



# FOR YOUR INFORMATION

News and Information about the Cancer Center @ Beth Israel Deaconess Medical Center

Winter 2018



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Ribbon-cutting and dedication

**RESEARCH**

## New Laboratory Facilitates Promising Cancer Vaccine Manufacture

### A Place to Accomplish Great Things

The Cancer Center at Beth Israel Deaconess Medical Center is launching a state of the art facility to generate personalized cellular immunotherapy for cancer. Under the direction of David Avigan, MD, Chief, Section of Hematological Malignancies and Director of the Cancer Vaccine Program, BIDMC has emerged as a national leader in this critical area.

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# What Makes a Cancer Center Great?

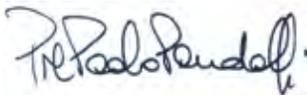
This question is always on my mind. Many things make a cancer center great:

- Clinical programs that offer the latest, most technologically advanced, evidence-based care.
- Rigorous research that probes the mechanisms of cancer and makes clinical trials available to patients.
- Training programs that constantly challenge the status quo with the new ideas, knowledge and attitudes of young doctors.
- Support programs that give patients and families a helping hand as they deal with lives rocked by cancer.
- Scale that is big enough to provide the full range of care, science, training and support, yet preserves the human touch.
- The aspiration to not only treat but also to cure cancer, for the individual and for humanity.

I am proud to say that our cancer center brings these elements together in a combination that is unique in New England.

Each year, there is a special moment when I take stock of all this activity, along with the ferment and creativity it generates. This happens at 8:45 am on the autumn day when I prepare to host the annual BIDMC Cancer Symposium. When I look around at the researchers, clinicians and students in the audience and on stage, buzzing about exciting breakthroughs that are taking place at BIDMC and around the world, I am filled with hope that we will one day cure this terrible disease. This year's symposium brought special pleasure because it marked its 10th Year (see story, page 13).

The BIDMC Cancer Center as a whole is truly greater than the sum of its parts. I thank each and every dietary worker, donor, environmental services worker, manager, nurse, patient, physician, receptionist, researcher, surgeon, vendor and others who make our programs so extraordinary. I wish all a year full of health and discovery.



Pier Paolo Pandolfi, MD, PhD, Director of the Cancer Center at BIDMC (right), with post-doctoral fellow Riccardo Panella, PhD

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# Clinical Trials Take Aim at Pancreatic Cancer

## Vaccine and Organoid Studies Test New Approaches to Challenging Cancer

In early 2018, Cancer Center investigators will begin evaluating whether a promising vaccine technology developed at BIDMC to treat blood cancers has similar potential for treating pancreatic cancer.

The V Foundation of North Carolina has provided partial funding for a vaccine pilot trial with a \$600,000 grant over three years. If the trial is successful, the Cancer Center will use the results as the basis for additional fundraising to support expansion of the study.

In a second pancreatic cancer study that opened in early February, organoids will be evaluated as a tool for personalizing targeted therapies to treat individuals' unique pancreatic tumors.

### The Vaccine Trial

The vaccine trial, a Stage 1B study, calls for 25 people with locally advanced pancreatic cancer to receive a vaccine made at BIDMC's new Schwartz Family Cancer Immunotherapy and Cell Manipulation Facility (see story, page 1). After the standard treatment is completed, participating patients will receive a form of immunotherapy that has not been aimed at pancreatic cancer before: a vaccine in which the patient's own tumor cells are fused with his or her own dendritic cells. Dendritic cells—found in the skin, blood and linings of the nose and certain internal organs—are antigen-regulating messengers that activate the disease-fighting T cells of the immune system.

The effectiveness of this fusion vaccine in treating acute myeloid leukemia (AML) and multiple myeloma has already been demonstrated in clinical trials by BIDMC physician-researcher David Avigan, MD, Chief of Hematological Malignancies and Bone Marrow Transplantation, and his colleagues.

Principal investigators for the pancreatic cancer vaccine study include Avigan, BIDMC researcher Senthil Muthuswamy, PhD, Deputy Director of Translational Research and Director of Cell Biology; and Manuel Hidalgo, MD, PhD, Director of the Rosenberg Clinical Cancer Center and BIDMC's Chief of Hematology/Oncology.

"Hundreds of clinical trials have attempted to apply immune oncology to pancreatic cancer, especially checkpoint inhibitors, but the results have been disappointing," said Hidalgo. "On the basis of our pre-clinical work in mice, we will be testing our hypothesis that the fusion vaccine could be the first therapeutic intervention other than surgery to have a real impact on pancreatic cancer."

In contrast to the ready availability of tumor cells for blood cancer vaccines, it is difficult for physician-scientists to gain access to the large numbers of tumor cells needed to manufacture a pancreatic cancer vaccine. A potential solution to this problem is organoids—laboratory-produced, three-dimensional cell cultures that are superior to traditional cell cultures because they allow researchers to replicate many attributes of the patient's organ or tumor for research or clinical purposes. BIDMC's organoid technology was developed by the Muthuswamy laboratory, part of the Cancer Research Institute at BIDMC.



Muthuswamy with organoid trays

*Continued on next page*

# Trials Take Aim at Pancreatic Cancer



A lab worker tests a drug on organoids

In the vaccine study, the clinical team will secure pancreatic tumor cells from the patient during the biopsy done at the time of diagnosis. The researchers will grow the cells into organoids over a period of eight-to-12 weeks.

In parallel, they will secure dendritic cells by drawing them from the patient's blood stream through apheresis. In this process, blood is drawn outside the body, a constituent is removed (in this case, dendritic cells), and the blood is returned to the body.

Next the team will combine the malignant and dendritic cells—fuse them—to manufacture a fusion vaccine.

"As soon as the fusion is made, it will be given to the patient to initiate an anti-tumor immune reaction," said Muthuswamy. The vaccine will be introduced into the patient's bloodstream through endoscopic ultrasound or other techniques. In a subset of patients, the investigators will combine the vaccine with additional chemotherapy drugs that may be needed to overcome roadblocks to activating immune cells that exist in the tumor's microenvironment.

"The dendritic cells in the vaccine will talk to the dendritic cells in the patient," Muthuswamy added. "They will roam around the body, encouraging the immune system to mount its own defense against the cancer."

The second, internally funded organoid study is aimed at refining the use of organoids to evaluate the

effectiveness of a range of therapies matched to the specific tumor type of 100 people with any stage of pancreatic cancer. In addition to tailoring therapy, it will serve as a platform for drug discovery and eventually immuno-oncology.

A team of eight Cancer Center investigators led by Hidalgo will run the trial—dubbed "Harnessing Organoids for Personalized thERapy," or "HOPE Trial"—over three years, in tandem with the vaccine trial.

The team will evaluate therapies in organoids rather than in the patient's body. This approach can minimize toxicities and save time, a crucial concern in the treatment of fast-moving pancreatic cancer.

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*"The dendritic cells in the vaccine will talk to the dendritic cells in the patient. They will roam around the body, encouraging the immune system to mount its own defense against the cancer."* — Senthil Muthuswamy, PhD

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"Over the past 12 months we have optimized a standard operating protocol to generate organoids and screen them for possible treatment options with a turnaround time of 12-14 weeks," said Muthuswamy. "We are now ready for clinical implementation of this personalized medicine approach."

The study is a feasibility trial that, in itself, does not include therapeutic intervention. However, the investigators will provide participants' BIDMC care teams with a "drug sensitivity report" within a clinically meaningful time frame. The oncologist will have the option to use the results when making treatment recommendations.

"Right now, any given line of chemotherapy for pancreatic cancer has a less than 50-50 chance of being effective," said Joseph Grossman, MD, a third-year oncology fellow who is one of the investigators. "The goal here is to select the drugs we are using more rationally."

**More info:** Joseph Grossman, MD, at [jgrossm2@bidmc.harvard.edu](mailto:jgrossm2@bidmc.harvard.edu)



# Jalisi Joins BIDMC to Lead Head and Neck Cancer Program

Surgical Oncologist Scharukh Jalisi, MD, has joined BIDMC as Chief of Otolaryngology and Head and Neck Surgery. Bringing with him 10 years of pioneering experience in robotic surgery, he has already introduced these techniques to the Cancer Center's Head and Neck Cancer Program.



Scharukh Jalisi, MD, MA

Jalisi came to BIDMC from Boston Medical Center, where he was Director of the Head and Neck Cancer Center of Excellence and Director of the Division of Head and Neck Surgical Oncology and Skullbase Surgery. He created Boston University's multispecialty head and neck service, forged strategic partnerships and expanded inpatient care with a focus on complex cases.

"At BIDMC, my initial focus is on nurturing a cohesive clinical team, building our offerings of advanced surgical techniques and enhancing the patient experience," Jalisi said. "With our excellent team in otolaryngology, oncology and plastic and reconstructive surgery, over time, we expect to expand the program significantly."

## New Developments

His plans include hiring a nurse navigator to help guide patients through treatment and an increasing emphasis on post-operative care and survivorship planning. He also anticipates renovation of the Otolaryngology Clinic offices on Lowry 6.

Working with Jalisi to accomplish these initiatives is Director of Clinical Operations Katie Deary, DNP, who also came from BMC.

Among the conditions Jalisi treats are head and neck cancers; tumors of the pituitary, thyroid parathyroid glands; skin and oral cancers; acoustic and skullbase tumors. He performs local and microvascular reconstruction of the head and neck.



In the operating room

Jalisi said he welcomes referrals from oral surgeons, dentists, community-based otolaryngologists and other physicians at BIDMC and in the community.

A dedicated educator, Jalisi has been active in medical student, resident and fellowship education. Jalisi was an Associate Professor of Otolaryngology/Head and Neck Surgery at BU and received the Charles-Vaughan Excellence in Clinical Teaching Award from the residents in Otolaryngology. He also served as Director of BU's Head and Neck Surgical Oncology Fellowship.

Jalisi has authored more than 60 original papers, case reports and reviews in peer-reviewed journals, as well as book chapters and textbooks. He is the author of three otolaryngology and robotic surgery textbooks and is a reviewer for several leading journals.

Jalisi holds leadership positions in many professional societies and lectures nationally and internationally.



**More info:** Katie Deary, NP, at [head&neckcancer@bidmc.harvard.edu](mailto:head&neckcancer@bidmc.harvard.edu)

**Appointments:** 617-632-7500

# Innovative TTFields Therapy Keeps Glioblastoma in Check

In June 2015, while gearing up for a summer of socializing, golfing and boating, Jack Moakley was diagnosed with glioblastoma. The common, aggressive and difficult-to-treat brain cancer has no known cure.

Earlier that year, he had noticed that he'd begun to drift to the left side of the road while driving. There were other unexplained symptoms, too: anxiety, coordination issues and a ghost taste and smell.

Moakley, 61 and a Falmouth resident, saw a neurologist at BIDMC. After a series of tests that pointed to glioblastoma, neurosurgeon Ekkehard M. Kasper, MD, PhD, Co-Director of the Brain Tumor Program at the Cancer Center at BIDMC, performed surgery to remove a "lemon-sized" tumor from Moakley's brain. The surgery was followed by radiation and chemotherapy.

As often happens with glioblastoma, Moakley's tumor had invaded the brain and could not be entirely removed. His care team discovered that the tumor was growing again.

## A Change of Tactics

Neuro-oncologist Eric T. Wong, MD, Co-Director of the Brain Tumor Program at the Cancer Center at BIDMC, suggested a change in tactics: Tumor Treatment Fields (TTFields). This electromagnetic therapy was approved by the FDA for use in recurrent glioblastoma in 2011.

Unlike chemo, which impacts the entire body—healthy cells and tumor cells—TTFields is a localized treatment with low-intensity electrical waves that in themselves cause virtually no side-effects. The electrical waves affect only tumor cells as they divide and reproduce. The waves are delivered through an unusual cap-like system, which contains wires and electrodes applied to a shaved head.

Although some doctors debate the effectiveness of TTFields, research in which Wong has participated indicates that the therapy extends the median survival of people with glioblastoma by five months and can stabilize the disease for as much as two years.



Jack Moakley in Times Square

The treatment sometimes concerns patients because it must be worn at least 75 percent of the time. It can cause skin irritation, difficulty sleeping and bathing, and concern about one's appearance.

"You just have to ask yourself, if this thing can save or extend your life, is it worth it?" said Wong. "I cannot make that decision for you, and some individuals cannot get over the inconveniences and impacts of the treatment. But that is okay, I will find other solutions for them."

Moakley set the concerns aside and never looked back. After nearly two years, his condition is stable. He continues to have MRIs every three months to check for tumor growth and returns to BIDMC biweekly for chemo infusions. He developed a collection of cool skull caps and again works, socializes, walks, bikes and golfs. He has even returned to his ultimate "happy place," his boat, suitably named All In.

Once you get used to TTFields, Moakley said, "Life can be anything you want it to be. The only limitation is your mind."



**More info:** Brain Tumor Program at [bidmc.org/braintumor](http://bidmc.org/braintumor) or 617-667-1665

# Research Reveals Role of Fat in Metastatic Prostate Cancer

The Western high-fat diet may be a key environmental factor driving metastatic prostate cancer, according to BIDMC Cancer Center researchers who recently published a tantalizing study on genetic mechanisms that promote metastasis in mice.

Many prostate tumors are slow-growing and not life-threatening. But when they metastasize, the disease is often fatal. In a set of papers published January 15 in the journals *Nature Genetics* and *Nature Communications*, Cancer Center researchers shed new light on causes of the disease.

"Although it is widely postulated that a Western diet can promote prostate cancer progression, direct evidence supporting a strong association between dietary lipids and prostate cancer has been lacking," said first author Ming Chen, PhD, a research fellow in the laboratory of Pier Paolo Pandolfi, MD, PhD, Director of the BIDMC Cancer Research Institute and Cancer Research Institute at BIDMC.

## Link between Fat and Cancer



Epidemiological data links dietary fats (and obesity) to many types of cancer, and rates of cancer deaths from metastatic cancers including prostate cancer are much higher in the United States than in nations where lower fat diets are more common.

Starting with an analysis of genomic data, the researchers discovered that metastatic prostate cancer is associated with the combined lack of the PTEN gene and the PML gene, a tumor suppressor. Comparing localized and metastatic tumors, the researchers found that the latter produced huge amounts of lipids, or fats. This presented the possibility that fat producing mechanisms could be a target in the search for drugs to treat or cure prostate cancer.

Such a drug already exists: fatostatin, a molecule



The BIDMC Cancer Research Institute study on prostate cancer and fatostatin made headlines on ABC's Good Morning America (above), WCVB-TV News in Boston and in *The New York Times*.

discovered in 2009, is currently being investigated as an obesity treatment. When Pandolfi and colleagues tested the molecule in lab mice, they found that it blocked fat production, caused tumors to shrink and prevented metastasis.

The findings also helped solve a puzzle. For years, researchers had difficulty modeling metastatic prostate cancer in mice, making it hard to study the disease in the lab. The lipid production finding raised a question in Pandolfi's mind.

"I asked, 'What do our mice eat?'" Pandolfi recalled.

The answer was a vegetable-based chow—essentially a low-fat vegan diet that bore little resemblance to that of the average American male. When Pandolfi and colleagues spiked the mice's diet with saturated fats—the kind found in fast food cheeseburgers and fries—they developed aggressive, metastatic tumors.

These findings could result in better mouse models that can accelerate discovery of therapies for the disease. Physicians could soon be able to screen early-stage prostate cancer patients for risk associated with the lack of both PTEN and PML tumor suppressing genes. These patients may be helped either by diet modifications or fat-blocking drugs.

"The data are tremendously actionable," Pandolfi said, "and they surely will convince you to change your lifestyle."



**More info:** <https://www.nature.com/articles>

# Two Cancer-Related Core Facilities Open for Business at BIDMC

Two new core facilities have opened at Beth Israel Deaconess Medical Center to provide key scientific services to researchers working in cancer and other fields.

Cores are centralized, shared resources that provide technical support to researchers at the home institution and elsewhere, allowing these clients to benefit from specialized expertise and economies of scale. The facilities are often located at academic medical centers. At BIDMC, more than three dozen institutional and departmental core facilities offer an array of services to the greater Boston scientific community and beyond..

The new cancer-related core facilities are:

- Non-Coding RNA Precision Diagnostics and Therapeutics Core Facility
- BIDMC Organoid Program (BORG) Core Facility

## Non-Coding RNA Core Facility

This institutional facility opened in December under the aegis of the Harvard Medical School Initiative for RNA Medicine (HIRM), hosted by the Cancer Center at BIDMC. The 1,393-square-foot, self-contained facility is located on BIDMC's East Campus. Over time it will provide methods for detection, quantification and discovery of non-coding (nc) RNAs; bioinformatics for interpretation of ncRNA discoveries; and delivery of targeted ncRNAs to diseased tissue for investigative use in pre-clinical science.

"This combined range of services is not available anywhere else," said HIRM Director Frank Slack. "This core facility provides investigators with not only the ability to identify new targets and biomarkers, but also the ability to validate them as relevant to the disease they are studying. Our aim is eventually to go all the way to designing molecules that could lead to treatments—truly a concierge service unique among academic medical centers."



The new core facilities are located in the Center for Life Sciences building adjacent to BIDMC

## BIDMC Organoid Core Facility

This departmental core is a new component of the Cancer Research Institute's Cell Biology Program, headed by Senthil Muthuswamy, PhD. Its purpose is to facilitate personalization of cancer treatment by serving as a resource for patient-derived organoid models. These three-dimensional cell models allow researchers to safely test drug response in the patient's own tumor tissue, outside the patient's body, saving time and money. After opening in Fall 2017, the lab is already serving and billing clients for cultures.

"We are currently developing platforms from human pancreatic, breast and lung tumor tissues," said Muthuswamy. "We will add other organ sites as funding allows. In addition to our collection of organoid models, we will be offering researchers a database of associated clinical information and training in how to culture and use organoids. We will also offer consultation with oncologists and patients."

Muthuswamy added that the facility will provide services to other Harvard affiliates and institutions in the Boston area, where no comparable service is currently available.



**More info:** [fslack@bidmc.harvard.edu](mailto:fslack@bidmc.harvard.edu) or [smuthusw@bidmc.harvard.edu](mailto:smuthusw@bidmc.harvard.edu)

# There's Nothing Simple about Survivorship (Plans)

In the complex world of cancer care, tasks that sound simple can sometimes be devilishly complicated. For example: Survivorship Care Plans.

These plans are documents given to cancer patients at the end of active treatment. They contain straightforward, practical information about the person's exact cancer diagnosis, treatment and side effects; guidelines for follow-up care; and lists of resources for clinical, psychosocial and spiritual support. They also describe symptoms to watch for in case of recurrence, and contact information for care providers.

What's so difficult about that?

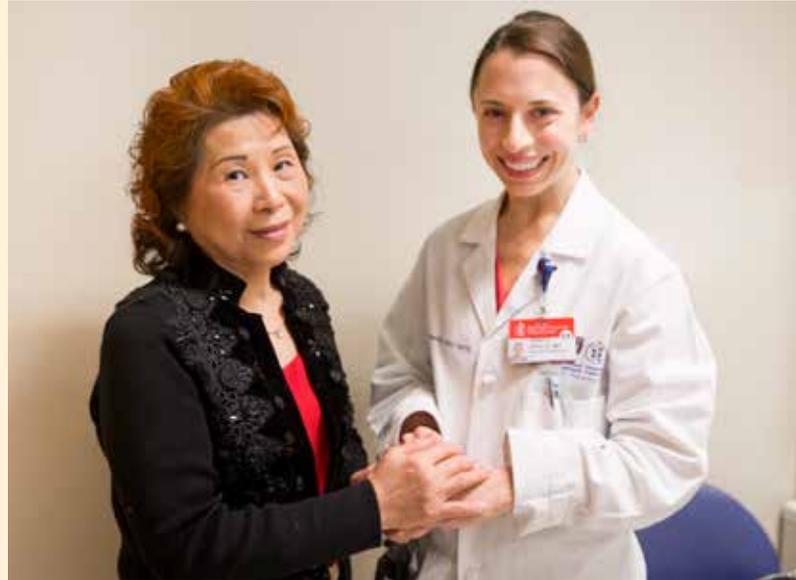
"Each patient's care is unique," says Quality Director Jessica Zerillo, MD, who led the survivorship planning effort after her appointment as Co-Chair of the hospital's Cancer Care Committee in early 2017. "You can't easily produce a summary of care for all patients, because each case is a little different."

Zerillo devoted a year to meeting with dozens of doctors and hashing out a mostly manual system for producing the plans with the BIDMC Tumor Registry. She worked closely with a task force of Committee on Cancer members that also included Co-Chairs Irving Kaplan, MD, and Mary Jane Houlihan, MD; Cancer Center Administrative Director Will Decaneas; and Gerry Abrahamian and Matt Cadorette from Health Information Management.

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*"Each patient's care is unique. You can't easily produce a summary of care for all patients, because each case is a little different."* – Jessica Zerillo, MD

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Jessica Zerillo, MD, meets with a patient to discuss her survivorship plan.

As a result, BIDMC now is reliably producing Survivorship Care Plans for many people nine-to-12 months from diagnosis, after the completion of curative treatment (for non-metastatic disease). The timeline is 18 months for breast cancer patients who receive hormone treatment.

The BIDMC Cancer Center produced its first plan in September 2017. Since then, Zerillo, a gastrointestinal medical oncologist, has delivered five of the six-page, word-processed plans to her own patients.

"Completion of treatment can be an anxiety-producing time for people," she says. "When the treatment and activity are over, their appointments are spaced out and they feel nothing is being done to treat their cancer anymore. Survivorship plans are reassuring. My patients have been thankful."

## A Good Problem to Have

In the past, survivorship plans weren't an issue because fewer people survived cancer. After treatment, individual providers dispensed information, but the entire care

*Continued on next page*

## There's Nothing Simple about Survivorship (Plans)

team's recommendations were not brought together in a single, coherent document. Today, according to the National Cancer Institute, there are 15.5 million cancer survivors—almost 5% of the US population—and a burgeoning number of treatment modalities.

In 2006, the U.S. Institute of Medicine recommended that physicians provide every cancer patient with an individualized Survivorship Care Plan. The American College of Surgeons' Commission on Cancer required that caregivers begin making progress toward providing patients with plans in 2015 and provide them to all patients by 2019.

Through meetings with colleagues, Zerillo quickly learned that "Issues one, two and three were 'we need to time to do this.' My worry was how to help physicians and nurses in the clinic actually do the plan."

### Tumor Registry to the Rescue

The solution—implemented with the aid of a donor gift—was for the BIDMC Tumor Registry to identify the timeframes and draft the plans. The Registry then sends the plan to physicians and nurses for edits and confirmation that treatment is complete. The plan is presented to the patient by the first member of the care

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*"Completion of treatment can be an anxiety-producing time for people. When the treatment and activity is over, their appointments are spaced out and they feel nothing is being done to treat their cancer anymore. Survivorship plans are reassuring. My patients have been thankful."* – Jessica Zerillo, MD

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team with whom she happens to have an appointment 9-12 months after her treatment ends—and the Tumor Registry follows up to make sure this happens.

Zerillo hopes the process eventually will be automated, and that someday the BIDMC Cancer Center will offer a multi-faceted survivorship program with patient-friendly evening and weekend clinics.

Right now, though, she says, "We're focusing on the document." By December 2017, about half of BIDMC patients who had concluded their cancer treatment received Survivorship Care Plans, close to the Commission's guidelines for the year.

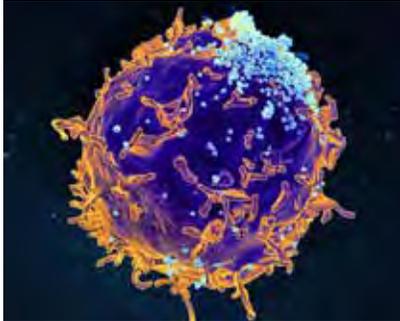
Zerillo is satisfied with this progress. "Some institutions have been cited for not doing it at all," she says. "Our work will be presented at the American Society of Clinical Oncology's Survivorship Symposium next year."



**More Info:** Dr. Jessica Zerillo at [jzerillo@bidmc.harvard.edu](mailto:jzerillo@bidmc.harvard.edu)

# Around the Cancer Center

## Avigan to Lead Myeloma Study



The Multiple Myeloma Research Foundation has awarded Dr. David Avigan a \$3 million Immunotherapy Networks of Excellence grant over two years to lead an international effort to develop immunotherapy for patients with multiple myeloma. The project will examine the use of a novel personalized cancer vaccine developed at BIDMC in combination with genetically engineered CAR T cells to induce disease regression and protection from relapse.

The grant brings together leaders of the cancer vaccine center at BIDMC (David Avigan, MD, and Jacalyn Rosenblatt, MD) with pioneers in the field of Car T cells (Michel Sadelain, MD, PhD, at Memorial Sloan Kettering Hospital and Tuna Mutis, MD, PhD, at VU University Medical Center in the Netherlands).

The grant will fund preclinical development of the combination of the dendritic cell vaccine and CAR T cells targeting the BCMA antigen and the CD38 gene. The researchers plan to develop a clinical trial in one year.

 **See also:** [bidmc.org/bloodcancers](http://bidmc.org/bloodcancers)

## A Reason to Ride Raises Research Funds

The annual A Reason to Ride event masterminded by a grateful BIDMC cancer patient on September 17 raised more than \$54,000 to support cancer research at BIDMC. The patient, Tom DesFosses, has been treated for brain cancer by BIDMC neuro-oncologist Eric T. Wong, MD. DesFosses was diagnosed 11 years ago and credits Wong with saving his life.



Helping to raise funds this year was Mary Ternullo of Plymouth, an acute myeloid leukemia patient of Malgorzata McMasters, MD, to whom DesFosses dedicated the event. Ternullo organized a family team and attended. Hematologic Malignancies staffers formed a team to support Ternullo and the event.

The North Shore bike-a-thon is organized by DesFosses, his wife Judy, and a number of friends and supporters. The presenting sponsor is Fuddruckers Restaurant.

In 2018, the event will be held on Sunday, September 9.

 **More info:** [areasontoride.com](http://areasontoride.com)

## BreastCare Center Reaccredited and Recognized

The Joseph M. and Thelma Linsey BreastCare Center at BIDMC was successfully reaccredited by the National Accreditation Program for Breast Centers (NAPBC) in the fall, following a site visit and comprehensive review. The NAPBC cited several features that contributed to the highest standard of patient care, including genetic testing and counseling, access to clinical trials, a patient-centered navigation program, and management of high-risk patients.



The NAPBC surveyor commented, "Care is provided with a great deal of thought and coordination." Another observation was, "Nurse navigators ensure proper coordination of care throughout the preoperative, intraoperative, and postoperative stages for each patient."

 **See also:** [bidmc.org/breastcare](http://bidmc.org/breastcare)

# Around the Cancer Center

## SRO Only at First Lymphedema Event



Dhruv Singal, MD

It was standing room only at the first Lymphedema Symposium at BIDMC, held in Sherman Auditorium in November. International experts in lymphedema traveled to Boston for the event, which attracted attendees from around the world who were eager to learn more about diagnosis and treatment options for lymphedema, a swelling of the extremities that can occur after cancer treatment.

Co-chairs were plastic surgeons Sumner A. Slavin, MD, and Dhruv Singhal, MD, Co-Directors of the Lymphedema Program.

“Our goal was to bring world authorities in both nonsurgical and surgical care of lymphedema under one roof,” explained Singhal, who is also Director of Lymphatic Surgery.

“The event provided a forum for physical and occupational therapists, surgeons, radiologists, breast surgeons and radiation oncologists to come together and share ideas about how best to treat this problem,” said Slavin.



**See also:** [bidmc.org/lymphedema](http://bidmc.org/lymphedema)

## Trial Aims to Improve Pancreatic Cancer Outcomes

Exocrine pancreatic insufficiency—difficulty digesting food due to a lack of enzymes—affects 68% of patients after pancreatic cancer surgery. It can lead to complications; causes weight loss, malnutrition and decreased quality of life; and is a key reason patients drop out of chemotherapy after surgery.

Surgical resection followed by adjuvant treatment (which includes chemotherapy) remains the only pancreatic cancer treatment with the potential for long-term survival and is considered the standard of care. Yet current rates of chemotherapy initiation after surgery are only about 40%, due to delayed recovery from surgery and poor tolerance related to nutritional status.

A clinical trial that will open at BIDMC in March will offer patients pancreatic enzyme replacement therapy (PERT), an experimental solution to this problem. Pancrelipase is an FDA-approved, orally administered drug for the treatment of exocrine insufficiency. The objective is to increase chemotherapy completion rates after surgery.



A. James Moser, MD

The trial, led by pancreatic surgeon A. James Moser, MD, will be a collaborative effort between the BIDMC Hematology/Oncology team and the Pancreas and Liver Institute. Patients with resectable pancreatic cancer will be offered the opportunity to receive pancreatic enzyme replacement therapy before and after surgery. Enzymes will be distributed free for a year, along with monthly nutritional status and quality of life evaluations.



**More info:** [bidmc.org/pancreascancer](http://bidmc.org/pancreascancer)

## Researchers Shed Light on BRCA-1

Using BIDMC-developed tools, researchers led by Ralph Scully, MB, BS, PhD, have made a set of discoveries that speak to the origins of breast and ovarian cancer in women who carry a mutation in the BRCA1 gene. Scully, a scientist in the Division of Hematology/Oncology and Cancer Research Institute, identified the mechanism underlying a genetic abnormality associated with BRCA1-linked cancer—a signature rearrangement of chromosomes—as well as the additional genes that normally suppress these important cancer-driving chromosomal rearrangements.

The findings advance our understanding of how BRCA1-linked cancers develop and also reveal new targets for therapy in BRCA1-linked breast and ovarian cancer. The work suggests that the signature chromosomal arrangement associated with BRCA1 mutant cancers might be useful as a biomarker for cancer diagnosis and cancer therapy. The findings were reported in the journal *Nature*.



**More info:** [nature.com/articles/nature24477](http://nature.com/articles/nature24477)

# 10th Annual Symposium Explores Cancer Research Themes



Symposium speakers and moderators included, left to right: David Avigan, MD, BIDMC; Jacalyn Rosenblatt, MD, BIDMC; Johanna Joyce, MD, University of Lausanne; Cheryl Marks, PhD, National Cancer Institute; Norman E. Sharpless, MD, NCI; Pier Paolo Pandolfi, MD, PhD, BIDMC; Joseph Schlessinger, PhD, Yale University; Charles Swanton, MD, PhD, University College, London; Gordon J. Freeman, PhD, Dana-Farber Cancer Institute; Senthil Muthuswamy, PhD, BIDMC. Missing: Kenneth C. Anderson, MD, DFCI; Laurie Glimcher, PhD, DFCI; Manuel Hidalgo, MD, PhD, BIDMC; Michel Sadelain, MD, PhD, Memorial Sloan Kettering Cancer Center; Alex Toker, PhD, BIDMC.

At the tenth annual BIDMC Cancer Symposium on November 8, the focus was on the future. Even as more than 400 scientists came together to acknowledge the progress researchers have made against cancer, the event titled “Standard of Cure” was dedicated to new themes in cancer research that have emerged only recently: genomics, immunotherapies and the cancer microenvironment.

“We celebrate the milestones and achievements we’ve made toward cancer eradication,” said Cancer Center Director, Pier Paolo Pandolfi, MD, PhD, in his opening remarks as the day of 10 lectures from prominent cancer scientists got underway. “And, importantly, we will celebrate our collective efforts toward a ‘standard of cure,’ which is the mantra of our cancer center.”

In a video message from Washington DC, Massachusetts Senator Elizabeth Warren pledged to secure an additional

\$5 billion annual funding for the National Institutes of Health (NIH).

“Years of cuts to NIH have had real consequences, not only for scientists, but for patients who rely on cures,” she said. “Your work is extraordinary and I am proud to support you in all your efforts.”



Key note speaker Norman E. “Ned” Sharpless, MD, who had been sworn in just three weeks earlier on October 17 as Director of the National Cancer Institute (NCI), gave an overview of what he has learned about the federal research organization since his appointment by President Donald J. Trump.

Sharpless described several “good problems to have” faced by not just the NCI, but also by the field of cancer research in general. For one, with so many new drugs and new therapeutic targets to test, the number of clinical trials currently far exceeds the number of patients willing and

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# 10th Annual Symposium Explores Cancer Research Themes

able to enroll. The NCI's MATCH trial, which has currently accrued more than 6,000 patients at 1,100 sites nationwide, provides one way to address that problem and improve upon the 3 percent of Americans with access to clinical trials today, said Sharpless.

In a Q&A session after his speech, Sharpless and Pandolfi discussed topics ranging from how to keep more women scientists working in the field to how the NCI reviews funding proposals. In response to a question about sequencing the human genome, Sharpless emphasized the need to foster better collaboration between clinicians and research scientists to develop a more robust physician-scientist work force.

"I'm a believer that we need to do more sequencing," said Sharpless, a physician-scientist himself, referring to the genetic data that came out of the human genome project. "But those data sets without clinical data are not nearly as useful as they could be. When a paper comes out, sometimes I see the faces of my patients who could have benefited from that data. How to get that data out in way we can use it is a critical challenge for our time."



Above, National Cancer Institute Director Ned Sharpless, MD; below, the crowd listens to a lecture



# Awards Recognize Importance of Women in Cancer Research



Johanna Joyce, PhD

The 10th annual Cancer Symposium witnessed an important first. In a heartfelt portion of the program, BIDMC Cancer Center Director Pier Paolo Pandolfi, MD, PhD, presented the first Pandolfi Award for Women in Cancer Research to a former colleague, Johanna Joyce, PhD.

Joyce, a professor of oncology at the Swiss Cancer Center Lausanne at the University of Lausanne in Switzerland, studies the tumor microenvironment. She is currently focusing on the non-malignant cells present there as targets for treatment that may be less prone to becoming resistant. Joyce and Pandolfi were formerly colleagues at Memorial Sloan Kettering Cancer Center.

"This is an incredible and unexpected honor for many reasons," she said, accepting the award. "To be the first recipient of any award is touching, but this is specifically so because it's in Dr. Pandolfi's name, and I benefited from his insights as a mentor when I started my career."

In introducing the new award, Pandolfi said he wanted to honor all women's talent, hard work and remarkable

achievements in cancer research. He also dedicated the creation of this award series to many women who inspired him and played an integral role in his work and his personal life. "There are key women who helped make me who I am," he said.

Joyce was introduced by two prestigious women in the field of cancer research: Margaret Foti, PhD, MD (hc), chief executive officer and president of the American Association for Cancer Research, and Cheryl Marks, PhD, who will be retiring soon as Associate Director of the Division of Cancer Biology at the National Cancer Institute (NCI).

"We at the NCI think Dr. Joyce's lab is pursuing one of the most important, underfunded areas of cancer research," said Marks in her introduction. "She aims to collect information about every type of cell in breast cancer and use this catalog to develop a three-dimensional version of breast tumors—a Google Earth, if you will, of breast cancer—yielding insights we've not yet had from 2D constructions."

Before Marks took the stage to introduce Joyce, Pandolfi took a moment to honor Marks as well, presenting her with a pewter bowl.

"She has paved the way not only for women in cancer, but for all of us," he said, noting her position managing the NCI Oncology Models Forum, which seeks to improve the reliability of preclinical mammalian models. "She is one of the influential women in my life."



Cheryl Marks, PhD, and Pier Paolo Pandolfi, MD, PhD

## PEOPLE

# Reflections on a Life of Discovery

## Hal Dvorak Looks Back and Looks Forward



Harold F. Dvorak, MD

*Harold F. Dvorak, MD, retired December 30 after a distinguished career at BIDMC as a translational researcher, Chief of Pathology and Mallinckrodt Professor of Pathology Emeritus. He arrived at BIDMC in 1979. His discovery in the early 1980s of the protein Vascular Epithelial Growth Factor, or VEGF, and his insight that “cancer is a wound that does not heal,” opened new frontiers in the treatment of cancer and other diseases. At his office in the Center for Vascular Biology Research (CVBR), where he closed his laboratory in July, he shared thoughts about his career with FYI.*

**Your discovery of VEGF—a protein that promotes blood vessel growth in tumors—led to novel angiogenesis blocking therapies for cancer, macular degeneration, diabetic retinopathy, rheumatoid arthritis and pre-eclampsia. On which disease did your work have the most impact?**

I wish I could say cancer. But in terms of patient care, it certainly has been macular degeneration. People actually can see better now following treatment. Previously, no drug had allowed that to happen.

But anti-VEGF therapy works in cancer, too, in some

patients. The thing there is that it works remarkably well in some patients and it doesn't work at all in others. Some patients improve dramatically but others do not. This is clearly because of differences in individual patients that we don't understand.

Still, anti-VEGF therapy for cancer has made a lot of money for Genentech.

### **Did it make a lot of money for you?**

It made no money for me. (Laughs.) Our work was originally supported by the Monsanto Company. They gave us grants, and we had a patent that was issued in 1982. In those days, academics were not seeking patents but Monsanto insisted that Harvard get one. So Harvard applied for a patent. Donald Senger and I owned the patent, but Monsanto was given exclusive licensing rights which made our ownership essentially worthless. Then Monsanto decided to get out of health care and, as I later learned, sold the licensing rights to Genentech for a half million bucks, which was a lot of money in those days. And that's the end of the story.

### **Do you feel any anger about that?**

Not very much. I laugh at it – it's funny. I guess if I were destitute, I'd feel otherwise. But I'm not sure what I'd do with a lot more money. Perhaps I'd give it to support BIDMC research.

The patenting situation has changed a lot and it's a good thing. There should be a much closer relationship between academics and companies. If you're going to develop drugs, which are needed, you can't be a snooty academic who has no chance in the world of developing a drug by yourself. You have to put it in the hands of people who are able to do that.

### **To what degree have VEGF and angiogenesis fulfilled your vision for them?**

I got into the field by accident, so I didn't have much of a vision. Today there are about 20 drugs at various stages

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that are targeting VEGF one way or another, produced by a lot of competing companies.

The field of angiogenesis for cancer is something that cycles. It becomes hot and then it reaches a barrier and becomes cold again. That's where things are at the moment.

### Why doesn't it work better?

It doesn't for several reasons, but one is that the types of blood vessels that are present in humans are highly heterogeneous. They are of at least six different types. Current angiogenic therapies against VEGF essentially target only one of these vessel types. The particular sensitive vessel type predominates in rapidly growing mouse tumors where all the pre-clinical work is done, but in humans, when the cancer has been around for months or years before it's discovered, most of those vessels have matured into vessel types that are no longer sensitive to anti-VEGF therapy.

### How has vascular targeting impacted cancer treatment?

It's had only a modest effect thus far. One needs first of all to identify the patients that are helped. Many people have looked for biomarkers, but so far it's just been a dead end. One would like to find targets that are highly expressed on all tumor blood vessels. If you're only targeting a small percentage of blood vessels with cancer you're not going to be very effective.

### On which types of cancer has anti-VEGF therapy had the most impact?

Colon cancer, stomach cancer, renal cancer and to some extent glioblastoma multiforme. Presumably its effectiveness reflects the number of sensitive blood vessel types present in each of those cancers.

We've founded a small biotech company that is exploring this—Angiex in Cambridge—which is based on a patent held by BIDMC. Now for the first time I'm making money on a patent because the hospital licensed the patent to our company, and the company has to pay royalties, which are split between the hospital and the company founders,

of which I am one. However, it's not a great deal of money. The unfortunate part is that because of patent issues, we've had to spend a year replicating the data to reprove what we'd already proven. But that isn't entirely bad because we were able to reprove it.

The target Angiex is studying is expressed in tumor cells as well as in tumor blood vessels and that is why we think it will be more successful. It certainly is effective in mice, but you never know when you get to human beings and that's a couple of years away.

### When VEGF hit a barrier, was that the end, or do you feel there are more discoveries to be made?

VEGF is a very exciting molecule. There are thousands of papers on it. Because it's involved in development, if you don't express the gene you don't get beyond an early stage of embryonic growth. It's an essential gene with

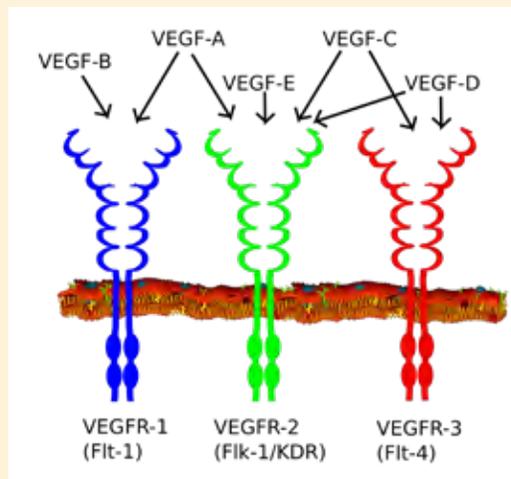
important roles in many fields like wound healing and inflammatory diseases. Certainly there are more factors besides VEGF, which is necessary but not sufficient for development. There's tremendous potential, absolutely. There's a great deal more to be learned.

For angiogenesis in general, if you kill the blood vessels that supply the tumor, the tumor is going to die. There is no question about that, but anti-VEGF therapy is not able to kill all the blood vessels. My own bias is that we're going to have to find other vascular targets and maybe

combine them with anti-VEGF.

### How can you stand leaving this exciting research?

(Laughs.) I'm 80 years old. I'm a bit tired physically and mentally. I've got other things to do with my life—piles of reading I want to do, three kids and three grandkids I want to spend time with who are scattered around the country. There are places I want to go. My wife who has been my partner in research all these years would like me to quit and do other things. And I'm not really getting out of it. Angiex's animal studies are actually done here in this hospital. Also, I still have some papers to write and so I am grateful to keep an office at CVBR.



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## Reflections on a Life of Discovery

### Where is cancer research headed?

Immunotherapy has cycled, since the 1900s. It's very hot at the moment. There are some very dramatic cures, in melanoma, for example. They don't last forever but they extend life without too many side effects and so are quite impressive. The question is why don't they last longer, and with a response rate of 20% or so in many cancers, why don't the majority of patients respond? So you end up in a similar place as with anti-angiogenesis.

The pharma companies are like lemmings. They switch fields on a dime, all going in one direction. Ten years ago it was all angiogenesis. Now it's all immunotherapy. That will die down at some point, too. Surgery and chemotherapy are still the backbones. Except for renal cancer, chemotherapy always accompanies anti-angiogenesis therapy and immunotherapy as well. I hope the immunotherapy cycle continues for a while. There are more discoveries that need to be made.

**You've been recognized for both your collegiality and your scientific achievements, but there are some who feel you have not been sufficiently recognized for the latter. How do you feel about that?**

I'm happy. I'm content. No regrets. I did not go into research for money or recognition.

## PEOPLE

# Pandolfi Receives Honors

## Inducted into AAAS and Primi Dieci Society



Pier Paolo Pandolfi, MD, PhD

Pier Paolo Pandolfi, MD, PhD, Director of the Cancer Center and Cancer Research Institute at BIDMC, recently received two prestigious awards recognizing his contributions to cancer research.

In late November, Pandolfi was named a Fellow of the American

Association for the Advancement of Science (AAAS). Election as an AAAS Fellow is an honor bestowed upon AAAS members by their peers on the basis of their scientifically or socially distinguished efforts to advance science. He was recognized Feb. 17 at a special ceremony during the AAAS Annual Meeting in Austin, TX.

In addition, the PrimiDieci Society has named Pandolfi "one of the 10 most successful Italians in the United States today." He will be honored March 15 along with the other recipients at the Cipriani Wall Street restaurant in New York City.

Pandolfi was elected as an AAAS Fellow in the Section on Medical Science for his "seminal contributions to the elucidation of the molecular genetics and biology of human cancer, which also led to the cure of Acute Promyelocytic Leukemia (APL)."

The PrimiDieci Society recognized Pandolfi for "his outstanding career as an internationally distinguished geneticist and molecular biologist ... his research work in numerous fields, particularly committed to clarifying the molecular mechanisms and genetics underlying the pathogenesis of cancers such as leukemias, lymphomas and solid tumors" and "being a true example of Italian Excellence, brilliantly blending professional qualities with a widely estimated personality."

The society's purpose is to inspire young people by honoring Italians who distinguish themselves through outstanding career achievements. Past recipients include actor-producer Sylvester Stallone, Formula 1 world champion Mario Andretti and former New York Police Department detective Frank Serpico.

**More Info:** [pandolfilab.org](http://pandolfilab.org)



# CCTO Receives New Leadership



Daniel Costa, MD, and Stephanie Wasserman, MS

The Cancer Clinical Trials Office received new leadership in the fall with the appointment of Daniel Costa, MD, as Medical Director and Stephanie Wasserman as Director.

Wasserman previously served as a Research Administrative Director at BIDMC, a position in which she was responsible for planning, development, and implementation of all pre- and post-award activities.

In this position, she led and managed the research administrator staff, overseeing hiring, training, supervising, and mentoring and forming strong working relationships with many cancer researchers.

In previous positions, she worked in research administration at Harvard Medical School, Eastern Cooperative Oncology Group and Massachusetts General Hospital. She earned a master's degree in Healthcare Administration from Simmons College.

Costa was named permanent Medical Director after serving in that position on an interim basis. He will provide overall guidance and strategic vision for the Cancer Clinical Trials Program. The Medical Director role has been expanded to reflect the Cancer Center's growing portfolio of clinical trials and the strategic importance of research in its mission.

An Associate Professor of Medicine at Harvard Medical School and a thoracic medical oncologist at BIDMC, Costa holds a number of leadership positions in research and clinical programs and has run clinical trials at BIDMC since 2007. His investigative work focuses on characterizing the mechanisms of sensitivity and resistance to tyrosine kinase inhibitors in lung cancers with oncogenic mutations or rearrangements.

Together, Costa and Wasserman will provide overall accountability for the supervision, recruitment, development and retention of personnel in the CCTO.

## Toker and Muthuswamy Named to Research Leadership Posts



Alex Toker, PhD

Alex Toker, PhD, has been named Deputy Director, International Affairs, for the Cancer Research Institute and Senthil Muthuswamy, PhD, has been named Deputy Director, Translational Research.

In his new role, Toker, who is also Director of the CRI's Signal Transduction Program, is now responsible for identifying, developing and implementing new international academic alliances. He provides leadership, strategy development, oversight and advocacy for these partnerships and for the CRI's relationships with individual international faculty, trainees and visiting scholars. He is also a resource providing advice on labor regulations and grant application procedures across international boundaries.



Senthil Muthuswamy, PhD

Muthuswamy, who is also Director of the CRI's Cell Biology Program, is now responsible for forming strategic partnerships and providing leadership to catalyze

translational research initiatives across the Cancer Center. He works with physician and scientific leadership at the CRI and the Leon V. and Marilyn L. Rosenberg Clinical Cancer Center to foster organ-specific, translational research efforts. In addition, he provides oversight and helps facilitate the integration of ongoing initiatives.

## PEOPLE



Leo Tsai, MD, PhD, MSc

### Tsai Named Director of Oncologic Imaging

Leo L. Tsai, MD, PhD, MSc, has been named director of the new Division of Oncologic Imaging in the Department of Radiology. In this role, he will serve as department's liaison on the Cancer Center Oversight Committee. Over time, his role will expand to include coordinating and standardizing reporting (tumor staging and metrics), teaching cancer imaging programs and overseeing multidisciplinary meetings across divisions and service lines.

Jonathan B. Kruskal, MD, PhD, Chief of Radiology, said the purpose of the new division is to "harmonize our growing oncological imaging services with BIDMC's Cancer Center."

Tsai joined the BIDMC medical staff in 2014 after completing his diagnostic radiology residency and Body Magnetic resonance imaging (MRI) fellowship here. His clinical interests include the imaging of gastrointestinal and genitourinary malignancies and MRI of lymphedema. Tsai's laboratory focuses on the use of 13C MRI to study metabolic changes in liver and renal cell cancer models in response to targeted therapies.

### Hutchinson Named Nursing Director

Rachel Hutchinson, RN, MHA, began work in November as the new Senior Nursing Director of Hematology, Oncology, Infusion and Apheresis. In this job, she oversees the clinical operations of these ambulatory clinics located on Shapiro 7, 9, Gryzmish 5 and 7.

Hutchinson began her nursing career at BIDMC in 1997. She received a bachelor's degree in nursing and a master's degree in health care administration and is currently pursuing a doctorate of nursing practice degree, all at Simmons College.

Hutchinson has nine years of direct patient care experience and 12 years of nursing leadership experience. Her most recent role was Nursing Director of Inpatient Surgery on Stoneman 5. She has also worked in Labor and Delivery, Nursing Administration and the Internal Medicine Unit.



Rachel Hutchinson, RN, MHA



Hester Hill Schnipper, LICSW, OSW-C

### Schnipper Receives Berman Award

The Cancer Center's manager of oncology social work, Hester Hill Schnipper, LICSW, OSW-C, has been awarded The Harriet K. Berman Award by Facing Cancer Together for her breakthrough work in her field. The award recognizes outstanding individuals who lead and inspire others towards compassionate understanding of the experiences of people with cancer and their family members.

Schnipper has been a pioneering force in oncology social work. She joined Beth Israel Hospital in 1979 when the Division of Hematology/Oncology had existed only five years and oncology social work was a new concept. Today she leads a team of 11 oncology social workers, community resource specialists and navigators. A nationally known speaker, Schnipper has written numerous articles for professional journals, authored two books for breast cancer patients and survivors and taught at the Simmons College and Boston University social work schools.

# Signature Healthcare Opens Greene Cancer Center



Medical Director Rolf Freter, MD, first row far right, and staff celebrate the opening of the center.

In October, Signature Healthcare, an affiliate of Beth Israel Deaconess Medical Center, opened a new cancer center in Brockton where patients can find treatment from expert clinicians, the latest technology and the full range of resources under one roof.

The 37,000-square-foot, \$24 million cancer center offers the only linear accelerator in the Signature service area. A linear accelerator is most commonly used to treat cancer with external beam radiation. The Signature service area, located in Southeastern Massachusetts, includes Abington, Bridgewater, Brockton, Hanson, Easton, East Bridgewater, Randolph and Raynham.

During a Grand Opening Celebration on October 4, Signature Healthcare announced the facility would be named the John, Steven and Caryl Greene Cancer Center after W.B. Mason's Executive Vice President, Chairman and his wife, respectively. W.B. Mason, headquartered in Brockton and the largest privately held office products dealer in the United States, was founded in 1898, just two years after Brockton Hospital. The family-owned company has more than 60 distribution centers across the country.

The Greene Cancer Center offers radiation oncology, medical oncology and hematology, chemotherapy,

national clinical trials, patient navigation and social support services like nutrition and financial counseling. Personalized medicine, new groundbreaking immunotherapies and targeted therapies are also available at the Greene Cancer Center, assuring patients that the most up to date advances are easily available.

At the Greene Cancer Center, most cancer services are offered conveniently at 25 Libby Street in Brockton, a new, two-story facility with a glass facade. Patients who need advanced treatment options or specialized expertise can access the BIDMC Cancer Center in Boston.

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Exterior view

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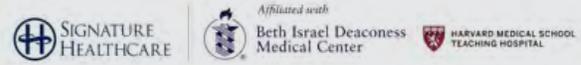
“Our affiliation with Beth Israel Deaconess Medical Center and Harvard Medical Faculty Physicians insures our patients will receive the very best in cancer care, close to home,” said Kim Hollon, President and Chief Executive Officer of Signature Healthcare, at the opening. “We are bringing Boston to Brockton through the latest technologies, treatments and most of all, a highly educated and caring staff.”

Hollon added, “Patients and visitors can expect the highest level of care without having to travel into Boston. Our continued partnership brings quality, safe care to the community and we look forward to many years of growth and excellence with this affiliation. In addition, the affiliation provides a robust program of community outreach and patient access to the latest advances in cancer care.”

The clinical affiliation between BIDMC and Signature Healthcare began in 2013. The cancer collaboration was formalized in 2016 under the leadership of Marc Garnick, MD, Director of Community Cancer Services at BIDMC and Rolf Freter, MD, who the same year joined Signature Healthcare Brockton Hospital as Chief of Medical Oncology and Hematology.

The Greene Cancer Center is an integral part of Signature Healthcare, a multi-specialty, non-profit hospital and physician group comprised of Signature Healthcare Brockton Hospital and Signature Medical Group, which is made up of more than 150 physicians practicing in 18 locations.

## THE GREENE CANCER CENTER



Entry area



Infusion bay



Physicist Edwin Lok and the linear accelerator

# Cancer Center Researchers Mentor High School Students



2017 mentors and students were, left to right: Frank Slack, PhD; Korsuk Sirinukunwattana, PhD; Adithya Vellal, a student from Massachusetts; Katherine Tian, California; Jimmy Lin, California; Rinni Bhansali, New York; Jan Heng, PhD; Jerry Han, Massachusetts; research associates Michael Pyle and Lisa Walker; and Leni Jacob, PhD.

Sixteen-year old Jerry Han doesn't seem nervous as he stands at the end of the conference room table. The math tutor, student science magazine editor, swim team member and tennis star has poise to spare—even when presenting his research project about the role of non-coding RNA in cancer to noted BIDMC Cancer Center researcher Frank Slack, PhD, Director of the Harvard Initiative for RNA Medicine for RNA Medicine.

Last summer Han, who attends Boston Latin School two blocks from BIDMC, was one of five high-achieving high school students who conducted biomedical research at the BIDMC Cancer Center alongside graduate and medical students and researchers. The program gives high school students an early, realistic glimpse of life in a research laboratory.

The BIDMC High School Summer Research Program, run by breast cancer researcher Jan Heng, PhD, Assistant Professor of Pathology and associate member of the Cancer Research Institute at BIDMC, allows students to

design and execute sophisticated research projects, often cancer-related. Heng has seen to it that they also learn less lofty but equally important practical skills. These range from using sterile techniques at the bench to comfort behind the lectern when presenting one's ideas to one's peers.

## Presentation Practice

That is why Han and his fellow interns each presented a total of three times: in early summer to introduce themselves, in midsummer to describe their projects and at summer's end to report their results.

"You've taken on more than a lot of first-year PhD students," says Heng when Han finishes his midsummer talk. "Don't stress out if you can't get it all done in six weeks," she adds, before providing feedback about his methodology and data sources.

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## Cancer Center Researchers Mentor High School Students

"She was joking, but only a little," says Leni Jacob, PhD, Han's mentor. "Our original plan for his project was probably too much. We did scale that back."

The program began six years ago when Andrew Jin, a student from San Jose, California, emailed Andy Beck, MD, PhD (who has since departed BIDMC), out of the blue and asked if he would help him do a summer research project. Beck, an expert in bioinformatics, agreed.

### Success

After Beck mentored Jin long-distance, Jin went on to win tens of thousands of dollars in scholarship money in the prestigious Regeneron Science Talent Search competition and the Siemens Competition in Math, Science and Technology.

"All of the sudden, Andy became famous in Andrew's school," says Heng. "Then by 2015, we had a little explosion."

Each successive year, with no outreach, more students from San Jose and then across the country began seeking summer mentorships with Beck. Heng has received six applications for the four available spots in the summer 2018 program. Two students from previous summers hope to return.

After Beck left BIDMC,, Heng took over. With help from a grateful parent who provided five years' worth of funding, she worked with Slack to establish an official application process and a formal structure. The program offers experiences in both wet- and dry-laboratory techniques including computational biology, medical imaging and artificial intelligence.

"This inter-disciplinary approach is what really sets this program apart, and, wow, what a great group of high school students we attract," says Slack. "Each is smart, motivated, creative and hard-working."



**More info:**

Jan Heng, PhD, at [yheng@bidmc.harvard.edu](mailto:yheng@bidmc.harvard.edu)



## RNAMEDICINE2018

4th Annual Non-coding RNA Symposium sponsored by the HMS Initiative for RNA Medicine and the Cancer Center at Beth Israel Deaconess Medical Center

**April 26, 2018, 8 am – 6 pm**

Joseph B. Martin Conference Center  
Harvard Medical School

**Speakers:**

David E. Avigan, MD  
BIDMC, Harvard Medical School

Dan Peer, PhD  
Tel Aviv University

Thomas R. Cech, PhD  
University of Colorado Boulder

Julia Salzman, PhD  
Stanford University

Elaine Fuchs, PhD  
The Rockefeller University

Erwei Song, MD, PhD  
Sun Yat-Sen University

Paula T. Hammond, PhD  
Massachusetts Institute of Technology

Thomas Steitz, PhD  
Yale University

X. Shirley Liu, PhD  
Dana-Farber Cancer Institute  
Harvard T.H. Chan School of Public Health

Phillip D. Zamore, PhD  
UMass Medical School

Lihan Zhou, PhD  
MIRXES

Carl Novina, MD, PhD  
Dana-Farber Cancer Institute  
Harvard Medical School

**Organizers:**

Frank Slack, PhD, and Pier Paolo Pandolfi, MD, PhD  
Cancer Center at Beth Israel Deaconess Medical Center



**INITIATIVE FOR  
RNA MEDICINE**  
HARVARD MEDICAL SCHOOL

[www.bidmc.org/rnamedicine2018](http://www.bidmc.org/rnamedicine2018)

## SUPPORT SERVICES

# The Most Unretired Man in Massachusetts

## Support Group Founder Tirelessly Helps Men with Prostate Cancer

In 1993, When Stanley Klein of Somerville retired from his engineering job after 31 years at Raytheon Corporation, he wondered what he would do in retirement. Then he was diagnosed with prostate cancer -- and the rest is history.

"I had advanced prostate cancer but it had not metastasized," said Klein, who is now 90. "Fortunately, 24 years later, I'm still here. I have side effects, yes, but I'm still kicking."

In the course of his treatment during what he called the "barbecue" days of now-refined radiation protocols, Klein learned a lot about prostate cancer. He then went to work devoting more than two decades to helping others learn about the disease, choose treatments and deal with the side effects.

He does this as the leader, organizer and inspiration of the Boston Prostate Cancer Support Group, a non-profit community of men and women helping other men and women cope with the disease.

Meetings are held the first Monday of each month in the Farr complex on BIDMC's West Campus. The main meeting with a speaker and Q&A session is held in Deaconess 312-315 from 7-8 pm. (Speaker topics are posted on the group's web site at [bostonpcsupportgroup.com](http://bostonpcsupportgroup.com)). From 6-7 pm, sub-groups meet for focused discussions of side effects, feelings, metastatic cancer, women's concerns and active surveillance.

In addition, Klein founded the Boston Prostate Cancer Walk, which from 2001 through 2012 raised \$3.5 million that went to 12 Boston research hospitals and institutions.

## Declarations of Independence

The organization is a rare cancer support group that is independent and open to all. Klein estimates that 3,400 people treated at many different institutions have come through in the past 24 years. The group's independence burns brightly in its programs featuring speakers with varied affiliations and opinions, in its support for the active surveillance approach to treatment and in its

irreverent, sometimes hard-nosed advice. See, for example, the Klein-authored Golden Rules accompanying this story.

When Klein was treated, he had surgery as well as radiation. "My surgery did not go too well," he recalled. "It was before robotics. The surgery was 11 hours and I was in the hospital 11 days. They couldn't stop the incontinence. I'm still incontinent. I could have had surgical revision but my wife didn't want me to. You learn to cope with your problems."

Klein was treated at New England Deaconess Hospital. One of the surgeons there was just starting Boston's only prostate cancer support group.

Klein got involved and soon reached out to invite seven other institutions to be co-sponsors, including Dana-Farber Cancer Institute and Massachusetts General Hospital. BIDMC, as the successor to New England Deaconess, still provides meeting facilities and a medical advisor, currently genitourinary medical oncologist Glenn Bubley, MD. In addition, Frank McCaffrey, LICSW, a BIDMC oncology social worker, facilitates the advanced prostate cancer subgroup.

"Stan has the energy and drive of a new, 26-year-old intern," said Bubley. "He never seems to tire and has been relentless in his mission to help not only patients, but also family members. As I said about him when he



Stan Klein prepares for a support group meeting at BIDMC

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## The Most Unretired Man in Massachusetts

was honored for lifetime achievement from the Massachusetts Prostate Cancer Coalition, Stan has found the secret of life. He took something that was bad in his life and turned it into a lifetime mission of helping anyone afflicted with prostate cancer.”

### The Golden Rules From the Boston Prostate Cancer Support Group's Web Site

1. If you have been diagnosed with Prostate Cancer, NEVER have any treatment until you visit with the three prostate cancer specialists, one at a time. They are the Urologist (Surgeon), Radiation Oncologist, and Medical Oncologist. The latter does research, and sees patients.

2. Never forget Rule 1

3. One of the best sources of how good a doctor is, are his patients. Ignore how great or experienced he says he is.

4. Silence is your enemy. Tell every male you know about your cancer. Silence enables self serving doctors to continue to mistreat, or needlessly treat men.

5. If you need treatment, know that there are treatments to overcome most side effects, so you can be dry and a better lover than before.

The penalty for omitting these rules, may be years, or a lifetime, of terrible side effects.

McCaffrey is also impressed. “Stan’s passion and commitment to this work has been remarkable,” he said. “He has provided one of the single greatest resources in the Boston area for men diagnosed with prostate cancer. These monthly groups and presentations provide not just medical information but also guidance on how one goes about living with prostate cancer. There is support for loved ones. There is fellowship and camaraderie. There is hope.”

### Active surveillance

One of the group’s goals is to make sure men know they may have the option of active surveillance. In this approach, those with early or indolent (slow-growing) prostate cancer are monitored carefully so that surgery or radiation can be postponed until it is truly necessary. Active surveillance allows many men to safely avoid or put off treatments and their potential side effects of incontinence and impotence.

The trend toward active surveillance, which was just getting going 20 years ago, would not have been relevant in Klein’s own situation. Nonetheless, he has become a force in getting out the word about this option to new generations. It all goes back to his original thinking, when he contemplated what to do in retirement.

“I thought, gee whiz,” he recalled. “Maybe I could help some poor people like me.”

**More info:** [bostonpcsupportgroup.com](http://bostonpcsupportgroup.com)

Cancer Center



Beth Israel Deaconess  
Medical Center



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### For Your Information

News and information about the Cancer Center at BIDMC and its affiliates for referring physicians, researchers, colleagues, patients, employees, donors and other members of the BIDMC Cancer Center Community

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Cancer Center at Beth Israel Deaconess  
Medical Center  
330 Brookline Avenue  
Boston, MA 02215  
617-667-1900  
[bidmc.org/cancercenter](http://bidmc.org/cancercenter)

## DEVELOPMENTS

# Donor Backs Avigan and GMP Facility

**R**andi Schwartz is an athlete for whom the challenge of competing in marathons, triathlons and other endurance events—not to mention caring for three teenage daughters—is a way of life. So in 2016, when two weeks after a race, the 48-year-old had flu-like symptoms and kept relapsing, she thought she was “bonking.”

In the language of athletes, this means hitting the wall—experiencing a sudden, dramatic loss of energy.

The condition lingered on. Was it aging? Hormones? An iron deficiency? Finally, Schwartz went to an emergency room near her home in Florida. Tests disclosed dehydration, anemia, kidney failure and ultimately the aggressive blood cancer known as multiple myeloma.

Thus began a quest for life-saving medical care in which Schwartz sought opinions at a famous New York hospital and at BIDMC. Through a friend whose brother is a BIDMC radiation oncologist, she heard about the Cancer Center at BIDMC and physician-researcher David Avigan, MD, Director of the Hematologic Malignancies Program.

## Search for Care

“While all my test results were still unfolding, David and [nurse practitioner] Amy Corrao spent a ton of time with me,” Schwartz recalls. “They had a very caring, supportive way about them and an incredible bedside manner, coupled with really thoughtful, careful consideration of my particular symptoms. They wanted all the information in hand. They were very meticulous. It’s unusual to have that pairing of the gentleness with the medical prowess and intellectual ability.”

Schwartz chose to be treated at the BIDMC Cancer Center. Avigan prescribed induction chemotherapy to put her cancer in remission. Next came a summer in Boston, where she received an autologous (using her own cells) stem-cell transplant on Feldberg 7.

Fast forward to December 2017: Schwartz is in remission, again participating in endurance athletic events—and flies to Boston to be honored at the dedication of BIDMC’s new “Randi and Brian Schwartz Family Cancer Immunotherapy and Cell Manipulation Facility.” The name recognizes a generous gift made by Schwartz and her husband to support Avigan’s clinical research.



Randi Schwartz and David Avigan, MD, at the dedication

## Investment in the Future

The GMP on Dana 9 is a state-of-the-art facility for manufacturing cancer vaccines, a form of immunotherapy in which tumor cells are combined with dendritic cells to fight cancer. In clinical trials, this method, developed by Avigan and colleagues, has shown remarkable results in treating acute myeloid leukemia and multiple myeloma (see related story, page 1).

Although Schwartz was not treated with a cancer vaccine, Avigan’s clinical research captured her interest. “I hope to never need the vaccine, but I want to help propel science forward so there are options for everyone, including myself, should I ever need them,” she says. “We need to identify the thought leaders in the medical profession and back them.”



**Giving info:** Kim O’Loughlin at [kim.oloughlin@bidmc.harvard.edu](mailto:kim.oloughlin@bidmc.harvard.edu) or 617-667-7327

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# New Laboratory Facilitates Promising Cancer Vaccine Manufacture



Cells are processed in a centrifuge in the previous facility

“This facility will enhance our ability to develop personalized immune-based treatments for patients and combine these efforts with many other strategies for maximum impact,” Avigan said. “In this facility, with the remarkable research and clinical work that will happen within its walls each day, we are going to accomplish incredible things.”

The facility is nearly complete and will open after final approval by the Massachusetts Department of Public Health.

Housed on Dana 9 on BIDMC’s East Campus, the 3,400-square-foot laboratory features 1,900 square feet of clean room space designed and equipped to remain contaminant-free in order to ensure the production of safe and effective therapeutic anti-cancer vaccines. Although the new space is officially the “Schwartz Family Cancer Immunotherapy and Cell Manipulation Facility,” staffers often refer to it informally as “the GMP.” Short for Good Manufacturing Practice, GMP facilities are designed with safety and sterility in mind. Architects included Good Manufacturing Practice specifications in their earliest plans for the lab; a third party vendor certifies that the lab lives up to GMP standards.

Among those GMP specifications: the clean room is divided into three tissue culture rooms, each outfitted

with biological safety cabinets and cell incubators.

The entire CICMF space is served by an environmental monitoring system and a dedicated air handling system that sits on the roof of Dana 9. Air pressure differentials ensure air always flows out of clean rooms into common areas where sterility isn’t required. The walls are free of nooks and crannies where particles can collect. Add to that a conference room, staff kitchen and lounge areas and a panoramic view of the Boston skyline.

In addition to Avigan, leadership of the facility includes Jacalyn Rosenblatt, MD, who will serve as Medical Director; Dina Stroopinsky, PhD, Scientific Director; and Lynne Uhl, Chief of Transfusional Medicine.

## Personalized Cancer Vaccines

The vaccines familiar to most people are preventative, taken prior to exposure to the microbes that can make one sick. These traditional vaccines teach the immune system to fight off illnesses like measles, mumps and influenza. Immune cells called dendritic cells are powerful educators of the immune response directing killer cells to go after pathogens. Avigan and Rosenblatt’s therapeutic vaccine works much the same way, despite being administered only after a person falls ill.

“These dendritic cells are the educators of the immune system,” said Avigan. “They are experts at starting immune responses.”

Avigan and Rosenblatt, Medical Director of the cell therapy program, have developed a patient-specific vaccine constructed from the patient’s own cancer cells fused together with dendritic cells.

“We combine the patient’s own tumor, which has all of the unique aspects of this cancer with these powerful educators to teach the immune system to see those cells not as belonging, but as foreign,” Avigan said.

The vaccine therapy program has conducted a series of clinical trials in patients with blood cancers showing that the vaccine powerfully stimulates the expansion of tumor specific killer T cells and disease regression. In one study of patients with multiple myeloma, vaccination resulted in a near doubling of the percentage of patients achieving complete remission after standard therapy with bone marrow transplantation.

As a result, BIDMC is leading a first of its kind national study under the auspices of the National Institutes of Health-sponsored oncology cooperative group (CTN) to study the effectiveness of the personalized cancer vaccine in patients with myeloma. In an open source format, investigators from 17 academic medical centers from coast to coast traveled to BIDMC immunotherapy facility and underwent specialized training regarding vaccine production. To date, the study has enrolled more than 100 patients with central monitoring of vaccine production being conducted at the BIDMC facility.

In late 2016, Cancer Center scientists published breakthrough results of another study. The reported that a personalized therapeutic cancer vaccine markedly improved outcomes for participants suffering from acute myeloid leukemia (AML), a potentially lethal blood cancer that typically affects older adults. The study demonstrated that 71% of patients treated with the vaccine remained in remission at nearly five years of follow up.

These results were in stark contrast to the historical experience in which only about 10% of patients remain in remission at three to four years of follow up. Two new trials for AML have been launched including a large multicenter trial for older patients with AML and a study of vaccination after donor bone marrow transplantation. In an exciting new area of investigation, Avigan and colleagues are collaborating with Manuel Hidalgo, MD, PhD, Director of the Rosenberg Clinical Cancer Center and Chief of Hematology/Oncology, and Senthil Muthaswamy, PhD, to develop a vaccine for pancreatic cancer using a novel approach to growing patient derived cancer cells outside the body to generate the vaccine (see story, page 3).



Lab benches at the dedication

“Immunotherapy strategies leverage the body’s own defense systems to fight cancer cells,” said Avigan. “The development of personalized vaccines requires both a scientific strategy and a manufacturing strategy, and that’s where the new facility comes in.”

The development of engineered killer T cells known as CART cells has also demonstrated a dramatic impact on patients with blood cancers with durable remissions produced in some patients with advanced disease. BIDMC has played a critical role in the clinical trials of these agents that have now started to receive FDA approval. The new facility will be used in the preparation and delivery of these T cell therapies.

Serving as a physical hub that will bring together the brightest scientific minds in cancer immunotherapy, the lab will advance the fight against cancer as researchers work to unlock the secrets of how and why cancer cells evade the immune system in the first place.



**More info:**

<https://clinicaltrials.gov/ct2/show/NCT02728102>

<https://clinicaltrials.gov/ct2/show/NCT03059485>

# BreastCare Center Offers Trials for Triple-Negative and BRCA-associated Cancer

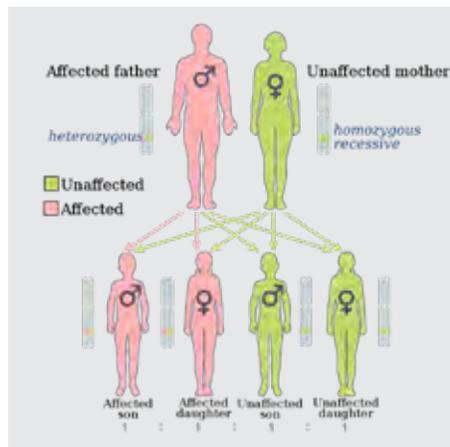
Progress in finding effective therapies for many breast cancer types has resulted in an intensifying focus on a still-challenging frontier: treatments for triple-negative breast cancer. The BreastCare Center, part of the BIDMC Cancer Center, is currently offering five clinical trials for breast cancer patients with triple-negative disease or a BRCA mutation and another three are expected to open at BIDMC very soon.

“Triple-negative is an aggressive form of breast cancer that affects 10-20% of women diagnosed with breast cancer,” according to Nadine Tung, MD, the Director of Breast Medical Oncology and Cancer Genetics at BIDMC. “It disproportionately affects women who are younger, of African American descent, and those with an inherited the BRCA1 gene mutation.”

“The standard treatment for triple negative is currently chemotherapy, including platinum agents, but the impact on survival rates is modest,” said Gerburg Wulf, MD, another BIDMC Cancer Center breast oncologist and investigator. “Some of the current trials are evaluating immune or targeted therapies. The studies are combining standard chemotherapies with immune-based therapies or combining immune-based therapies with targeted inhibitors.”

Some of the triple-negative trials currently available at BIDMC are listed below.

**BRCA+ neoadjuvant (prior to surgery) therapy patients.** A triple-negative diagnosis is permitted but not required. The target is 160 participants, seeking 50 more. National Principle Investigator (PI): Nadine Tung, MD. INFORM: A Randomized Phase II Trial of Neoadjuvant Cisplatin versus Doxorubicin/Cyclophosphamide (AC) in Women with Newly Diagnosed Breast Cancer and Germline BRCA Mutation.



BRCA mutations are inherited in a genetically dominant fashion, from either parent.

**Triple-negative adjuvant patients (after completion of surgery).** Pre-screening is required to test the tumor for HL-A2 positivity. Testing is free. The target is 20 patients, seeking one-two more. PI: Nadine Tung, MD. A Phase 1b Study of Safety and Immune Response to PVX-410 Vaccine Alone and in Combination with an Antibody Targeting the PD-1/PD-L1 Pathway in HLA-A2+ Subjects Who Have Completed Initial Standard Treatment of Stage II or III Triple-Negative Breast Cancer.

**Triple-negative + BRCA+ metastatic patients.** The trial combines immune therapy with a PARP inhibitor. Target is 90 patients, seeking 5-10 more. PI: Gerburg Wulf, MD. A Phase II Multiple-Arm, Open-Label, Randomized Study of PARP inhibition (veliparib; ABT-888) and Anti-PD-L1 Therapy (atezolizumab; MPDL3280A) either Alone or in Combination in Homologous DNA Repair (HDR) Deficient Triple-Negative Breast Cancer.

**Triple negative platinum-naive metastatic patients.** The study combines cisplatin, a standard treatment for triple-negative patients with a targeted therapy, a PI3 kinase inhibitor. Target is 60 patients, seeking 12 more. PI: Gerburg Wulf, MD. A Study of Gedatolisib (PF-05212384, PI3K/mTOR inhibitor) in Combination with Cisplatin in Patients with Triple Negative Breast Cancer in an Expansion Arm (TNBC).

**Refractory/relapsed triple-negative metastatic patients:** The study combines a standard chemotherapy Eribulin with the immunotherapy agent Pembrolizumab (Keytruda). PI: Gerburg Wulf, MD. An Open-Label, Single-Arm Multicenter Phase 1b/2 Study to Evaluate the Efficacy and Safety of Eribulin Mesylate in Combination With Pembrolizumab in Subjects With Metastatic Triple-Negative Breast Cancer (mTNBC).



**More info:** Cassandra Cruz at [ccruz@bidmc.harvard.edu](mailto:ccruz@bidmc.harvard.edu) or 617-975-7411

# An Oncologist Experiences Cancer

Do everything humanly possible to avoid infection. My biggest fear was a complication that would require hospitalization, since 70-75% of lymphoma patients do. Doctors don't always have the time to explain this to patients but it's incredibly important.

Handwashing is critical. I didn't eat any fruits or vegetables except maybe an orange because it has a skin. The bacteria count on fruits and vegetables is incredible. I didn't floss my teeth. You should make sure your dental needs are met before chemo because you can't have dental work when you are neutropenic (an infection-prone state when the white blood cell count is very low).

Patients need to be aware of the dos and don'ts of bowel movements. Constipation and diarrhea are common accompaniments of chemo. They can damage the mucosa of the lower rectum, which can cause dangerous infections. Constipation can become a real big deal, especially if you are taking certain chemotherapy drugs or pain medicines.

The patient should listen to his or her own body and not try to overdo it. Take a nap and chill out.

I discovered that the whole issue of friends having access to you is underappreciated, especially if the patient is older. Friends want to do everything—visit, cook you dinner, have you send them on an errand—but it's exhausting. It's a problem when you don't want to spend 15 minutes with your closest friends, but you need to just say "no" and reach out to them when you are ready.

Caps are very important. People on chemo are constantly cold. I made the gas company very rich. I never kept my cap off more than two minutes. It was part of my body 24/7 for six or seven months. I had a special relationship with my caps—I had 14!

## Did you gain any insight into cancer care at BIDMC?

The medical care was superlative in each and every way: surgery, outpatient treatments, diagnostic studies, chemotherapy administrations and nursing. It was simply incredible.

However, there are many other aspects of the patient experience which for me were easy since I work at the hospital, but for other patients could be better. I would love to enter a building that is completely spic and span.

I would like to have the facilitator who checks you in for an appointment smile, acknowledge that you know or recognize each another, and just make you feel at ease. I would like to have someone help me navigate the complexities of getting from one test to another. I would like to have parking close to the hospital door, especially if it is a chemo day.

We need to constantly ask ourselves: how can we enhance the experience for the patient who has this devastating disease? But still, I just can't imagine it would have been better anywhere else. I would hope I am representative of a typical patient. Whether I am or not, I can't tell you, but I had very good experiences. Through my own treatment, I discovered how critical every single person is to the patient experience.

## Is there any one insight you wish you had gained at the beginning of your career instead of 45 years later?

The issue of life-long uncertainty. If you've never had cancer, you can't understand the emotional impact a cancer diagnosis has on a patient, the uncertainty that a cancer patient lives with daily. You're exhausted and you feel that you look like death warmed over, but your feelings about your body image are temporary. The uncertainty is permanent. If I had known this 45 years ago I would have attempted to be better in helping counseling my patients about these issues.

## Tell us how you feel about being a cancer doctor today, after all your experiences as a cancer patient.

Being an oncologist is an extraordinary experience that is unmatched by any other human-to-human interaction. As someone with cancer, you've got something in your body that could kill you and you're looking to a stranger to come up with a plan to get rid of it. Patients are literally putting their lives in your hands. If I had to select my career again, I would do exactly the same thing.

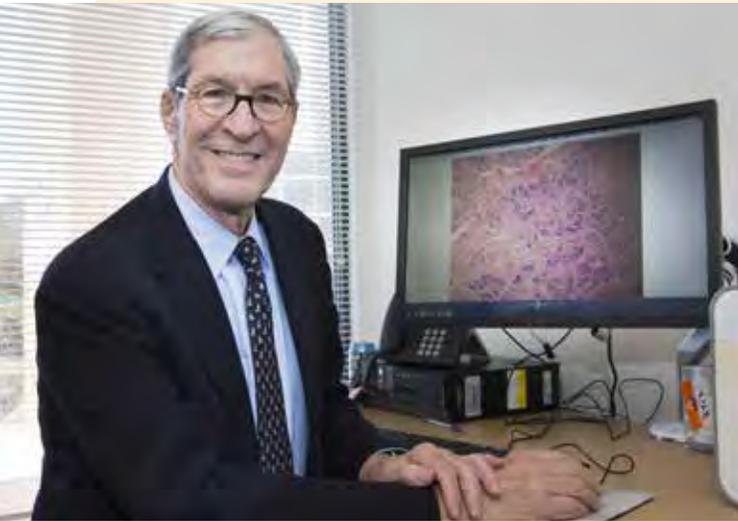


Garnick and his cap collection

## CONSULT

# An Oncologist Experiences Cancer Care at BIDMC, First-Hand

*Marc B. Garnick, MD, is a specialist in genitourinary oncology at the BIDMC Cancer Center and Gorman Brothers Clinical Professor of Medicine at Harvard Medical School. In the spring, he spoke to graduating hematology/oncology fellows about insights he gained from his recent treatment for cancer at BIDMC. He shared some of these thoughts with FYI.*



Marc B. Garnick, MD

### **Please tell us about your diagnoses and your care.**

In November 2015, I was diagnosed with stage T1, high-grade, multi-focal (with multiple tumors) non-muscle invasive bladder cancer. This is the most common form of bladder cancer, and it's aggressive. The treatment was a three-year program with two bladder operations, five evaluations and multiple installations of immunotherapy consisting of intravesical bacillus Calmette-Guerin vaccine and Interferon.

One year later, almost to the day, I was diagnosed with non-germinal center B-cell non-Hodgkin's lymphoma. The treatment was six cycles of chemo and immunotherapy with an investigational agent from November 2016 through March 2017.

Upon completion of my chemotherapy for the non-Hodgkin's lymphoma, I then, after hearing of the excellent results, had to immediately continue with my bladder cancer therapy.

### **What was it like to be a patient who is also a doctor?**

It was eye-opening. After the bladder cancer diagnosis, I didn't tell anyone and was back at work 10 days after

surgery. With the lymphoma, I suspended my medical practice but I was able to carry out all of my administrative duties at Harvard Medical School and as Director of cancer network development at BIDMC. The support I got from my colleagues was phenomenal.

A critical decision I had to make, for privacy considerations alone, was did I want to get care for each of my two cancers at Beth Israel Deaconess Medical Center? Even though my anonymity would be completely gone, I chose BIDMC, and I made the right decision.

I decided early on to be a patient, and not my own doctor. Whatever the doctor recommended, I just did. I did not second-guess my doctors even for a minute. Never. Physicians should not second-guess—but accept, even though reluctantly, the role of a patient.

I kept seeing patients during my bladder cancer treatment and it was a very interesting thing. If patients were complaining of side effects, I could empathize with them. Now, when I say to my patients "I understand," I fully understand. Before I was diagnosed I didn't understand even though I thought I did. The right thing for a doctor who hasn't had cancer to say is, "I appreciate that it must be difficult," instead of, "I understand."

### **What "dos" and don'ts" do you have for patients in the light of your experiences?**

First, there is a great deal of complexity in the medication regimens that are taken while you are home, and unfortunately, there is often not enough time for a full explanation of specific directions. This can be a place to focus on. Make sure that you know exactly what you are to take, and when and how much. I was a very knowledgeable person, but I had problems as well. So I can only imagine what other patients who are not involved in the health care system must be experiencing. I have become very involved with this area of "medication adherence" which is an important, unmet medical need that deserves more study and attention.

*Continued on page 31*