THE OHIO STATE UNIVERSITY COMPREHENSIVE CANCER CENTER
ARTHUR G. JAMES CANCER HOSPITAL AND RICHARD J. SOLOVE RESEARCH INSTITUTE

Toward a Cancer-Free World

2011 ACCOMPLISHMENTS REPORT

THE OHIO STATE UNIVERSITY The James

NCI CCC
A Comprehensive Cancer Center Designated by the National Cancer Institute

Welcome to the 2011 Accomplishments Report of The Ohio State University Comprehensive Cancer Center – Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC – James).

The Ohio State University's cancer program, embodied in both our Comprehensive Cancer Center and the Arthur G. James Cancer Hospital and Richard J. Solove Research Institute (OSUCCC – James), is working to create a cancer-free world, one person, one discovery at a time. We strive to eradicate cancer by integrating groundbreaking research with personalized patient care and excellence in education.

This report offers a glance at some of our most notable achievements and activities of the past year as we continued pursuing our vision of a cancer-free world.

View expanded copy and videos at go.osu.edu/AccomplishmentReport2011

FROM THE DIRECTOR/CEO

We in Ohio State's cancer program are committed to creating a cancer-free world, one person, one discovery at a time. Some say that's an impossible dream, but my response to them is the same as what the Mad Hatter told Alice in the latest "Wonderland" movie when she thought something was impossible: "Only if you believe it is."

In 2011 we continued our pursuit of a world without cancer as we celebrated both the 40th anniversary of the 1971 signing of the National Cancer Act and the 35th anniversary of Ohio State's Comprehensive Cancer Center (CCC), which was first designated by the National Cancer Institute (NCI) in 1976.

Our most recent NCI redesignation, in 2010, came with that agency's highest rating – "exceptional" – and in 2011 we learned that our rating had earned us an NCI support grant of $23 million, a 16-percent increase over our previous support grant. So at a time when federal funding for cancer research is dwindling, and many cancer centers are seeing their NCI core funding decrease, ours has increased, a testament to the promise that the NCI sees in our research, clinical and community programs.

In looking back at 1971 when the global "war on cancer" was officially launched, and then glancing forward through the progress made since then, we should be heartened to see that survival rates are significantly up and that some cancers are now curable or, at the very least, managed as a chronic illness rather than a life-taking disease.

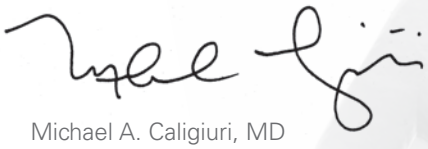
Ohio State's cancer program, which predates the National Cancer Act and our subsequent CCC designation, is playing a large role in that progress, as our more than 270 researchers study this disease at the molecular level to make discoveries that translate into innovative patient care tailored to each person's unique biological makeup.

Much of this vital work goes unseen, but there are also plainly visible signs of our progress, not the least of which has been the rise of steel beams for our new 276-bed James Cancer Hospital and Solove Research Institute, which is targeted for completion in 2014. The design of this facility will allow for close interaction among researchers, clinicians and educators, hastening the process of discovery and treatment.

Also in 2011, we opened our state-of-the-art Stefanie Spielman Comprehensive Breast Center, the only facility of its kind in the Midwest to offer in one location the full continuum of breast cancer care, from prevention and screening through detection, diagnosis and treatment. In addition, we began "building out" two more floors for cancer research in Ohio State's Biomedical Research Tower.

Central to the success of any cause – especially one as huge as conquering cancer – is getting people to join you. In our grassroots bicycle tour called Pelotonia, we have done just that. Our third annual Pelotonia in August 2011 attracted nearly 5,000 riders who, along with numerous donors, generated $13.1 million for cancer research at the OSUCCC – James, bringing our three-year fundraising total from this event to $25.47 million.

With so many people rolling along with us and contributing to our recent successes – a few of which are chronicled in this 2011 Accomplishments Report – we have to believe that our shared vision of a cancer-free world is far from impossible.



Michael A. Caligiuri, MD
Director, The Ohio State University Comprehensive Cancer Center
CEO, The James Cancer Hospital and Solove Research Institute

A Comprehensive Cancer Center Designated by the National Cancer Institute

Exceptionally Rated, Nationally Ranked

Accolades kept coming for Ohio State's cancer program in 2011. A year after receiving the National Cancer Institute's (NCI) highest rating, "exceptional," the OSUCCC – James learned that it would receive from the NCI a $23 million support grant – a 16-percent increase over the previous NCI support award. Also in 2011, the OSUCCC – James earned a spot on the *U.S.News & World Report* annual list of America's Best Hospitals for cancer care for the 13th consecutive year. *U.S.News* ranked the OSUCCC – James 20th in the nation, a jump from the previous year's ranking of 26th. The hospital first made the list in 1999, less than a decade after opening, and has remained there ever since.

Research Dollars Fuel Cancer Studies

The OSUCCC – James received 71 peer-reviewed research grants in 2011, of which 21 came from the National Cancer Institute (NCI) and totaled $20.5 million. The cancer program's total NCI funding stood at $48 million, ranking 15th among cancer centers nationally. "One of our goals is to be among the top 10 NCI-funded programs," says OSUCCC Director and James CEO Michael A. Caligiuri, MD. "To reach today's top 10, we'll need to fill the gap between $48 million and $61 million. We hope to achieve that within the next few years. Dollars are truly the driving force in cancer research." The OSUCCC – James' entire grant portfolio totals more than $110 million.

Pelotonia 2011

Pelotonia '11 Raises $13.1 Million

Riders and donors in Pelotonia 2011, the third annual grassroots bicycle tour that raises money for cancer research at the OSUCCC – James, generated a record $13,108,639, a 68-percent increase over the 2010 total of $7.8 million. From Aug. 19-21, 4,986 riders from 38 states and four countries rode up to 180 miles on one of four routes between Columbus and Athens, Ohio. The three-year Pelotonia fundraising total is about $25.47 million. Every dollar raised is invested in research initiatives, including: fellowship awards enabling Ohio State students at all levels of scholarship to conduct cancer studies in the labs of faculty mentors; "idea" grants that help teams of faculty researchers start innovative projects that might attract future funding from external sources; the purchase of new equipment to assist the more than 270 researchers at the OSUCCC – James; and the recruitment/retention of top medical scientists to Ohio State's cancer program.

New Breast Center Offers Full Continuum of Care

In 2011 the OSUCCC – James opened the Stefanie Spielman Comprehensive Breast Center, the only facility of its kind in the Midwest to offer the full continuum of breast cancer care, from prevention and screening to detection, diagnosis and treatment. The Center, located on Olentangy River Road near the Ohio State campus, also contains a radiation oncology wing. The Center is named for the late Stefanie Spielman, who after being diagnosed with breast cancer at age 30 in 1998 spent more than a decade heightening public awareness of the disease and raising millions of dollars for research.

The Stefanie Spielman Comprehensive Breast Center

Gastrointestinal Oncologist Named Physician-in-Chief

Richard Goldberg, MD, an acclaimed gastrointestinal oncologist, was named physician-in-chief at The James. Goldberg is noted for evaluating new agents for treating colorectal cancer and for studying inherited colorectal cancer syndromes. Before coming to Ohio State, he was physician-in-chief at North Carolina Cancer Hospital at the University of North Carolina, Chapel Hill. In his new role at Ohio State, Goldberg will help lead preparation for and transition into the new James Cancer Hospital and Solove Research Institute slated to open in 2014. He also will help expand infrastructure to unite researchers and clinicians in science-based patient care.

Richard Goldberg, MD

Cancer Prevention Expert Named OSUCCC Deputy Director

The OSUCCC – James named Peter Shields, MD, a physician-scientist and expert in cancer prevention, as deputy director of the Comprehensive Cancer Center. A leading researcher in biomarkers of cancer risk, molecular epidemiology and carcinogenesis, Shields came to Ohio State from Georgetown University, where he was deputy director of the Lombardi Comprehensive Cancer Center. His primary research focus is on identifying biomarkers for use in the clinic to assess breast and lung cancer risks, particularly those related to diet, smoking and lifestyle. He has published more than 180 studies on topics from toxicology and epidemiology to behavior and health disparities.

Peter Shields, MD

Carlo Croce, MD

Croce Named to Institute of Medicine

Carlo Croce, MD, director of Human Cancer Genetics at Ohio State, was named to the Institute of Medicine (IOM) of the National Academies, one of the highest honors in the field of health and medicine. Croce also chairs Ohio State's Department of Molecular Virology, Immunology and Medical Genetics, and he is a member of the Molecular Biology and Cancer Genetics Program at the OSUCCC – James. IOM election recognizes those who have demonstrated outstanding professional achievement and commitment to service. Croce's research has uncovered early events in the pathogenesis of many malignancies. He also discovered the role of microRNAs in the genesis of various cancers.

Clara D. Bloomfield, MD

Bloomfield Elected to Academy of Arts and Sciences

Clara D. Bloomfield, MD, a Distinguished University Professor who also serves as cancer scholar and senior adviser to the OSUCCC – James, was one of 212 accomplished leaders from academia, business, public affairs, the humanities and the arts who were elected to the 2011 class of the American Academy of Arts and Sciences, one of the nation's most prestigious honorary societies and a leading center for independent policy research. An internationally renowned expert in leukemia and lymphoma, Bloomfield was one of only 11 members elected in 2011 in the Academy's Medical Sciences (including physiology and pharmacology), Clinical Medicine and Public Health section. The Academy's 4,000 American Fellows and 600 Foreign Honorary Members conduct a range of interdisciplinary, long-term policy research.

Electra Paskett, PhD, MSPH

Paskett Honored for Stellar ASPO Presidency

The American Society of Preventive Oncology (ASPO) created a scholarship in the name of Electra Paskett, PhD, MSPH, associate director for population sciences and leader of the Cancer Control Program at the OSUCCC – James, in honor of her highly successful two-year term as president of that multidisciplinary society. The Electra Paskett Scholarship Award will be presented each year to help a cancer research trainee attend ASPO's annual meeting, which in 2011 had a record attendance. The scholarship was only the second named honor ever bestowed by ASPO, for which Paskett is now serving a two-year term as past president. She also presided at the 2011 annual meeting and presented "The Promise of a Cancer-Free World: Where Are We?" Succeeding Paskett as president of ASPO was Peter Shields, MD, a professor of Internal Medicine at Ohio State who also is deputy director of Ohio State's Comprehensive Cancer Center.

Caligiuri Completes Term as AACI President

In October 2011, OSUCCC Director and James CEO Michael A. Caligiuri, MD, completed a two-year term as president of the Association of American Cancer Institutes (AACI) and now serves as immediate past president. Representing 95 academic and free-standing cancer research centers in the United States, the AACI promotes efforts by member institutions to eradicate cancer through a multidisciplinary program of research, treatment, patient care, prevention, education and community outreach. One of Caligiuri's main initiatives as AACI president was Project Cancer Education, an advocacy platform devised at the OSUCCC – James that helps legislative and opinion leaders learn how cancer research is translated to treatments by having them spend a day at a cancer center and assume the roles of researchers, oncologists and patients.

Cancer Facilities Continue to Expand

An effort to expand facilities for Ohio State's cancer program was boosted in 2011 by the continuing construction of a 276-bed James Cancer Hospital and Solove Research Institute and the "build-out" of two more floors for cancer research in the Biomedical Research Tower:

- Steel beams began to rise for the new hospital, which is targeted for completion in 2014. The hospital's 21 stories will make it the 14th tallest healthcare facility in the nation. Its design integrates research, clinical and education areas to allow greater interaction among researchers, clinicians, patients and families.
- The University used an $8 million grant from the National Cancer Institute to start developing the fourth and fifth floors of the Biomedical Research Tower for additional lab space for cancer research. This work will be finished in 2012.

The new James Cancer Hospital and Solove Research Institute, conceptual rendering

Ehud Mendel, MD

Surgeons Rebuild Cancer Patient's Pelvis

A multidisciplinary team of surgeons at the OSUCCC – James removed the left leg, hip and pelvis of a cancer patient and used the healthy bones from his amputated leg to rebuild the connection between his spine and remaining right pelvis to support a high-tech prosthetic leg. It was the first time the procedure had been performed in the United States, according to Joel Mayerson, MD, an orthopaedic oncologist who worked with a team that included spine neurosurgeon Ehud Mendel, MD, and plastic surgeon Michael Miller, MD. Their work was voted "Reconstructive Surgery Case of the Year" at the American Society of Reconstructive Microsurgeons annual meeting.

Removing Brain Tumors Through the Nose

Within a week's time, a 33-year-old woman gave birth to a healthy baby and underwent successful endoscopic endonasal surgery for removal of a large malignant tumor from her sinus cavity, thanks to collaboration between a team at the Ohio State Cranial Base Center and the patient's obstetrician. The endoscopic endonasal approach is a minimally invasive neurosurgical technique that gives surgeons access to the base of the skull, intracranial cavity and top of the spine by operating via the nose and paranasal sinuses with tiny surgical instruments. As part of her treatment, surgeons also implanted a prosthetic roof of her mouth. Ohio State's cranial base team includes Ted Teknos, Daniel Prevedello, Bradley Otto and Matthew Old, all MDs.

Joel Mayerson, MD

Rare 'Rotationplasty' Surgery Helps Young Patient Stay Active

When Dugan Smith, an athletic fourth-grader, fell and broke his femur, doctors found a softball-sized tumor above his knee. After learning their son had osteosarcoma, a rare cancer that attacks the bones, his parents opted for an unusual surgery called rotationplasty to increase his chance not only of survival but of regaining an active lifestyle. A team led by Joel Mayerson, MD, who directs the Division of Musculoskeletal Oncology at Ohio State, amputated the boy's lower leg, removed the tumor, rotated his leg and reattached it so his ankle functions as his knee. He is cancer-free and back to playing sports. His story appeared on ESPN and on the Anderson Cooper syndicated talk show.

Findings May Result in Blood Test for Lung Cancer

OSUCCC – James researchers identified patterns of abnormal microRNA molecules in the blood of people with lung cancer that might reveal the presence and aggressiveness of the disease, and perhaps who is at risk of developing it. These patterns may be detectable up to two years before the tumor is found by a sensitive method such as spiral computed tomography (CT) scans. Principal investigator Carlo Croce, MD, says researchers showed it might be possible to use the patterns to detect lung cancer in a blood sample. The findings appeared in the journal *Proceedings of the National Academy of Sciences*.

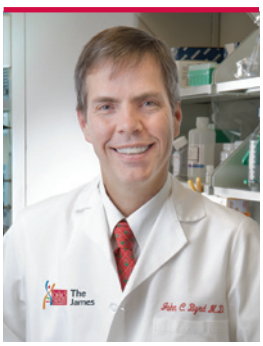
OSUCCC – James Leads National Pancreatic Cancer Trial

The OSUCCC – James is leading a phase II clinical trial on a formulation of the human reovirus that is designed to kill cancer cells. The study, expected to enroll 70 patients with recurrent or metastatic pancreatic cancer at Ohio State and other institutions, will assess results for those who receive the virus Reolysin® plus standard chemotherapeutic drugs, relative to those who receive the standard drugs followed by addition of the virus. Principal investigator Tanios Bekaii-Saab, MD, says Reolysin® is an engineered version of the reovirus that replicates in and destroys cells with mutations that activate the *RAS* gene signaling pathway. *RAS* mutations are found in nearly 90 percent of pancreatic cancers, making this pathway a prime therapeutic target.

Tanios Bekaii-Saab, MD

Novel Agent Active Against Chronic Leukemia

An interim analysis of a phase II clinical trial indicated that an experimental agent for treating chronic lymphocytic leukemia (CLL) is active and well-tolerated both in patients undergoing initial treatment and in those who have relapsed and are resistant to other therapy. The agent, PCI-32765, was the first drug designed to target Bruton's tyrosine kinase, a molecule that is essential for CLL cells to grow and proliferate. Study leader John C. Byrd, MD, says the early findings suggest that this agent is an active oral therapeutic that produces a high rate of durable remissions with acceptable toxicity in relapsed and refractory CLL. He presented the findings at the 2011 American Society of Clinical Oncology annual meeting.



John C. Byrd, MD

Scientists Identify Subset of Cells That Leads to Rare Leukemia

OSUCCC – James researchers led by Michael A. Caligiuri, MD, identified a subset of normal white blood cells that gives rise to large granular lymphocyte leukemia, a rare and incurable disease. The subset involves NKT cells, which share features of immune cells known as T lymphocytes and natural killer cells. Researchers found that, in mice and humans, NKT cells responsible for this leukemia are marked by a surface protein called NKp46. They also found that overexpression of the interleukin-15 hormone can drive NKT cells, but not others, to become leukemic. In addition, they showed that using an antibody to block interleukin-15 kept this leukemia from developing in a mouse model. The study was published in the *Journal of Clinical Investigation.*

Pravin Kaumaya, PhD

Experimental Cancer Vaccine Study Under Way

An early-phase clinical trial on the safety of a vaccine designed to prevent several types of solid tumors opened in July 2011 at the OSUCCC – James. The vaccine targets two regions of the human epidermal growth factor receptor 2 (HER-2), a molecule that occurs at abnormally high levels in up to 30 percent of breast cancers. Another component of the vaccine targets HER-1 (EGFR), a molecule that is overexpressed in many other solid tumors, including ovarian, renal, colon, lung and gastrointestinal cancers. Study leader Pravin Kaumaya, PhD, led development of the vaccine and the protocol for this National Cancer Institute (NCI)-funded trial. Tanios Bekaii-Saab, MD, is the clinical principal investigator, and William Carson III, MD, is co-principal investigator.

Arnab Chakravarti, MD

Loss of Gene Promotes Brain Tumor Development

Research at the OSUCCC – James showed that loss of a gene called *NFKBIA* promotes the growth of glioblastoma multiforme, the most common and deadly form of brain cancer. Published in the *New England Journal of Medicine*, the study suggested that therapies to stabilize this gene may improve survival for certain patients. Senior co-author Arnab Chakravarti, MD, says investigators showed that *NFKBIA* status may be an independent predictor of survival in some patient populations. They also showed that this gene plays a key role in glioblastoma behavior, and that it could be useful for predicting treatment outcomes. Chakravarti, along with Markus Bredel, MD, PhD, and colleagues analyzed data from 790 cases of glioblastoma for this study.

Ohio State Hosts National Roundtable on Drug Development

As part of the cancer program's drug development innovation, Ohio State in May 2011 hosted a Drug Development Roundtable that enabled national leaders from industry, academia and government to focus on methods of working together to speed drug discoveries to patients. "In particular, we discussed ways to accelerate the development of multi-compound drugs when the compounds are owned by different companies – usually a showstopper for research," says OSUCCC Director and James CEO Michael A. Caligiuri, MD. "Good conversation and collaboration occurred, and we believe we'll be announcing progress very soon."

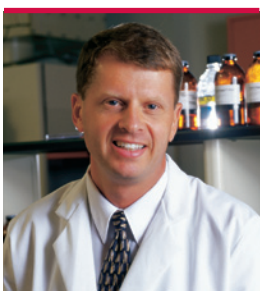
Drug Development Institute Will Expedite Clinical Research

An effort to create the Ohio State Drug Development Institute got under way in 2011, launched by the OSUCCC – James in collaboration with leaders in the colleges of Medicine, Pharmacy and Business. The institute will create a cancer drug development pipeline for taking new compounds through phase II clinical trials. Timothy Wright, a former executive of several pharmaceutical companies, was recruited to direct this effort in conjunction with Brian Cummings, the University's lead for technology commercialization.

Timothy Wright

Ohio State Selected for Cancer Immunotherapy Trials Network

The Ohio State University is one of 27 research institutions in North America selected to join the Cancer Immunotherapy Trials Network (CITN) funded by the National Cancer Institute (NCI). William Carson III, MD, associate director for clinical research at the OSUCCC – James, is principal investigator for the project at Ohio State. As a new initiative in immunotherapy, the CITN will establish a group of top academic immunologists to conduct multicenter research on agents that boost patients' immune systems to fight their cancer. The NCI held an open competition for institutions to apply for member-site status in the CITN.



William Carson III, MD

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