

Forward

Broadening the Conversation About Cancer

FALL/WINTER 2016



**STUDIES SHOW OBESITY INCREASES THE RISK FOR CERTAIN
CANCERS, WHILE PATIENTS ALSO HAVE TO MANAGE
WEIGHT CHANGES AFTER CANCER TREATMENT**

ALSO

**IMMUNOTHERAPY FRONTIERS EXPLORED
DRAGON BOAT TEAM SAILS DOWN THE SCHUYLKILL
TAKING THE REINS AFTER A CANCER DIAGNOSIS**

 **FOX CHASE**
CANCER CENTER

TEMPLE HEALTH

CONTINUOUS GROWTH

With our immense and growing base of knowledge about cancer and how it develops, we focus ever more closely on how best to treat and prevent it. We pursue a world where cancer as we know it no longer exists. This is the sentiment behind the federal government's National Cancer Moonshot Initiative. We heard Vice President Joe Biden passionately rally support for this effort as we joined with him and others in June for the first-ever Cancer Moonshot Summit.

In this issue of *Forward*, we reflect on the momentous goal of the Cancer Moonshot: to double the rate of progress in cancer research over the next five years. The challenge is to galvanize our resources and break down barriers to make way for discovery and growth. National Cancer Institute (NCI)-designated Comprehensive Cancer Centers are uniquely positioned to tackle the challenges before us, to address key scientific questions, and introduce the newest therapies. Fox Chase is proud

to be among this distinguished group of leaders.

This year, we mark the renewal of our NCI designation. Such an honor brings with it a level of prestige, but it represents much more. It allows us to recruit top researchers and clinicians to our institution, it affirms the high caliber of research we conduct, and it sets us apart in our capacity to provide life-saving clinical trials and world-class treatment.

As we move forward, cancer prevention and control will be critical avenues for advancement. In our cover story, we explore the link between obesity and cancer risk — an area where emerging research is shedding light on how we might prevent certain types of cancers. Weight management plays a role in patients' lives both during and after cancer treatment and can be attributed, in part, to the development of cancer.

As well, new avenues of treatment are turning cancers once thought terminal into chronic conditions. In these pages, we



discuss the role of immunotherapy in fighting cancer. By harnessing the power of the immune system, this approach helps investigators better tailor patients' treatment and helps patients live longer lives. We cannot do it alone, though. Philanthropy bolsters this effort right here at Fox Chase; with our donors and friends, we are making real progress.

The future holds great promise. Truly, we are on the cusp of a new era in the fight against cancer.

Richard I. Fisher, MD
PRESIDENT AND CEO

Forward FALL/WINTER 2016

FORWARD magazine is published twice a year for friends of Fox Chase Cancer Center by the communications department of Fox Chase. One of the leading cancer research and treatment centers in the United States, Fox Chase was founded in 1904 as one of the nation's first cancer hospitals, and was among the first institutions to be designated a National Cancer Institute Comprehensive Cancer Center in 1974. Fox Chase joined Temple University Health System in 2012.

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FALL/WINTER 2016

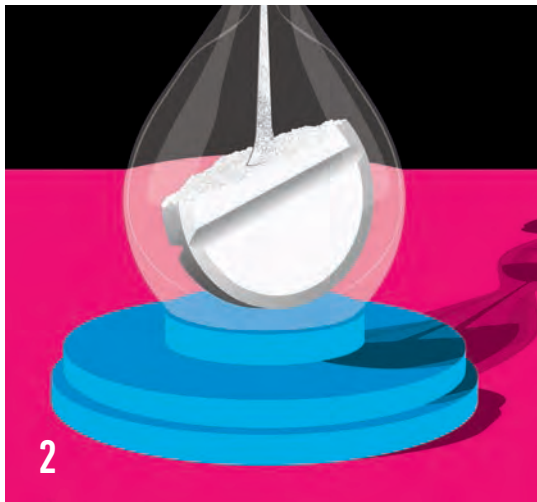
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PATIENTS MAY FACE BARRIERS TO ORAL CHEMOTHERAPY TREATMENT

Patients starting oral chemotherapy drugs may face delays in starting treatment due to the complexity of the processes needed to obtain these drugs, according to study findings from Fox Chase Cancer Center researchers.

Yu-Ning Wong, MD, a genitourinary medical oncologist at Fox Chase, indicated that changes are needed to make the process easier for patients to navigate and avoid a delay in treatment.

“As payers and policymakers look for ways to provide quality care, they need to examine the

difficulty patients and providers have in accessing necessary medications,” Wong said.

Wong and her colleagues conducted a retrospective review of patients’ charts to characterize potential delays in treatment. They compared differences between oral chemotherapy drugs using demographics, date of the oral chemotherapy prescription, date of the first dose, copay amount, whether financial assistance was requested, and the number of and reason for staff phone calls required to obtain the oral chemotherapy.

“As payers and policymakers look for ways to provide quality care, they need to examine the difficulty patients and providers have in accessing necessary medications.”

— YU-NING WONG, MD, MSCE
PROGRAM DIRECTOR OF
GENITOURINARY MEDICAL
ONCOLOGY



The researchers reviewed the charts of 116 patients with prostate and kidney cancer who were aged a median of 65 years and had 149 unique prescriptions.

Results revealed the initiation of on-label oral chemotherapy drugs was a labor-intensive process, and on average, it took two weeks and five phone calls for a patient to start a drug from the time it was prescribed. Additionally, out-of-pocket costs were variable and required considerable staff effort to mitigate through financial assistance.

“The process is extremely complex and requires multiple steps that can delay care,” Wong said. “Efforts should be made to streamline care so patients receive treatment as quickly as possible.”

IMMUNOTHERAPY DRUG IMPROVES LONG TERM SURVIVAL IN LUNG CANCER

The immunotherapy drug OPDIVO improved long-term survival with fewer side effects in patients with advanced lung cancer compared with standard chemotherapy, according to data from a study conducted by Fox Chase Cancer Center researchers and sponsored by Bristol-Myers Squibb.

In this phase 3 trial, researchers randomly assigned previously treated patients with advanced

“It is important to follow patients in a clinical trial for several years to see if the drug is maintaining its advantage over standard chemotherapy.”

— **HOSSEIN BORGHAEI, DO**
CHIEF OF THORACIC MEDICAL ONCOLOGY

non-small cell lung cancer (NSCLC) to treatment with OPDIVO or Taxotere, a standard chemotherapy drug.

“It is important to follow patients in a clinical trial for several years to see if the drug is maintaining its advantage over standard chemotherapy,” said lead study author Hossein Borghaei, DO, chief of thoracic medical oncology at Fox Chase. “At the two-year mark, patients had better survival



with OPDIVO over chemotherapy. Though we need more follow-up, it is still significant.”

At the follow-up, nearly double the patients with nonsquamous NSCLC and triple the patients with squamous NSCLC were alive at two years compared with patients treated with the standard chemotherapy drug.

The immunotherapy drug works by using the immune system to fight cancer. As a result, some side effects associated with the drug were immune-related, including hypothyroidism, and

inflammation in the lungs and gut. The most commonly reported side effect was fatigue.

Fewer side effects were reported with OPDIVO than with standard chemotherapy.

“This is not a traditional chemotherapy drug,” Borghaei said. “There’s no hair loss, blood counts are usually not affected and there’s not so much nausea.”

The drug will need additional follow-up to determine if it is still maintaining its advantages over standard chemotherapy, Borghaei said.

FOX CHASE HOSTS REGIONAL CANCER MOONSHOT SUMMIT TO DISCUSS RESEARCH PROGRESS

Can 10 years of cancer-fighting progress really be cut in half?

Vice President Joe Biden believes so, and he has challenged U.S. researchers and clinicians to double progress to end cancer as we know it.

In cooperation with the American Cancer Society and the U.S. Department of Health and Human Services, Fox Chase Cancer Center hosted the official Cancer Moonshot Summit for Region 3 — including Maryland, Delaware, Pennsylvania, Virginia, West Virginia, and Washington, D.C. — on Wednesday, June 29, 2016.

“I firmly believe we can do in the next five years what would ordinarily take 10.”

— JOE BIDEN
VICE PRESIDENT OF THE
UNITED STATES OF AMERICA

More than 100 clinicians, researchers, patients, and experts gathered at Fox Chase for the summit, which was hosted by Wafik El-Deiry, MD, PhD, FACP, deputy cancer center director of translational research and coleader of the Molecular Therapeutics Program.

Vice President Biden urged the country to push forward in the fight against cancer.

“I firmly believe we can do in

the next five years what would ordinarily take 10,” he said. “Think about what this will mean. Time matters, days matter, minutes matter. We’re on the cusp of breakthroughs that can get us there. The goal is to propel us there today. These are breakthroughs that are just beyond our grasp. I really do believe it’s within your power to fundamentally change and turn despair into hope a lot sooner rather than later.”

Following Vice President

Biden’s comments, Bert Vogelstein, MD, codirector of the Ludwig Center at the Johns Hopkins Kimmel Cancer Center, delivered his remarks through a livestream from Johns Hopkins.

“The only way to win this war in the immediate future, in the time period of the Moonshot, is to do as much research on prevention and early detection as on new therapeutics,” Vogelstein said.

Fox Chase also held three panels of clinicians, researchers,



Richard I. Fisher (center), CEO of Fox Chase, talks with former CEO Robert C. Young (left), and Robert Carlson, CEO of the NCCN (right)

PAUL REITANO



and patients from Fox Chase and other institutions in the region.

In “Research: The Foundation of Progress,” panelists highlighted the importance of basic science discovery in cancer and discussed impediments like flat funding, working-group silos, and the challenges of translating the bench to the bedside. They agreed that motivating young scientists, changes in university cultures, and problems getting work funded are all major issues to be addressed.

In “Data Sharing in Precision Oncology,” panelists explored data sharing, collaboration, and the potential and challenges of recent technological advances in multiple testing platforms, liquid biopsies, clinical guidelines, electronic records, and data retrieval and integration. In particular, they discussed the need for larger population pools for research, which is necessary for genetic research.



Top: From left to right, Margaret Zuccotti, Jane Clifford, and Yvonne Paterson.
Bottom: From left to right, Wafik El-Deiry, Deputy Secretary Joanne Grossi, Richard I. Fisher, and Congressman Brendan Boyle.

In “Clinical Trials and Patient Advocacy,” panelists discussed the challenges of enrolling patients in clinical trials and what institutions and health care teams can change to address the issue. “One simple thing would be knowing what trials are open

where — what they’re working on, what’s open, what’s closed, and in the rare case I don’t have a trial open, show them where else may have something available,” said panelist Elizabeth Plimack, MD, director of genitourinary clinical research at Fox Chase.



WEIGHING THE IMPACT

STUDIES SHOW
OBESITY INCREASES
THE RISK FOR CERTAIN CANCERS,
WHILE PATIENTS ALSO HAVE TO MANAGE
WEIGHT CHANGES AFTER CANCER TREATMENT

Millions of Americans know the risk factors associated with being overweight or obese: diabetes, stroke, heart disease, high blood pressure — but what about cancer? For many, this disease has never been a part of this conversation.

“I have always been a ‘big’ girl, but not once has anyone said to me they worried about my weight in relation to cancer,” said Melanie Mizenko, 25, who was diagnosed with stage 4 endometrial cancer in early 2015. “Doctors have said to me, ‘Let’s try dieting; let’s do the gym.’ No one ever said, ‘Let’s try dieting because you might get cancer.’”

Though not always discussed in the doctor’s office, more and more studies have shown that weight and obesity are linked to cancer. In April 2016, the World Cancer Research Fund International reported in its Continuous Update Project that about one-third

BY PAIGE ALLEN
PHOTOGRAPH BY CLINT BLOWERS

of the most common cancers could be prevented with diet, weight management, and physical activity. The project also revealed that physical activity reduced the risk for colon, endometrial, and breast cancer in postmenopausal women.

“Being overweight can increase the risk for numerous cancers. In nonsmokers, around 20 percent of all cancers could be attributed to being overweight or obese,” said Ed Giovannucci, MD, professor of nutrition and epidemiology at the Harvard T.H. Chan School of Public Health.

DIRECT AND INDIRECT ASSOCIATIONS

The cancers most commonly associated with obesity are breast, endometrial, colon, kidney, liver, esophageal, pancreatic, and aggressive prostate cancer. Obesity increases the risk for esophageal cancer because it causes acid reflux disease. Obesity also increases levels of insulin, which may be a growth-stimulating hormone in the colon, pancreas, liver, and kidney, according to Giovannucci. In postmenopausal women, obesity increases estrogen levels, which in turn increase the risk for breast and endometrial cancer because those tissues are sensitive to estrogen.

Of all the cancers linked to being overweight, breast and endometrial cancers have the strongest association. Pointing to the higher levels of estrogen in overweight women and higher insulin growth factor, the connection between weight and endometrial cancer is clearer than with breast cancer. “It’s been a difficult field to study,” said Mary B. Daly, MD, chair of clinical genetics and director of the Risk Assessment Program at Fox Chase Cancer Center.

Carmen Sapienza, PhD, professor at the Fels Institute for Cancer Research and Molecular Biology at Temple University, indicated a correlation between increased body mass index and the risk for cancer. For infants with a higher birth weight, there is a greater risk for breast and colon cancers later in life, Sapienza said.

“Weight by itself and body fat do influence your risk,” Sapienza said. He added that a high-fat, high-carbohydrate diet puts people at risk for colon cancer and it affects the body at a cellular level. Once mutations register in the cells, they are replicated for a lifetime and are repeated in new generations of cells.

CHANGING LIFESTYLE HABITS

Though a higher weight is tied to an increased risk for cancer, diet and exercise can change the trajectory, similar to how smoking cessation reduces one’s chances for lung cancer. However, like quitting smoking, losing weight can be a challenge for many. “It’s hard for people to change lifestyle habits,” Sapienza said.

For many patients, shedding those extra pounds — even after learning about the increased risk for cancer — may be even harder than kicking a smoking habit, according to Daly. “You don’t have to smoke, but you do have to eat,” she said.

Gaining weight after cancer treatment can increase the chances for cancer recurrence, which is another challenge for patients. On average, women with breast cancer gain about 15 pounds throughout treatment, according to Daly. “I tell patients to try not to gain weight after therapy, menopause, or breast cancer,” she said.

Though it is ideal to maintain weight within the normal range, not gaining additional weight is also helpful. “If people find it difficult to lose weight, they should not give up and gain even more,” Giovannucci said. “While diet and exercise are important for weight control, they have additional benefits. An overweight person who maintains some level of activity and a good diet is much better off than an overweight person who is completely sedentary and has a poor diet.”

For some patients, adopting a healthy lifestyle after a cancer diagnosis can be helpful in losing and maintaining weight. Though research in the field is still early, basic factors like diet, exercise, and avoiding smoking and excessive alcohol consumption may prove beneficial

“It’s hard to say to a patient that the risk factor for your cancer is your weight.”



— CRYSTAL S. DENLINGER, MD
CHIEF OF GASTROINTESTINAL MEDICAL
ONCOLOGY AT FOX CHASE

to a patient’s prognosis. “For some cancers with a relatively good prognosis such as early-stage breast cancer or prostate cancer, the patient may actually be more likely to die of other causes such as heart disease, and the lifestyle factors definitely help in that regard,” Giovannucci said.

The conversation regarding patients and their weight can be very touchy, but it is necessary, according to Crystal S. Denlinger, MD, chief of gastrointestinal medical oncology at Fox Chase. “It’s hard to say to a patient that the risk factor for your cancer is your weight,” she said.

The No. 1 cause of death in cancer survivors, other than cancer, is cardiovascular disease, and being overweight or obese can increase that risk, according to Denlinger. “It’s important to maintain a healthy lifestyle — not only for cancer risk, but for overall health.”



Crystal S. Denlinger, MD

DOCTORS ENCOURAGING WEIGHT MANAGEMENT

For some patients, achieving and maintaining weight loss can be difficult, especially as they ease back into a more normal routine following treatment. Years before she was diagnosed with breast cancer in 2008, Kathy Petrozelli, 56 and a patient of Denlinger's, lost 120 pounds through the Weight Watchers program. "Doctors told me if I hadn't lost any weight, my cancer would have been initially missed because it was so small on the mammogram," she said. "Losing that weight probably helped the radiologist see what was going on."

Though she gained some weight back, Petrozelli is working on controlling her weight once again after a diabetes diagnosis. At her routine follow-up appointments at Fox Chase, Petrozelli said Denlinger encourages her to keep losing weight and increase physical activity. "She is interested in my weight and weight management. She wants me in control for me," Petrozelli said. "She wants me down another 10 pounds at my next appointment and to continue to exercise and diet. It's a lifestyle."

Denlinger works with her patients to help maintain their weight. "It's important for providers to ask patients what they're eating, what their diet looks like," she said. Denlinger encourages her patients to "eat the outside-aisle foods of the grocery store" by focusing on produce, lean meats, low-fat dairy, and grains — foods

often found on the perimeter of grocery stores. Steering away from the middle aisles — which are often packed with processed food — is key.

For some, using smartphone weight-loss apps to track calorie intake or activity monitors like Fitbits, which track steps taken throughout the day, can be helpful. However, Denlinger recommended patients utilize methods that work best for them — whether an app or an old-fashioned paper and pencil. Although maintaining or losing weight can be beneficial to a patient's health, Denlinger stressed they should work with their doctors before making any drastic changes to eating regimens or physical activity levels.

"Patients should talk to providers about whether losing weight is a good idea and how they should go about it," she said. "It's really important for patients to work with their doctors to avoid radical weight loss or changes while going through cancer therapy."

MANAGING WEIGHT CHANGES AFTER TREATMENT

For some patients, weight changes during therapy are inevitable. Mizenko lost about 80 pounds while going through her first round of chemotherapy. "My appetite changed. I would not be hungry but then would want something specific to eat. Then I would eat two bites of the food and be done," she said.

FIVE TIPS FOR LOSING AND MAINTAINING WEIGHT

Living a healthy lifestyle can feel overwhelming. It seems like every day, there is new, often-contradictory information about what we should be eating and how we should be exercising. But getting healthy and losing weight do not have to be complicated. Here are some simple, effective, and easy steps you can take to begin your weight-loss journey.

1. SHOP THE FOODS AROUND THE PERIMETER OF THE GROCERY STORE

Grocery stores are set up so that healthy and natural foods such as fruits, vegetables, proteins, grains, and dairy can be found along the perimeter of the store. Avoid going in the aisles where many processed foods are found.

2. TRACK YOUR DIET AND EXERCISE

Weight Watchers, Jenny Craig and other weight-loss programs provide guidance in tracking your food intake, and many of these programs have developed smartphone apps designed to help you monitor caloric intake and look up nutritional information. Other apps like MyFitnessPal monitor movement and track activity levels.

3. UTILIZE AVAILABLE TECHNOLOGY

Along with apps, there are many gadgets on the market that aid in a healthy lifestyle. For example, Fitbits track your steps and motivate you to get up and move, and electronic food scales do all the work for you to make sure you eat the correct portions.

4. UNDERSTAND YOUR POSTCANCER BODY

Chemotherapy and other treatments for cancer can lead to appetite changes and weight loss. Consult with your doctor or a nutritionist about what works best for you — whether eating smaller meals throughout the day or increasing protein in your diet. After cancer treatment, gradually ease back into an exercise routine. For example, if tracking your steps on a Fitbit, start with a lower step count goal and try gradually increasing over time.

5. TALK TO YOUR DOCTOR

Before beginning any diet or exercise plan, it is always a good idea to speak with your doctor. Together, come up with safe and effective goals to maintain a healthy lifestyle.

“We need to let the world know that weight matters for a lot of different diseases.”



— CRYSTAL S. DENLINGER, MD
CHIEF OF GASTROINTESTINAL MEDICAL
ONCOLOGY AT FOX CHASE

In an effort to help keep her protein levels up, Mizenko ate a lot of protein-rich salads during her chemotherapy treatment, which may have contributed to the weight loss. However, once she finished her treatment and got back to her normal routine, her weight started climbing.

Now enrolled in a clinical trial at Fox Chase, Mizenko finds that she is more inclined to graze on snacks throughout the day rather than sit down for a full meal. Though still early, she has not noticed much change in her weight with her new treatment.

Kim Hagerich, 47, who had two daughters ages 1 and 3 at the time of her breast cancer diagnosis, lost weight due to stress. During her chemotherapy and radiation treatment, she had to consume Boost nutrition drinks to maintain her weight because doctors did not want her losing additional weight during treatment. “I’ve never had an issue with food, so to be sick during treatment, it was hard to eat, which was not a good feeling,” Hagerich said.

Dietary changes are not unusual for patients who are undergoing chemotherapy, according to Denlinger. “How patients approach food changes: treatment alters the sense of taste and appetite,” she said. Though some patients may experience weight loss, others may gain weight. Better chemotherapy drugs mean there are now less severe adverse effects.

For other patients, hospitalizations, surgeries, and treatment can impact weight. Kenneth Kittel, 74, who was diagnosed with cancer of the larynx in 2006, was treated for his cancer at Fox Chase after a large university teaching hospital told him he was too heavy to be treated there. Kittel lost 80 to 100 pounds after undergoing a tracheotomy and then spending 12 weeks in a community hospital with aspiration pneumonia.

While in the community hospital, Kittel had a feeding tube. Because the feeding tube delivered only essential nutrition in measured doses, it aided in his weight loss. Additionally, learning how to chew and swallow solid foods after the operation altered his diet, and the radiation treatment Kittel underwent also changed his appetite.

Other patients struggle with weight issues due to adverse side effects from life-saving medications or surgeries. After Hagerich’s cancer surgery, she was switched from tamoxifen to letrozole, a medication that lowers estrogen

production and is used to treat breast cancer in postmenopausal women. One of the adverse effects of the drug is joint pain, and Hagerich felt the impact.

“I would get really bad pain, especially in my knees, which made it very difficult for me to walk,” she said. “It went on for years, and it was very frustrating because I would try to exercise, but it was too difficult.”

On the advice of her oncologist, she would sometimes briefly stop taking her medication until the inflammation subsided.

About a year ago, Hagerich was diagnosed with type 2 diabetes. In an effort to better track her carbohydrate intake, she started using the MyFitnessPal mobile app on her smartphone. For her birthday, she received a Fitbit and made it a goal to start walking more, although she approached exercise with a different mindset. “I started off slower. Before then, I kept trying to jump right back into what I was doing precancer, and that would hurt my body,” Hagerich said. “I wanted to get back to normal again, but my body was different. When I stepped back and went slower, eventually I was able to walk more.”

Hagerich gradually increased her daily number of steps from 3,000 to 10,000. Now, her daily goal is 12,000 to 14,000 steps. Her hard work has paid off: she has dropped 40 pounds during the last year, been able to cease her diabetes medications, and lowered her heart rate, which was important because of the heart issues she developed after treatment with one of her chemotherapy drugs. Adjusting her expectations and understanding her postcancer body have proven to be the key to her success. “Now I’m able to walk long distances and even do some light jogging,” Hagerich said.

Focusing on the health benefits of her weight loss by tracking sugar levels and heart rate instead of worrying about the extra pounds has also made a difference. “As soon as I started focusing on the weight loss, I would fall off the wagon,” she said. “I had to focus on keeping my sugar down and my diabetes in control.”

As research into the connection between weight and cancer progresses, doctors are exploring how to get the message across to their patients. “We need to let the world know that weight matters for a lot of different diseases,” Denlinger said. “We need to work on weight management before, during, and after a cancer diagnosis.”

With education on the subject slow to spread, many patients are left to wonder if their weight influenced their cancer diagnosis and what they can do differently to prevent a recurrence. Though Mizenko’s cancer was attributed to having the BRCA gene mutation, she wishes the connection between obesity and cancer would be better publicized so that people have a better understanding about what may increase their cancer risk.

“I can’t change the past, but I wish I’d known if there was a link,” she said. ♦

Fox Chase Continues as an NCI Comprehensive Cancer Center

BY PAIGE ALLEN

PHOTOGRAPHY BY JOSEPH V. LABOLITO





Fox Chase Cancer Center continues its 40-plus-year designation as a Comprehensive Cancer Center after receiving reviews of excellent to outstanding from the National Cancer Institute (NCI).

One of the original four institutions classified by the NCI in 1974, Fox Chase continues its position in a prestigious group of 69 centers nationwide to be awarded a Cancer Center Support Grant. A smaller group offer groundbreaking research, state-of-the-art education, as well as cancer prevention and control programs and earn the “comprehensive” designation. Fox Chase is one of two in the Philadelphia region.

“To be designated an NCI Comprehensive Cancer Center is the gold standard in cancer care and research and reflects tremendous work by the entire team,” said Richard I. Fisher, MD, president and CEO of Fox Chase. “We look forward to offering our patients the best in cancer prevention, diagnosis, and treatment in the coming years.”

Comprehensive Cancer Centers meet specific standards for breadth and depth in research and serve as models for moving research discoveries, treatments, and information from the academic setting to patients and the general public.

In rating the Center’s programs as excellent to outstanding, government reviewers commented on the long history of Fox Chase, saying it “continues to be a superb environment for clinical, basic, and translational research.”

Reviewers continued: “Fox Chase Cancer Center is composed of strong researchers, producing areas of high-impact cancer research that has made important contributions to the field of cancer.”

The renewal of the Center’s status as a Comprehensive Cancer Center comes with a financial “core grant” over the next five years.

“The NCI designation is critical to recruiting the best faculty out of top



CAROLYN FANG, PHD

Coleader, Cancer Prevention and Control

“One of the criteria for NCI designation as a Comprehensive Cancer Center is excellence in population research. This designation supports quality research facilities; as a population scientist, having those facilities has allowed me to conduct the best science possible. Fox Chase has a strong commitment to working with communities to promote better health and treatment outcomes for all populations.”



WAFIK EL-DEIRY, MD, PHD

Deputy Cancer Center Director,
Translational Research
Coleader, Molecular Therapeutics Program

“Fox Chase is everything a cancer center should be. I chose to come here because of the Center’s history, its present activity, and because it’s an NCI-designated Comprehensive Cancer Center. Important, original discoveries are developed here. We know that designation provides an opportunity that not everybody has.”

training programs,” said J. Robert Beck, MD, senior vice president, deputy director, chief academic officer, and chief administrative officer at Fox Chase. “The value is many times more than the actual amount of funding.”

For patients, coming to a Comprehensive Cancer Center rather than a local hospital can make all the difference.

“Having the NCI designation provides research funding. It allows us to translate scientific discovery into the clinic and vice versa. Community hospitals don’t have that ability,” said Margaret von Mehren, MD, chief of the Sarcoma Program, physician director of the Clinical Trials Office, and associate director of clinical research at Fox Chase.

Fox Chase has cutting-edge treatments available to patients to which they may not have access at local hospitals, said Jonathan Chernoff, MD, PhD, senior vice president, deputy director, and chief scientific officer at Fox Chase.

“If your purpose is to manage or cure, you will likely do better here,” he said.

While the NCI designation is important for patients, it is also important to those working at Fox Chase. Researchers and clinicians

spoke about why working at a Comprehensive Cancer Center is important.

PAUL F. ENGSTROM, MD

Special Assistant to the President
Former Chair, Hematology/Oncology

“Having a core grant immediately brought recognition to Fox Chase and has continued that recognition nationally and internationally. Cancer centers that have core grants form a special club known for the quality and rigor of their research. When I’m looking for partners for research, I look for institutes with core grants because I know their science is high level. I’ve been here for 46 years. I wanted to practice oncology and be part of an institution that was developing new treatments and applying those treatments. There’s no better place or way to do that than to be part of a Comprehensive Cancer Center.”

JONATHAN CHERNOFF, MD, PHD

Senior Vice President
Deputy Director
Chief Scientific Officer

“There are fewer NCI-designated Comprehensive Cancer Centers than there are states in the United States.





To be taken seriously in the cancer field, you have to be in that group. The designation is so important that, in my opinion, even if the NCI gave no money and just gave their stamp of approval, centers would still be applying. The money is not the reason; it's helpful, but it's not the reason. I always wanted my work to make a difference in this lifetime. Being here has shaped the work I engage in and brings me closer to that goal."

JOSEPH R. TESTA, PHD

Scientific Leader, Kidney Cancer Working Group
 Coleader, Cancer Biology
 Director, Clinical Cytogenomics Laboratory
 Director, Genomics Facility

"It's absolutely critical to have a Comprehensive designation for any cancer center to be on the cutting edge. Because we're an NCI-designated Comprehensive Cancer Center, we as faculty know that we're in this together. We're not going to succeed on individual merit alone. Successful renewal of our Cancer Center Support Grant (CCSG) breeds success in all our future endeavors.

Having a congregation of scientists, physicians, and support staff who share a mission to prevent, delay, treat, and cure cancer on the same campus, we understand that we all benefit by helping each other."

MARGIE CLAPPER, PHD

Coleader, Cancer Prevention and Control Program

"From the time you wake up to the time you go to bed, that's all you think about — the cancer problem and how to make a difference in the lives of others. The NCI designation ranks us among the most elite of cancer centers with respect to our clinical care and research. To have that gold seal of approval means a great deal to the Center. It's a reflection of the value and quality of our research discoveries and clinical advancements. It brings recognition internationally and attracts the best and the brightest. For Fox Chase, the funding is important, but it's trumped by the gold seal of approval from the NCI. It means we're one of the best cancer centers in the country." ♦



MARGARET VON MEHREN, MD

Chief, Sarcoma Program
 Physician Director, Clinical Trials Office
 Associate Director, Clinical Research

"Many physicians like working here because of the ability to do clinical research. Having the NCI designation provides funding, and without it, we wouldn't necessarily be able to do as much as we can do. Part of the designation means your institution is doing cutting-edge research in the lab and the clinic. Having that designation puts you in a class of elite institutions."

IMMUNOTHERAPY: FRONT LINE IN THE WAR ON CANCER

In April 2016, more than 450 guests came together for In Vino Vita, Fox Chase Cancer Center's signature wine auction and benefit, which raised \$1 million for cancer research. The funds raised include more than \$560,000 for the Center's 2016 special pledge: funding a new laboratory to advance research and clinical interests in immunotherapy. Immunotherapy is a treatment that uses a patient's own immune system to fight their cancer. Faculty at Fox Chase recently spoke about the field of immunotherapy: Hossein Borghaei, DO, chief of thoracic medical oncology; Elizabeth Plimack, MD, chief of genitourinary medical oncology and clinical research; David Wiest, PhD, deputy chief scientific officer and coleader of blood cell development and function; Kerry Campbell, PhD, director of the Cell Culture Facility; and Glenn Rall, PhD, associate chief academic officer and director of the Postdoctoral Program. Also, Judy Mullins, a patient with advanced kidney cancer, discussed what immunotherapy treatment meant for her after she joined a Fox Chase clinical trial in 2013.



Why immunotherapy? Why now?

Hossein Borghaei: It's exciting because there are so many new ways of manipulating the immune system. We are at a crucial juncture when it comes to the treatment of cancers. The reason we're so excited is because we have all these great drugs.

Elizabeth Plimack: The reason I went into oncology is because we can do better. I believe that chemotherapy

"It's our responsibility to make sure this field progresses ... Now we have an opportunity to get ready for the next 20 years."

— HOSSEIN BORGHAEI, DO
CHIEF OF THORACIC MEDICAL
ONCOLOGY

is not going to be the same in 10, 20, or 30 years — we can do better.

Borghaei: It's our responsibility to make sure this field progresses, and we have to build on what we've learned, like we did 20 years ago. Now we have an opportunity to get ready for the next 20 years, which will, hopefully, help us make even more progress.

David Wiest: My desire, and the desire of every researcher at Fox Chase, is to offer hope to anyone who walks through the doors of this place, irrespective of the diagnosis. In my estimation, the immune system offers that hope. It's so powerful that it can destroy organs yet so sensitive and discerning that it can discriminate between viruses, even though the differences are minute. We are only beginning to appreciate how to unlock its fury and direct it against tumors. The thing about cancer is it is similar to our own normal tissues, so you have to help the immune system focus on what's different about the cancer cells. The only thing that limits us is our resources.

What could you do with a dedicated lab space that you can't do now?

Kerry Campbell: The immunotherapy lab is currently operating in the Pathology Department, where we share a sophisticated machine, called a flow cytometer, to analyze the immune system in blood of patients with cancer who are enrolled in immunotherapy clinical trials. It's becoming a volume issue because there are now four to five new immunotherapy clinical trials going on at Fox Chase, all of which acquire samples. It's getting very tight because as new trials come into play, there are always more samples. If we get two or three samples a day, that's a lot of processing. Each sample takes about four to six hours to process and then about an hour to run in the machine. The purchase of a new flow cytometer and acquisition of dedicated lab space would significantly improve our operating efficiency.

One of the things we really need to find out is why patients are not responding to treatment. What we can do with a new immunotherapy lab is find out how the immune system is different in the patients who do respond versus the patients who don't.

Plimack: Kerry, to your point — I think if we can discover a patient who isn't responding, we can tweak their treatment. Our goal is to take patients for whom immunotherapy isn't working and change that. Maybe they don't need just one drug. We learn a tremendous amount from patients who volunteer for these trials.



“In order for us to help patients with intractable, difficult-to-treat tumors ... we have to do something wholly new and innovative.”

— GLENN RALL, PHD
ASSOCIATE CHIEF ACADEMIC
OFFICER, DIRECTOR OF THE
POSTDOCTORAL PROGRAM



“We are only beginning to appreciate how to unlock its fury and direct it against tumors.”

— DAVID WIEST, PHD
DEPUTY CHIEF SCIENTIFIC
OFFICER, COLEADER OF
BLOOD CELL DEVELOPMENT
AND FUNCTION

How do you regard patients who are leading the crowd when it comes to immunotherapy?

Plimack: These patients, along with clinicians and researchers, are pioneers in this process. Every advance in clinical use depends on patients who take risks, who step into the unknown at a most insecure time in their lives. There is no question that without the incredible courage of patients who agree to enroll in these trials, this would be impossible.

Judy Mullins: When I met with Dr. Plimack, she had one trial position open on an ipilimumab and nivolumab combination. She asked if I wanted that position and I said absolutely.

When the trial was offered, Dr. Plimack said to me, ‘If this doesn’t work, we’re going to find something that does. We’re not going to stop. We’re going to keep fighting.’ That was another encouraging statement because at that point I was feeling dread, knowing survival rates were about three years. That was three years ago.

Since then, the combination of nivolumab and ipilimumab has been transformative. Within three to four months, Dr. Plimack performed repeat CT scans, came in, and said the tumors were

melting. I went from having many sites, and within a year, maybe longer, they were completely dissolved. Since that time, my CT scans have remained clear.

It’s been an honor to be on the trial, continuing on, really feeling like I’m contributing to the understanding of immunotherapy.

Glenn Rall: I see this from a historical perspective. In order for us to help patients with intractable, difficult-to-treat tumors — kidney, lung, and prostate — we can’t use the same old strategies. We have to do something wholly new and innovative.

I think patients would be heartened to know that the foundation of this progress begins with our scientists. These passionate researchers, who they may never see, are very much part of the development of new approaches that Fox Chase offers.

Mullins: The scientists need to understand that even though they’re not in the treatment room, the work they’re doing is vitally important and continues because it’s changing lives. Instead of a terminal illness, immunotherapy has reduced my illness to chronic, and for me, I can live

“These patients, along with clinicians and researchers, are pioneers in this process. There is no question that without the incredible courage of patients who agree to enroll in these trials, this would be impossible. We’re all in it together.”

— ELIZABETH PLIMACK, MD
CHIEF OF GENITOURINARY MEDICAL
ONCOLOGY AND CLINICAL RESEARCH



“It’s becoming a volume issue ... it’s getting very tight because as new trials come into play, there are always more samples.”

— KERRY CAMPBELL, PHD
DIRECTOR OF THE CELL CULTURE
FACILITY

with that. We’re at the beginning of changing the entire face of cancer and eliminating the word ‘terminal.’ I never thought I would see that in my lifetime.

For more information about immunotherapy and to watch the video related to this article, please visit Foxchase.org/Immunotherapy

BACK IN THE SADDLE

BY LISA BROIDA BAILEY

Jennifer Gilbert felt completely alone. It was June 2010, and her brother, who eventually died two and a half years later, was suffering from a terminal brain disease. Her father had passed away, and her mother was caring for her grandmother in South Carolina. The recently divorced 35-year-old accepted a new job as a veterinary tech at a horse hospital in New Jersey — without knowing a soul.

had spread from her cervix to her uterus and into the upper part of her vagina. Although she was frightened, Gilbert was somewhat relieved to finally have an answer. She was then referred to Fox Chase Cancer Center.

In December 2010, Gilbert underwent a radical hysterectomy, where she learned the cancer had also spread to her lymph nodes. After recovering from surgery, she was ready for chemotherapy.

“I am extremely grateful to everyone at Fox Chase for the compassionate care I received. Now that everything has come together for me, I can truly enjoy my life.”

— JENNIFER GILBERT, CANCER SURVIVOR

That is when she began to experience uncontrollable bleeding and pain, which continued for several months. She sought medical attention from local physicians, but after several rounds of testing, no one had an answer. Finally, during a pelvic exam, a gynecologist suspected what could be wrong: Gilbert had cervical cancer.

An MRI revealed the mass was two and a half centimeters and

Because she had no family in the area, she could not drive back and forth. Fortunately, Fox Chase had a partner hospital in South Jersey, close to Gilbert's home. Gina Mantia-Smaldone, MD, a gynecologic surgical oncologist at Fox Chase, managed her care.

“Exercise is really important to me, so I ran as often as I could,” Gilbert said. “It’s not only healthy, but therapeutic.”



Fox Chase patient and cancer survivor, Jennifer Gilbert

Within a few months, she began to experience severe swelling in her legs and was diagnosed with a condition known as lymphedema.

“I worked with several lymphedema therapists over the next few years, and while my symptoms could be managed, I was never back to normal,” Gilbert said. After she worked with the physical therapy department at Fox Chase, the swelling in her leg reduced from 35 percent to 14 percent (with some fluctuation) and she was able to resume her exercise schedule.

Fortunately, Gilbert continued working with horses and met new friends. In 2012, she met a

COLIN LENTON



fellow horse owner, Nick Gilbert. “We had so much in common and quickly fell in love,” she said. They both enjoy fishing, boating, skeet shooting, hunting — and obviously, riding horses. However, Gilbert continued to suffer from lymphedema.

“When my leg blew up, I told Nick he didn’t have to stay,” she said, adding that she did not want to be a burden to him. But he stuck around much to Gilbert’s delight, and he eventually proposed. The couple were married in June 2013.

Just before the wedding, Gilbert was referred to Sameer Patel, MD, a plastic and reconstructive

surgeon at Fox Chase. He had expertise in a new procedure to reduce the swelling from lymphedema. “Dr. Patel was incredible and I felt completely confident in his care,” Gilbert said. She figured she had nothing to lose and everything to gain.

“The surgery was a miracle,” Gilbert said, and her swelling decreased to a miraculous 5 percent after surgery. She continues to practice the exercises she learned during physical therapy, and she feels closer to normal.

As Gilbert’s health improved, she and her husband decided it was time to start a family. They worked

with Child and Family Services to foster two young children with the intent to adopt them. They brought a 9-year-old girl and a 2-year-old boy into their home in October 2015. In the spring of 2016, the Gilberts began the adoption process. “They are great kids, and I can’t imagine our life without them now,” Gilbert said.

The Gilberts moved to a bigger house in the country to accommodate their growing family. “I am extremely grateful to everyone at Fox Chase for the compassionate care I received,” Gilbert said. “Now that everything has come together for me, I can truly enjoy my life.”

ROWING FOR RESEARCH

West Pharmaceutical Services' Dragon Boat Team Raises Funds for Fox Chase

Guided by a crew leader known as a drummer, 20 paddlers race down Philadelphia's Schuylkill River in what can only be described as the longest two

and a half minutes of one's life. Although the race itself is only 0.31 miles, the strength and teamwork required are incredible. West Pharmaceutical Services Inc. has been participating in this

race — part of the Philadelphia International Dragon Boat Festival — for 14 years. It is a difficult feat, but the team is not slowing down anytime soon.

West Pharmaceutical Services, headquartered in Exton, Pa., is a leading manufacturer of packaging components and delivery systems for injectable drugs and health care products. At West, the culture of giving motivates all employees to make it a priority

“West has a long history of community support. As our company grew globally, so did our passion for helping others.”

— CURT HOOVER, SENIOR SPECIALIST OF GLOBAL COMMUNICATIONS AT WEST PHARMACEUTICALS

to give back to the community through fundraising. West encourages all of its employees to contribute to local charities in any way they can.

West Without Borders, the company's global employee giving program, has donated millions of dollars to various organizations around the world that focus on aiding cancer research and care; science, technology, engineering,



West employees gear up for the race.

PHOTOS COURTESY OF WEST PHARMACEUTICAL SERVICES



West employees celebrate another successful race.

and mathematics (STEM) education; and children with special needs. “West has a long history of community support. As our company grew globally, so did our passion for helping others,” said Curt Hoover, senior specialist of global communications at West.

West employees have also focused their efforts on supporting cancer research at Fox Chase for more than a decade. The Dragon Boat Race is West’s largest event to raise money for Fox Chase, with all employees participating in some capacity. The race raised more than \$13,000 for Fox Chase in its very first year. After their initial success, the team brainstormed ways to raise even more money the following year.

“We sold sunglasses and passes to let employees wear jeans to work. We also held bake sales, raffled prizes, and held various events throughout the year,” said Hoover. “Our most successful fundraising technique was to develop Dragon Boat T-shirts. Initially they were just for paddlers, but we expanded it so anyone who made a donation would receive a shirt. Fourteen T-shirt designs later, and they continue to be our most popular way to raise money.”

West’s combined fundraising efforts, culminated a gift of \$1.5 million to create the H.O. West & J.R. Wike Chair in Cancer Research at Fox Chase, which is currently held by J. Robert Beck, MD, chief

academic and administrative officer at Fox Chase. The chair was created in 2005 and named for Herman O. West and Jesse R. Wike, University of Pennsylvania classmates who founded West Pharmaceutical Services in the 1920s. The title recognizes and supports an outstanding leader in cancer science and medicine who represents the highest standards of excellence.

“Everyone’s life is touched by cancer. You hope it’s not going to happen to you, but in your lifetime, many of your friends and family will be faced with cancer either directly or indirectly,” Hoover said. “West employees know they are lucky to be located close to a world-class facility like Fox Chase Cancer Center.”

RAP CELEBRATES SILVER ANNIVERSARY

On April 14, 2016, Fox Chase Cancer Center celebrated the 25th anniversary of its Risk Assessment Program (RAP). Mary B. Daly, MD, chair of clinical genetics, founded the program in 1991 to help patients and families identify and better understand their cancer risk factors.

Fox Chase hosted 175 people including RAP families, friends, supporters, faculty, alumni, and staff at the Knowlton Mansion in Philadelphia. Guests enjoyed an evening of celebration, information, and shared experiences. The event was hosted by Emmy award-winning former Philadelphia TV news anchor Pat Ciarrocchi.

Richard I. Fisher, MD, president and CEO of Fox Chase, presented a commemorative crystal bowl to Daly in honor of her pioneering work and dedication to the mission of the program.

Advocacy groups, including Bright Pink, Sandy Rollman Ovarian Cancer Foundation, Facing Our Risk of Cancer Empowered, and the National Ovarian Cancer Coalition were on site to provide additional information about their various organizations to attendees.

Several RAP patients, including Don Meadows, Laura Simonetti,



Top: Mary Daly and former news anchor, Pat Ciarrocchi. **Left:** RAP patients, faculty, friends, and supporters. **Right:** Richard I. Fisher and Mary Daly

and Amy Dysart, shared a glimpse of their journeys and stressed the importance of understanding family cancer history. Daly concluded

the program with a historic overview of 25 years of progress and her vision for the future of genetic cancer research.

TOGETHER FACING PANCREATIC CANCER



Fox Chase faculty and patients

On June 15, 2016, Fox Chase Cancer Center held a free educational seminar for pancreatic cancer patients, survivors, caregivers, family, health care professionals, and friends in Fox Chase's Reimann Auditorium. Hosted by Igor Astsaturov, MD, PhD, Together Facing Pancreatic Cancer featured speakers from Fox Chase's pancreatic cancer treatment and research team. During dinner and the informational session, guests learned about pancreatic cancer, immunotherapy, and molecular targeted therapy in pancreatic cancer treatment. After the seminar, the Pancreatic Cancer Action Network held its monthly meeting and offered further discussion on how to support individuals facing pancreatic cancer.

TOP: TOM STEPHANO; BOTTOM: PAUL REITANO



From left to right: Jamie Roche, Susan Fisher, Richard I. Fisher, and Karrie Borgelt

IN VINO VITA MEETS \$1 MILLION GOAL

In wine, life. This is the meaning behind In Vino Vita, Fox Chase Cancer Center's signature wine auction and benefit. On Saturday, April 9, 2016, more than 450 guests gathered for the third annual event in Philadelphia and raised \$1 million for cancer research at Fox Chase — a record number that doubles the amount raised in 2015. The funds raised included more than \$560,000 for this year's special pledge: funding for a new laboratory that will advance

research and clinical interests in immunotherapy (see related article on page 16).

With a new venue, Vie, on Broad Street just north of City Hall, and a new night — a Saturday rather than a weeknight — Fox Chase hosted a spectacular event that featured more auction lots than ever before. A live band and a packed dance floor added to the party atmosphere, creating the perfect Saturday night out.

Contributing to the night's success were event chairs David and Sandy Marshall and wine chairs Louis and Carol Della Penna, whose leadership in planning the event stemmed from their close association with Fox Chase and reflects their belief in the important work of the Center.

In addition, Karrie Borgelt, chief development officer, and Jamie Roche, director of donor events, along with the entire Institutional Advancement team at Fox Chase, stepped up to host a record-setting event.

3 YEARS

3 DIFFERENT VENUES

MORE THAN \$1.8 MILLION RAISED FOR FOX CHASE CANCER CENTER

(\$280K IN 2014, \$560K IN 2015, \$1 MILLION IN 2016)

MORE THAN 1,100 ATTENDEES

(232 ATTENDEES IN 2014, 412 IN 2015, 460 IN 2016)

NUMBER OF AUCTION LOTS OF HIGH END WINES AND EXPERIENCES: 113

(14 IN 2014, 32 IN 2015, 67 IN 2016)

OLDEST VINTAGE AUCTIONED: 1870

BOTTLES OF WINE AUCTIONED: 268



Richard E. Greenberg, MD, chief of urologic oncology, received the 2016 American Urologic Association (AUA) Residents

Committee Teaching Award at the organization's annual meeting in San Diego in May. The AUA Residents Committee Teaching Award is presented annually to an outstanding urology educator or program director who has dedicated a portion of his or her career to teaching residents. The award also recognizes an individual who influences residents to pursue a career in academic medicine.



Anne Jadwin, MSN, vice president of nursing services/ chief nursing officer, has received the 2016 Outstanding Nurse Award from the Delta

Tau Chapter-at-Large: Sigma Theta Tau International Honor Society of Nursing. The award was announced at the 2016 induction ceremony for the Delta Tau Chapter-at-Large on April 10, 2016, at Holy Family University. The award recognizes leadership in nursing practice, administration, research, and education.



Rosaleen B. Parsons, MD, chair of the department of diagnostic imaging, has been elected a fellow of the Society of Abdominal

Radiology (SAR). To qualify as a fellow of the SAR, a medical professional must make significant contributions to the field. Fellows demonstrate continued interest in abdominal radiology and devote at least 50 percent of their professional medical practice to the study of the abdomen and pelvis.

STUDENTS IMMERSE IN SCIENCE

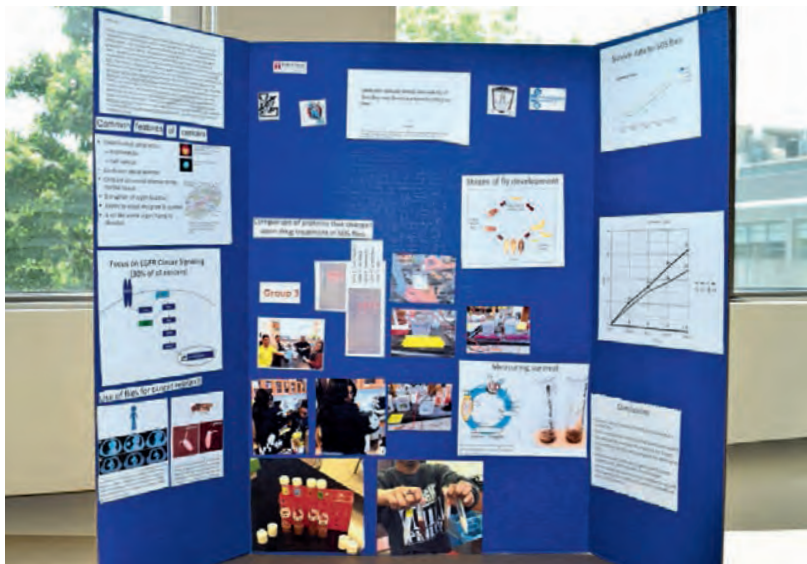
On June 6, 2016, on the Fox Chase Cancer Center campus, more than 50 students from two Philadelphia public high schools presented their own scientific findings on understanding how dietary components affect oncogenic signaling pathways in fruit flies. This mini-symposium, hosted by Fox Chase's Immersion Science Program, and run by Dara Ruiz-Whalen and Alana O'Reilly, MD, gave students the opportunity to conduct their own relevant research study.

The primary goal of the Immersion Science Program is to provide comprehensive science research training to high school students to prepare them for future careers in science and health. During the symposium, Fox Chase faculty came to hear the student presentations and ask questions, similar to the way a postdoctoral candidate would present his or her research to colleagues.

The Immersion Science Program hosts a number of events, training courses, and programs for both students and teachers, such as the Immersion Science Teachers Program. This program



Above and top right: Students from Palumbo High School and Abraham Lincoln High School. Bottom right: Student presentations.



trains high school teachers in implementing lab practices that allow students to participate in real-time research experiments.

The teaching program led to the mini-symposium and the collaboration between two Philadelphia high schools. Twelfth-grade advanced placement science students from Palumbo High School partnered with ninth-grade science students from Abraham Lincoln High School to research the effects of three dietary supplements on mutant fruit flies. The

scientific goal of the project was to determine how dietary components influence cancer signaling, with the idea that diets may be tailored to enhance the efficacy of chemotherapies.

The first of its kind, the mini-symposium is a crowdsourcing event with the goal of reaching public schools across the country — and getting more students involved in scientific research. The hope is to give students the tools for success in their educational pursuits.

FOX CHASE HOSTS RECEPTIONS AT AACR AND ASCO ANNUAL MEETINGS

On April 17, 2016, Fox Chase Cancer Center President and CEO Richard I. Fisher, MD, hosted a reception at the American Association for Cancer Research Annual Meeting at the New Orleans Downtown Marriott at the Convention Center. On June 4, 2016, Fisher also hosted a reception at the American Society of Clinical Oncology Annual Meeting at the Hyatt Regency Chicago. To see more photos from the events, visit the Fox Chase Cancer Center Flickr page.



Right: Hossein Borghaei and Hugh Fan. Top: Fadia Duna-Issa, Jean-Pierre Issa, Wafik El-Deiry, Richard I. Fisher, Susan Fisher. Bottom: Robert Carlson, Richard I. Fisher, Susan Fisher, Lori J. Goldstein

BEACH PARTY AT FOX CHASE



“Unsinkable. This simple word describes an incredible group of researchers, scientists, physicians, and all staff members, characterized by excellence, teamwork, and dedication,” said Fox Chase CEO and President Richard I. Fisher, MD, about Fox Chase’s faculty and staff. To honor the faculty and staff’s continued hard work and dedication to the Center, Fox Chase hosted an on-campus event held in the Fox Chase cafeteria and continued outside in the courtyard on June 16, 2016. The event, entitled the “Unsinkable” Beach Party, included music, games, food, prizes, and gifts such as beach chairs, beach towels, beach balls, and blankets. In addition to games and prizes, Fox Chase employees enjoyed a visit from the Phillie Phanatic and treats from an ice cream truck.

TOP: RON GOULD; BOTTOM: PAUL REITANO

THE STUDY THAT LAUNCHED 50,000 PAPERS (AND COUNTING)

Fox Chase Scientists Celebrate 25 Years of AKT-Related Research

BY BRYAN BECHTEL

October 2016 marks the 25th anniversary of a landmark study that originated in a laboratory at Fox Chase Cancer Center. The study, called “A Retroviral Oncogene, AKT, Encoding a Serine-Threonine Kinase Containing an SH2-Like Region,” is considered the starting point for a plethora of research that significantly impacted the field of cancer.

Fox Chase researchers Philip Tsichlis, MD, (now at Tufts University in Boston), Joseph R. Testa, PhD, and Alfonso Bellacosa, MD, PhD, studied the differences in a protein, known as AKT, that originated from human instead of viral DNA. Although that work would take about a day with modern facilities, the comparison of human and viral sequences took months of effort 25 years ago. The work paid off when the researchers obtained the results of their analysis.

The study revealed that although the viral and human genetic sequences coding for the AKT protein were similar, there were some important differences in the viral sequence that made the protein for which it coded continuously active, and it gave the cell better survival ability.

The reason this finding was so significant is that the AKT

protein is important in shutting down the process that kills abnormal cancer cells. Because viral-derived AKT is continuously active and the human form is not, the scientists realized there must be an additional factor that activates it. Once activated, AKT appeared to be extremely important in tumor formation.

“When the AKT protein is activated, cancer cells can survive,

“The reason this finding was so significant is that the AKT protein is important in shutting down the process that kills abnormal cancer cells.”

proliferate faster, and invade more. It was also found that AKT can regulate angiogenesis (growth of new blood vessels that make a tumor grow),” said Testa, a professor in cancer biology at Fox Chase and the Carol & Kenneth E. Weg Chair in Human Genetics. “It turned out that AKT is involved in so many aspects of cancer. It is indeed a central player.”

Testa recently ran a search and found that more than 50,000 papers have been published that include AKT in the title or abstract. The subsequent research has demonstrated that among other important properties, AKT is

overly expressed in many different tumor types, including prostate, breast, lung, ovarian, and pancreatic cancers.

In November 2016, Bellacosa, Testa, and Tsichlis will reunite in remembrance of their great discovery, joined by fellow researchers from all around the country. The symposium, dedicated to the 25th anniversary of the paper’s publication, marks the great

impact the discovery had on Fox Chase and the scientific community as a whole.

Bellacosa, then a postdoctoral fellow and now a professor in cancer epigenetics, fondly recalls the importance of the work. At the moment of discovery, these three researchers were the only people in the world who knew the origin point of several different cancer types.

“Sharing the excitement of that discovery creates a very strong emotional bond, and so my friendships with Phil and Joe are very strong to this day,” Bellacosa said.



Alfonso Bellacosa, MD, PhD,
(left) and Joseph R. Testa, PhD,
in the lab



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“Where I started
my cancer care
really did matter.”

Linda Snow
Breast Cancer Survivor

When Linda learned she had the BRCA1 gene, she did everything she could to reduce her risk of breast cancer. But she still found a lump. It was triple negative breast cancer. At first she was in shock, but then Linda knew she needed to take control. She went to Fox Chase for specialists with expertise in her specific type of cancer. For Linda, that decision made all the difference. Where you start matters.

NEXT BUSINESS DAY APPOINTMENTS 888-FOX-CHASE FOXCHASE.ORG



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