

THE JOHNS HOPKINS KIMMEL CANCER CENTER

# BREAST MATTERS

## Overcoming Endocrine Resistance

### INSIDE

- SYMPTOM REPORTING APP
- RADIATION ONCOLOGIST  
JEAN WRIGHT TALKS ABOUT  
PROTON THERAPY, RESEARCH  
AND TREATMENT ADVANCES
- FETTING FUND NEWS
- AND MORE

2022/2023

From left to right: Breast cancer experts  
Eneda Toska, Ph.D., M.S., Uthara Nayar, Ph.D.  
and Jessica Tao, M.D.

# BREAST MATTERS

THE NEWSMAGAZINE OF THE BREAST CANCER PROGRAM

2022-2023

*Click on the headline to read the story*



## Overcoming Endocrine Resistance

- An important area of focus in breast cancer research
- Understanding causes and resistance prevention opportunities



## Melody's Journey

How an accurate diagnosis was critical to the right treatment plan



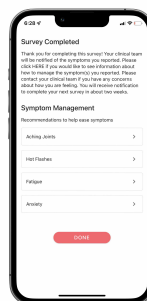
## Noteworthy

- In the news
- New appointments



## Headline Makers

- Rapid Test
- Duct Work
- Molecular Networking
- Coming 2023!



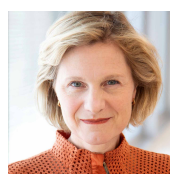
## SMART-ER App

Allows patients to report symptoms and adhere to cancer therapies



## Fetting Fund News

**Dipali Sharma, Ph.D.** named 2023 Fetting Scholar



## Radiation Therapy for Breast Cancer

**Jean Wright, M.D.**, discusses proton therapy, new therapies being studied, and more



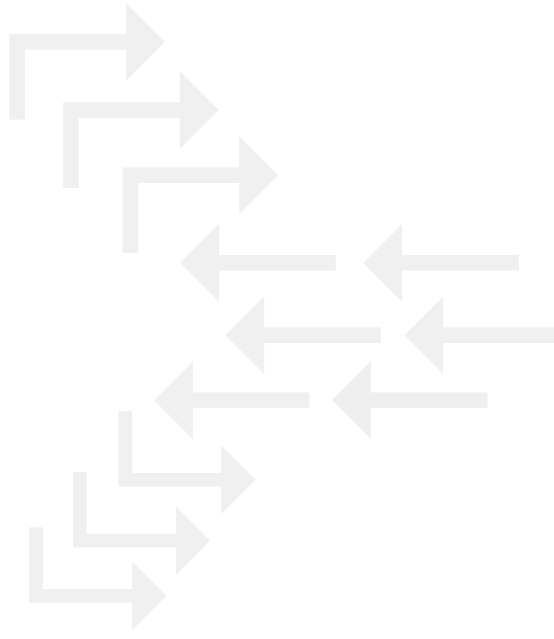
## The Baltimore Breast Cancer Medical Oncology Team

Help us make a difference



[New Technologies]

# OVERCOMING ENDOCRINE RESISTANCE



AN IMPORTANT AREA of focus in breast cancer research is identifying new ways to overcome a problem known as endocrine resistance. The term describes ways breast cancer cells find workarounds to drugs that block the ability of the hormone estrogen to fuel the growth and spread of the most common type of breast cancer. These drugs keep the breast cancer in check, improving the quality of life for patients and often extending survival by many years.

It is so important, says breast cancer expert **Jessica Tao, M.D.**, assistant professor of oncology, because these drugs are often the best treatment for advanced and early-stage estrogen receptor positive (ER+) breast cancers, which account for approximately 70% of breast cancers.

“The backbone of treatment for these patients are drugs that block estrogen or destroy receptors that receive the hormone,” explains Dr. Tao. “They often have the best and longest responses.”

Dr. Tao and colleagues **Utthara Nayar, Ph.D.**, an expert in using next-generation sequencing to study endocrine resistance, and **Eneda Toska, Ph.D., M.S.**, an expert in breast cancer genetics (mutations to DNA) and epigenetics (chemical alterations to DNA), are studying the mechanisms

of endocrine resistance, exploring ways to prevent it and to combat it when it occurs.

Estrogen acts like a fertilizer, providing cancer cells fuel and instigating growth. Everyone has some estrogen in their bodies, says Dr. Nayar, including postmenopausal women and even men.

**“The backbone of treatment for these patients are drugs that block estrogen or destroy receptors that receive the hormone. They often have the best and longest responses.”**

There are three main types of endocrine therapies: selective estrogen receptor modulators (tamoxifen), aromatase inhibitors, and selective estrogen receptor degraders. Tamoxifen blocks the estrogen receptor. It plugs it up like Play-Doh in a lock, says Dr. Tao. Aromatase inhibitors, including letrozole (Femara), anastrozole (Arimidex), and exemestane (Aromasin)—all FDA-

#### Endocrine Resistance

Refers to the ways breast cancer cells find workarounds to drugs that block the ability of the hormone estrogen to fuel the growth and spread of the most common type of breast cancer. These drugs keep the breast cancer in check, improving the quality of life for patients and often extending survival by many years.

approved—are oral pills that reduce the body’s production of estrogen.

The only FDA-approved selective estrogen receptor degrader is fulvestrant (Faslodex), which is given by monthly injection into muscle. The injection can be painful, so oral versions of degraders are currently in clinical devel-

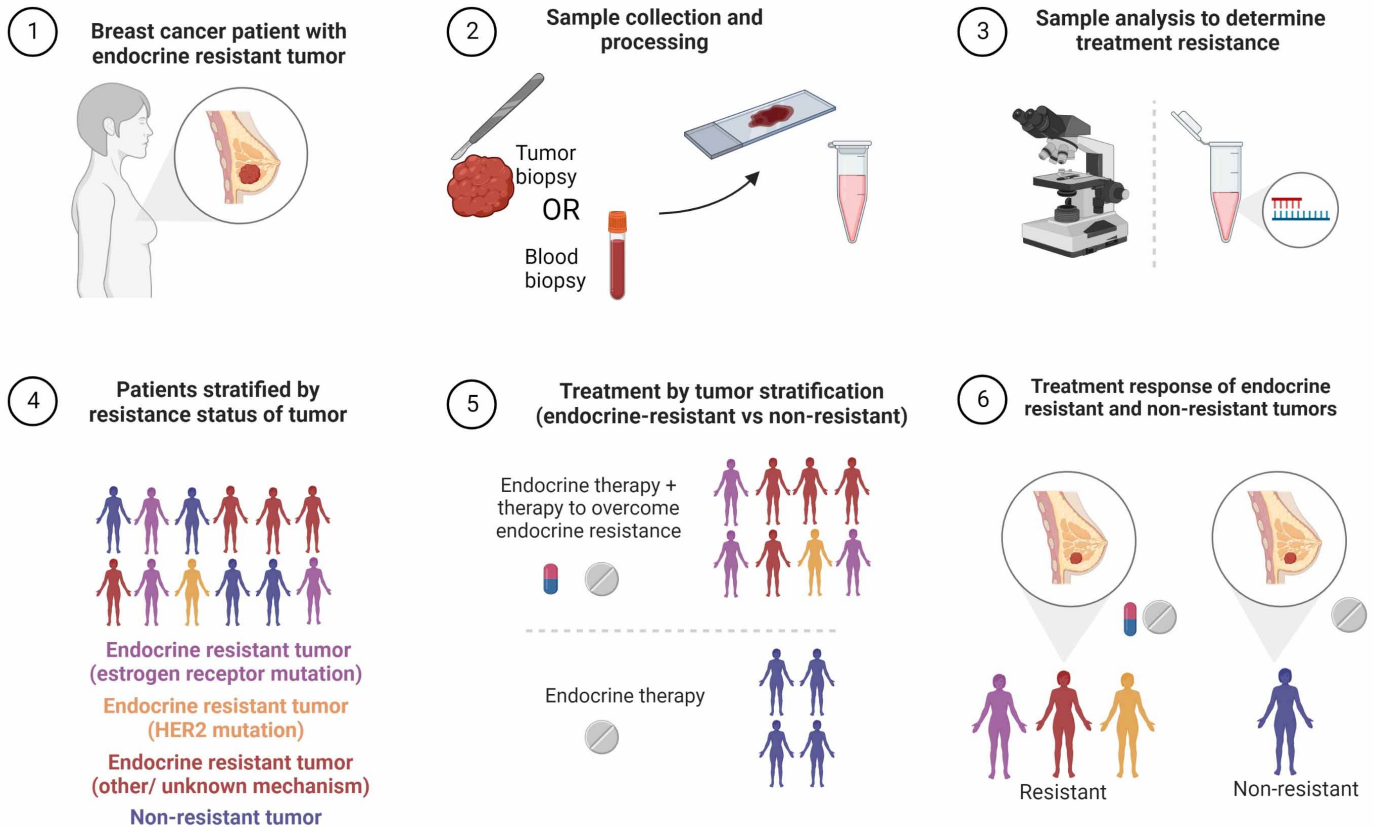
opment. These novel oral estrogen receptor degraders are the next generation of therapies, explains Dr. Toska. They get rid of the estrogen receptor altogether. Without a receptor, breast cancer cells cannot receive the hormone. They are not yet FDA-approved, but there are many being studied in clinical trials, the experts say.

These drugs work well, but cancer cells eventually grow resistant to endocrine therapy. When that occurs, chemotherapy is often the only option, which usually has more toxic side effects, is harder to administer, and typically works for shorter periods of time, says Dr. Tao.

One approach to the problem is a form of precision medicine that looks at

# Endocrine resistance in metastatic breast cancer

Adapted by Utthara Nayar from "Radiotherapy-Resistant Breast Cancer Patients: Screening and Therapeutic Approach", by BioRender.com (2022). Retrieved from <https://app.biorender.com/biorender-templates>.



drivers within the patient's cancer that could be causing the endocrine resistance, says Dr. Toska. Alterations to estrogen receptors and genes, such as HER2, are examples of how patients can develop resistance to endocrine therapy. In addition, inhibition of estrogen receptor can lead to abnormal activation of the cancer-promoting PI3K pathway in breast tissue, and vice versa. In clinical studies combining endocrine therapies with targeted therapies, drugs called inhibitors that block the effects of the abnormal pathway activation, extend the time the cancer is held in check, and PI3K inhibitors are now FDA approved for PI3K-driven tumors. Another treatment that has prolonged survival compared to endocrine therapy alone in patients with ER+ breast cancer is the addition of CDK4/6 inhibitors to antiestrogens.

Drs. Toska and Nayar are looking for more genetic mutations associated with endocrine resistance. Since tumors change over time, and these changes

vary from person to person, they hope to start a nontherapeutic clinical trial to observe breast cancer samples collected from patients over time throughout endocrine therapy to see if they can capture the resistance-causing change or changes as they occur and the specific mechanism that caused the resistance. They hope this research will help identify new treatments to target and interrupt the resistance-initiating mechanism.

New technologies, such as single cell sequencing and organoids, are helping them in this goal, providing new windows into the inner workings of cancer cells and the causes of endocrine resistance.

Single cell sequencing provides a detailed view of the cellular composition of tumors and enables scientists to measure all cell types in the tumor and examine how cells interact and function in the tumor. It gives researchers the ability to reveal and understand the instruction manual for every single cell in

the tumor and the role of these cells in driving cancers.

Organoids are tiny, natural replicas of human tissue grown from patients' own cells. "We can use this model to observe the mechanism of endocrine resistance in the lab and test drugs on the organoids to see what works," says Dr. Toska.

Xenografts, or mouse models implanted with human tumors, are also used to test the effectiveness of drugs, says Dr. Nayar.

"There is much work to be done," says Dr. Nayar, "but the science is moving fast, and progress is being made." Drs. Tao, Nayar, and Toska are optimistic and focused.

"Endocrine therapy resistance is the cause of most breast cancer deaths, so overcoming endocrine resistance would represent a major advance in breast cancer therapy, extending the lives of countless numbers of patients," say Drs. Tao and Nayar. "We are committed to finding answers."



[Feature]

# MELODY'S JOURNEY

WHEN MELODY FELT a lump in her breast, she was busy preparing for her mother's 100th birthday. Her focus was on the details of this special celebration, so she delayed getting a mammogram. She'd felt lumps before that turned out to be nothing, and she was confident this would be a similar situation.

The vibrant 73-year-old great grandmother and Nevada resident was in excellent health and felt fine. She exuded a youthfulness and vitality that defied her age.

A couple of months later, however, when Melody went for her mammogram, it became clear that this time was different. She was sent for additional testing, including an ultrasound and biopsy. When all results were in, they revealed she had breast cancer.

"I was in a state of shock. It was very frightening," says Melody. Things moved slowly in Nevada, she recalls. She had her mammogram in October but did not have a diagnosis until January. "There was no integrated system. Everything was separate. The cancer center was separate from the lab and imaging," she says. What's worse, her doctors were concerned the cancer had already spread.

They told me, "If it has spread to your liver, all we can do is palliative care."

With that news, she took the advice of her son, who accompanied her to appointments in Nevada, and her brother and sister, who live in Maryland, and traveled to the Johns Hopkins Kimmel Cancer Center Under Armour Breast Innovation Center for a second opinion.

It proved to be a lifesaving decision. In Nevada, Melody was told she had



**"They are two of the many reasons for me to be strong and healthy."  
—Melody**

Pictured: Melody (left) holding her great grandson Cassius and her now 101-year-old mother Hope.







HER2-positive breast cancer. The Johns Hopkins experts had a different finding, diagnosing her with triple negative breast cancer. Unlike most types of breast cancer, this type is not driven by hormones. Instead, it is characterized by a lack of hormones and the cellular receptors that receive them—estrogen, progesterone and HER2 receptors.

To confirm the triple negative diagnosis, Kimmel Cancer Center experts obtained Melody's original tumor samples from her biopsy in Nevada, performing specialized testing on them and putting all of the findings before the Center's Breast Cancer Tumor Board.

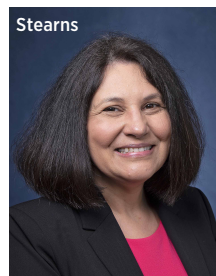
The Breast Cancer Tumor Board is comprised of experts in breast cancer imaging, pathology, surgery, medical oncology, radiation oncology, and genetics, and laboratory scientists who understand the biological characteristics, and all of their subtleties, for each type of breast cancer. This helps guide local and systemic treatment and other therapies targeted to the unique features of each patient's cancer.

An accurate diagnosis was critical since the treatment for triple negative breast cancer is very different from treatment for HER2-positive breast cancer. The thought of what might have happened had she not taken her son's and siblings' advice and come to Johns Hopkins was troubling to the active and otherwise healthy great grandmother.

Melody was surprised by how much faster things moved at Johns Hopkins. "It was like lightning in comparison to what I experienced in Nevada," says Melody, who was impressed by the streamlined process with all specialists and services amassed in the Kimmel Cancer Center and in one location.

**“Our goal at the Kimmel Cancer Center is to provide the best possible care to patients with breast cancer and to those at risk for the disease.” —Vered Stearns, M.D.**

“Our goal at the Kimmel Cancer Center is to provide the best possible care to patients with breast cancer and to those at risk for the disease,”



says **Vered Stearns, M.D.**, Director of the Women's Malignancies Program and the Breast Cancer Research Chair in Oncology. “It is important to take the time to ensure the

correct diagnostic tests and pathology review take place before initiating an individualized treatment plan.”

With her diagnosis of triple negative breast cancer confirmed, Melody met with breast cancer expert **Dr. Danijela Jelovac**.



“I bonded with Dr. Jelovac right away,” says

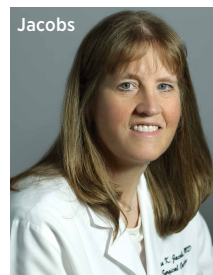
Melody. “She is a great communicator. She diagrammed my various choices on paper and made them all understandable. I was so impressed with her.”

When Melody told her about the Nevada doctors who offered nothing if her cancer had spread, Dr. Jelovac was stunned and told her about the countless patients who live many years with cancer that has spread.

Fortunately, her Nevada doctors were wrong about the stage of Melody's cancer too. Although triple negative breast cancer tends to be more aggressive, Melody was diagnosed at an early stage.

This made it possible for her surgeon, **Dr. Lisa Jacobs**, to perform a procedure known as a lumpectomy, removing the tumor and some tissue

around it, while leaving most of the breast intact. Surgery is followed by chemotherapy and radiation therapy to mop up any remaining cancer cells that could seed new tumors and spread the cancer.



Melody was still reeling from all that had transpired in the months before—learning she had breast cancer, receiving an incorrect diagnosis and worrying that it already spread.

“Dr. Jelovac helped me to understand my story, what was happening to me,” says Melody. For the first time, Melody says, she felt like she understood her diagnosis and her treatment. She compared her newly gained clarity to a camera lens that gradually opens to reveal the full view of the object being photographed.

Despite being in excellent health prior to her cancer diagnosis, four rounds of chemotherapy over eight weeks took its toll on Melody. She lost taste, developed mouth sores and had trouble swallowing. She was often dehydrated and also lost hair, although she believes she benefited from the cooling cap she wore throughout her treatment.

The cooling cap is an FDA-approved device that prevents or minimizes chemotherapy-induced hair loss and is made available to all Kimmel Cancer Center breast cancer patients. Nurse **Zakiya Stanley, B.S.N., R.N.**, assists patients with the cap at the Under Armour Breast Health Innovation Center.

One of the most troubling side effects Melody experienced was nerve damage to her feet and toes caused by one of the breast cancer-fighting drugs she received. Weighing the advantages of the drug with the risk of the nerve damage continuing into her legs, she consulted with Dr. Jelovac, and decided not to continue with that drug.

“I did not want to risk losing my mobility,” says Melody.

She is now in the final step of her breast cancer treatment, a four-week course of radiation therapy.

As she nears the end of her treatment, Melody says she is grateful for



everyone who cared for her—her medical oncologist Dr. Jelovac, surgeon

Lisa Jacobs, radiation oncologist **Jean Wright**, nurse navigator **Elizabeth Saylor**, Duffy Patient and Family Services social worker **Amy Miller** and chaplain **Moira Bucciarelli**—and especially all of



the infusion nurses, who even through the stress of the COVID pandemic, cared for each patient with the same skill, focus, and compassion.

“They were gracious and professional. What a team they have,” says Melody. “It fills my heart. I can’t thank the nurses enough.”

Still, as she looked ahead to the finish line, Melody recognized she didn’t have a full picture of what that meant for her. “How will I know when I’ve beaten the cancer?” she asked, wondering how doctors measured success.

Dr. Jelovac told her “when the cancer does not return.” Understandably, Melody was hoping for more certainty.

“I recognized that I don’t have control over the cancer, so I don’t think about the cancer. I think about building and maintaining a healthy body, mind and spirit. I will get strong again,” says Melody.

As she plans to return home to Nevada, her Kimmel Cancer Center doctors will stay connected. Dr. Stearns says it is a priority to assist patients who travel a long distance to the Kimmel Cancer Center for care and help them arrange follow up care and testing close to home when possible.

Melody is looking forward to reuniting with her family, resuming her active lifestyle and rebuilding her strength and energy. She says, “My goal is to live every moment to its fullest.”

## NOTEWORTHY

**Olutayo Sogunro, D.O.**, joined the Johns Hopkins Breast Center team and



will be practicing primarily at Howard County General Hospital. She is a surgical oncologist who completed her general surgery residency at Ohio University – Mercy St. Vincent Medical Center in Toledo, OH, and her breast surgical oncology fellowship at Georgetown University Hospital in Washington, D.C. She received her medical degree at Edward Via College of Osteopathic Medicine in Blacksburg, VA. She enjoys working with cancer patients and helping to tailor their treatment to their unique needs, while being part of the journey from diagnosis through treatment. Her areas of focus include triple negative breast cancer, male breast cancer, radiation induced angiosarcoma and health disparities in breast cancer.



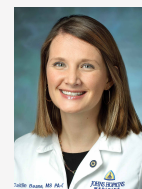
**Andrea Richardson, M.D., Ph.D.**, associate professor of pathology and oncology and Director of Pathology for the National Capital Region, was installed on

October 19 as the inaugural recipient of the Peter and Judy Kovler Professorship in Breast Cancer Research in the Department of Pathology.

**Jenna Canzoniero, M.D., M.S.**, joined the Women’s Malignancies Program.



Dr. Canzoniero earned her medical degree and master’s degree in bioinformatics from University of Michigan. She completed internal medicine residency at University of Maryland and served as Chief Resident. She joined the faculty at Johns Hopkins as an academic Hospitalist before pursuing her passion for oncology. She completed a medical oncology fellowship at Johns Hopkins, including serving as Chief Fellow, and then rejoined the faculty. Her research focuses on expanding the use of molecular diagnostics, including liquid biopsy, to guide the treatment for patients with breast cancer. She helps to lead the precision (individualized) medicine initiative for the Women’s Malignancies program.



Nurse practitioner **Deanna Glass-Macenko, C.R.N.P.** and physician assistant **Caitlin Beane, P.A.**, joined the breast cancer surgery team.



**Melissa Camp, M.D., M.P.H.**, was named program director of the Halsted General Surgery Residency Program.



# HEADLINE MAKERS



## Rapid Test

A NOVEL, automated liquid biopsy test in development by researchers **Saraswati**



Mary Jo Fackler

**Sukumar, Ph.D.**, and **Mary Jo Fackler, Ph.D.**, can accurately detect the presence of cancer DNA in the blood of patients with metastatic breast cancer within five hours.

The test, currently a prototype for research use only, potentially could be used to quickly help oncologists determine if cancer treatments are working.

“Our goal was to develop an assay that would be sophisticated yet simple to perform worldwide and could be used at the point of care to provide same-day feedback to clinicians and patients,” Dr. Sukumar says.

The work was supported by the Department of Defense (grant W81XWH-18-1-0018) and a research agreement from Cepheid.

Read more: <https://bit.ly/3COpFFK>

## Duct Work

DELIVERING A targeted immunotoxin into breast ducts via openings in the nipple wiped out all visible and invisible precancerous lesions in laboratory studies of very early stage breast cancers. The study, led by breast cancer researcher **Saraswati Sukumar, Ph.D.**, provides a strong preclinical foundation for conducting feasibility and



Saraswati Sukumar

safety trials with patients who have stage 0 breast cancer, also known as ductal carcinoma in situ (DCIS). Many women have breast removal surgery and radiation treatments for these

very early cancers, and in some cases, they receive chemotherapy or hormone therapies, says Dr. Sukumar.

“In our research, we proposed an alternative treatment in which injecting the immunotoxin drug through the duct could result in cleaning out the DCIS,” says Sukumar. “To our big surprise, the drugs killed every single lesion present in that breast duct. I had never seen such dramatic results in my life.”

The next step, she says, is to study the approach further in women receiving mastectomy.

The work was supported by the Janine Goebel Fund and the John Fetting Fund for Breast Cancer Prevention.

Read more: <https://bit.ly/3V9p4W2>

## Molecular Networking

DIFFERENT ACTIVITY in two molecular networks could help explain why triple negative breast cancers tend to be more aggressive in African American women compared with white American women, research led by **Dipali Sharma, Ph.D.**, suggests.

The research revealed two genes, known as GLI1 and Notch1, were more active in cells isolated from African American women compared with those isolated from white American women.

Dr. Sharma, a Fetting Fund Scholar, and team plan to test GLI1 and Notch1 inhibitors in mouse models of triple negative breast cancers to find the best combination with chemotherapies and eventually investigate this strategy in clinical trials of patients with this disease subtype.

This research was funded by the National Cancer Institute (R01CA204555).

Read more: <https://bit.ly/3eo5dlx>

## Coming 2023!



A new breast cancer center at Johns Hopkins Howard County General Hospital is under construction and expected to be completed in spring 2023.

A STUDY BY breast cancer and cancer survivorship expert **Karen Smith, M.D., M.P.H.**, is testing a smart phone



app that allows women on hormonal therapies for hormone receptor positive breast cancers to report symptoms. She hopes the app will help on-

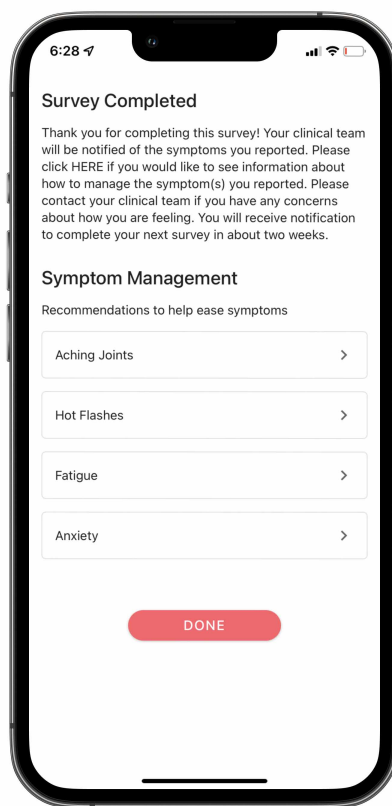
cologists better identify and address patients' side effects and decrease the number of patients who discontinue therapy.

Hormonal therapies, often referred to as endocrine therapies, essentially cut off the fuel feeding certain types of cancer. Drugs like tamoxifen and aromatase inhibitors work well to shut down hormones and prevent recurrence, however, side effects caused by the loss of hormones, can result in a variety of symptoms, including hot flashes, fatigue, vaginal dryness, and joint pain. Some find these symptoms so uncomfortable it drives them to quit taking them before completing the full course, often without notifying their doctors until their next scheduled appointment, she says.

"These patients are doing well. They are back to living their normal lives. They don't come to the clinic often, maybe every three to six months. There are data that show providers don't always know about patients' side effects," says Dr. Smith. "We have interventions that can help reduce side effects, but often we don't know patients are struggling."

She believes this could be leading patients to stop the treatments before the five- to 10-year course is completed, which can result in poorer outcomes.

With this in mind, Dr. Smith is building upon an earlier study, called the ePRO study (electronic patient-reported outcomes) in which participants used a smart phone app to complete a survey to assess the severity of common side effects during endocrine therapy. If a patient reported anything concerning, it was shared with her care team. Patients' care teams could then offer interventions



## SMART-ER APP ALLOWS PATIENTS TO REPORT SYMPTOMS

### Having symptoms acknowledged and addressed may be a key to adherence to cancer therapies.

to manage symptoms with the goal of helping the patients stay on these important cancer medicines.

The ePRO study was aimed at determining if symptom monitoring via a smart phone app was feasible. The findings surpassed this goal and also demonstrated low rates of discontinuation of therapy.

"We were able to show that symptoms were reported to the provider, and at one year, continuation for therapy was favorable," says Dr. Smith.

Now, with funding from an ECOG-ACRIN Cancer Control and Outcomes

Pilot Project Award, and in collaboration with Virginia Commonwealth University, Dr. Smith is expanding her research into assessing symptoms during endocrine therapy using surveys collected on smart phone apps. The new study, called SMART-ER, is similar to the ePRO study but is directed specifically to patients with established risk factors associated with higher risk of not taking the full course of endocrine therapy as prescribed. This includes patients with other health conditions, such as diabetes, high blood pressure, obesity, chronic lung disease, or anemia; those under age 40 or over age 70; or on medications for anxiety or depression. Special efforts are also being made to recruit minority patients to this new app study.

Participating patients will use the app to report symptoms before starting endocrine therapy and then after two weeks, four weeks, eight weeks and 12 weeks. Patients can quickly complete the surveys in 10 to 15 minutes.

Patients who are participating in the study download the app on their smart phone, and a patient report outcome module is turned on. The results of their symptom surveys are shared with their care teams if they report any concerning symptoms.

Based on the symptoms reported, the care team can provide patients with interventions and additional resources. For example, if a main concern is menopausal symptoms, women can be referred to the Women's Wellness and Healthy Aging Program.

"There is evidence that better symptom monitoring leads to better symptom management and better adherence to therapy in patients with advanced cancer," says Dr. Smith. "We want to find out if we can extend this benefit to patients with early stage breast cancer taking endocrine therapy to prevent recurrence and who are most at risk for not completing the full course of endocrine therapy as prescribed."

Additional app-based surveys are being developed with funds provided by Under Armour.



# FETTING FUND NEWS

**Dipali Sharma, Ph.D.**, was named the 2023 Fetting Scholar and will receive research support from the John Fetting Fund for Breast Cancer Prevention. Dr. Sharma is studying breast cancer predictors and ways to intervene to stave off breast cancer before it develops. Dr. Sharma's discoveries include finding that a molecule produced by fat cells, called leptin, cancelled out the drug tamoxifen's ability to prevent breast cancer recurrence in obese mice. The new finding intersected with Dr. Sharma's research of a natural compound derived from magnolia trees, called honokiol. The compound is known to have cancer-protective properties, and in the leptin studies it appeared to block another gene acting as a master switch for dozens of obesity-related genes. Dr. Sharma continues to study the potential of interventions that lower leptin, such as losing weight and honokiol, to prevent breast cancer.

From left, Dipali Sharma, Ph.D., and John Fetting, M.D.

## The Power of Prevention

"I think the world of Dr. Fetting. I believe in what he is doing and that it is going to move the cause forward. Prevention is the way of the future," says Millie Goodman breast cancer survivor and contributor to the John Fetting Fund for Breast Cancer Prevention.

The John Fetting Fund for Breast Cancer Prevention supports breast cancer research discoveries aimed at identifying women at highest risk of developing breast cancer, with the goal of preventing the cancer.





### What is proton therapy?

Proton therapy is a form of radiation therapy used to treat cancer for several decades. Johns Hopkins Sibley Memorial Hospital is home to one of just 40 proton centers in the U.S.

Proton therapy uses charged particles, rather than photon therapy's high-powered X-rays beams, to kill cancer. Proton is another tool we have to treat cancer, but is important for patients to know that it does not replace photon therapy.

### What is the difference between proton therapy and photon therapy?

The machines and the way the radiation is delivered are different, but they kill cancer cells in a similar way—breaking its DNA. Proton has a special property of being able to penetrate through tissue—go to a certain depth and stop—so we can avoid healthy organs and tissues we don't want to receive radiation. Using modern technology, we angle the beam so that it hits the target we want to treat and avoids the parts of the anatomy that we want to protect from radiation, such as the heart and lungs.

### Is one type of radiation therapy preferable to the other in treating breast cancer?

Proton therapy is a fantastic tool we are fortunate to have as a treatment option, but often patients will do as well with photon therapy. Our approach at Johns Hopkins is to do the right and best thing for each patient.

In certain situations, particularly when we are treating a specific group of lymph nodes, known as internal mammary lymph nodes, that sit behind the ribs and are sandwiched between the ribs and heart, proton therapy may be preferable. The depth or thickness of tissue is variable, depending upon where in the breast a tumor is located. Protons can go to different depths of tissues and come to stop and match the curvature of the ribs and chest wall without radiation passing deep into the tissue. There are many cases where the radiation exposure to the heart and lungs is not improved with proton therapy, and in those cases, we do not recommend using protons.

### What types of research are you doing in radiation therapy for breast cancer?

Patients may opt to participate in our proton registry, which helps us maintain data to learn more about patient outcomes and toxicities and which patients are best suited for proton therapy versus photon therapy.

We also are participating in a national randomized study, called RADCOMP, that compares proton therapy to photon therapy for patients who need mammary internal lymph nodes treated. We want to find out if one is better than the other in terms of toxicity, such as damage to the heart. A companion study, open to all patients participating in RADCOMP, includes more in depth assessment of heart toxicities, using tests like echocardiograms at various timepoints before and after radiation therapy is completed.

In the next few months, we will also begin a new study of partial breast radiation for patients with cancers at low risk of recurring. In this study, we will explore narrowly focusing radiation to the area of the cancer, using protons.

Over the past decades, we have learned how to tailor and minimize radiation therapy, focusing on highest risk areas and not exposing tissue that does not need to be exposed. Partial breast radiation is one approach that reduces the volume of tissue treated that we already use with photons, and we will begin offering a similar regimen using protons.

### Are you studying any other treatment advances?

Another approach is shortening the course of radiation.

In the 2000s, radiation therapy was delivered over five to seven weeks for almost all patients needing breast radiation. About 15 years ago, studies found that shorter, three- to four-week courses, were as effective for patients at lower risk for breast cancer recurrence, and we have moved to these shorter courses for many of our patients. About two years ago, a United Kingdom (UK) study compared data from patients who received three- to four-week courses to an even shorter



## RADIATION THERAPY FOR BREAST CANCER

Director of the Breast Cancer Program's Radiation Oncology service, **Jean Wright, M.D.**, discusses proton therapy, new therapies being studied, and more.

course of high-dose whole breast radiation, using a dose that is biologically equivalent to the more traditional three-week course.

This one-week, whole breast radiation approach is most suitable for older patients with low-risk breast cancer. The UK study has only had five years of follow up. Potentially, as patients are followed for longer periods of time, younger patients could experience some cosmetic effects, such as loss of breast volume or hardening of tissue, so whether this very convenient course is appropriate has to be weighed for each patient depending on their breast cancer risk as well as personal preferences and priorities. This is another great example of how our field is evolving toward patient-centric, tailored treatments.



# THE BALTIMORE BREAST CANCER MEDICAL ONCOLOGY TEAM

Standing, from left: Asnakech Bayable, Jenna Canzoniero, Eneda Toska, Kala Visvanathan, Daniele Gilkes, Cesar Santa-Maria, Dipali Sharma, Jessica Tao, Rima Couzi, Utthara Nayar Seated, from left: Antonio Wolff, Vered Stearns, Danijela Jelovac



## Help Us Make a Difference

Each contribution to the Johns Hopkins Kimmel Cancer Center makes a difference in the lives of cancer patients here at Johns Hopkins and around the world.

Our physician-scientists are leading the way on many of the scientific breakthroughs in cancer, and your donation will support patient care and innovative research that is translated to better, more effective treatments. We are also focusing on ways to prevent cancer and support survivors.

You may designate a gift to a specific faculty member.

To make your donation online  
[hopkinscancer.org](http://hopkinscancer.org) and click  
"Make A Gift"

To mail your donation  
Johns Hopkins Kimmel Cancer Center  
750 E. Pratt St., Suite 1700  
Baltimore, MD 21202

To contact our Development  
Office

Phone: 410-361-6391  
Fax: 410-230-4262  
Email: [KimmelGiving@jhmi.edu](mailto:KimmelGiving@jhmi.edu)

Visit us on the Web  
[hopkinscancer.org](http://hopkinscancer.org).



**JOHNS HOPKINS**  
MEDICINE

THE SIDNEY KIMMEL  
COMPREHENSIVE CANCER  
CENTER

If you prefer not to receive fundraising communications from the Fund for Johns Hopkins Medicine, please contact us at 1-877-600-7783 or [JHHOptOut@jhmi.edu](mailto:JHHOptOut@jhmi.edu). Please include your name and address so that we may honor your request.