

you
make
the
difference

THE JOHN FETTING AWARD

FOR BREAST CANCER PREVENTION



I know

I am not the first person to be diagnosed with breast cancer. It happens frequently. Each of us knows someone who has been diagnosed within the past year alone. In fact, the number of people being treated for breast cancer continues to increase, even while improvements in cancer drugs help many people live longer after being diagnosed.

We are all grateful for the improvements in treatment, and for more options for plastic surgery related to reconstruction after mastectomies. However, we cannot underestimate the damage that breast cancer causes to the individual, to the families of people being treated or who lose their loved ones to it, and to our society. When one link in our family chain is weak or broken, we are all broken. In families with fewer links holding them together, the emotional, physical and financial bonds are often broken beyond repair.



Leslie Ries

We have to try and intervene—to protect ourselves, our children, and others from getting this disease. That is what we are doing in this campaign.

Dr. John H. Fetting, III and the scientists at the Johns Hopkins Kimmel Cancer Center are dedicated to making significant progress in the medical research to prevent breast cancer. This is an area to which few resources and little attention has been given. It is natural for the drug companies to invest in drugs to treat cancer. They are making great strides to help people live longer and to realize a return on the investment of their research and marketing efforts.

Advancements in treatment options are not enough.

The past seven years since I was first diagnosed with breast cancer have been life changing for me and for my family. I am grateful for the wonderful care I received. However, I can't bear to think that my daughters and the mothers, daughters, and sisters of others would have to go through what I have been through. I don't want them to be treated. I want them to never have cancer in the first place.

The only way to reduce the incidence of breast cancer is to fund medical research on preventing it.

By establishing the John Fetting Award in Breast Cancer Prevention at Johns Hopkins, my husband Tom and I are supporting promising new ideas, both in the laboratory and in patient care.

We are grateful to Dr. Fetting and the team at Johns Hopkins who helped me to survive, and we have the utmost confidence that this team will take the fight against breast cancer to the next level and find ways to actually stop it from occurring in the first place.

*We will replace our fear with hope.
We all deserve a future without cancer.*

—Leslie Ries, *Breast cancer survivor*

letter

FROM JOHN FETTING

Over the course of my career, we have made substantial progress in the battle against breast cancer. With screening mammography, we diagnose breast cancer earlier. Treatments have become more effective and, when we give them at an earlier stage, we prevent recurrences which are almost always fatal. More patients are surviving and living full lives, and I'm very excited and gratified by that.

But, while we have made real progress, let's not overlook one overwhelming fact: breast cancer incidence world-wide is still increasing. Even though we can diagnose and treat breast cancer more effectively, an increasing number of women around the world develop this disease every year.

This cannot continue.

We must find ways to prevent breast cancer, but this will not be easy. We need the same kind of concerted effort that has been mounted to cure breast cancer.

The good news is that scientists are making discoveries which point the way to prevention. At Johns Hopkins, we've led the way in understanding the biology of cancer. Our breast cancer physicians and scientists are working on new ways to prevent this disease, but there is so much more work to be done and we need your help to sustain this work because prevention is an underfunded area of research.

Competition for grants is fierce and very often good work is not funded at all or funding is not renewed. We need philanthropy. We need support from committed, generous partners in this effort to prevent breast cancer.

I'm proud to support prevention research at the Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins.

Please join me as we work to find a way to PREVENT breast cancer.

Sincerely,

John Fetting, M.D.



John Fetting

BREAST CANCER

prevention

WHERE DO WE STAND?

The lifetime risk of breast cancer has increased from 1 in 20 in 1964 to 1 in 9 today.

In 2010, an estimated 207,000 women will be diagnosed with breast cancer in America.

Of those diagnosed, 40,545 will die from this disease. The problem is not ours alone. Globally, breast cancer incidence continues to rise. At this time, our attention needs to turn to prevention. By preventing breast cancer, we can save lives and spare patients and their loved ones the trauma of a breast cancer diagnosis and debilitating treatment. Can this be done? In our generation we have witnessed the development of vaccines that have eliminated dreaded diseases like polio, and there is reason to expect that in the near future, we will see the elimination of cervical cancer. Key to this success was the identification of causative agents. Although breast cancer may have multiple causes, we have made huge strides in identifying the genes that are responsible for breast cancer. It is now time to build on this scientific progress, achieved largely at Johns Hopkins, to focus our attention to eradicating breast cancer through prevention.

- **Hormone replacement therapy.** At menopause was widely used to reduce menopausal symptoms and prevent heart disease in women. However, clinical trials conducted in 1990s found that it increased breast cancer but, unexpectedly, did not reduce heart disease. As a result, hormone replacement therapy has been much less frequently used and breast cancer incidence has dropped.

- **Early onset of menstruation and age at first pregnancy.** Women who start menstruating early and women who have a first pregnancy after 30 are at higher risk. Since 1964, there has been an increase in the frequency of menstruating early and late first pregnancy.

- **Obesity** is on the rise in in the United States and studies have shown it is a risk factor for developing breast cancer. Even the foods we eat, such as canned meat and red meat may contribute to breast cancer risk.

- **Genetics.** In approximately 5-10% of patients we have learned that breast cancer results from a single gene mutation inherited from a parent. The two most common genes affected are

BRCA 1 and 2. Not all carriers of these mutations develop breast cancer but more than half do. If we know that someone has a BRCA 1 or 2 mutation, we are certain enough about their risk to act.

We know it is not be enough to work on the risk factors we have already identified. Even when one takes into account all the risk factors currently known, most women with breast cancer do not have any of the known risk factors for breast cancer. We have much work to do to identify other risk factors. We need to search for potent risk factors so that knowing that a patient has a risk factor empowers us to prevent her breast cancer. We must realize, however, that most of the new risk factors we discover will be less potent and that there will be hard work to do to determine the underlying biological mechanisms by which these new risk factors cause breast cancer in some women but not in most.

Once diagnosed one of the first and most natural questions a patient asks is, “how did I get this?” But for the overwhelming majority of patients, we cannot give them an answer. We don’t know.

- **Fighting the “fat” in cancer**

Leptin, a hormone secreted by fat

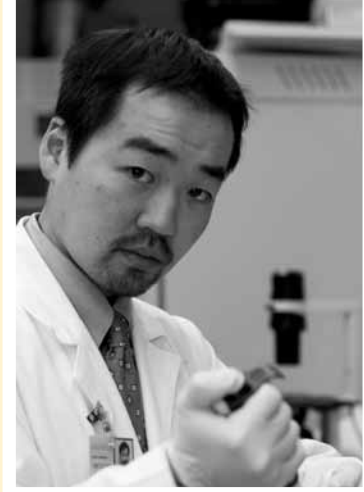


Kala Visvanathan

cells, is known to spur breast cancer growth and metastasis. Johns Hopkins investigators are testing ways to block leptin's effect on breast cells. They are testing three bioactive food components on their ability to prevent breast cancer.

- **To prevent cancer, go directly to the source.** Breast tissue contains a vast network of ducts that act as tributaries delivering milk to the nipple. Most breast cancers develop in cells that coat the inner lining of these ducts, and targeting these cells with therapies may be a way to prevent the disease. Johns Hopkins experts have conducted early tests on patients showing that delivering chemotherapy through the nipple via tiny catheters is feasible. Their idea is to deliver high concentrations of therapies to the ducts, the cells that line the ducts, and breast tissue with minimal discomfort and little exposure to the rest of the body.

- **Soy compound may strengthen breast cells against cancer.** A nutrient called genistein, found in soybeans, may make breast cells more receptive to the cancer-prevention benefits of vitamin D. Work by Johns Hopkins researchers has shown that soy genistein reverses abnormal changes in the way proteins wrap around genes. These abnormal or "epigenetic" changes can push a breast cell's fate more toward cancer. Reversing the epigenetic change can make cells sensitive to vitamin D, according to the investigators. They are identifying these changes in patients' tissue samples, determining whether the changes pair with increased risk for breast cancer, such as hormonal factors, family history of breast cancer, and dense breast tissue. Their goal is to use epigenetic changes as a biomarker for women at increased risk for breast cancer and use medications or natural



Ben Ho Park

products like soy genistein and vitamin D as a way to reduce risk.

- **Preventing breast cancer from coming back.** Breast cancer patients and those with pre-cancers are at higher risk of getting another breast cancer as compared with other women their age. Johns Hopkins investigators are studying whether drugs such as a cholesterol-lowering statin and bisphosphonate zoledronic acid, a drug that prevents bone loss in cancer patients, can reverse changes in breast tissue and prevent a second cancer in the unaffected breast.

- **Safer Prevention Strategies.**

Prevention strategies sometimes have risks of their own. Women who have had had their ovaries removed for breast and ovarian cancer prevention are at risk for metabolic changes, cardiac disease, loss of bone density, and other cancers. Researchers are working to better

understand and avert the side effects and maximize the benefits.

- **Biomarkers.** Not everyone at risk will develop breast cancer. Many factors, including genetics, family history, a personal history of benign breast disease, and environmental exposures, play a role and are different for every woman. Laboratory research is leading us to biomarkers that will help us better identify and monitor women for biological changes indicative of cancer development so that we can individualize more aggressive preventive care to women who need it.

This has to change.

why

JOHNS HOPKINS?



Vered Stearns

Cancer is very complex. It is a disease of many broken parts and in order to fix these parts, researchers need to understand them in detail. Groundbreaking discoveries led by scientists at the Johns Hopkins Kimmel Cancer Center found that breast cancer is not just one disease but a number of diseases. Several breast cancers might look alike under the microscope, but genetically they are very different. Most breast cancers are caused by a series of changes in normal cells acquired over time. These cellular alterations are red flags or biomarkers which can identify those at risk and can serve as targets for prevention.

Johns Hopkins physician-scientists recognize that most women desire prevention strategies that have few or no side effects. They are examining the protective effects of certain chemicals found in fruits and vegetables. The challenge is employing these compounds in the right amounts, at the right time, and in the right population.

Evaluating enzymes, genes and proteins related to breast cancer also show promise for turning on and off key switches that may stop breast cancer before it begins.

Johns Hopkins has led the world in deciphering the cellular causes of cancer. Now our internationally recognized team of Johns Hopkins breast cancer physician-scientists, lead by Vered Stearns, M.D., and Sara Sukumar, Ph.D., is poised to lead in the prevention of cancer.

The Johns Hopkins Kimmel Cancer Center is one of the few centers in the country where significant collaboration occurs across departments and schools within the University system. Researchers in the Bloomberg School of Hygiene and Public Health identify and decipher risk factors for breast cancer while laboratory scientists in the School of Medicine describe the biological basis for breast cancer development. When these groups collaborate risk factors identified by our public health scientists can be investigated so that we understand their biological basis; biomarkers identified by our laboratory scientists can be the next



Sara Sukumar

generation of risk factors used by our public health scientists to identify groups at risk.

Below is a brief overview of some of the research our team currently is conducting.

SINCE MOST BREAST CANCERS originate in the cells lining the breast ducts, it may be possible to prevent the breast cancer by destroying these cells. Our laboratory studies and early clinical experience suggest that it may be possible to instill drugs directly into the breast duct. By doing so, we can produce high concentrations of drug in breast tissue with little exposure to the rest of the body, with little discomfort, and with effective eradication of the cells lining the ducts.

OUR RESEARCH SUGGESTS THAT, not only mutations in genes, but also variations in the proteins that wrap the genes, can lead to a future breast cancer. These variations are called epigenetic changes. We are conducting studies designed to correlate the presence of these changes with known breast cancer risk factors such as hormonal factors, family history, and density of the breast tissue as seen on a mammogram. We hope to identify specific epigenetic markers in individual women that will help us determine her risk for breast cancer and whether specific medications or natural products. For example, our laboratory work shows that the soy genistein can

reverse epigenetic changes, and can make breast cells sensitive to vitamin D.

WOMEN WHO HAVE BEEN DIAGNOSED with breast cancer or a precursor of the disease are at a higher risk compared to other women their age for developing a new breast cancer. These women are candidates for new prevention agents such as a statin drug used for lowering cholesterol and a drug we now use to prevent loss. Nearly 90% of the breast is made up of fat cells. Fat cells secrete chemicals called cytokines or hormones. Leptin is one of the hormones secreted by fat cells. Leptin increases the growth of breast cancer and its potential to spread, i.e. metastasize. Therefore, it is of great interest to inhibit leptin's effect on the breast. We have identified three bioactive food components to successfully inhibit this effect of leptin on the breast and will test the ability of these food components to prevent breast cancer.

Johns Hopkins is ready to meet the challenges of 21st century medicine and, with your help, we will lead the way to preventing breast cancer.

THE *campaign*

The task before us is both urgent and challenging. Very few resources from institutions, corporations, foundations or the government have been dedicated to prevention research.

The JOHN FETTING AWARD IN BREAST CANCER PREVENTION will enable us to fund the most promising research in breast cancer prevention making this ambitious goal within the realm of possibility.

This work and future work needs sustained support. The John Fetting Award in the Breast Cancer Program will be granted the most promising work. The awards will be for a period of one to two years, adequate time to lay the foundation that will assure eligibility for larger national awards. An Advisory Board will guide the identification of award recipients. It will consist of William Nelson, M.D. PhD, Director of the Sidney Kimmel Comprehensive Cancer Center, Sara Sukumar, PhD, and Vered Stearns, M.D. who serve as Co-Directors of the Breast Cancer Program at Kimmel Cancer Center, Kala Visvanathan, M.D., MHS, Associate Professor of Epidemiology and Oncology, John Fetting, M.D., Dina Klicos, Director of Development for the Breast Cancer, and Leslie Ries.

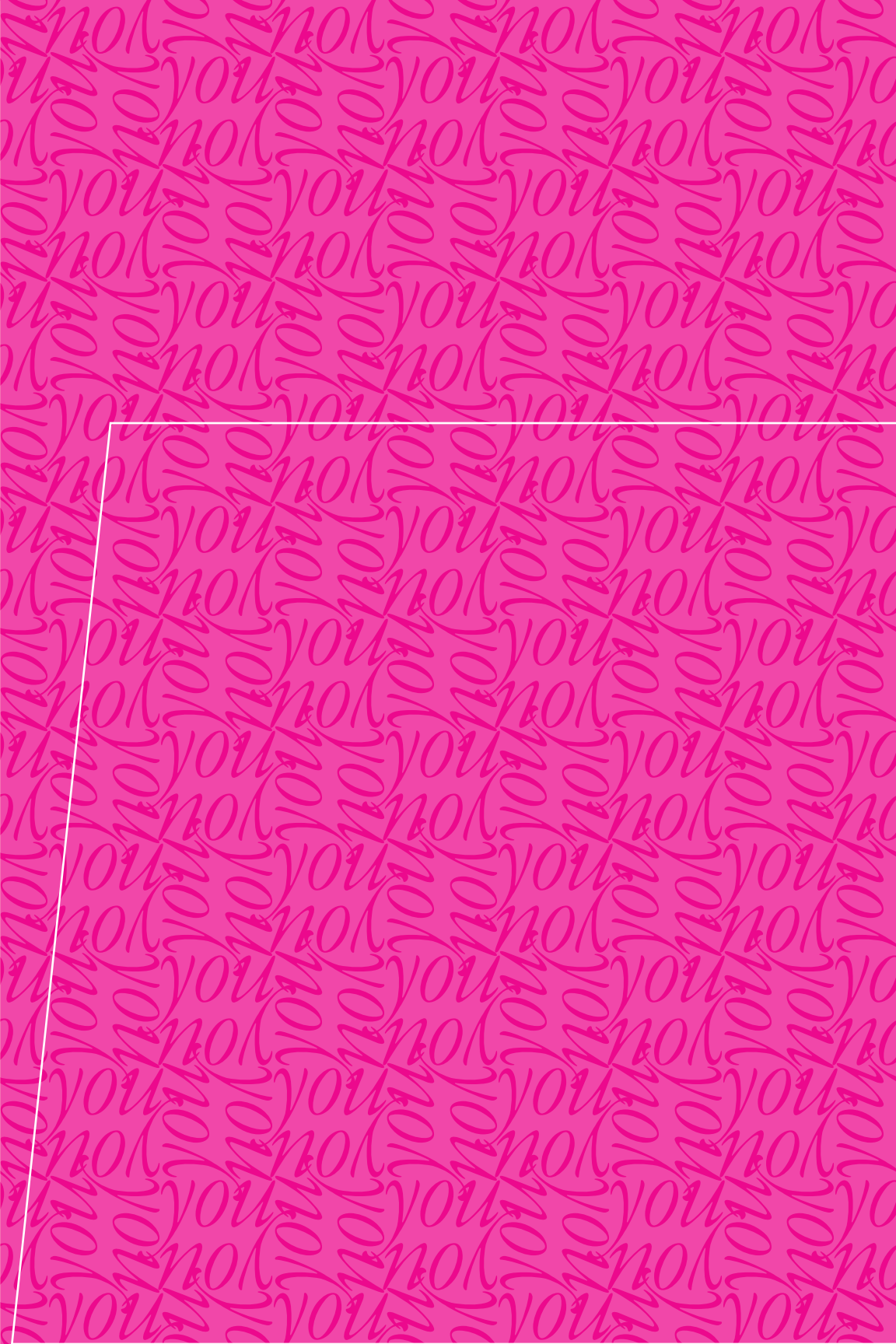
We are committed to raising money for the JOHN FETTING AWARD IN BREAST CANCER PREVENTION. Our gifts will help world-renowned physicians and scientists at Johns Hopkins build upon their past success and find new answers in the fight to stop breast cancer.

Please consider a gift to help us achieve our goal of raising \$x million. Together we can make a difference.

For more information, please contact:

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