Cracking the Cancer Code
A DRAMATIC IMPACT ON PATIENTS

WHAT’S INSIDE

The Power of POG: Turning Cancer into a Chronic Disease
Leslie Laforest says POG, “has given me life.”

The Future of Prostate Cancer Cures Starts Here: A new made in B.C. drug, targeted therapies and a genomic approach to prognostics

A Life-saving Test for Follicular Lymphoma: New prognostic test means patients less likely to encounter treatment failure
Celebrating a Decade of Cancer Discovery in B.C.

This year, the BC Cancer Agency Research Centre celebrated a decade of discovery from its lab, rising from the basement of an old bakery to a state-of-the-art research facility. The Research Centre has become a global powerhouse in scientific discovery. Within the Research Centre, experts have redefined cancer from a biological standpoint—how it develops, evades treatment, and how it can be treated at the genetic level. This significant progress is ensuring more patients are cured of their disease today and more cures will be a reality in the decades to come.

The past ten years have seen the expansion of people, programs and technology at the Research Centre, which has catapulted the facility onto a global scale. BC Cancer Foundation donors have been instrumental in bringing the world-class research hub to life, while philanthropy also supported the development of early detection tools critical in reducing the burden of cancer on British Columbians.

“The work conducted through the Research Centre is proof of the importance of cancer survivors, who are committed to finding innovations that have changed the way we look at cancer,” said Health Minister Terry Lake. “I’ve experienced the significance of cancer survivorship as husband to my lovely wife, Leslie, who has been afforded new hope and quality of life.”

In this special feature from the BC Cancer Foundation, you’ll read about game-changing research initiatives currently underway at the BC Cancer Agency. Thanks to 100,000 donors across the province, these critical advancements are giving researchers the power to turn cancer into a manageable disease in our lifetime.

A DECADE OF DISCOVERY: To learn more, visit us online at bccancerfoundation.com/discovery

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Dr. Stuart Peacock, a world-renowned health economist, was chosen by the BC Cancer Agency to lead the Chair. Dr. Peacock’s commitment is to improve the experience of cancer survivors and their families, and to lead health lives post-treatment.

“Dr. Peacock is excited and humbled to have the opportunity to lead the new cancer survivorship research to foster innovative, world-class research to improve the well-being of cancer survivors and their families,” says Dr. Peacock.

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Improving Survivorship for British Columbians

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The B.C. Effect: Changing the Global Landscape in Breast Cancer

Dr. Karen Gelmon tells the story of Leslie Laforest, a breast cancer patient in British Columbia whose diagnosis and treatment were transformed by the Personalized Onco-Genomics (POG) Program. Leslie was diagnosed with triple-negative breast cancer, one of the most aggressive and lethal forms of the disease. Her cancer was sequenced to identify the specific genomic features driving her disease and matched to a targeted therapy, creating a personalized treatment plan.

“This bottom line is, we want to cure more women.” —Dr. Gelmon

The BC Cancer Foundation's 2015 Hope Couture raised $460,000 for the Breast Cancer Research Initiative to support the purchase of:

• Next-Generation PET/CT Scanner to provide the highest quality imaging available to track patient tumours as the disease changes over time.
• Cutting-Edge, Automated Microscope System to match millions of disease changes over time;
• Next-Generation PET/CT Scanner to provide the highest quality imaging available to track patient tumours as the disease changes over time.

These three pieces of equipment will fast-track the studies of Dr. Aparicio and his team to lead to better therapies for breast cancer patients in B.C. and around the world.

The BC Cancer Foundation donates power POG through their generous donations.
The Future of Prostate Cancer Care

Dr. Kim Chi

I expect that in the next 15 years, we will continue to see more patients cured or their cancers turned into a chronic, manageable disease.

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BC Cancer Agency Researchers Develop New Prognostic Test for Follicular Lymphoma

BC Cancer Agency researchers have developed a prognostic test for a common subtype of lymphoid cancer, follicular lymphoma. Their important findings were released in The Lancet Oncology in August.

The two-year study saw BC Cancer Agency researchers collaborate with scientists at the University Hospital of the Ludwig-Maximilians-University Munich and the Dana Farber Cancer Institute in Boston. Together, they developed a new test, known as “m7-FLIPI,” and based on comprehensive genetic information which could reveal predictive markers to help oncologists determine which patients will respond to a specific treatment.

The initial exploratory research into ct-DNA was funded by the BC Cancer Foundation. This year, Dr. Chi and his team have been able to leverage that seed funding into more than $3 million in grants and contracts to expand their work.

With so much progress taking place, Dr. Chi is able to see the big picture when it comes to prostate cancer research. “I expect that in the next 15 years, we will continue to see more patients cured or their cancers turned into a chronic, manageable disease,” he said.

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A significant discovery made by scientists at the BC Cancer Agency has brought new hope for the treatment of high-risk childhood sarcomas. Sarcomas are cancerous tumors of the connective tissues—including bones and muscles—that are more common in children and can be extremely difficult to treat because they have a high tendency to spread. Up until now, there has been very little known about how sarcoma cells spread to other organs. To better understand this process, BC Cancer Agency’s Dr. Paul Sorensen and his team studied a previously unrecognized pathway involving two proteins, YB-1 and HIF1α. The researchers found that YB-1 can directly stimulate the production of HIF1α when large tumors outgrow their blood supply and become oxygen deficient. It allows oxygen deficient tumor cells to adapt to the stresses of low oxygen (called hypoxia), making these adapted tumor cells more resistant to treatment. “Dr. Sorensen’s landmark study provides real hope that dramatic improvements in the treatment of childhood sarcomas are around the corner. This is a testament to the power of a childhood cancer diagnosis in the future,” said Erik Dierks, Vice President of Development at the BC Cancer Foundation.

The research also showed that when YB-1 drives HIF1α production, sarcoma cells become much more invasive and metastatic. When the process is blocked, it dramatically inhibits the spread of childhood sarcoma cells to the lungs. “As a parent of a child who died of Rhabdomyosarcoma, it is really important to know that the work of Dr. Paul Sorensen and Team Finn is helping to change that story for other Finns’, and families around the world,” said Patrick Sullivan, who formed the Ride to Conquer Cancer team to honour his late-son and raise funds in support of life-saving childhood cancer research.

The Robert L. Conconi Foundation inspired the public to support immunotherapy clinical trials and together $2 million was raised!

The BC Cancer Foundation and Robert L. Conconi Foundation partnered for an exciting opportunity that matched donations totaling an incredible $2 million in support of an innovative new cancer treatment for BC patients. Immunotherapy is an approach to cancer treatment that enhances the body’s natural potential to eliminate cancer in much the same way it wards off the common cold or flu. After a decade of research at the Dasilva Research Centre, under the leadership of Dr. Brad Nelson, the BC Cancer Agency is now ready to launch an immunotherapy clinical trials program in BC. After successful cancer treatment years ago, Robert Conconi believes he owes his life to cancer research and the hard-working scientists and clinicians at the BC Cancer Agency. His eldest son Alex was immediately drawn to the promise of harnessing the potential of a patient’s immune system to eliminate every remaining cancer cell. Together, they decided to support upcoming immunotherapy clinical trials with a $1 million matching gift, in the hope that other British Columbians would join them.

Clinical trials will launch in 2017 with a specific form of immunotherapy, Adoptive T cell Therapy. Patients facing advanced-stage cancer will be the first to enroll. The goal is to collect, activate and expand the patients’ own tumour-reactive T cells and infuse massive quantities of them back into the bloodstream. Adoptive T cell Therapy will identify every remaining cancer cell in the patient’s body and launch an attack on the cells to destroy them. Once the therapy is complete, the patients’ T cells will recognize the cancer and mount an automatic response if the cancer attempts to return.

You can help launch immunotherapy clinical trials for a number of cancers by making a gift today online at our website: bccancerfoundation.com/blog

FOLLOW ALONG: The October blog series features the entire Immunotherapy Lab team! bccancerfoundation.com/blog

Over the last seven years, the Ride to Conquer Cancer has raised $10 million to support innovative research breakthroughs—like those in childhood cancer—among others, including:

• the creation of new light-based devices aiming to detect oral, cervical, skin, colorectal and lung cancers earlier;
• the development of an “oncopanel” to test for genetic markers that may indicate the best treatments for metastatic colorectal cancer patients;
• the decoding of the genetic make-up of triple negative breast cancer to prove that it is not one uniform subtype, but a complex mixture of cells.

Clinical Trials Set to Launch, thanks to B.C.’s Conconi Family
Help for Those at Risk of Deadly Hereditary Stomach Cancer

PanGen Ushers in a New Approach to Treating Pancreatic Cancer

Hereditary diffuse gastric cancer is a rare condition that can result in aggressive, early-onset cancers of the stomach and breast across several generations of a family. Motivated by her own family’s cancer experience, Samantha Hansford sought help for those at risk of deadly hereditary stomach cancer.

Researchers at the BC Cancer Agency and University of British Columbia, joined the Agency after being inspired by the life-saving impact the genetics research team had on her family. BC Cancer Agency pathologist Dr. David Huntsman and his team discovered the cause of the gastric cancers that had claimed the lives of many in Hansford’s family and developed a genetic test to determine who was at risk of developing the disease. This test enabled family members who carry a CDH1 mutation to undergo a surgical prevention strategy, which saved the lives of Hansford’s mother, grandmother, and uncle.

“BC Cancer Foundation funding was critical in enabling our research to continue on a path that will have life-saving impacts for families around the world who are affected by this cancer susceptibility gene,” says Dr. Huntsman.

The risk-analysis study will help to inform whether or not preventative surgery is a life-saving option for those carrying mutations within the CDH1 gene.
PET/CT has led to 80 per cent of lymphoid cancer patients being spared radiation therapy

**Made-in-B.C. Prostate Cancer Drug About to Enter the Clinic**

Eleven years ago Harold Mahood proposed an idea to his Country Meadows Senior Men’s Golf Club that their annual tournament support prostate cancer research.

Over 3,000 men will be diagnosed with prostate cancer each year in B.C.—a fact that motivated Mahood and his friends to improve the odds for men impacted by the disease.

The Country Meadows Senior Men’s Golf Tournament has since raised over $1 million to support the work of BC Cancer Agency Distinguished Scientist Dr. Marianne Sadar. She has discovered a method of targeting advanced prostate cancers by blocking the cells’ ability to grow.

When Mahood passed away his wisdom and foresight ensured the continued success of the projects that meant so much during his lifetime. Through a legacy gift his estate has further supported Dr. Sadar’s work as she and colleagues screened thousands of compounds derived from sea sponges to identify a select few with the most potential in controlling prostate tumour growth.

On average, 20 per cent of patients with prostate cancer have recurrence, and to date patients have had no other successful treatment options.

After several years of pre-clinical research, one drug, named EPI-506, was identified as the best candidate for clinical studies, set to get underway this year in a Phase I trial at the BC Cancer Agency Vancouer Centre.

The long-term partnership between the Country Meadows Senior Men’s Golf Tournament, the BC Cancer Foundation, and Dr. Sadar’s lab has enabled the development of a new treatment that will soon offer hope to men who have failed current hormone therapies.

**Dr. François Bénard**

"Over the 10 year history of our program more than 35,000 patients have benefited from PET/CT scans."

"In 2005, the BC Cancer Agency installed its first PET/CT scanner, which has been through a cancer diagnosis recently, PET/CT would sound as routine as blood work. Yet, this critical tool is just over 10 years old. For most who have been through a cancer diagnosis recently, PET/CT has meant improved staging, determining whether or not a cancer is localized or has spread, and with these precise results oncologists can plan more personalized treatment regimens. Thanks to the higher sensitivity, resolution and detail of PET/CT imaging, Dr. Bénard says that thousands of patients have been spared unnecessary radiation therapy. While PET/CT has become standard of care, it’s a rapidly evolving program that has advanced with the support of BC Cancer Foundation donors whose contributions have a life-saving impact on patient care.”

**RESEARCH IS OUR FOUNDATION**

**DID YOU KNOW?**

Dr. Bénard and collaborators helped solve a global shortage in medical isotopes with an effective new production method in the BC Cancer Agency’s cyclotron.

**Dr. François Bénard**

”Our team is developing targeted compounds designed to seek out cancer cells within the body and make a patient’s cancer glow on a PET scan. “Our team a developing molecules that will be injected into patients and hone in on cancer cells so we can detect them,” says Dr. Bénard. While diverse in exploring ways to improve detection for all cancers, the FC1 program specializes in developing radiotracers for breast and prostate cancer—combined, the diseases impact over 6,500 new patients per year in B.C. One of the radiotracers Dr. Bénard’s team has designed will be able to detect prostate cancers at an early stage and help figure out when the cancer comes back and where it is coming back, he says. Overall, PET/CT has meant improved staging, determining whether or not a cancer is localized or has spread, and with these precise results oncologists can plan more personalized treatment regimens. Thanks to the higher sensitivity, resolution and detail of PET/CT imaging, Dr. Bénard says that thousands of patients have been spared unnecessary radiation therapy. While PET/CT has become standard of care, it’s a rapidly evolving program that has advanced with the support of BC Cancer Foundation donors whose contributions have a life-saving impact on patient care.”

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Clinical Trials a Pinnacle of Excellence in Cancer Care

Across the BC Cancer Agency’s six centres, clinical trials are an integral part of the spectrum of care. International data shows that active clinical trials programs improve patient survival outcomes and quality of care.

Dr. Bernie Eigl is provincial medical director of clinical trials at the BC Cancer Agency. In his daily practice treating patients, he says clinical trials are an ongoing effort to improve on the best standards of care, especially for those with metastatic cancer when first line therapies are no longer working.

Dr. Eigl believes that clinical trial patients are heroes. Every day patients make an informed choice to enroll in clinical trials. While the hope is that they benefit, Dr. Eigl says that most take part for altruistic reasons, knowing their participation will help others if better therapies are discovered.

For Edward London, a patient of Dr. Eigl’s, clinical trials has meant hope for his own future. After early success with standard chemotherapy and surgery he was facing an aggressive recurrence of bladder cancer. Edward was a candidate for a Phase II clinical trial with an immunotherapy drug known as a check-point inhibitor. Similar drugs have shown incredible success treating cancers such as advanced melanoma. Prior to the trial Edward says, “I could tell I was dying,” yet just months later he could physically feel his tumour disappearing. “Entering this trial was the greatest thing that’s happened in my life. I took a complete 180 turn,” says Edward. He’s back to cycling, mowing the lawn and even travelled to Europe this summer, activities he never thought possible two years ago.

Of Edward’s success, Dr. Eigl said, “This is why we do clinical trials. The most exciting laboratory studies will never help a single person if we don’t prove them in trials.” With funding support from the BC Cancer Foundation, the Agency recently joined a national network called 3CTN that provides infrastructure to expand academic clinical trials across all six cancer centres. 3CTN is a part of a greater strategy that Dr. Eigl leads to streamline infrastructure and boost the overall capacity of trials for the benefit of all cancer patients.

In order to be successful, patients also have a role to play. Dr. Eigl notes, “I would love it if all patients routinely asked their doctor, ‘are there any clinical trial options for me.’”

I’m still here because of cancer research.

The BC Cancer Foundation is the largest funder of cancer research in BC. To learn more or to make a donation, please visit bccancerfoundation.com or call 604.877.6040.