

The Stanford Cancer Institute is a National Cancer Institute-designated Cancer Center



In conversation with philanthropist John Freidenrich

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Lynn Westphal, MD, studies cancer treatment and fertility

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Stanford Cancer Institute News

A PUBLICATION FOR PATIENTS AND FRIENDS OF THE STANFORD CANCER INSTITUTE



Science, technology and compassionate care support every cancer patient at Stanford.

WINTER 2013

Philanthropy Fuels Effort to Transform the Cancer Patient Experience Stanford Launches New Cancer Initiative

Stanford has begun a sweeping effort to change the way the world sees cancer. The *Stanford Cancer Initiative* is a joint project of the School of Medicine and Stanford Hospital & Clinics, and directed by the Stanford Cancer Institute (SCI), to invest at least \$250 million in philanthropic contributions across four critical areas:

- Creating a new standard of cancer care
- Targeting the toughest cancers
- Capturing the power of Stanford science
- Seizing the innovations of our age

The Initiative's launch is currently being propelled by a \$125 million gift from an anonymous group of generous and visionary donors. The School of Medicine is undertaking a campaign to raise the additional \$125 million in the coming years to fully realize the Initiative's goals. SCI's rapid and strategic growth has enabled it to

take on this extraordinary opportunity to create the world's leading cancer program.

Our goal is nothing short of changing both the prognosis and the patient experience of cancer.

— SCI Director Beverly Mitchell, MD

"The Stanford Cancer Initiative is the result of seamless cooperation across the University and the exceptional generosity of our community," said SCI Director Beverly Mitchell, MD. "Our goal is nothing short of changing both the prognosis and the patient experience of cancer."

Creating a New Standard of Cancer Care
The Initiative aims to design and implement an integrated set of concepts and practices to create a new cancer care model that is comprehensive, multidisciplinary, highly

coordinated and structured around the unique needs of each individual patient. Stanford aims to be a national model for efficient and effective cancer treatment by combining leading-edge technology with smart, compassionate care that both informs and empowers patients.

The model for transforming the patient experience begins with the initial contact, prompt appointment scheduling, engaging the patient and family in their care goals and decision-making, and assigning a Multidisciplinary Care Coordinator (MCC) to help lead the entire cancer care process for the patient.

"The Multidisciplinary Care Coordinators are designed to take on the complexity of coordinating the cancer care process and thus allow patients and their families to

See *CANCER INITIATIVE*, page 4



Message from the Director Transforming, and Clarifying, Cancer Treatment



During the last half century there has been dramatic progress in preventing, diagnosing and treating cancer. After years of adverse trends, the rate of people dying from cancer has begun a steady decline. Many cancers remain untreatable, but there are an increasing number of therapeutic options available for many patients.

While the new treatment options provide additional hope, the expanded therapeutic range can also create confusion. Patients are presented with options for chemotherapy, radiation therapy, surgery, targeted therapeutics, immunotherapeutics, anti-angiogenics, as well as a range of imaging and diagnostic options. These typically involve complex coordination among experts from several medical disciplines. Combined with the general complexity in the nation's 21st century health care system, navigating the cancer care process has become a daunting challenge—and one that seems to grow along with promising treatment options.

This issue of the *Stanford Cancer Institute News* describes a new initiative to meet this challenge. Thanks to a generous \$125 million gift from a group of anonymous donors, the SCI has undertaken a major effort to transform the patient experience by helping the cancer patient efficiently and confidently navigate the complex cancer care landscape. The elements of this strategy, which include near-term innovations and long-term research goals, are described in the lead story. The School of Medicine is also undertaking a major fundraising campaign to raise an additional \$125 million for the Stanford Cancer Initiative.

In addition to improving the cancer patient's interaction with the healthcare system, our story on Page 9 describes the new Cancer Genomics Program, which is a key element of the initiative. With new tools to probe the molecular characteristics of cancer, this program may direct physicians to treatment strategies that are not immediately obvious for every case, but are relevant for tumors with particular molecular characteristics. Such "genomic profiling" may also help physicians develop therapeutic strategies tailored to minimizing side effects in particular patients.

Years of steady basic scientific research have opened the potential for dramatic new approaches to cancer therapy. The Stanford Cancer Initiative will insure that those research insights are translated into new therapies, and that patients will be able to access these opportunities with greater knowledge, increased confidence and reduced anxiety.

Beverly S. Mitchell, MD
Director

The Stanford Cancer Institute

The Stanford Cancer Institute provides support and coordination for the range of cancer-related activities occurring at Stanford University, Stanford Hospital and Clinics, and the Lucille Packard Children's Hospital. Our 300-plus faculty members belong to more than 30 academic departments, and represent the array of disciplines involved with comprehensive cancer research and treatment.

The Institute is a National Cancer Institute-designated Cancer Center, with a scientific agenda combining laboratory research, clinical study and population science. The Institute also engages in patient care, community education, clinical trials, as well as support and training for the next generation of cancer physicians and researchers.

Simply put, all of our members and resources are focused on one goal: to reduce the occurrence and impact of cancer.

Stanford Cancer Institute News is a quarterly update for members, supporters and friends. On behalf of our members and staff, we thank you for your ongoing support and welcome your feedback and inquiries.

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In Profile

Oliver Dorigo, MD, PhD

New Faculty Member Working to Advance Ovarian Cancer Research and Treatment

Oliver Dorigo, MD, PhD, is associate professor of obstetrics and gynecology, and director of Gynecologic Oncology Service at the Stanford Medical Center and the Stanford Women's Cancer Center. Joining Stanford's rich tradition of physician-scientists, he is a gynecologic surgeon as well as a laboratory and clinical researcher, focused primarily on ovarian cancer.

Dorigo's interest in ovarian cancer began during medical training in his native Germany, when he assisted in treating a teenage girl—just a few years his junior—who had an aggressive ovarian tumor. Though the girl could not be saved, the experience helped propel Dorigo into a career studying the mechanisms of this difficult cancer and working to improve the diagnostic and therapeutic options available to women.

He received his medical degree from the University of Heidelberg and trained at the University of Munich. He then earned a grant from the German government to pursue gene therapy research at the Sidney-Kimmel Cancer Center in San Diego. He moved to the University of California, Los Angeles in 1995 to pursue clinical training in obstetrics, gynecology and gynecologic oncology. While there he also obtained a PhD in molecular biology. After seven years as a UCLA faculty member, he was recruited to Stanford.

"Stanford is a fabulous research environment for ovarian cancer, both in terms of basic and clinical science," said Dorigo. "There is a tremendous amount of energy here to make a difference in this highly lethal disease."

Dorigo refers to the ovary as "the most creative organ in the body," both for its essential reproductive functions and its complexity. Ovaries are comprised of many

different cell types, and each can develop multiple kinds of cancer.

Each year in the US approximately 22,000 women are diagnosed with ovarian cancer, making it only the eighth most prevalent women's cancer. However, it accounts for the fifth most deaths—about 14,000 per year—primarily due to tumors going undetected until they spread.

The survival rate is over 90 percent for women diagnosed when the cancer is still confined to the ovaries or fallopian tubes. Unfortunately, only a small percentage of cases are diagnosed this early, as the common symptoms tend to be neglected. Typical symptoms include discomfort in the lower gastrointestinal area, bloating, pain or changes in bowel function, all of which may be attributed to other conditions.

There is a blood test to measure a protein called CA 125, which occurs in higher concentrations in ovarian cancer. However, the test is not definitive and false-positives can be triggered by non-cancerous conditions such as uterine fibroids, endometriosis and congestive heart failure. Therefore, the CA 125 test is only one part of a potential diagnosis and is not used as a screening tool.

Other elevated proteins can be found in the blood of women with ovarian cancer, and Dorigo and others are studying whether these increased levels occur early enough in the cancer's development to make them an effective screening test.

A family history of ovarian, endometrial and breast cancer might put a woman at higher risk. As with some breast cancers, inherited mutations in the BRCA1 and BRCA2 genes are involved in about 12 percent of ovarian cancer cases. Women with the BRCA1 mutation have an approximately 45-55

percent lifetime risk of developing ovarian cancer. The risk is about 20-25 percent for BRCA2 mutation carriers.

Most women with ovarian cancer are initially treated with surgery, which can be a long, complicated procedure, particularly if the cancer has spread.

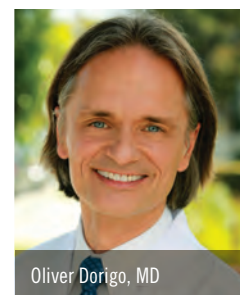
"I consider it a great privilege to be able to perform these surgeries," said Dorigo. "It is an honor to have patients trust in your skills."

Surgery is usually followed by chemotherapy, but the incidence of cancer recurrence remains high. Dorigo and others are testing chemotherapy combined with drugs that disable cells' internal DNA repair mechanisms to see if they make the chemotherapy more effective and reduce recurrence.

He is also developing a clinical trial in which patients' immune system cells—called T-cells—are extracted, genetically engineered to more effectively kill cancer cells and then infused back into the patients. Termed "adoptive T-cell transfer," the process has potential application to ovarian and other cancers.

"It is exciting because Stanford has the infrastructure, support and the desire to execute this type of innovative trial," said Dorigo, also noting a worldwide escalation in the number of clinical trials involving ovarian cancer.

"In the last ten years there has been much more interest in studying ovarian cancer," he said. "There is increased hope for better therapies and prognosis." ■



Oliver Dorigo, MD

Courtesy of Oliver Dorigo, MD



CANCER INITIATIVE, *continued from page 1*

focus on the healing” said Sridhar Seshadri, PhD, Vice President, Cancer Service Line.

In conjunction with the lead physician, the MCC functions as a “cancer companion” to advise, guide, support and advocate for the patient’s interests and desires throughout their cancer journey. If desired, a patient’s loved one is welcomed to the team, forming a cancer “care circle” of patient, doctor, family member and the specially trained Care Coordinator.

The goal is to transform the cancer patient experience from one where patients are often left on their own to navigate many complex logistical and care decisions, while trying to cope with a life turned upside down by a single word. Stanford’s vision will create an experience where patients feel empowered and supported by the professionals who guide them through their cancer treatment and participate in the important decisions with them, as expert partners. It will be an experience where research, technology, compassion and skill all come together so that every patient can be confident of the quality of their care and the expectation of the longest, highest quality life possible.

Some patients with particularly challenging cancers will receive genetic analysis to potentially increase their treatment options, and with permission, their samples will be anonymously stored to aid future research. Over time, it is possible that genetic profiling of individuals and their tumors will become standard treatment for cancer patients. *(See Page 9 to learn more about SCI’s new Cancer Genomics Program.)*

Genetic counseling and cancer clinical trial support will also be provided early in the care continuum, and innovative new information and collaboration technologies—such as remote monitoring, video chats and “e-Visits”—will streamline care while reducing travel time, inconvenience and expense.

And these innovations won’t stop with

cancer care. Stanford will take the lessons learned through the Cancer Initiative and apply them to other complex diseases requiring coordinated multidisciplinary care teams. Cancer is the model for a new era of comprehensive, data-driven and patient-centered care for a range of difficult conditions.

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**Changing the cancer patient
 experience requires that we radically
 improve outcomes.**

Stanford also recognizes that there is no more rapid way to improve the patient experience than to reach patients receiving inadequate treatment. SCI’s Community Partnership Program works with local healthcare providers and community organizations to reduce discrepancies in cancer care and outcomes among lower income and minority populations. Solutions involve raising awareness of available resources, increasing coordination with Stanford cancer physicians and boosting enrollment of underserved populations in cancer clinical trials.

Underpinning all of these efforts is the unwavering commitment to deliver complete and compassionate care for every cancer patient who enters the Stanford system. Ultimately, though, changing the cancer patient experience requires that we radically improve outcomes, survival rates and quality of life over the current treatment standards. To do so the Stanford Cancer Initiative will invest in the people, technology and systems that will spur innovative research and speed discoveries to patients.

Tackling the Toughest Cancers

Over the past 40 years, medical science—including that conducted at Stanford—has made great strides against some cancers, such as lymphoma, childhood leukemias and certain solid tumors. However, in an environment of limited resources,

numerous research ideas get left unexplored and many early discoveries are not fully developed due to lack of support. In no case is this more true than in the types of cancer that have proven very difficult to treat, and these are among the challenges the Stanford Cancer Initiative is intended to meet.

The Initiative seeks to change the prognosis for the most lethal cancers by identifying the best researchers and physicians anywhere in the world and recruiting them to join our talented cadre of investigators, and then provide an unparalleled environment for collaboration. With this pool of expertise and a targeted focus, we hope to convert the most deadly cancers into conditions that may be treated, managed and, very possibly, prevented.

The Power of Stanford Science

Working to improve cancer care is certainly not unique to Stanford, but the Initiative takes the things that make Stanford exceptional and applies them to every aspect of cancer research and treatment. For example, combining strengths in genomics and bioinformatics, Stanford’s multidisciplinary cancer care teams are beginning to base treatment plans on some patient’s genetic profile—and that of their tumor—to identify specific drug compounds or combinations that will be most effective for them. And the care doesn’t end when the treatment does; patients will receive long-term monitoring and follow-up that incorporates genetic predictors to minimize risk of their cancer recurring.

Immunotherapy—treatments that empower the body’s immune system to eradicate disease—is another Stanford strength, and a resurgent area of cancer research. Investigators are testing several promising approaches to boost patients’ immune response to cancer cells and provide more targeted, less toxic therapy than the current standard of care.

When discoveries are made, whether in immunotherapy, stem cell medicine or other promising fields, it is critical to test

them in patients as soon, and as safely, as possible. The new Freidenrich Center for Translation Research (FCTR) gives Stanford an edge by providing a centralized home for conducting and monitoring cancer clinical trials. The FCTR consolidates Stanford's many clinical trial specialists to enhance efficiency and promote synergy among investigators, research personnel, care providers and, most importantly, the patients they study and treat.

Seizing the Innovations of Our Age

To keep the FCTR buzzing and the clinical trials pipeline full, the Stanford Cancer Initiative is also investing in novel and impactful research, and the brilliant minds that conceive of it. In addition to supporting Stanford's many cancer research and treatment experts, new faculty

are actively being recruited to enrich the School of Medicine's tradition of discovery and innovation.

Leveraging the breadth and depth of its research enterprise, its partnerships with Silicon Valley and its propensity to explore across disciplinary lines, Stanford will also create faculty and graduate student awards to fuel advances—the high-risk, high-reward research ideas that can propel cancer care forward. And it will assemble flexible funds that allow SCI leadership to respond quickly to new opportunities as they arise. The payoffs promise to extend even beyond cancer.

In fact, the Initiative itself is designed to be adaptable to new research discoveries as well as responsive to a new level of

internal monitoring and analysis. The same evidence-based review and scientific rigor used in basic research will be applied to every aspect of this ambitious effort, and only those practices that are proven to deliver better outcomes for cancer patients will be continued. Stanford's people, processes and technologies will be assessed and refined with each patient encounter, and every patient should feel confident that they chose the right medical partner for their cancer diagnosis, treatment and follow-up.

The possibilities that lie ahead in cancer are profound. The Stanford Cancer Initiative puts Stanford at the forefront of realizing the best possible experience for cancer patients in the near term, and reducing the incidence of cancer in the years to come. ■

Can an Anti-depressant Treat Lung Cancer? Stanford Science Discovers Unlikely Therapy

“Capturing the power of Stanford science” is one of the Stanford Cancer Initiative's central pillars. Three SCI members recently demonstrated that power by combining genetics, bioinformatics and translational medicine to identify a new potential treatment for an aggressive form of lung cancer.

Associate professors of pediatrics, **Julien Sage, PhD**, and **Atul Butte, MD, PhD**, hunt for new cancer drugs using a computerized search tool developed in Butte's lab. The tool uses custom software to scan hundreds of thousands of gene-expression profiles (gathered by multiple researchers and stored in large databases) of different cell and tissue types searching for predetermined molecular interactions.

In this case they were looking for compounds that activate a “self-destruct”

mechanism within small-cell lung cancer cells. The match they found was a little-used drug approved by the US Food and Drug Administration (FDA) to treat depression.

Sage's lab tested the drug on lung cancer cells grown in a dish, then on tumors in rodents, and found it to be effective—even on cells resistant to chemotherapy. Since the drug was already FDA approved, the team moved quickly to test it in patients. SCI member and lung cancer expert Joel Neal, MD, PhD, an assistant professor of medicine, is now leading the clinical trial at Stanford.

“We are cutting down the decade or more and the \$1 billion it can typically take to translate a laboratory finding into a successful drug treatment to less than two years, spending about \$100,000,” said Butte.



Photo courtesy of Atul Butte, MD, PhD

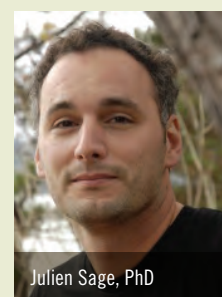


Photo courtesy of Julien Sage, PhD

Small-cell lung cancers account for approximately 15 percent of all lung cancers, but they are particularly deadly: the five-year survival rate is only about 5 percent, and no new therapies have been developed in 30 years. Hopefully, that is about to change through the power of Stanford science.

For information about the ongoing clinical trial, contact the Stanford Cancer Clinical Trials Office at 650.498.7061 or email ccto-office@stanford.edu. ■



In Conversation

John Freidenrich

In 2006 Jill and John Freidenrich made a \$25 million dollar investment in cancer research and clinical care at Stanford. Their generous donation was the catalyst for a major expansion of the Stanford Cancer Institute's capacity to conduct "translational medicine," the long and complicated process of turning basic research insights into new diagnostic and therapeutic options for patients.

The most visible result of that effort is the stunning Jill and John Freidenrich Center for Translational Research (FCTR), which opened in October 2012. The FCTR is a state-of-the-art facility expressly designed to help accelerate the development and testing of new and better cancer therapies, and helped make Stanford one of the premier cancer clinical trial centers in the nation.

With the major milestones of the gift having been reached, *SCI News* spoke with John Freidenrich about the motivation behind it, the results and his views on Stanford's approach to cancer research and patient care.

John received both his undergraduate and law degrees from Stanford and is a former chair of the University's board of trustees. He is also a longstanding member of the board of Stanford Hospital & Clinics, as well as the former chair of the board at Lucile Packard Children's Hospital.

Jill Freidenrich, who also received her undergraduate degree from Stanford, became an influential advocate after surviving breast cancer. She is the co-founder of Breast Cancer Connections, and an active member on the "Under One Umbrella" committee, which raises funds for Stanford Women's Cancer Center. She also serves on the Stanford Cancer Council, a community advisory group supporting the SCI.

You made a significant philanthropic gift to cancer research at Stanford. Why cancer? Why Stanford?

Jill has had breast cancer twice, and it was very serious. It's something that only someone who has gone through that experience with a spouse or child can understand. She received excellent treatment at Stanford, and naturally that increased our connection to the doctors, nurses and everyone in the Medical Center.

We've had a long relationship with the University, particularly the School of Medicine, and have a very high regard for Stanford's cancer care. We were interested by the opportunity to help Stanford build a world-class program in cancer translational medicine that would serve patients even better.

I think there is no better place to be investing one's efforts, dollars and commitment than Stanford Medicine.

— John Freidenrich

How did the opportunity come about?

It grew out of a School of Medicine retreat on translational medicine—the hard work of transitioning laboratory discoveries into actual treatments for patients. There were faculty presentations and energized discussions about the importance of translational research and how Stanford could become one of the leaders in the country. While driving back from the retreat with former Dean Phil Pizzo, I remarked that it was a great meeting, but without any follow-through it would just be a waste of time. The next thing I knew he was talking to me about the importance of a dedicated translational medicine facility (laughs).

What convinced you that creating the Freidenrich Center for Translational

Medicine was the right philanthropic investment?

A number of things. Part of it was the critical need to bring people together in one physical place. The School of Medicine had grown so much—both its research and clinical affairs activities—that people who were supposed to work together were scattered all over campus, and even off campus. The translational medicine program needed its staff to be located together in order to have an efficient operation. This was critical to creating a new paradigm where they could do translational work and support clinical trials to advance research and deliver better care to patients, all at one location.

But our investment supported more than just a building. It also helped with recruiting talented new faculty members and providing for a more robust research effort. It's the combination of things that was the key—the facility, the people and the support for new research.

Have you achieved the goals you set when you made the gift?

Not yet. We have completed a fabulous building and we have wonderful people working there, but that is just the beginning. It's like planting a seed and now we look forward to the tree growing and bearing fruit. We are hopeful that the work being done in that facility—both the research and the clinical care—will change the lives of cancer patients for many years to come.

SCI Director Beverly Mitchell, MD, has stated that your gift was vital to the Cancer Institute's growth and maturation, and laid the foundation for the current \$250 million Stanford Cancer Initiative to transform the cancer patient experience. How do you feel about that?

The goal was to help the cancer program grow and expand, and clearly Dr. Mitchell and the other cancer leaders have done a

JILL & JOHN FREIDENRICH CENTER FOR TRANSLATIONAL RESEARCH



Jill and John Freidenrich at the dedication of the three-story 30,000-square-foot facility.

Photo by Steve Castillo

terrific job of that. I see our contribution as one piece in the puzzle of comprehensive cancer care. Basic research is an important piece, as is providing excellent patient care and undertaking prevention efforts to reduce the incidence of cancer. We are hopeful that the translational medicine program will be another piece that helps speed new and more effective treatments to the patients who need them.

What do you feel is unique about Stanford's approach to cancer research and patient care?

I certainly don't claim to know everything about Stanford's cancer program, but I am impressed with the talent, dedication and compassion of their people. I can also say that these integrated facilities, like the translational medicine center and the Stanford Women's Cancer Center that we

are also involved with, are truly making a difference for patients. We know that cancer is a complex and difficult disease, and Stanford is bringing together all the different specialists and technologies to deliver complete and individualized care.

You and your wife have given much to Stanford's cancer programs. What have you gotten back?

We have received a lot back. We are encouraged about the progress that is being made against cancer—but of course we would like to see it go faster. We've also developed great relationships with many people in the Medical Center as well as in the community. For example, Jill has been very involved with Breast Cancer Connections in Palo Alto, a wonderful group of professionals and volunteers who don't provide medical care, but are there to support, advise and help women who are dealing with breast cancer. We get a lot of satisfaction out of working on these various cancer-related projects. We believe they are worthwhile and are proud to help in whatever ways we can.

What is your advice for others considering philanthropic giving during this unique time as we create a new model for cancer care at Stanford?

I would say—and I do say—that I think there is no better place to be investing one's efforts, dollars and commitment than Stanford medicine. I can say, without reservation, that I have never had any concerns that what we were supporting was not being done both well and conscientiously. There is a huge amount of personal gratification in being related to these kinds of activities that achieve such impressive results. I am confident that people who become involved will feel a great sense of satisfaction. ■



A Disappointing Side Effect of Surviving Cancer

Stanford Researchers Study Impact of Cancer Treatment on Fertility

The physical and emotional after-effects of cancer treatment—things like fatigue, pain and depression—have been well documented. And because some treatments cause havoc on parts of the body's reproductive system, younger patients often must also contend with fertility issues.

about infertility and survivorship—and what we still need to study further. Among the information shared about patients' reproductive health and the health of their offspring:

- Since it varies with type of treatment and patient age, among other things, there is no accurate estimate of women's risk of infertility or primary ovarian insufficiency after cancer treatment. But, the researchers write, studies have shown the incidence of acute ovarian failure or premature menopause among childhood cancer survivors varies from 6 to 12 percent.

- In the landmark Childhood Cancer Survivor Study, exposure of the ovaries to radiation was shown to be one of the highest risks for acute ovarian failure and premature menopause in women.

Discussion of the changes
to a patient's reproductive health
after cancer treatment is essential
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quality care.

- In several studies comparing pregnancies in cancer survivors with those in the general population, "the vast majority of pregnancies occurring in cancer survivors are routine and uneventful." But patients who have undergone abdominal or pelvic radiotherapy are known to face a higher risk of preterm birth, low birth-weight offspring, stillbirth and early neonatal death.

- Testicular and hematologic malignancies are the most common cancers that

are associated with impaired sperm production in men.

- Recent estimates suggest that up to two-thirds of all pediatric cancer survivors will face male germ cell dysfunction.

- For most cancer survivors, there is no increase in cancer or birth defects in their children. One study comparing more than 2,100 offspring of cancer survivors with more than 4,500 offspring of controls in the United States found no difference in birth defects between the two groups.

The authors discuss specific types of fertility preservation, including egg and embryo freezing, and note that techniques to help survivors have children have improved over the past decade. Yet, they write, only "a subset of oncologists discuss the gonadotoxic effects of cancer treatments with patients of reproductive age, and even fewer refer them for fertility preservation consultations."

In light of research showing that treatment-related infertility is significantly associated with depressive symptoms among survivors, Westphal and her colleagues encourage clinicians to address these issues—and the options—with their patients.

"Discussion of the changes to a patient's reproductive health after cancer treatment is essential to providing comprehensive quality care," they conclude. ■

By Michelle Brandt, Associate Director of Media Relations and manager of the Stanford School of Medicine blog Scope, where this article first appeared.

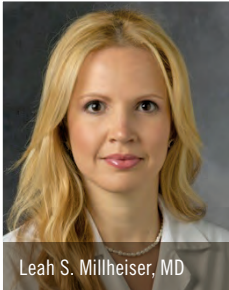
In a paper recently published online in *CA: A Cancer Journal for Clinicians*, a group of Stanford researchers review the existing literature on fertility and cancer survivorship. The topic, they explain, is an increasingly important one, given that around nine percent of patients diagnosed with cancer in the United States are younger than 45 years old and that infertility has been shown to negatively impact quality of life among cancer survivors. They write:

"The distress resulting from the interruption of fulfilling one's reproductive goals as a result of a cancer diagnosis and treatment persists several years after the diagnosis, particularly for those who never conceive."

The goal of the review, which was led by SCI member **Lynn Westphal, MD**, associate professor of obstetrics and gynecology, was to aid in pre- and post-treatment fertility counseling for patients. In their lengthy article, Westphal and her colleagues, including SCI member **Leah S. Millheiser, MD**, assistant professor of obstetrics and gynecology, summarize what is known



Lynn Westphal, MD



Leah S. Millheiser, MD

Genetic Analysis Helps Treat Resistant Tumors

Cancer Genomics Program Looks Beyond Standard Care

Imagine that you are a cancer patient. You have been diagnosed with colon cancer, which unfortunately has metastasized, or spread outside the colon. The arsenal of standard treatments—surgery, chemotherapy, radiation and drugs—hasn't worked. The prognosis worsens with each failed therapy and hope dwindles.

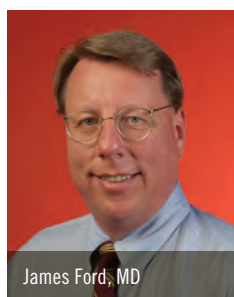


Photo courtesy of James Ford, MD

With few remaining options, your Stanford cancer care team biopsies the tumor and sequences its DNA in search of clues into what drives your resistant cancer. The analysis turns up something un-

expected: a type of mutation called an “amplification” of the HER2 gene, a defect most commonly associated with certain types of breast cancer. You are informed that there are powerful drugs, known as monoclonal antibodies, specifically targeting HER2 mutations. You receive the treatment, your cancer recedes and your future returns.

Though dramatic, this account is not fictional. HER2 mutations do occur in a small number of colon cancer patients, and some of those have been identified and successfully treated at Stanford. And this is but one example of hundreds of different gene mutations that may be found in individual tumors and for which targeted drugs exist or are in development.

“You would never think to give this breast cancer drug to a colon cancer patient, and for 99 out of 100 patients it would be ineffective, but for a few select patients it works,” said SCI member **James Ford, MD**, professor of oncology and genetics, and head of SCI's new Cancer Genomics Program.

These cases are rare, but to Ford and his colleagues they demonstrate the possibility of a potential new era of personalized cancer treatment: one in which therapies are prescribed based on the genetic characteristics of a patient's cancer, rather than merely its location in the body. Research shows that some of the same genetic mutations appear in a small percentage of tumors found in different locations—such as the breast and colon—and drugs targeting those mutations may be effective against cancer in either site.

“We are trying to better subdivide cancer types and individualize the treatment of them based on their particular genetic profiles,” said Ford.

Doing so requires advanced gene sequencing and computing technology to analyze the vast amounts of genetic data, and a multidisciplinary team of experts in pathology, genetics, bioinformatics, oncology and drug interactions to decipher it. Members of the Cancer Genomics Program function as a “molecular tumor board,” meeting together each week to interpret the genetic analyses of patients' cancers and outline individualized treatment plans.

Many challenges remain, though. Tumors can be highly complex, with differences in their genetic make-up within a single cancer site and among metastases. Some may have multiple genetic targets, and clinicians are only beginning to understand how to safely and effectively combine drug therapies. And drug resistance to the new agents may arise. However, keeping track of patients' responses to this new approach will enhance our understanding and hopefully improve our cancer care.

Therefore, Stanford's program is structured to facilitate both clinical care and research. Every patient reviewed by the tumor board receives an individualized assessment and treatment, then all their genetic data, clinical information and outcomes are de-identified, catalogued, combined with data from other cancer centers conducting similar procedures and made available for study.

Ford emphasized that the program serves both patients and clinical investigators. Treating physicians get access to the team's expertise and technology, and patients are given the possibility of a “rescue” treatment for their difficult cancer. This approach is still experimental, and more research is needed to determine how often it can be an effective strategy for patients. The hope is that it will become a common practice done concurrently with standard treatments in order to identify less obvious therapies.

The initial focus is on cancers of the breast, lung and gastrointestinal system, due to the relatively high frequency of known mutations in these sites, as well as the expertise of the program leaders. **George Sledge, MD**, chief of the division of oncology, leads the clinical breast cancer group, assistant professor of oncology **Joel Neal, MD, PhD**, leads the lung cancer group, and Ford heads the gastrointestinal group. Other key members include professor and chair of the genetics department, **Michael Snyder, PhD**, and professor of pathology **James Zehnder, MD**.

The Cancer Genetics Program has received leadership and support from SCI Director Beverly Mitchell, MD, President and CEO of Stanford Hospital & Clinics, Dan Amir Rubin and Christopher Dawes, CEO of Lucile Packard Children's Hospital. ■



New Workshop Helps Oncology Physicians Improve Communication Skills Teaching Doctors to Deliver Bad News

One of the hardest parts of a doctor's job—delivering bad news to patients and their loved ones—is rarely addressed in medical school.



Photo courtesy of Jonathan Berek, MD

Now, a new workshop offers Stanford medical trainees valuable communication instruction to help them handle challenging oncology and end-of-life discussions with clarity and compassion. They even

get to practice difficult conversations with real people: trained actors who portray cancer patients and their family members, and provide a range of real-world responses.

The School of Medicine launched the Karen K. Anderegge Communication Workshop series in late August to improve the communication skills of physicians. The first of the anticipated series of training sessions was a two-and-a-half-day program called “Challenging Conversations in Oncology.” It was designed to help cancer clinicians of all specialties learn to communicate more effectively with their patients.

Facilitators with expertise in both cancer and communications led a series of talks and small group exercises in which the trainees interacted with the simulated patients and families. The sessions served to enhance participants' awareness of ways to build a rapport and establish trust with patients and families, and develop individualized strategies for delivering the difficult news to them.

“The importance of these programs in physician-patient communications cannot be overemphasized,” said SCI member **Jonathan Berek, MD**, director of the Stanford Women's Cancer Center and professor and chair of obstetrics and gynecology, who organized the first workshop. “The skills required to deal with complex interactions with patients facing

life-threatening illnesses can be taught and refined, and this workshop was designed to substantially enhance the finesse with which our oncology fellows-in-training deal with these complicated issues in a compassionate and positive manner.”

.....
**“The importance of these programs
 in physician-patient communications
 cannot be overemphasized.”**

— Jonathan Berek, MD

Twelve oncology fellows, representing medical, gynecologic, pediatric, radiation and surgical oncology, as well as palliative care medicine, participated in the intensive sessions. The participants' goal was to improve their ability to conduct “serious conversations” in oncology, including “breaking bad news” about diagnosis, disease prognosis and relapse, end-of-life care and referral to hospice. They learned coping and adaptive mechanisms to tailor information to patients' needs, as well as counseling strategies to become more comfortable with emotion in patients and themselves. Instruction on cultural awareness and sensitivity also was included, as was strategies for preserving their emotional well being in the face of cancer patient deaths.

“I learned that taking time to stop and let patients express their feelings helps in fostering a more meaningful relationship

and may aid in their care,” one participant wrote in a post-workshop evaluation.

“I will take time to let them cry or be silent,” another wrote.

Berek, who is also the Laurie Kraus Lacob Professor, and the other faculty instructors hope the lessons learned are practice-changing for the trainees and will help improve the experience of each cancer patient with whom the participants interact in the future.

Other faculty who taught at the workshop included SCI member **David Spiegel, MD**, the Jack, Lulu, and Sam Willson Professor in Medicine and professor and associate chair of psychiatry and behavioral sciences; SCI member **Kavitha Ramchandran, MD**, medical director of the Stanford Supportive Oncology (Palliative Care) Program and clinical assistant professor of medicine; and Lidia Schapira, MD, an associate professor of medicine at Harvard Medical School.

The course was supported by the Karen K. Anderegge and William D. Rutherford Fund for Cancer End-of-Life Care, the Stanford Cancer Institute, the Stanford Women's Cancer Center and Stanford Hospital & Clinics.

Berek plans to repeat the oncology workshop each year and is exploring other types of sessions in patient-communication training for doctors, including for those who work in intensive care units. ■



Workshop participants learned coping and adaptive mechanisms to tailor information to patients' needs.

Dear Friends...

A Message from a Stanford Cancer Council Member

Cancer: A Word We Have All Heard, But None of Us Wishes to Experience Personally

Yet the reality is that cancer touches every one of us in some way, at one time or another. No family seems to escape its reach. But what if we could turn cancer from a life threatening illness to a preventable, manageable and survivable disease?



Chris Bowers (right) with his wife Anitra and son Matthew.

Photo courtesy of the Bowers family.

That is what we aim to achieve at Stanford, and led by a visionary gift of \$125 million from a group of anonymous donors, we believe we have the opportunity to do it. Working with the Institute's Director Beverly Mitchell, MD, its leadership and its faculty, we have launched the Stanford Cancer Initiative to transform fundamentally not only the prognosis, but also the experience of suffering from cancer. By providing new tools—and new resolve—for the fight, this initiative will create a higher standard of personalized and precise cancer care for the whole world to follow.

This thoughtful and integrated effort will completely reform the patient experience. It will target the toughest cancers and capture the unique capacity of Stanford science. And it will translate the latest innovations to real-time treatments for

patients. It will help your loved ones to survive the diagnosis of cancer.

But we need your help with this unprecedented opportunity.

New hope and new therapies rely on research. To realize fully the goals of this initiative in transforming patient care, we aim to raise an additional \$125 million from community members. Every investment, regardless of the amount, moves us closer to the day when cancer is more preventable, manageable and survivable. This is an ambitious undertaking, but it will be possible if we do the lifting together.

We ask that you join us.

Gratefully,

Chris Bowers
Cancer Survivor
Member, Stanford Cancer Council

Campaign
for
Stanford
Medicine



You = Hope

Every Gift Has an Impact

Support of the Stanford Cancer Institute will change the prognosis for many of the most difficult-to-treat cancers. Together, we will turn terminal diagnoses into survivable episodes and give new hope to those who need it most.

We will gather the best researchers and physicians working on some of the deadliest cancers and provide them with the support they need to pursue their most promising ideas.


The Cancer Discovery Fund supports Stanford's physician-scientists and their groundbreaking research by providing vital resources at the initial stages of their projects, and includes:

- Advancing innovative research ideas
- Accelerating early-stage drug development
- Training future cancer researchers
- Extending outstanding cancer research and care to communities in need

Fighting the toughest cancers requires an ambitious investment in talent, and gifts of all sizes are welcome.

For more information or to make a gift to the Cancer Discovery Fund, please visit cancerdiscoveryfund.stanford.edu or contact Maria Burns, director of annual giving, 650.562.3400 or via email, maria.burns@stanford.edu.


We are all part of the equation. ■



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2013 Canary Challenge Breaks Records for Riders and Funds

On Saturday, September 28 over 800 cyclists took part in the third annual Canary Challenge cycling event, raising more than \$800,000 for the Stanford Cancer Institute and the Canary Center at Stanford for Cancer Early Detection. This is the largest total raised to date, and the SCI wishes to thank everyone who participated!

The riders, representing a 60 percent increase over 2012, were supported by 120 volunteers, plenty of food and beverages, on-road repair service, volunteer medical professionals and even massage therapists for a post-ride rub down. A 5-K run/walk course was added this year, giving non-cyclists a chance to participate and

contribute. And the festive “vender village” featured something for everyone, including

food trucks, games and music to enjoy along with the spectacular weather.



Members of the Vanderkitten female professional cycling team, one of 79 teams in the 2013 Canary Challenge.

Photo courtesy of Canary Foundation.

Registration is now open for next year’s Canary Challenge, to be held Saturday, September 27, 2014.



Organizers are looking forward to the biggest and best event yet, with training rides, instruction and other fun activities scheduled during the year.

Register and find more information—including photos from this year’s event—at canarychallenge.com. ■