RICHARD WANG
Father of
Emily Wang

TINA WANG
Mother of
Emily Wang



When Emily got the 3F8 usually the pain would come about 20 minutes later. But when Suzi danced with her, the pain never came.

MRS. WANG



The next phase of Emily’s treatment involved the addition of a novel immunotherapy called 3F8, a monoclonal antibody developed by Dr. Cheung and his colleagues. 3F8 antibodies seek out and attach to neuroblastoma cells, signaling the immune system to destroy them.

To learn more about 3F8 and 8H9, the second antibody with which Emily was treated, see the sidebar on the next page.

DR. CHEUNG

We know that 3F8 targets very well to neuroblastoma tumor cells. But there is one big side effect — pain. Two decades ago, when we first gave it to children and saw that they had pain, we actually stopped for a year and went back to the lab to try to understand what was going on. We discovered that when 3F8 attaches to GD2 [a sugar lipid that is abundant on neuroblastoma cells and also present on some nerve cells], a message is sent to the brain and the patient feels pain.

MRS. WANG

You warned us that it was going to be painful, and it was. The first time Emily got 3F8 her body suddenly stiffened, and she began screaming at the top of her lungs. All we could do was cradle her. Then the nurse gave her pain medication and slowly it subsided. We also learned from the nurses how to put hot packs on her, how to massage her legs and her belly.

MR. WANG

We really have to say how amazing all the nurses were. They were there to help us every step of the way.

To read more about the contribution of the neuroblastoma team nurses, see page 24.

MRS. WANG

And after Emily had had a number of cycles, they brought in a dance therapist to see if she could help. When Emily got the 3F8 usually the pain would come about 20 minutes later. But when Suzi danced with her, the pain never came. [Suzi Tortora is a member of MSKCC’s Integrative Medicine Service.] We were watching her vital signs. Her heartbeat didn’t go up, her blood pressure didn’t go up — it was incredible!

DR. CHEUNG

We provide every resource we can to help children use what is within them to deal with the stress of this illness and its treatment. We’re concerned with the entire child, not just the disease.

A stem cell transplant was next in the protocol. Emily was admitted to the hospital and put in isolation as she underwent a preparative regimen of chemotherapy to destroy her bone

Even though Emily didn't feel well she was a real trouper.

MR. WANG



marrow and any remaining cancerous cells. The high-dose chemotherapy that destroys the bone marrow also cripples the body's immune system. Everyone who has contact with such patients must be gowned, masked, and gloved. Until the healthy transplanted stem cells are infused and are engrafted patients are extremely susceptible to infection.

- MRS. WANG It was 29 days exactly. We counted.
- MR. WANG And even though Emily didn't feel well she was a real trouper.
- MRS. WANG She had tea parties with her stuffed animals. She watched her favorite videos. No matter how hard it was, she got out of bed every morning to try to enjoy herself like a regular three-year-old. She got us through it.
- MR. WANG I remember the day Dr. Boulad injected the stem cells. [Farid Boulad is the Director of MSKCC's Pediatric Day Hospital and a member of the Bone Marrow Transplant Service.] It was the Chinese New Year.

Emily's stem cell transplant was successful. 3F8 immunotherapy was resumed and differentiation therapy was instituted to halt the growth and spread of any remaining neuroblastoma cells. Differentiation therapy is an approximately six-month course of oral medication known as 13-cis-retinoic acid (Accutane®). The same medication that is sometimes used to treat severe acne, it also encourages immature neuroblastoma cells to stop dividing. Emily was within days of completing her entire course of treatment when, in March 2005, came a devastating turn of events.

3F8 and 8H9



Nai-Kong Cheung led an MSKCC team that collaborated on the development of the 3F8 and 8H9 antibodies that were used in Emily Wang's treatment and were critical to her survival.

Antibodies are proteins that help the immune system identify foreign substances by binding to them and marking them for removal. However, because cancer — including neuroblastoma — arises from the normal tissues of the body, the immune system usually does not recognize cancer cells as foreign; or if it does, is unable to mount a strong and sustained attack.

3F8 is a monoclonal antibody. Conceived and developed by Nai-Kong Cheung and his colleagues in the neuroblastoma laboratory, 3F8 is a treatment that is injected into the bloodstream where it travels through the body until it finds and attaches to a marker called GD2 present on all neuroblastoma cells. When it does so, this signals the patient's immune system to recognize neuroblastoma cells as foreign and to attack and kill those cells.

Until recently, 3F8 was available only to patients at MSKCC. It has now been licensed to an outside company, and a randomized clinical trial is scheduled to begin at several institutions nationwide.

8H9 is a newer monoclonal antibody also developed by Dr. Cheung. It is being used at MSKCC to target neuroblastoma cells that have metastasized to the brain. 8H9 is linked to radioactive iodine and infused directly into the cerebrospinal fluid. It is currently in clinical trials at the Center, and approximately three-quarters of neuroblastoma patients who have received the treatment are doing well up to five years later.

NAI-KONG CHEUNG
Pediatric Oncologist,
Head, Neuroblastoma
Program

KIM KRAMER
Pediatric Oncologist

BRIAN KUSHNER
Pediatric Oncologist

SHAKEEL MODAK
Pediatric Oncologist

MARK SOUWEIDANE
Pediatric Neurosurgeon

TINA WANG
Mother of
Emily Wang

SUZANNE WOLDEN
Radiation Oncologist

MRS. WANG

We were in the last cycle of Accutane. Suddenly Emily began throwing up, and pretty soon she became lethargic, almost unresponsive. So we raced her to the hospital. Kim, you were there. The minute you saw us you knew something was seriously wrong.

KIM KRAMER

I did. The neuroblastoma had spread to her brain. In this whole journey I think that was the hardest day for everyone. You just feel like the rug's been pulled out from under you.

BRIAN KUSHNER

As a team, we were devastated.

DR. KRAMER

But at the same time, we rallied, regrouped immediately, and sat down to discuss the new plan.

MRS. WANG

I remember I thought, "This is the end." But you all said, "There's a new treatment — we're going to get her back into remission."

DR. CHEUNG

This was a problem we did not anticipate because in the past we were not yet good enough at controlling the disease in the rest of the body. But now children are surviving at a much higher rate — the long-term survival rate of patients treated with 3F8 is better than 50 percent — and we're seeing this new pattern of relapse. It is like another mountain behind the mountain.

DR. KUSHNER

Up until 8H9, which we developed within the past five or six years, a child like Emily wouldn't have survived. But that's the great thing about working at Memorial: We're not here just to dish out treatments — we're here to study the disease and come up with better therapies.

Pediatric neurosurgeon Mark Souweidane removed the tumor in Emily's brain.

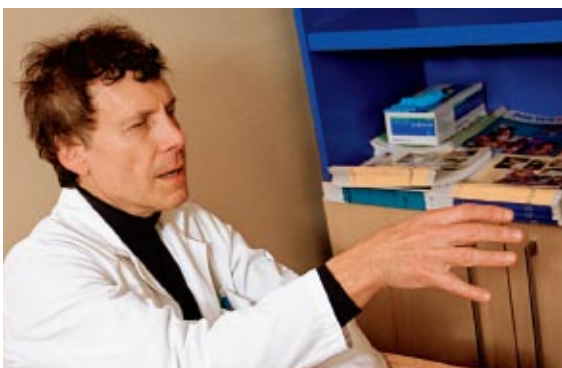
MARK SOUWEIDANE

The tumor was in the left temporal region. Taking these tumors out is a very delicate proposition. This is an area that's responsible for speech and language. Also, metastatic neuroblastoma lesions tend to grow around the brain's major blood vessels and can bleed quite readily. But Emily came through the operation remarkably well and was discharged after only a couple of days in the hospital.

DR. WOLDEN

I then saw her again for additional radiation therapy. Because neuroblastoma cells can travel through the cerebrospinal fluid and "seed" elsewhere, we use a technique called craniospinal radiation to deliver radiation to the entire brain and spine to try to get every neuroblastoma cell that might be floating around. It's a very complex and technically difficult treatment requiring millimeter accuracy. Our treatment planning and all our technology are highly dependent on medical physics — and we have one of the best teams in the nation. We collaborate very closely with the physicists in planning and in evaluating radiation doses. We also rely on our colleagues in diagnostic radiology to provide us with the images we need for treatment planning and in the evaluation of those images.

After Emily's craniospinal radiation was complete, Dr. Souweidane implanted a catheter into Emily's brain through which the 8H9 antibodies would be delivered.



The tumor was in the left temporal region. Taking these tumors out is a very delicate proposition. This is an area that's responsible for speech and language.

DR. SOUWEIDANE



DR. SOUWEIDANE The 8H9 antibodies are infused into the cerebrospinal fluid, so I implanted a port under Emily's scalp with a catheter that I threaded into one of the ventricles in her brain. This allowed the injection of the therapeutic antibodies directly into the brain through a simple needle stick to the port.

DR. KRAMER We arm 8H9 with radioactive iodine and use it as a radiation delivery system — we're actually bathing the cerebrospinal fluid in liquid radiation. Again, it's important to point out that this is a multidisciplinary effort. We depend on our radiochemist [Peter Smith-Jones], medical physicists [John Humm and Pat Zanzonico], and the nuclear medicine team [Steven Larson, Chief of the Nuclear Medicine Service; Neeta Pandit-Taskar; and Jorge Carrasquillo] to tell us exactly how much radiation is going to different parts of the brain and how long it's staying there.

DR. CHEUNG Dr. Larson has collaborated with us over the past 20 years in looking at how radiolabeled antibodies like 8H9 target human tumors. We now use PET imaging to tell us precisely where the antibody is going and how much of the dose is getting to the tumor.

MRS. WANG The 8H9 was much easier than the 3F8. Emily went through the treatments like they weren't anything.

DR. KRAMER We were the ones who were nervous. A team of eight or nine people descend on this kid and she can't see what's going on behind her —

MRS. WANG Well, she *did* say, "What are they doing to my head?!"

[Laughter]

DR. CHEUNG Emily was the first female patient to receive 8H9, and only the third patient on this regimen. Sixteen neuroblastoma patients have now been similarly treated, and we're using it in other types of tumors.

DR. MODAK Certain sarcomas affect the abdomen, and we're trying to use the antibody there. And Dr. Kramer is also starting to evaluate it in other types of brain tumors.

DR. CHEUNG We're always working on the next step so that we have something new up our sleeves to give children who may need it a second, a third, or even a fourth chance.

DR. KUSHNER My personal goal 20 years ago was that if we could cure one child it would be amazing. Then we woke up one day and suddenly realized we *expected* cures. So two decades ago you wanted to cure just one kid, and you couldn't. And today, if we don't achieve a cure we ask, "What went wrong?" That's a huge evolution.

■ NAI-KONG CHEUNG
Pediatric Oncologist,
Head, Neuroblastoma
Program

■ KIM KRAMER
Pediatric Oncologist

■ RICHARD WANG
Father of
Emily Wang

■ TINA WANG
Mother of
Emily Wang

■ DR. CHEUNG

These children are all pioneers. They've been to the mountaintop and have come back to tell us what it was like and what we should do.

■ MRS. WANG

There came a point where we didn't want to stop seeing all of you.

■ MR. WANG

You became like our family.

■ DR. KRAMER

I think Emily may have been more comfortable here than being forced to go to school! [Laughter] By the way, I expected to see her today. Where is she?

■ MRS. WANG

In *school* — but she wanted to come! Emily will always remember being sick, but she doesn't see herself as anything except normal. She's just like other kids, and nobody can take advantage of her.

■ MR. WANG

And she makes sure everybody knows it!

Emily Wang, now seven, is thriving. The only long-term side effects of treatment so far are her small stature, some high-frequency hearing loss, and an underactive thyroid. She is followed by members of the neuroblastoma treatment team as well as by Charles Sklar, Director of MSKCC's Long-Term Follow-Up Program, and members of his team. To read more about that program, please see page 26. Dr. Cheung and the neuroblastoma team continue to investigate new antibodies to improve outcomes for patients.

MSKCC radiologists Sara Abramson and Anita Price and the members of the Department of Clinical Laboratories made significant contributions to Emily Wang's treatment and continue to collaborate with the neuroblastoma team in the treatment of other patients. The late MSKCC surgical and molecular pathologist William Gerald also made major contributions to ongoing research and understanding of the disease.



Dedicated nurses and social workers play a central role in the care of children and families going through treatment for neuroblastoma. Here are their voices as they talk about Emily Wang; parents, Tina and Richard; and the journey they all took together. They also share their thoughts on families coping with cancer and their own roles as specialists in pediatric oncology at MSKCC.

We have children like Emily who have had CNS relapses. Just a few years ago that would have been fatal. Now three or four years later, we're watching them get their brown belt in karate, finish kindergarten, go into the first grade, have their first communion. We've come so far.

MS. TOMLINSON



My main role was caring for Emily through her 3F8 antibody treatment. These treatments are painful, and they're hard on the parents and the children. At the time, Emily wasn't talking much, but she started calling me "Jie-Jie." I didn't know at first what it meant, but I found out that Jie-Jie means "older sister" in Chinese and that her grandmother was teaching her to call me Older Sister.

MS. ENERO

I was here the day Emily's parents brought her in with her CNS [central nervous system] relapse. She was draped in her father's arms, completely listless. I had a terrible feeling in the pit of my stomach. Her parents were beyond devastated. My heart bled for them. I'll never forget that day.

MS. D'ANDREA

We have different nationalities, different socioeconomic classes, and yet everyone reaches out to everyone else. Everyone understands there's no right or wrong way to get through this kind of experience.

MS. IANNUZZI

People allow you into their lives at their most vulnerable point, and you get to know them in a way you might not know your own neighbors or maybe even your own family. It's very intimate, and it's a privilege to participate in pediatric oncology here at Memorial.

MS. LIN



I've been at Memorial for more than 30 years. I was in Pediatrics for nine years, then left to set up an oncology service in a community hospital. But I returned. I missed the connections you form in Pediatrics with the children, their families, and your colleagues. When I came back, it was like coming home.

MS. DANTIS

Established in 1990 by MSKCC's Department of Pediatrics, the Long-Term Follow-Up Program, led by Charles Sklar, helps children and families manage the chronic medical conditions that may often develop after treatment for cancer.



Charles Sklar
DIRECTOR OF MSKCC'S
LONG-TERM FOLLOW-UP PROGRAM

Emily Wang is seen every six months by Dr. Sklar, director of the program and a pediatrician specializing in endocrinology. Her treatment for neuroblastoma has given rise to several medical issues for which she is monitored by Dr. Sklar and the two nurse practitioners on his team. "Emily has short stature, an underactive thyroid gland, and hearing loss," Dr. Sklar says. "These are common in children who have undergone treatments similar to hers." Treatment-related long-term side effects (also called late effects) are generally correlated with specific therapies, explains Dr. Sklar. Children treated with similar therapies will be at risk for similar problems regardless of their diagnosis.

"When we see children for the first time we develop a care plan based on their past treatments and their age at the time they were treated."

DR. SKLAR

In the course of her treatment, Emily received chemotherapy as well as radiation therapy to her abdomen, spine, and brain. "The problems that she has are most likely due to the radiation, although her hearing loss may be related to the chemotherapy," Dr. Sklar says. If children receive radiation to the brain early in life they are at risk for cognitive disabilities, growth problems, and especially for very young girls, early puberty.

"You're radiating the brain at a time when it's still developing," Dr. Sklar explains. "For example, the brain has the capacity to send one into puberty at any age. However, there are central nervous system restraining mechanisms that tell the hypothalamus and the pituitary gland, 'Don't start puberty yet.' But various insults — including head trauma, infection to the brain, and radiation — may damage these inhibitory signals, and the brain can send the body into puberty prematurely." (As of now, Emily shows no signs of early puberty.)

The Long-Term Follow-Up Program team sees approximately 80 to 100 patients a month. Eighty percent of the program's patients were treated at MSKCC, and about 20 percent were treated elsewhere. "When we see children for the first time we develop a care plan based on their past treatments and their age at the time they were treated," says Dr. Sklar.

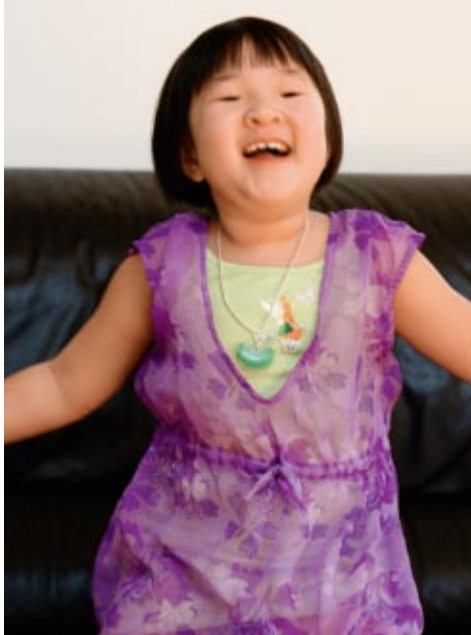
This individual plan details the tests that should be done to monitor for specific problems and the frequency with which they should be performed. "There are many things we can do to treat conditions before they cause symptoms," Dr. Sklar elaborates. "For instance, Emily is on thyroid medication, and her thyroid levels are now normal. If you wait for someone to become symptomatic it could take months to years and damage may already have been done."

Children who face growth and development problems may require hormonal therapies; learning and cognition difficulties can often be addressed with special schooling arrangements; cardiac complications, while less common, may be helped with certain medications; and patients at high risk for secondary cancers can be more rigorously screened throughout life.

Dr. Sklar points out that even if early interventions cannot entirely do away with all medical problems, simply knowing what to expect can help to mitigate the effects of coping with them. "A child with cancer is a *family* with a child with cancer — these are family issues. If everybody is aware of potential problems from the outset, it won't necessarily neutralize them, but it can help in the psychological adjustment." Dr. Sklar goes on to observe that the Long-Term Follow-Up Program provides a resource that offers families great comfort. "We're experts in what they and their child have been through," he says.

Dr. Sklar also collaborates closely with his colleagues in the Department of Pediatrics. "I need to know what the treatments are and how they're evolving because I'm going to be seeing these kids down the line," he comments. "And my colleagues often discuss with me what sort of late effects a child may suffer as a result of a particular form of therapy. We meet every week as a department. There's a tremendous amount of give-and-take. They learn from me and I learn from them."

As children in the Long-Term Follow-Up Program reach their late teens and early 20s, they transition into MSKCC's Program for Adult Survivors of Pediatric Cancer, led by Kevin Oeffinger. "There are very few institutions in the world that offer this kind of continuum of care," says Dr. Sklar. "We're very fortunate to have these truly comprehensive, ongoing programs."



Jianda Yuan
IMMUNOLOGIST,
HEAD, IMMUNE MONITORING
CORE FACILITY

James Allison
CHAIR, IMMUNOLOGY
PROGRAM

Jedd Wolchok
MEDICAL ONCOLOGIST

James Creaby
PATIENT



meet

James

James Creaby was diagnosed
with melanoma ten years ago.

In 1999, James Creaby — then 51 and a foreign exchange currency trader with Morgan Guaranty — was diagnosed with melanoma, the most serious form of skin cancer. Thus began a journey studded with numerous recurrences and remissions that continues to the present day. He is currently being treated at Memorial Sloan-Kettering with an innovative immunotherapy discovered and developed by James Allison, Chair of Sloan-Kettering Institute's Immunology Program. Mr. Creaby recently sat down with his physician Jedd Wolchok, Dr. Allison, and Jianda Yuan, head of MSKCC's Immune Monitoring Core Facility, to talk about the arduous and complex path of his therapy.

JAMES CREABY

I first knew something wasn't right when a mole about the size of a pencil eraser appeared on my right side around the area of my ribs. My wife, Jane, said "Let's get that checked, Jim." But they run in my family, and I was sure it was nothing. So it wasn't until about eight months later that I finally went to a dermatologist. He removed the mole, and two days after that we got a call asking us to come to his office — where he told us it was melanoma.

Mr. Creaby underwent surgery to remove skin surrounding the melanoma in order to reduce the risk of recurrence. At the time of surgery, a biopsy showed that the sentinel lymph node under his right arm contained a few melanoma cells. The sentinel node is the first lymph node to which cancer cells are likely to spread from a primary tumor. Subsequent surgery to remove all the remaining underarm nodes showed no further spread of the disease.

I was fine — for about three years. Then I was sitting at work one day and stretched, just raised my arm, and felt this lump. I went for a needle biopsy and was told that it was melanoma that had metastasized to the base of my pectoral muscle.

MR. CREABY



In most patients with Stage 3 melanoma there is about a 50-50 chance of melanoma coming back. Some people are at higher risk and some at lower, but generally that's the reality.

DR. WOLCHOK

[Antigen-presenting cells] are what get the body's immune response going. The notion was to take advantage of these antigen-bearing dendritic cells to initiate an immune response against the melanoma.

DR. ALLISON



MR. CREABY

The protocol at the time was high-dose interferon. [A type of protein produced by white blood cells, interferons have been shown to help stop the growth and spread of cancer cells.] It required infusions five days a week for a month, during which I'd have to stay home, unable to work — and then I'd have to inject myself three times a week for the next 11 months. When I learned that there was already a 50-50 chance that the melanoma would come back anyway — and that interferon would only increase the odds of it not returning by an additional 10 percent — I decided to forgo the injections and have the disease monitored with periodic CT and PET scans.

JEDD WOLCHOK

In most patients with Stage 3 melanoma there is about a 50-50 chance of melanoma coming back. Some people are at higher risk and some at lower, but generally that's the reality. And it's correct that interferon doesn't have a dramatic effect on recurrence.

MR. CREABY

I was fine — for about three years. Then I was sitting at work one day and stretched, just raised my arm, and felt this lump — again, on the right side. I went for a needle biopsy and was told that it was melanoma that had metastasized to the base of my pectoral muscle. It was surgically removed, and that's when I was referred to you, Dr. Wolchok. You referred me to James Young for the vaccine.

James Young, currently Interim Chief of MSKCC's Adult Bone Marrow Transplant Service, was then leading a clinical trial at the Center of a dendritic cell vaccine he had developed for the treatment of metastatic melanoma.

JAMES ALLISON

Dendritic cells are antigen-presenting cells [APCs]. APCs are what get the body's immune response going. They take inside themselves infections, viruses — even dying tumor cells — and break down the antigens on the cell surfaces into smaller pieces called peptides. They then display these peptides to the body's T cells. Receptors on the surface of the T cells recognize the peptides, bind to them, and become activated. Thousands of T cells are generated that can now go out and do their work — which is to kill target cells that express the antigen presented by the APCs. So the notion was to take advantage of these antigen-bearing dendritic cells to initiate an immune response against the melanoma.

[Ralph Steinman of The Rockefeller University was a co-discoverer — with the late Zanvil Cohn — of dendritic cells, work for which he was awarded the 2007 Albert Lasker Award for Basic Medical Research.]



From your blood, we generated lots of dendritic cells. Then we loaded these cells with peptides — antigens derived from melanoma — and injected them back into you.

DR. YUAN



MR. CREABY

I thought one of the most fascinating things was the theory behind it. That you took my blood and —

JIANDA YUAN

I was a member of Dr. Young's lab then — you gave us quite a lot of your blood! [Laughter] From it, we generated lots of dendritic cells. Then we loaded these cells with peptides of gp100 and tyrosinase — two differentiation antigens derived from melanoma — and injected them back into you.

MR. CREABY

I remember you also gave me antigens from a deep-sea organism.

DR. WOLCHOK

There's a pigment called keyhole limpet hemocyanin, made from a sea creature called a keyhole limpet, that's been shown to enhance the immune response against tumor antigens by interacting with T cells. In other words, this pigment is very interesting to T cells that have never seen it before.

MR. CREABY

And it did seem to work. My melanoma didn't come back for another three years. But then I went in for a PET scan and, lo and behold, it showed I had a growth on my right adrenal gland.

DR. WOLCHOK

Temozolomide is licensed for the treatment of certain types of brain tumors, but we use it "off-label" for melanoma. At the time there was no clinical trial that accommodated your situation, and it seemed reasonable to try to treat any micrometastatic disease with temozolomide. It's an oral medication without many side effects, so the risk-benefit profile was favorable.

MR. CREABY

And from November 2005 until June 2006 I was okay. Then I woke up one morning and felt a lump on the right side of my neck. It turned out to be melanoma, and the tumor was removed. You put me on GM-CSF [granulocyte macrophage colony-stimulating factor].

DR. WOLCHOK

GM-CSF is a protein of the immune system that helps regulate immune response. There's evidence showing that it may help rev up the immune system to fight melanoma. Again, we didn't have a trial that would've accommodated your circumstances, so I was drawing from the literature for any therapies I could offer.

MR. CREABY

Unfortunately, a few months later I found another tumor on my neck.

Mr. Creaby's adrenal gland was surgically removed, and Dr. Wolchok put him on temozolomide (Temodar®). It was now November 2005.

This tumor was removed in September 2006, and Mr. Creaby underwent radiation therapy to his neck. However, in December, while showering, he discovered a lump on his left oblique muscle.

MR. CREABY

The tumor was where your “love handles” are — it felt as if I’d inserted a pickle under my skin. A CT scan showed that there was also a lesion on my left pectoral muscle as well as multiple metastases in my liver and lungs. It was all over the place. There wasn’t any possibility of surgery. But I have to be immensely thankful for the fact that this recurrence made me eligible for a clinical trial of anti-CTLA-4 [now known as ipilimumab] that was closing in two weeks. I’m blessed that I made it into the trial, and I’m blessed that it’s worked.

To learn more about Dr. Allison’s development of anti-CTLA-4, see the next page.

DR. WOLCHOK

What anti-CTLA-4 [ipilimumab] is saying to your T cells is, “Go, be free. See what you want to see.”

Patients who are treated with ipilimumab usually exhibit a unique pattern of response. We’re building an army of T cells — and it may take one person six weeks to muster that army while another person’s immune response may not be seen for six or seven months.

DR. WOLCHOK

DR. ALLISON

Whatever’s going on —

DR. WOLCHOK

— look at it —

DR. ALLISON

— and go crazy! To coin a phrase . . .

[Laughter]

DR. WOLCHOK

There’s another aspect to this that’s important to mention. Patients who are treated with ipilimumab usually exhibit a unique pattern of response. Unlike with traditional chemotherapy — where you give someone a treatment and within a fairly predictable time period you see tumors start to get smaller and hopefully go away — ipilimumab works very differently.

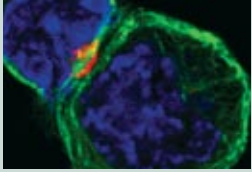
DR. ALLISON

Because we’re not treating the tumor, we’re treating the patient.

DR. WOLCHOK

We’re building an army of T cells — and it may take one person six weeks to muster that army while another person’s immune response may not be seen for as long as six or seven months. During that time, some patients’ tumors may grow larger, or they may even develop new tumors as older tumors regress. There are also patients who have long periods of stable disease, meaning the tumors don’t go away, yet they don’t progress.



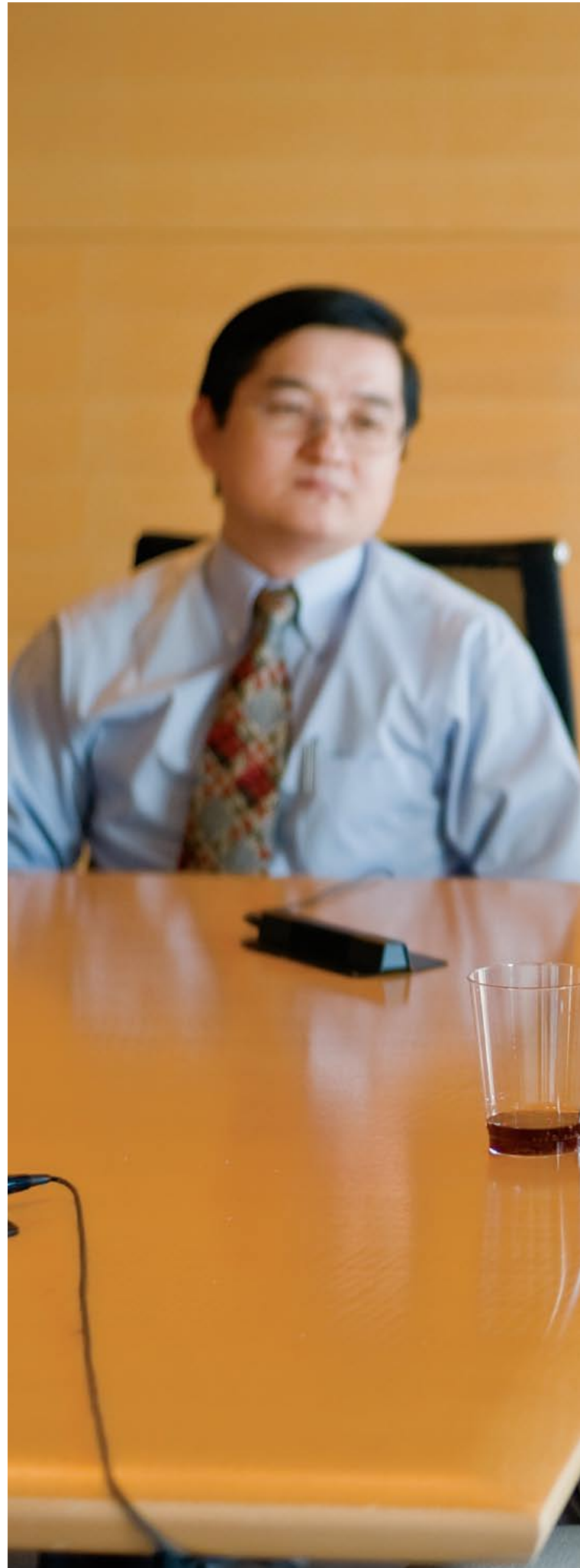



A T cell is shown interacting with an antigen-presenting cell. The red indicates the presence of CTLA-4 in the region of interaction between the two cells. (Image by Jackson Egen and James Allison.)

The Development of Anti-CTLA-4 (Ipilimumab)

For more than 20 years, James Allison's work has focused on understanding how T cells are activated and the mechanisms that regulate their response. He was chair of the immunology program at the University of California, Berkeley, when, in 1982, he and members of his laboratory discovered the receptor that T cells use to recognize antigens on the surface of antigen-presenting cells. However, recognition alone is not enough to stimulate T cell proliferation. In the late 1980s, Dr. Allison demonstrated that a protein called CD28 found on the surface of T cells was the co-stimulatory signal needed to activate a T cell response. He uses the analogy of an automobile.

"Just turning on the ignition won't get the car to go. There needs to be a second signal, a foot on the gas pedal so to speak. No one knew what that signal was until we showed the function of CD28." The final part of Dr. Allison's car analogy is the immune system's "brake," an immune-regulating molecule known as cytotoxic T lymphocyte-associated antigen-4, or CTLA-4. "Once your T cells have successfully killed all the invaders, CTLA-4 sends an inhibitory signal that decreases T cell production. It's what keeps the immune system from becoming hyperactivated and attacking the body's own tissues," he explains. "Members of my lab and I hypothesized that if we could find a way to block CTLA-4 this might enhance antitumor T cell responses. Eventually we were able to make antibodies to temporarily block CTLA-4's signal so that T cells could do their work unrestrained. In the simplest terms, anti-CTLA-4 takes the brakes off the immune system."



A photograph of two men in a meeting. The man in the foreground, Dr. Allison, is wearing a light blue shirt and glasses, and is gesturing with his hands while speaking. The man in the background, Dr. Wolchok, is wearing a white lab coat and glasses, and is listening. The background is a plain, light-colored wall.

As we get more tumor specimens from patients whose tumors are regressing we'll be able to look at the specificity of the T cells *within* the tumors.

DR. WOLCHOK

Because any self-respecting, tumor-attacking T cell is going to be in the tumor — that's where the action is, presumably.

DR. ALLISON

JAMES CREABY
Patient

JEDD WOLCHOK
Medical Oncologist

JIANDA YUAN
Immunologist,
Head, Immune Monitoring
Core Facility



I've been fortunate. Ipilimumab doesn't work for everybody . . .

MR. CREABY

. . . that's what we're trying to figure out in the Immune Monitoring Core Facility — why some people have very good, durable responses and others don't.

DR. YUAN



MR. CREABY

All my tumors have now disappeared. But during those three months after I got the first dose of ipilimumab the tumor in my pectoral muscle blossomed, the tumors in my liver grew, and the tumors in my lungs didn't go away — although they remained stable.

DR. WOLCHOK

You were on a randomized double-blind study evaluating the efficacy of several different dose levels of ipilimumab. Then the blind was broken, and we discovered that your first dose was a low one. Right after you had your 12-week scans we re-induced you with the high dose.

of SKI's Immunology Program and Director of the New York Branch of the Ludwig Institute for Cancer Research]. We asked Jianda to look at the amount of NY-ESO-1 antibody in your blood — and this is where it got very interesting.

MR. CREABY

It's working for me. I can pretty much carry on with my normal life. My biggest side effect is itching.

To read more about the Ludwig Center for Cancer Immunotherapy at MSKCC, please see page 39.

DR. WOLCHOK

Patients may experience a rash and gastrointestinal problems. But they're almost always manageable.

NY-ESO-1 is a member of a special class of proteins called cancer-testis, or CT antigens. CT antigens are expressed in almost half of all melanomas and in a variety of other cancers, but not in normal adult tissues, except for the germ cells of the testes and the placenta.

MR. CREABY

I've been fortunate. Ipilimumab doesn't work for everybody.

DR. YUAN

Right. And that's what we're trying to figure out in the Immune Monitoring Core Facility — why some people have very good, durable responses and others don't. I want to say that we deeply appreciate all our patients who are so willing to contribute blood and tissue samples, because without them we couldn't learn.

DR. WOLCHOK

You see, melanoma patients can spontaneously make immune responses to NY-ESO-1. And so you might ask, "If they can make these immune responses, then why doesn't the tumor get controlled?" Well, maybe there isn't enough of it, or maybe all the cells don't have it. We don't know the answer yet.

DR. WOLCHOK

Your blood, Jim, has been very important to our efforts. One of the first things we did was to look in your blood for antibodies that may have been produced by your immune system to targets that we know are sometimes found on melanoma. The particular target we were interested in is a protein called New York ESO-1 [NY-ESO-1]. It was discovered here at the Ludwig Institute [by Lloyd Old, a Member

DR. YUAN

When you got your low dose of ipilimumab, we saw a low level of NY-ESO-1. But right after Jedd gave you the high dose, your NY-ESO-1 antibodies increased tremendously. And we also saw a beautiful T cell response. Your T cells, doing their work unrestrained, recognized NY-ESO-1. So we surmise that the T cells are indeed eliminating the tumor.

JAMES ALLISON
Chair, Immunology
Program

JAMES CREABY
Patient

JEDD WOLCHOK
Medical Oncologist

DR. WOLCHOK

It was at this same point that all your tumors regressed and you had a complete remission.

DR. ALLISON

The difficult thing is that we still don't know for certain that the specific T cells we're measuring are the cause of the tumor going away. The tests we have for blood are useful, but may not be the most informative.

DR. WOLCHOK

True. As we get more tumor specimens from patients whose tumors are regressing we'll be able to look at the specificity of the T cells *within* the tumors.

DR. ALLISON

Because any self-respecting, tumor-attacking T cell is going to be in the tumor — that's where the action is, presumably.

DR. WOLCHOK

So having tumor specimens is vital. One of the great advantages of working at Memorial Sloan-Kettering is that we're at the interface of science and medicine. There are very few institutions that could carry out the kinds of studies we've done — very few places that can run clinical trials and then try to understand the science of the drug they're investigating.

DR. ALLISON

Also, we're taking what we've learned from analyzing patient specimens in the lab back to the animal model. We're now starting to manipulate some of the new molecules that we see are increased in patients on ipilimumab. As we identify these molecules that seem relevant in humans, we can go back and design carefully controlled mouse experiments where we'll learn if they're good therapeutic targets and build layer upon layer like this, over time.

DR. WOLCHOK

It's really a gift to be able to bring things from the lab to the clinic and back to the lab — as Jim's just said, to complete the circle.

MR. CREABY

It's been wonderful to be in the same room with all of you.

DR. ALLISON

Well, it's always a thrill to meet people who have benefited from our work. [Pause] I've met a lot of the mice. They don't seem to care as much.

[Laughter]





(Above) James Allison (left) and Jedd Wolchok (middle) serve as Director and Associate Director for Clinical Research, respectively, at the Ludwig Center for Cancer Immunotherapy at MSKCC. Jianda Yuan (right) heads the Immune Monitoring Core Facility.

The Ludwig Center at MSKCC

Memorial Sloan-Kettering is one of six distinguished United States institutions to have been named a Ludwig Center. In 2006, the institutions shared in a \$120 million gift from the Virginia and D. K. Ludwig Fund for Cancer Research, plus stock in a real-estate holding company, to create the Ludwig Centers. The Ludwig Center for Cancer Immunotherapy at MSKCC focuses on harnessing the power of the immune system to monitor and treat cancer. The support of the Ludwig Fund is accelerating the pace at which researchers can move the findings of basic scientific studies into translational work, so that promising innovative therapies and diagnostic approaches can be evaluated in people with cancer. James Allison and Jedd Wolchok serve as Director and Associate Director for Clinical Research, respectively. Jianda Yuan heads the Immune Monitoring Core Facility that is part of the Ludwig Center. That facility works to develop immune monitoring tests able to determine immune responses in patients receiving novel immunotherapies.



James Creaby is a member of the Pipes and Drums of the Jersey Shore Shillelaghs, a parade band located in Belmar, New Jersey. The nonprofit group plays approximately a quarter of its performances for charitable events, including fundraisers, and in support of other volunteer organizations.

MR. CREABY

One of the things I try to do now is to speak to other people with cancer. What I want is to give them hope. In other words, to tell them that there is the potential for a positive outcome.

DR. WOLCHOK

You're actually responsible, Jim, for at least one other person joining the ipilimumab trial even though that person was quite fearful and uncertain at first. And he's having a very good response — in fact, such a good response that he's missing office visits left and right because he can't take time off from work!

James Creaby receives a maintenance dose of ipilimumab every three months to periodically reinhibit CTLA-4. He continues to show no evidence of disease. To date, approximately 3,700 patients have been treated with ipilimumab, mostly for melanoma, although it is also being evaluated for the treatment of prostate, ovarian, and kidney cancers. Collaborative investigations continue at MSKCC to refine, discover, and develop new and more-effective immunotherapies against cancer.



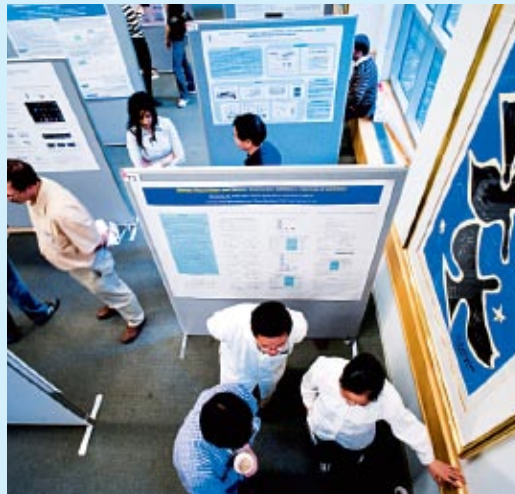


Education
&
Training

Memorial Sloan-Kettering's training programs prepare the next generation of physicians, scientists, and other healthcare professionals for leadership roles in the life sciences and medicine, especially as related to cancer. In 2008, MSKCC trained 1,609 residents and clinical fellows; 481 postdoctoral research fellows, research scholars, and research associates; 232 PhD candidates; 29 MD/PhD candidates; 72 nursing students; and 358 medical students.

Postdoctoral training takes place after young investigators have earned their PhD degrees and provides these scientists with opportunities to initiate independent research projects under the guidance of experienced mentors who provide advice and laboratory resources.

In October, Memorial Sloan-Kettering postdoctoral researchers got the chance to showcase their accomplishments at the second annual **Postdoctoral Research Symposium**, held in MSKCC's Rockefeller Research Laboratories. The event enabled the postdocs to share their latest findings with MSKCC colleagues and mentors, and other members of the Tri-Institutional community (which also includes The Rockefeller University and Weill Cornell Medical College). More than 80 scientific projects were described through oral presentations and poster discussions during the daylong event, expanded from a half day last year. The committee also added a poster competition, in which a faculty panel chose the top projects. Two posters shared first prize — one presented by Christina Stallings, in the laboratory of infectious disease specialist Michael Glickman, and the other by Roy Sillitoe, in the laboratory of developmental biologist Alexandra Joyner. The symposium culminated with a keynote address by Christine Guthrie, a leading RNA researcher and professor of biochemistry at the University of California, San Francisco.



The symposium allowed postdoctoral researchers to share findings with colleagues and interact with scientists, such as (clockwise, from top right) Alan Hall, Chair of SKI's Cell Biology Program; MSKCC President Emeritus Paul Marks; keynote speaker Christine Guthrie, from the University of California, San Francisco; and Jayanta Chaudhuri, a molecular biologist in SKI's Immunology Program.



The third class of the Gerstner Sloan-Kettering Graduate School of Biomedical Sciences poses for a group photograph.

In late July, MSKCC welcomed the third class of the **Gerstner Sloan-Kettering Graduate School of Biomedical Sciences (GSK)**. The 11 students matriculating in the third class came to GSK from universities across the United States — Stanford University, the University of Puerto Rico, and the University of Wisconsin — as well as from nearby schools — New York University, the University of Massachusetts, Princeton University, Cornell University, Drexel University, the University of Rochester, and Rutgers. After completing orientation week and their first laboratory rotation, the students immersed themselves in the Gerstner Sloan-Kettering core course beginning in September. The school's second- and third-year students have completed their core-curriculum courses and are now focusing on research projects in their thesis laboratories.

To ensure continued progress in cancer research, it is vital that young people develop and maintain an interest in science and medicine. In the fall, MSKCC held its third **Major Trends in Modern Cancer Research** symposium, which was moderated by MSKCC President Harold Varmus. The event is designed to stimulate high school students' interest and excitement in medical discovery and to encourage them to consider a career in science. Aimed at both students and their teachers, the seminar drew approximately 460 students from about 60 New York City-area schools. In the program, three investigators — Kathryn Anderson, Chair of the Developmental Biology Program in the Sloan-Kettering Institute; Prasad Jallepalli, a member of SKI's Molecular Biology Program; and Kenneth Offit, Chief of the Clinical Genetics Service in Memorial Hospital — described their individual areas of research and put that research into a larger context, explaining how the understanding of certain genes or cellular or developmental processes contributes to a deeper understanding of what goes awry in the body when cancer forms. After the presentations students had the opportunity to ask the speakers about their work.



(Clockwise, from top left): Students gather around MSKCC President Harold Varmus in the Rockefeller Research Laboratories Auditorium following the *Major Trends in Modern Cancer Research* symposium; Developmental Biology Program Chair Kathryn Anderson speaks with a student at the symposium; geneticist Kenneth Offit speaks about the role of inherited genes in the development of cancer; a student asks a question during the lecture; molecular biologist Prasad Jallepalli shares the details of his research with a student.



MSKCC PEOPLE
APPOINTMENTS



Eric M. Cottingham joined MSKCC as Vice President of Research and Technology Management, with overall responsibility for Sponsored Projects, Research Administration, and Industrial Affairs. This division oversees the administration of resources essential to the health of MSKCC's research enterprise. This includes proposals to external sponsors for funding to support research; funds actually awarded or provided to MSKCC for research (including grants, contracts, restricted gifts, and institutional funds); and intellectual property (such as inventions) that is the result of research conducted at MSKCC. Prior to joining MSKCC, Dr. Cottingham was Associate Vice President for Research at Case Western Reserve University for nearly eight years.



William R. Jarnagin, who joined the MSKCC faculty in 1997, was named Chief of the newly formed Hepatopancreatobiliary Service in the Department of Surgery. A successor to the Hepatobiliary Service, the new service will foster clinical and translational research in liver, biliary, and pancreas disease and will allow for centralization of research activities and clinical care. Dr. Jarnagin is a surgeon who is an expert in the diagnosis and treatment of benign and malignant diseases of the liver, bile ducts, gallbladder, and pancreas. In his clinical research, he is investigating novel approaches to treating primary liver cancer as well as a new image-guided surgical system that may help facilitate hepatic resections.



Jason S. Lewis joined MSKCC as Chief of the Radiochemistry Service in the Department of Radiology and Director of the Cyclotron-Radiochemistry Core Facility. His research centers on developing new PET radiopharmaceuticals for noninvasive imaging of cancer. He has published more than 70 peer-reviewed articles as well as numerous book chapters and reviews and is a member of the editorial board of *Current Radiopharmaceuticals* and an associate editor of *Cancer Research*. Dr. Lewis was previously on the faculty of Washington University School of Medicine, in St. Louis.



Paul A. Glare was appointed Chief of the Pain and Palliative Care Service in the Department of Medicine. He came to MSKCC from the Sydney Cancer Center at the Royal Prince Alfred Hospital, in Australia, where he spent ten years as chief of a large academic palliative medicine program. His research interests include prognostication and the cancer cachexia syndrome (loss of body weight and muscle mass). Dr. Glare is associate editor of the textbook *Palliative Medicine*, published in August 2008, and has edited books on opioid pharmacology as well as a textbook on cancer prognosis. He is co-chair of the Palliative Care section of the Multinational Association of Supportive Care in Cancer.



Jason M. Klein joined MSKCC as its first Vice President and Chief Investment Officer. Mr. Klein oversees the Center's complex investment portfolio, which is globally diverse and includes several niche alternative investments. He will build out a new Investment Management Division to develop in-house expertise to steward the long-term investment assets of MSKCC. Previously, Mr. Klein was the Chief Investment Officer for the Museum of Modern Art and had been a vice president and principal in the private equity division of Lehman Brothers. He has also been an equity capital markets associate at Prudential Securities and a commercial credit analyst at Chemical Bank.



Kathy Lewis was named Vice President of Public Affairs. Ms. Lewis has a long history of distinguished service in the world of healthcare and advocacy and came to MSKCC after having served for three years as President and Chief Executive Officer of the Christopher and Dana Reeve Foundation. There she was engaged in philanthropy, public relations, and other aspects of the Foundation. Previously, she spent more than 20 years at the Kessler Rehabilitation Corporation, an internationally recognized physical rehabilitation services company with facilities in ten states. At Kessler she held leadership positions in marketing, community relations, and public relations and, in 2000, was appointed Executive Vice President for Corporate Strategy and Development.



Steven C. Martin joined Memorial Hospital as Chief of the General Internal Medicine Service. Dr. Martin hopes to build on the current strengths of the service — which is made up of internists who provide pre- and perioperative consultations for MSKCC's surgical patients and hospitalists who are dedicated to enhancing the quality of care for inpatients — and add geriatricians to the faculty to strengthen the 65+ Program and bring added expertise to the care of older adults being treated here. Prior to joining MSKCC, Dr. Martin was affiliated with Jacobi Medical Center, where he served as Vice Chair of the Department of Medicine and director of the internal medicine residency program.



Simon N. Powell joined MSKCC as Chair of the Department of Radiation Oncology and the incumbent of an Enid A. Haupt Chair. Dr. Powell is a leader in research into DNA repair, including the *BRCA1* and *BRCA2* genes, mutations in which can sharply increase breast cancer risk. He has recently developed tests to determine if a specific breast cancer has lost the DNA repair function that is controlled by these genes, which could ultimately influence treatment decisions. He also holds a joint appointment in Sloan-Kettering Institute's Molecular Biology Program and is interested in genomic approaches to understanding the effects of radiation on tumors as well as on normal tissue.



Steven B. Solomon was appointed Chief of the Interventional Radiology Service in the Department of Radiology. Dr. Solomon, who joined MSKCC in 2005, specializes in minimally invasive treatments carried out using image guidance, including x-ray, CT, ultrasound, and MRI. He has a particular expertise in thermal ablation — a technique that uses imaging to guide a needle to a target tumor and then destroy it through the application of heat (radiofrequency ablation) or extreme cold (cryoablation). He has invented a number of technologies that make surgery easier and has expertise in robotics and other image-guided therapies.



Monica Morrow was named Chief of the Breast Service in the Department of Surgery. She came to MSKCC from Fox Chase Cancer Center, where she had served for four years as Chair of Surgical Oncology with a clinical practice dedicated to the treatment of breast cancer. She is currently studying the way treatment choices for breast cancer surgery are made — including medical decisions as well as the factors that are important to women when making treatment choices, how well they understand their choices, and the level of conflict they experience with their surgeons. Dr. Morrow is the incumbent of the Anne Burnett Windfohr Chair of Clinical Oncology.



Isabelle Rivière is director of the newly created Cell Therapy and Cell Engineering Facility, which merges the existing cell and vaccine production activities previously handled by the Adoptive Immune Cell Therapy Facility, the Immunobiology Facility, and the Gene Transfer and Somatic Engineering Cell Facility, which Dr. Rivière led as co-director since she joined MSKCC in 1998. The new laboratory provides support to MSKCC investigators who are conducting early-stage clinical trials that require biological materials for immunotherapies, vaccines, and stem-cell-based therapies. The facility is designed to meet all manufacturing standards required by the US Food and Drug Administration to ensure patient safety.



Physician-scientist **Marcel R. M. van den Brink** was named Head of the Division of Hematologic Oncology in the Department of Medicine. He is an expert in allogeneic (donor-provided) blood stem cell transplantation for adult cancer patients and also heads a laboratory in SKI's Immunology Program. His research focuses on the immunology of bone marrow transplantation and the role of T cells in graft-versus-host disease, graft-versus-tumor activity, and immune reconstitution. Prior to this appointment, Dr. van den Brink had been Chief of the Adult Bone Marrow Transplant Service since 2005. He is the incumbent of the Alan N. Houghton Chair.

ENDOWED CHAIRS

An endowed chair represents one of the highest honors that MSKCC bestows on its most talented faculty. During 2008, six staff members were named to either new or established chairs.



Breast surgeon **Tari A. King** was named to the newly endowed Jeanne A. Petrek Junior Faculty Chair. An expert in the surgical management of breast cancer, Dr. King also has an active interest in translational research and is the principal investigator of the Breast Surgery Research Laboratory. A major focus of her research is elucidating the molecular genetics of the invasive breast cancer risk associated with lobular carcinoma in situ. The chair she holds is named in honor of Dr. Petrek, a highly regarded breast surgeon and clinical investigator whose career at MSKCC spanned more than 20 years, from 1984 until her death in 2005. It was endowed with funds from more than 500 donors, many of whom were Dr. Petrek's patients.



Steven M. Larson, Chief of MSKCC's Nuclear Medicine Service, is the incumbent of the newly endowed Donna and Benjamin M. Rosen Chair in Radiology. Mr. Rosen has been a member of MSKCC's Boards of Overseers and Managers since 1985 and currently serves on the Joint Finance and Funding Committee. He and his wife are longtime supporters of the Center's programs. Dr. Larson is a leading physician-scientist and innovator in the field of nuclear medicine whose research focuses on the experimental aspects of molecular imaging and targeted radiotherapy. He has also used advanced imaging techniques to elucidate the causes of fundamental setbacks in previously successful treatment of cancer.



Peter T. Scardino, Chair of the Department of Surgery, is the incumbent of a newly endowed David H. Koch Chair, established in recognition of a gift from Mr. Koch, a member of MSKCC's Boards. Dr. Scardino is an internationally recognized expert in the prognosis, early detection, and treatment of prostate cancer. He and his team have developed nomograms to predict the results of treatment, imaging studies to improve staging, and new techniques that lead to better outcomes after surgery for prostate cancer. In 1999 Dr. Scardino became the inaugural Chair of the Department of Urology and in 2006 was named to his current position. He formerly held the Florence and Theodore Baumritter/Enid Ancell Chair of Urologic Oncology.



David W. Kissane was named the incumbent of the newly endowed Jimmie C. Holland Chair. Funded by a group of generous donors with a substantial lead contribution from MSKCC Board member Jack Rudin, the chair honors Dr. Holland, who founded the Psychiatry Service at MSKCC in 1977 and 20 years later became the inaugural Chair of the Department of Psychiatry and Behavioral Sciences. She continues her clinical practice at MSKCC. Dr. Kissane succeeded Dr. Holland in 2003 and is responsible for a broad program of services, research, and training in the diagnosis and treatment of psychiatric problems experienced by cancer patients. He is internationally recognized for his work characterizing demoralization of late-stage cancer patients and distinguishing between this syndrome and depression. He formerly held an Alfred P. Sloan Chair.



Stephen D. Nimer was named to an Alfred P. Sloan Chair. Dr. Nimer, who has been Chief of the Hematology Service since he joined MSKCC in 1993, is an internationally known hematologist who has utilized novel agents and stem cell transplantation to treat malignant blood cell disorders. He established the inpatient hematology service and the adult autologous peripheral blood cell transplantation program for hematologic malignancies at MSKCC. As a Member in SKI's Molecular Pharmacology and Chemistry Program, he has helped define the molecular defects that underlie several myeloid malignancies. The chair he holds is one of four endowed in honor of the late Alfred P. Sloan, who was well known for his commitment to biomedical research.



Andrea Ventura was named to a Geoffrey Beene Junior Faculty Chair. These chairs provide funding to outstanding young researchers at a crucial early stage in their careers and are part of the Geoffrey Beene Cancer Research Center at MSKCC, an initiative funded by a gift from the estate of the late fashion designer and philanthropist Geoffrey Beene. Dr. Ventura joined the Center in September 2008 as an Assistant Member in SKI's Cancer Biology and Genetics Program. His laboratory studies the function of microRNAs in mammalian development, seeking to understand how these small particles act on genes to promote or suppress cancer.

ACADEMIC APPOINTMENTS AND PROMOTIONS

The following individuals received academic appointments or promotions during the past year.

MEMBER LEVEL

APPOINTMENTS

Philip A. Bialer
*Department of Psychiatry
and Behavioral Sciences*

Paul A. Glare
*Chief, Pain and Palliative Care
Service, Department of Medicine*

Meera Rathika Hameed
Department of Pathology

Steven C. Martin
*Chief, General Internal Medicine
Service, Department of Medicine*

Monica Morrow
*Chief, Breast Service,
Department of Surgery*

John P. Mulhall
Department of Surgery

Raul O. Parra
Department of Surgery

Simon N. Powell
*Chair, Department
of Radiation Oncology*

Alexander Rudensky
Immunology Program

Gerald A. Soff
*Department of
Clinical Laboratories;
Department of Medicine*

PROMOTIONS

Ariadne M. Bach
Department of Radiology

Mary K. Baylies
Developmental Biology Program

Mark J. Bluth
Department of Radiology

Mercedes Castiel
Department of Surgery

Guido Dalbagni
Department of Surgery

William R. Jarnagin
*Chief, Hepatopancreatobiliary
Service, Department of Surgery*

Nancy E. Mills
Department of Medicine

Andrew J. Roth
*Department of Psychiatry
and Behavioral Sciences*

Karen D. Schupak
Department of Radiation Oncology

Samuel Singer
Department of Surgery

Satish K. Tickoo
Department of Pathology

Marcel R. M. van den Brink
*Head, Division of Hematologic
Oncology, Department of Medicine*

Carolyn Wasserheit
Department of Medicine

Pat B. Zanzonico
*Department of Medical Physics;
Department of Radiology*

ASSOCIATE MEMBER LEVEL

APPOINTMENTS

Deborah M. Capko
Department of Surgery

Maxine S. Jochelson
Department of Radiology

Vincent F. LaRussa
*Department of
Clinical Laboratories*

Vincent Laudone
Department of Surgery

Jason S. Lewis
*Chief, Radiochemistry Service,
Department of Radiology*

Barbara Wajsbrot-Kandel
Department of Radiology

PROMOTIONS

Jacqueline F. Bromberg
Department of Medicine

Carol L. Brown
Department of Surgery

Chih-Shan Jason Chen
Department of Medicine

Anne M. Covey
Department of Radiology

Michael D'Angelica
Department of Surgery

Gary E. Deng
Department of Medicine

Raja M. Flores
Department of Surgery

Venera Grasso
Department of Medicine

Prasad V. Jallepalli
Molecular Biology Program

Noah D. Kauff
*Department of Medicine;
Department of Surgery*

Delia Keating
Department of Radiology

Kim Kramer
Department of Pediatrics

Vivek T. Malhotra
*Department of Anesthesiology
and Critical Care Medicine*

James G. Mechalakos
Department of Medical Physics

Babak J. Mehrara
Department of Surgery

Sadek Nehmeh
*Department of Radiology;
Department of Medical Physics*

Kenneth K. Ng
Department of Medicine

Ariela Noy
Department of Medicine

Snehal Patel
Department of Surgery

Viviane S. Tabar
Department of Neurosurgery

Derek S. Tan
*Molecular Pharmacology
and Chemistry Program*

Larissa K. F. Temple
Department of Surgery

Tanya M. Trippett
Department of Pediatrics

Yukio Sonoda
Department of Surgery

Jedd D. Wolchok
Department of Medicine

Richard J. Wong
Department of Surgery

STATISTICAL PROFILE

PATIENT CARE	2004	2005	2006	2007	2008
Patient Admissions: Adults	18,584	19,624	19,626	20,195	21,039
Patient Admissions: Children	1,480	1,532	1,553	1,673	1,650
Total Admissions	20,064	21,156	21,179	21,868	22,689
Total Patient Days	135,762	139,301	136,920	137,787	139,847
Average Patient Stay (days)	6.8	6.6	6.5	6.3	6.2
Bed Occupancy Rate ⁽¹⁾	87.3%	88.3%	88.1%	87.4%	88%
Outpatient MD Visits: Manhattan	340,179	351,452	363,458	368,200	384,889
Outpatient MD Visits: Regional Network	60,789	70,170	67,702	75,631	81,995
Total Outpatient MD Visits	400,968	421,622	431,160	443,831	466,884
Screening Visits	29,425	31,383	31,198	30,200	28,888
Surgical Cases	15,431	16,043	16,329	16,951	16,035
Radiation Treatments and Implants: Manhattan	63,240	62,754	59,369	57,307	58,494
Radiation Treatments and Implants: Regional Network	45,980	47,751	44,175	44,615	43,550
Total Radiation Treatments and Implants	109,220	110,505	103,544	101,922	102,044
X-ray Examinations and Special Procedures	274,124	291,127	305,404	329,329	346,157
Clinical Investigation Protocols ⁽²⁾	436	445	460	493	522

(1) Based on adjusted bed count
(2) Excludes studies closed to accrual

STAFF	2004	2005	2006	2007	2008
Center ^{(1) (2)}	692	726	798	766	826
Hospital Attending Staff	620	650	713	672	727
Sloan-Kettering Institute Members ⁽²⁾	111	116	122	128	133
Registered Nurses	1,262	1,377	1,504	1,615	1,738
Total Employees ⁽³⁾	8,320	8,760	9,309	9,917	10,509
Volunteers	903	877	895	848	871

(1) All Hospital Attendings and Institute Members hold appointments in the Center; in 2008, 34 staff members held appointments in both the Institute and the Hospital

(2) Includes professional support staff appointments

(3) Includes all clinicians, scientists, nurses, other health professionals, and support staff

EDUCATION	2004	2005	2006	2007	2008
Residents and Clinical Fellows—Positions	377	385	412	419	414
Residents and Clinical Fellows—Annual Total	1,311	1,347	1,421	1,687	1,609
Research Fellows	336	340	400	404	254
Research Scholars	—	—	—	—	140
Research Associates	63	65	62	63	87
Senior Research Scientists	28	30	34	40	46
Frank A. Howard Scholars	—	—	1	1	1
PhD Candidates	147	155	163	195	232
MD/PhD Candidates	28	25	23	24	29
Registrants in Continuing Medical Education Programs	1,863	2,010	2,140	2,035	2,115
Medical Observers	455	488	534	522	561
Medical Students	302	318	332	368	358
Nursing Students	84	62	71	61	72
Social Work Students	6	5	6	6	6
Radiation Oncology Technology Students	20	17	16	16	15
Cytotechnology Students	3	3	3	4	3
Physical Therapy Students	3	3	4	3	3
Occupational Therapy Students	1	1	2	1	5

FINANCIAL SUMMARY

REVENUES AND EXPENSES (IN THOUSANDS)	2004	2005	2006	2007	2008
OPERATING REVENUES					
Patient Care Revenue	\$1,094,797	\$ 1,249,379	\$ 1,398,393	\$ 1,531,639	\$1,606,989
Grants and Contracts	119,396	117,428	129,693	149,275	163,352
Contributions Allocated to Operations	69,114	74,277	83,538	95,481	108,844
Royalty Income	61,128	46,297	44,558	38,302	94,131
Other Income	64,780	34,294	39,439	39,902	41,963
Investment Return Allocated to Operations	70,635	88,664	116,143	113,131	116,546
Transfer of Board-Designated Annual Royalty Annuitization	10,599	17,163	26,083	29,440	33,122
Total Operating Revenues	1,490,449	1,627,502	1,837,847	1,997,170	2,164,947
OPERATING EXPENSES					
Compensation and Fringe Benefits	813,584	880,565	966,034	1,061,946	1,164,155
Purchased Supplies and Services	464,147	525,120	594,671	659,488	684,872
Provision for Bad Debts and Assessments	34,274	40,506	41,978	13,387	6,823
Depreciation and Amortization	130,974	135,143	139,402	157,494	175,870
Interest Expense	20,808	24,205	45,463	54,872	59,023
Less Fund Raising Expenses Transferred to Non-Operating Income (Expenses)	(25,697)	(29,631)	(28,390)	(33,523)	(36,048)
Total Operating Expenses	1,438,090	1,575,908	1,759,158	1,913,664	2,054,695
Income from Operations	\$ 52,359	\$ 51,594	\$ 78,689	\$ 83,506	\$ 110,252
PHILANTHROPY (IN THOUSANDS)					
Unrestricted	\$ 152,461	\$ 162,335	\$ 193,538	\$ 172,604	\$ 246,335
Temporarily Restricted	42,256	26,157	61,453	(12,419)	30,990
Permanently Restricted	11,811	10,191	43,737	78,835	1,778
Total Philanthropy	\$ 206,528	\$ 198,683	\$ 298,728	\$ 239,020	\$ 279,103
CAPITAL SPENDING (IN THOUSANDS)					
Capital Spending	\$ 272,218	\$ 297,519	\$ 309,524	\$ 273,944	\$ 345,135

Memorial Sloan-Kettering's financial statements are available by writing to the Department of Public Affairs,
 Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10065
 Or the New York State Department of Law, Office of the Attorney General, Charities Bureau,
 120 Broadway, New York, NY 10271- 0332

DEPARTMENTS OF MEMORIAL HOSPITAL

MEDICAL BOARD



CHAIR

Robert E. Wittes, MD
*Vincent Astor Chair of
Clinical Research*

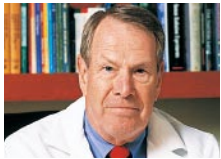
David R. Artz, MD
Gay Bailey, RN

Richard I. Beattie, JD
Colin B. Begg, PhD
Ellin Berman, MD
George J. Bosl, MD
Kevin Browne, RN
Michelle Burke, RN
Lisa M. DeAngelis, MD
Mary Dowling, RN
Martin Fleisher, PhD
Jeffrey S. Groeger, MD
John R. Gunn
Philip H. Gutin, MD
William J. Hoskins, MD

Hedvig Hricak, MD, PhD
William R. Jarnagin, MD
Lewis J. Kampel, MD
Thomas J. Kelly, MD, PhD
Aileen Killen, PhD, RN
David W. Kissane, MD
Robert C. Kurtz, MD
Michael P. La Quaglia, MD
Charles D. Lucarelli, RPh
Kathryn Martin
Mary Jane Massie, MD
Mary McCabe, RN

Elizabeth Nelkin McCormick,
MSN, RN
Larry Norton, MD
Eileen M. O'Reilly, MBCh, BAO
Richard J. O'Reilly, MD
David G. Pfister, MD
Simon N. Powell, MD, PhD
Marc K. Rosenblum, MD
Jean M. St. Germain, MS
Leonard B. Saltz, MD
Peter T. Scardino, MD
Harold Varmus, MD
Roger S. Wilson, MD

DEPARTMENT OF ANESTHESIOLOGY AND CRITICAL CARE MEDICINE



CHAIR AND ATTENDING

Roger S. Wilson, MD
Founder's Chair

ATTENDINGS

David Amar, MD
Ruth A. Borchardt, MD
Dawn P. Desiderio, MD
Mary Ellen Fischer, MD

Florence J. Grant, MD
Jeffrey S. Groeger, MD
Neil A. Halpern, MD
Paul M. Heerd, MD, PhD
Anne C. Kolker, MD
Ronald A. Kross, MD
William L. Marx, MD
Stephen M. Pastores, MD
Diane E. Stover, MD
Alisa C. Thorne, MD
Robert A. Veselis, MD

ASSOCIATE ATTENDINGS

Lisa R. Barr, MD
Paul H. Dalecki, MD
Jamie A. Fortunoff, MD

Alan L. Kotin, MD
Vivek T. Malhotra, MD
Roger E. Padilla, MD
Josephine P. Ragasa, MD

ASSISTANT ATTENDINGS

Clara Broad, MD
Mohit Chawla, MD
Sanjay Chawla, MD
Kenneth H. Cubert, MD
Anahita Dabo, MD
Oscar E. Del Valle, MD
Marc B. Feinstein, MD
Rodney H. Garcia, MD
Amitabh Gulati, MD

Eric R. Kelhoffer, MD
Jennifer Mascarenhas, MD
Eileen P. McAleer, MD
Leslie S. Ojea, MD
Alessia C. Pedoto, MD
Kane O. Pryor, MBBS
Nina D. Raoof, MD
Ruth A. Reinsel, PhD
Luis E. Tollinche, MD
Louis P. Voigt, MD

INSTRUCTORS

Amy Lu, MD, MPH
Elizabeth Fay Rieth, MD
Cindy Beng-Imm Yeoh, MD

DEPARTMENT OF CLINICAL LABORATORIES



CHAIR AND ATTENDING

Martin Fleisher, PhD

ATTENDINGS

Ann M. Dnistrian, PhD
Bo Dupont, MD, DSc
Timothy E. Kiehn, PhD
Hans G. Lilja, MD, PhD
Peter G. Maslak, MD
Eric Pamer, MD
*Enid A. Haupt Chair in
Clinical Investigation*

Lilian M. Reich, MD
Gerald A. Soff, MD
David L. Wuest, MD

ASSOCIATE ATTENDINGS

Vincent F. LaRussa, PhD
Celia J. Menendez-Botet, PhD
Trudy Nan Small, MD

ASSISTANT ATTENDINGS

Renier J. Brentjens, MD, PhD
Alex J. Rai, PhD
Larry J. Smith, PhD

DEPARTMENT OF EPIDEMIOLOGY AND BIostatISTICS



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Colin B. Begg, PhD
Eugene W. Kettering Chair

ATTENDINGS

Glenn Heller, PhD
Chris Sander, PhD

ASSOCIATE ATTENDINGS

Peter B. Bach, MD
Jonine L. Bernstein, PhD
Mithat Gonen, PhD
Adam B. Olshen, PhD
Katherine S. Panageas, DrPH
Malcolm C. Pike, PhD
Jaya M. Satagopan, PhD

Howard T. Thaler, PhD
Andrew J. Vickers, DPhil
Ann G. Zauber, PhD

ASSISTANT ATTENDINGS

Ethan M. Basch, MD
Victoria S. Blinder, MD
Marinela Capanu, PhD
Elena B. Elkin, PhD
Lawrence S. Engel, PhD
Mia M. Gaudet, PhD
Alexia E. Iasonos, PhD

Yuelin Li, PhD
Chaya S. Moskowitz, PhD
Susan A. Oliveria, ScD, MPH
Sara H. Olson, PhD
Irene Orlow, PhD
Irina Ostrovnaya, PhD
Sujata Patil, PhD
Li-Xuan Qin, PhD
Talya Salz, PhD
Ronglai Shen, PhD
Zhigang Zhang, PhD

DEPARTMENT OF MEDICAL PHYSICS



ACTING CHAIR AND ATTENDING
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ATTENDINGS

Howard I. Amols, PhD
 Chandra M. Burman, PhD
 John L. Humm, PhD
 Peter Kijewski, PhD
 Jason A. Koutcher, MD, PhD
 Gloria C. Li, PhD

C. Clifton Ling, PhD
*Enid A. Haupt Chair of
 Medical Physics*
 Thomas J. LoSasso, PhD
 Gikas S. Mageras, PhD
 Ellen D. Yorke, PhD
 Marco Zaider, PhD
 Pat B. Zanzonico, PhD

ASSOCIATE ATTENDINGS

Douglas J. Ballon, PhD
 Maria F. Chan, PhD
 Yusuf E. Erdi, DSc
 Y. C. David Huang, PhD
 Margie A. Hunt, MS
 Andrew Jackson, PhD
 Assen S. Kirov, PhD

Dale M. Lovelock, PhD
 James G. Mechalakos, PhD
 Sadek Nehmeh, PhD
 Ceferino H. Obcemea, PhD
 Joseph A. O'Donoghue, PhD
 Kristen L. Zakian, PhD
 Binsheng Zhao, PhD

ASSISTANT ATTENDINGS

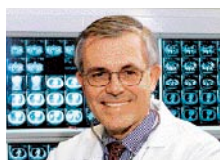
Ase M. Ballangrud-Popovic, PhD
 Lawrence T. Dauer, PhD
 Amita Dave, PhD
 Cesar Della Bianca, PhD
 Paul Frisch, PhD
 Bob L. Hou, PhD
 Hongbiao Carl Le, PhD
 Jingdong Li, PhD

Ruimei Ma, PhD
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 Yulin Song, PhD
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*The Patrick M. Byrne Chair in
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*Division of Network
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*Division of Solid Tumor Oncology;
 Winthrop Rockefeller Chair in
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 Diane E. Stover, MD
Division of General Medicine
 Marcel R. M. van den Brink, MD, PhD
*Division of Hematologic Oncology;
 Alan N. Houghton Chair*

SENIOR ATTENDING

Bayard D. Clarkson, MD
*Enid A. Haupt Chair of
 Therapeutic Research*

ATTENDINGS

James P. Allison, PhD
*David H. Koch Chair in Immunologic
 Studies; Howard Hughes Medical
 Institute Investigator*
 Dean F. Bajorin, MD
 Ellin Berman, MD
 William S. Breitbart, MD

Murray F. Brennan, MD
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 Michael S. Baum, MD
 Jacqueline F. Bromberg, MD, PhD
 Martin Brower, MD
 Hugo R. Castro-Malaspina, MD
 Cih-Shan Jason Chen, MD, PhD
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 Teresa Ann Gilewski, MD
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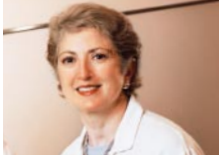
ASSISTANT ATTENDINGS
 Ghassan K. Abou-Alfa, MD
 David R. Artz, MD
 Christopher G. Azzoli, MD
 Juliet N. Barker, MBBS
 Ethan M. Basch, MD
 Katherine M. Bell-McGuinn,
 MD, PhD
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 Renier J. Brentjens, MD, PhD
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 Sanjay Chawla, MD
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 Liang Deng, MD, PhD
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 Azeez Farooki, MD
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 Ilya G. Glezerman, MD
 Zoe Goldberg, MD
 Deborah J. Goldfrank, MD
 Mila Gorsky, MD
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 Polly D. Gregor, PhD
 Yvona Griffo, MD
 Shellie L. Gumbs, MD
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 Tobias M. Hohl, MD, PhD
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 Erik K. Johnson, MD
 Rana Kaplan, MD
 Amsale Ketema, MD
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 Virginia M. Klimek, MD
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 Guenther Koehne, MD, PhD
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 Lee M. Krug, MD
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 Taha Merghoub, PhD
 Matthew Milowsky, MD
 Shanu Modi, MD
 Michael J. Morris, MD
 Natalie Moryl, MD
 Gan Xon Ng, MD
 Michelle K. Nowak, MD
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 Maria Lia A. P. Palomba, MD
 William Pao, MD, PhD
*Miner Family Chair
 in Intrathoracic Cancer*
 Miguel-Angel Perales, MD
 Maria C. Pietanza, MD
 Milind Rajadhyaksha, PhD

Nina D. Raooff, MD
 Dana E. Rathkopf, MD
 Diane L. Reidy, MD
 Gregory J. Riely, MD, PhD
 Jenny Romero, MD
 Marina Rozenberg, MD
 Mabel M. Ryder, MD
 Wendy L. Schaffer, MD, PhD
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 Dharmarao Thapi, PhD
 Roma Tickoo, MD, MPH
 Emily S. Tonorezos, MD, MPH
 Tiffany A. Traina, MD
 Tiffany Troso-Sandoval, MD
 Archie Ngai-chiu Tse, MD, PhD
 Leigh M. Vaughan, MD
 Anjali A. Vaze, MBBS
 Adrienne Vincenzino, MD
 Louis P. Voigt, MD
 Steven Q. Wang, MD
 Kathleen M. Wesa, MD
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 Samarth Beri, MD
 Isaac Brownell, MD, PhD
 Sarat Chandralapaty, MD, PhD
 David Chung, MD, PhD
 Julie Fasano, MD
 Benjamin A. Gartrell, MD
 Rebecca D. S. Guest, MD
 Mini Kamboj, MBBS
 Sharon L. Karmon, MD, MPH
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 Dragos Rancea, MD
 Cori Salvit, MD
 Nelson Felix Sanchez, MD
 Sabeena Setia, MD, MPH
 Stephanie Smith-Marrone, MD
 Frank Young-Chin Tsai, MD

DEPARTMENT OF NEUROLOGY



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Lisa M. DeAngelis, MD
*Lillian Rojzman Berkman Chair
in Honor of Jerome B. Posner*

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Robert B. Darnell, MD, PhD
Kathleen M. Foley, MD
*The Society of Memorial
Sloan-Kettering Cancer Center Chair*
Paul A. Glare, MBBS
Eric C. Holland, MD, PhD
Emily Tow Jackson Chair in Oncology
Eugenie A. M. T. Obbens, MD, PhD
Gavril W. Pasternak, MD, PhD
*Anne Burnett Tandy Chair
of Neurology*
Jerome B. Posner, MD
*American Cancer Society Clinical
Research Professor; George C.
Cotzias Chair of Neuro-Oncology*

Neal Rosen, MD, PhD
*Enid A. Haupt Chair
in Medical Oncology*
Jonathan D. Victor, MD, PhD

ASSOCIATE ATTENDINGS

Lauren E. Abrey, MD
Ying-Xian Pan, PhD

ASSISTANT ATTENDINGS

Edward K. Avila, DO
Xi Chen, MD, PhD
Alexie Cintron, MD
Denise D. Correa, PhD
Christian M. Custodio, MD
Igor T. Gavrilovic, MD
Yvona Griffo, MD

Adilia M. V. Hormigo, MD, PhD
Yasmin Khakoo, MD
Erik J. Kobylarz, MD, PhD
Andrew B. Lassman, MD
Paolo L. Manfredi, MD
Ingo K. Mellingshoff, MD
Natalie Moryl, MD
Craig P. Nolan, MD
Antonio M. P. Omoru, MD
Sonia K. Sandhu, DO
Jonas M. Sokolof, DO
Michael D. Stubblefield, MD
Roma Tickoo, MD, MPH

INSTRUCTOR

Timothy R. Gershon, MD, PhD

DEPARTMENT OF NEUROSURGERY



CHAIR AND ATTENDING

Philip H. Gutin, MD
Fred Lebow Chair in Neuro-Oncology

ATTENDINGS

Eric C. Holland, MD, PhD
Emily Tow Jackson Chair in Oncology
Samuel H. Selesnick, MD
Philip E. Stieg, MD, PhD

ASSOCIATE ATTENDINGS

Mark H. Bilsky, MD
Michael Kaplitt, MD, PhD
Mark M. Souweidane, MD
Lorenz P. Studer, MD
Viviane S. Tabar, MD

ASSISTANT ATTENDINGS

Cameron W. Brennan, MD
Sonia K. Sandhu, DO

DEPARTMENT OF PATHOLOGY



CHAIR AND ATTENDING

Marc K. Rosenblum, MD
*James Ewing Alumni Chair
of Pathology*

ATTENDINGS

Klaus J. Busam, MD
Daniel A. Filippa, MD
Meera Rathika Hameed, MBBS
Suresh C. Jhanwar, PhD
David S. Klimstra, MD
Marc Ladanyi, MD
Victor E. Reuter, MD
Robert A. Soslow, MD
Satish K. Tickoo, MD
William D. Travis, MD
Maureen F. Zakowski, MD

ASSOCIATE ATTENDINGS

Cristina Antonescu, MD
Edi Brogi, MD, PhD

Ronald A. Ghossein, MD
Dilip D. Giri, MBBS
Oscar Lin, MD
Khedoudja Nafa, PhD
Jinru Shia, MD
Lee K. Tan, MD
Julie Teruya-Feldstein, MD
Christina E. Vallejo, MD

ASSISTANT ATTENDINGS

Hikmat Al-Ahmadie, MD
Violetta V. Barbashina, MD
Diane L. Carlson, MD
Samson W. Fine, MD
Anuradha Gopalan, MBBS
Cyrus V. Hedvat, MD, PhD

Nora Katabi, MD
André L. Moreira, MD, PhD
Melissa P. Murray, DO
Kay J. Park, MD
Melissa P. Pulitzer, MD
Alex J. Rai, PhD
Natasha Rekhtman, MD, PhD
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Efsevia Vakiani, MD, PhD
Liyang Zhang, MD, PhD

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Christine Ann Wynveen, MD

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Claire L. Tow Chair in
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Nai-Kong V. Cheung, MD, PhD
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in Pediatric Oncology
Rubin S. Cooper, MD
Donna DiMichelle, MD
Patricia A. Giardina, MD
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Peter G. Steinherz, MD

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Farid Boulad, MD
James B. Bussel, MD
Ira J. Dunkel, MD
Bruce M. Greenwald, MD
Kim Kramer, MD
Trudy Nan Small, MD
Tanya M. Trippett, MD
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Leonard H. Wexler, MD

ASSISTANT ATTENDINGS

Abraham S. Bartell, MD
Naomi B. Bishop, MD
Sheila J. Carroll, MD
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Jennifer S. Ford, PhD
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Wayne E. Chapman Chair
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Mary Jane Massie, MD
Andrew J. Roth, MD

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Richard Brown, PhD
Jack E. Burkhalter, PhD
Carma L. Bylund, PhD
Jeanne Carter, PhD
Jennifer S. Ford, PhD
Miriam M. Friedlander, MD

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Adriana Haimovitz-Friedman, PhD
Gloria C. Li, PhD
Beryl McCormick, MD
Karen D. Schupak, MD
Joachim Yahalom, MD
Michael J. Zelefsky, MD

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Daphna Y. Gelblum, MD
Nancy Lee, MD
Borys R. Mychalczak, MD
Kenneth E. Rosenzweig, MD
Suzanne L. Wolden, MD

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Karen Borofsky, MD
Timothy A. Chan, MD, PhD

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Richard M. Gewanter, MD
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Boris Mueller, MD
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Helen L. Sidebotham, MD
Yoshiya Yamada, MD

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Carroll and Milton Petrie Chair

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Mark J. Bluth, MD
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Richard J. Steingart, MD
H. William Strauss, MD
Jerrold B. Teitcher, MD
Pat B. Zanzonico, PhD
Robert D. Zimmerman, MD

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Linda R. Aboody, MD
Timothy J. Akhurst, MD
Douglas J. Ballon, PhD
Michael S. Baum, MD
Lynn A. Brody, MD
Anne M. Covey, MD
Otilia-Liana Dumitrescu, MD
Arthur A. Fruauff, MD
Michelle S. Ginsberg, MD
Marc J. Gollub, MD
Linda A. Heier, MD
Tunç A. Iyriboz, MD
Stefanie S. Jacobs, MD
Maxine S. Jochelson, MD
Karen B. Karlson, MD
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Jason S. Lewis, PhD
Eric Lis, MD
Elizabeth A. Morris, MD
Sadek Nehmeh, PhD
Heiko Schöder, MD
Marc Z. Simmons, MD
Amy Singer, MD
Peter M. Smith-Jones, PhD

Constantinos T. Sofocleous,
MD, PhD
Stephen B. Solomon, MD
Hilda E. Stambuk, MD
Jean M. Torrissi, MD
Barbara Wajsbrot-Kandel, MD
Corinne B. Winston, MD
Kristen L. Zakian, PhD
Binsheng Zhao, PhD

ASSISTANT ATTENDINGS

Oguz Akin, MD
William Alago, Jr., MD
Michelle S. Bradbury, MD, PhD
Sandra Brennan, MB, BCh, BAO
Betty A. Caravella, MD
Joshua Chaim, DO
Donna D. D'Alessio, MD
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Athanasios P. Glekas, PhD
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Duan Li, MD
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Weining Ma, MD
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FACILITIES UPDATE

Work on the floors, framework, and façade of the seven-story structure that constitutes Phase II of the **Mortimer B. Zuckerman Research Center (ZRC)** continued in 2008 and will be completed in 2009. Once this is finished, work will be suspended and the interior floors will be fitted out at a future date. The new building will complete the ZRC and is expected to house conference facilities, a 350-seat auditorium, office space, and dry laboratories.

Construction progressed on Phase II of the ZRC.



In 2008, work continued on the interior of the new 16-story **Breast and Imaging Center**, on Second Avenue between 65th and 66th Streets, which contains the expanded Evelyn H. Lauder Breast Center. Eleven floors are expected to be completed by the summer of 2009, with the remaining five floors — planned for academic space — to be ready at a later date. The building will house a range of important MSKCC initiatives, including a diagnostic imaging center, and will open for patients in the fall of 2009.

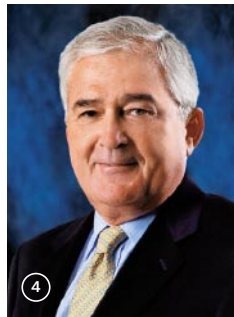
(From left) Exterior view of the Breast and Imaging Center seen from Second Avenue and 66th Street; the center's interior will accommodate clinical space and academic offices.



THE CAMPAIGN FOR MEMORIAL SLOAN-KETTERING

The generosity shown by thousands of contributors to the Campaign for Memorial Sloan-Kettering helped make 2008 the Center's best fundraising year ever. As of December 31, the Campaign had recorded more than \$1.82 billion in gifts and pledges, bringing it within sight of its \$2 billion target with three years still to go.

- | | | |
|---------------------------|---|---|
| 1 Douglas Warner III | 3 Tennis star James Blake and Harold Varmus | 5 David Koch |
| 2 Michael and Zena Wiener | 4 Louis Gerstner, Jr. | 6 A Fred's Team member at the 2008 ING New York City Marathon |



Cash gifts for the year totaled \$315.4 million, the most in Memorial Sloan-Kettering's history and two-and-a-half times the amount received in 2002, the first year of the Campaign.

This strong forward momentum will be essential in the months to come, as Memorial Sloan-Kettering seeks to generate critical new support in the midst of a global economic downturn. Under the leadership of Co-Chairs Douglas A. Warner III and Louis V. Gerstner, Jr., the Campaign will continue to spotlight the vital role of philanthropy in helping to drive future breakthroughs in understanding and treating cancer.

Moving ahead, they and the entire Memorial Sloan-Kettering community find inspiration in the generosity of the Center's benefactors, including those who made the following large commitments during the past year:

- The gift of a **membership interest in Geoffrey Beene, LLC**, brings total contributions from various entities associated with the celebrated fashion designer to \$101.9 million. These funds are being used to underwrite the Geoffrey Beene Cancer Research Center, which was established in 2006 with support from the Estate of Geoffrey Beene. It brings together researchers and physicians from the Human Oncology and Pathogenesis Program and the Cancer Biology and Genetics Program to pursue a range of activities aimed at translating the latest scientific breakthroughs into new approaches to patient care.

- A \$5 million commitment from **Louis V. Gerstner, Jr.**, through his foundation will help support a new generation of promising cancer scientists at a critical early stage in their careers. The Louis V. Gerstner, Jr. Young Investigators Fund assists exceptional men and women who have already demonstrated their commitment to careers in science; it responds directly to a crisis in funding at the NIH that has severely constrained the agency's grant-making ability, with young investigators being especially hard-hit. This latest commitment from Mr. Gerstner brings his total Campaign giving to more than \$20 million.
- **Michael A. and Zena Wiener** have pledged \$5 million for a new research initiative designed to promote significant progress in understanding and treating bladder cancer. With its goal of putting laboratory discoveries to work for patients, the Michael A. and Zena Wiener Research and Therapeutics Program in Bladder Cancer is focused on the development of new tools and techniques for detecting the disease at the earliest possible stage and for targeting each patient's tumor with individualized therapies.
- With his commitment of \$3 million to establish an endowed position for a senior faculty member, Board member **David H. Koch** has increased his total giving to the Campaign to nearly \$45 million. The new David H. Koch Chair is the latest in a series of gifts — including the creation of the

David H. Koch Center for the Immunological Control of Cancer and support for prostate cancer research — that together reflect the breadth of Mr. Koch's interests and the extraordinary impact he has had on Memorial Sloan-Kettering.

- The **Bristol-Myers Squibb Foundation** has committed \$3 million to create two endowed positions for talented young investigators, to be known as the Bristol-Myers Squibb/James D. Robinson III Junior Faculty Chairs. The gift, which recognizes Mr. Robinson's service as a leader of the Bristol-Myers Squibb Company and as Honorary Chairman of Memorial Sloan-Kettering's Boards of Overseers and Managers, comes on top of an earlier commitment from the Foundation to support the Bioinformatics Core Facility.
- Bequests and other planned gifts continued to provide a significant source of support for the Center in 2008. Memorial Sloan-Kettering received \$4.5 million from the Estate of **Charles J. Mauro**, to be divided evenly between translational research and a fund that will assist patients who are unable to pay for their care, in many cases because their insurance has run out. In addition, funds directed to Memorial Sloan-Kettering under the Trust of the late **Elizabeth Frelinghuysen** will provide \$3.5 million in unrestricted support, assuring the Center of crucial flexibility in meeting needs as they arise.

Many dedicated friends of Memorial Sloan-Kettering have put their energy and enthusiasm to work in support of the Center's mission through their participation in special athletic events. A total of 689 runners took part in the 2008 ING New York City Marathon as members of Fred's Team, in the process generating support for a range of research initiatives. In all, Fred's Team raised nearly \$3.6 million for the Center last year.

In June, the second annual Rock & Run on the River drew an estimated 4,000 participants for a 5K walk/run and celebration of cancer survivorship that benefited Memorial Sloan-Kettering's Cancer Survivorship Initiative.

Also helping to boost public awareness about the work being done at Memorial Sloan-Kettering was tennis star James Blake, who announced plans to honor his late father through the creation of the Thomas Blake, Sr., Memorial Research Fund. The fund is raising money for research into early detection and screening through a merchandise program, a charity tennis exhibition, and other activities.

As the Campaign for Memorial Sloan-Kettering enters its final phase, the resources it attracts will play an increasingly important role in confronting the complex challenges posed by cancer. The Campaign will continue paving the way to future breakthroughs with the encouragement of benefactors whose gifts, both large and small, have had such an enormous impact so far.

\$25,000,000 or More	\$5,000,000 — \$9,999,999	\$2,500,000 — \$4,999,999	\$1,000,000 — \$2,499,999
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Founded in 1946, The Society of MSKCC is a volunteer organization that has provided more than six decades of service to ensure the well-being and comfort of patients, raise funds for cancer research and treatment, and educate the public about cancer. Society members actively participate on 22 committees that raise money for The Society's programs and work closely with Memorial Hospital staff and leadership to implement them.

The Society's **Patient Environment Program**, or PEP, works with MSKCC employees who have demonstrated a keen understanding of patients' needs to make improvements to the hospital setting. Each year, PEP funds a number of initiatives proposed by MSKCC employees designed to benefit patients. This year, projects that received support from PEP included the following: new chairs for ambulatory care patients, blanket warmers for the bone marrow infusion suite, a DVD library for intensive care unit patients and their families, and an acupressure course for nurses to train them to help alleviate pain and manage other symptoms that a patient may experience.

The **Social Services Committee** of The Society of MSKCC works in partnership with the Department of Social Work to offer financial assistance to patients and their families. The funds are distributed by social workers based on financial need for expenses such as housing, transportation, parking, and patient emergencies. In addition, the Social Services Committee maintains the Patient Emergency Fund, which extends small sums of money for patients in need to help pay for necessities such as medication not covered by insurance, critical daily living expenses including food, and assistance with utilities, rent, and childcare. In 2008, the committee provided 1,115 patients with assistance totaling more than \$500,000.

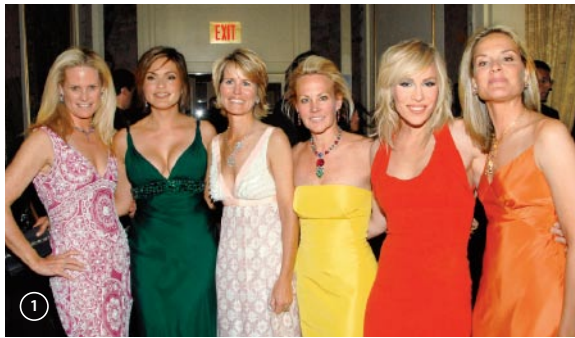
In June, The Society's **Children's Committee** helped bring song, dance, and a revolving disco ball to patients of the Pediatric Day Hospital as part of the annual Pediatric Prom. Members of the Children's Committee also assisted in the creation of "Promingdale's" — a boutique set up in the recreation center from which prom-goers could select from an assortment of dresses and tuxedos — and pinned on more than 200 corsages and boutonnieres prior to the festivities.

Now entering its third decade, the **Annual Preview Party for The International Fine Art and Antique Dealers Show** gave more than 1,000 attendees the opportunity to marvel at works ranging from a blue Tiffany dragonfly lamp to an antique English diamond necklace on view at Manhattan's Seventh Regiment Armory. A major source of funding since 1989, the October event raised approximately \$850,000 for the Center's programs in patient care, research, and education. The Preview Party was sponsored by Elle Decor and art historian Michel C. Witmer, with additional support from Bacardi USA, Empire Merchants, 1stdibs.com, Bloomberg, and Davidson Kempner Capital Management LLC.

This year The Society debuted a new annual event — the **Spring Ball** — which was held in the Grand Ballroom of the Plaza Hotel and sponsored by Italian goods retailer Bulgari. The evening culminated in a live auction conducted by James G. Niven, a longtime MSKCC Board member and Vice Chairman of Sotheby's auction house. The auction contributed more than \$600,000 out of the more than \$2,875,000 that was raised.

The **Associates Committee** helps advance MSKCC's mission by hosting educational meetings, assisting with volunteer efforts at the Center, and organizing fundraising events. This year the Associates Committee hosted several events to fulfill a pledge to raise \$1.4 million over four years to endow the Department of Pediatrics' Clown CareSM program. Clown Care is a community-outreach program of the Big Apple Circus that brings specially trained performers to the pediatric inpatient and outpatient units four times a week. In March, the committee's 17th annual **Bunny Hop** raised more than \$350,000 for Clown Care, and in May the **Spring Party**, "Safari at Sunset," raised an additional \$336,300.

The **Thrift Shop** has been a vital part of The Society's fundraising program for more than 55 years. The shop has been at its current location — Third Avenue between 81st and 82nd Streets — for more than 20 years. Through sales of new and gently used merchandise, including designer and vintage clothing, home furnishings, children's clothes, books, and artwork, the Thrift Shop provides support for The Society's patient care, research, and education programs at the Center. In 2008, the shop brought in more than \$1.4 million.



1 (From left) Spring Ball Co-Chairman Ashley McDermott, actress Mariska Hargitay, Society President Leslie Jones, Co-Chairman Muffie Potter Aston, singer Natasha Bedingfield, and Co-Chairman Libby Fitzgerald.

2 Joined by a team of Clown Care's "Doctors of Humorology" at the 17th annual Bunny Hop are Associates Committee Co-Chairs (from left) Elizabeth Fuller, Lisa Errico, and Christina Addison.

3 An MSKCC pediatric patient has a patriotic good time at the Society-sponsored Pediatric Prom in June.

4 MSKCC President Harold Varmus (left) with Leslie Jones and MSKCC Board member James Niven at the Spring Ball.

5 Present and former Antique Show Preview Party Chairmen gather. (Seated, from left) Karen LeFrak, Barbara Gimbel, Grace Meigher, and Mary Carpenter. (Standing, from left) Alexandra Lind Rose, Lavinia Snyder, Muffie Potter Aston, Joanne de Guardiola,

James Niven, Jamee Gregory, Daisy Soros, Leslie Jones, Nicole Limbocker, and Alexia Hamm Ryan.

6 Sponsors of the 20th annual Preview Party for the International Fine Art and Antique Dealers Show, Michel Witmer and Margaret Russell.

Those generous friends and benefactors who wish to support the Center as part of the Campaign for Memorial Sloan-Kettering can choose from a range of initiatives designed to benefit the institution at every level — its talented people; its outstanding programs of research, education, and cancer care; and the ongoing demand for the most up-to-date facilities and equipment. The Center especially welcomes donations that help meet its general operating needs, since these provide maximum flexibility in seizing new opportunities as they arise.

All gifts, regardless of size, really do make a difference. Contributions may take a number of forms, including:

- Gifts of cash or cash equivalents, either paid outright in a single installment or as a pledge to be fulfilled over a period of several years. A cash gift may entitle the donor to a charitable deduction of up to 50 percent of adjusted gross income annually, with a carry-over provision of up to five years should the value of the gift exceed 50 percent of the individual donor's adjusted gross income.
- Gifts of appreciated securities, which offer donors a range of potential benefits such as the avoidance of capital gains taxes when the securities have been held long-term — that is, for more than one year. Such gifts are deductible up to 30 percent of adjusted gross income annually, with a carry-over provision of up to five years should the value of the gift exceed 30 percent of the individual donor's adjusted gross income.
- Planned gifts, which may help particular donors realize their philanthropic goals more efficiently and comfortably than through outright gifts. These arrangements also allow larger contributions than might otherwise be possible. Planned gifts take a variety of forms, including life income plans such as charitable gift annuities with their relatively generous payout rates and charitable remainder and lead trusts. Individuals who opt to support Memorial Sloan-Kettering through planned gifts may also do so through bequests provided for in their estate plans or by naming the Center as beneficiary of insurance policies or pre-federal income tax qualified plans such as an IRA and certain retirement plans.
- Gifts of real estate and personal property, which may also provide significant tax benefits. In most cases, gifts of real estate allow a donor to claim a tax deduction based on the full market value of the property when it has been held for at least one year.

For information about these and other ways of making a gift to the Campaign, please contact:

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