

## Cancer Issue

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# MEDICAL TECHNOLOGY WATCH CANADA

## BC CANCER AGENCY: TRANSLATING NEW DISCOVERIES INTO CLINICAL PRACTICE

Cancer is a serious health threat in Canada and around the globe. One in three people can expect to develop cancer in his or her lifetime. And, due to an aging population, the cancer burden is increasing.

New prevention, treatment, and research strategies are needed to stem the tide, and the BC Cancer Agency is leading the pack in giving cancer a one, two punch. The Agency operates a province-wide cancer control program for the population of B.C. including screening and prevention, treatment and care, and research.

The BC Cancer Agency is unique in that its four regional treatment centres are linked to two basic science research facilities. In Vancouver, a 231,000 square foot facility is home to nine specialty laboratories, including the world-renowned Terry Fox Laboratory and the Genome Sciences Centre. In Victoria, the research centre houses a tissue tumour repository, an international resource of genetic material, and a databank linking treatment to outcome. This means promising new innovations can be quickly transferred to a clinical setting. And clinicians can work closely with scientists to solve real-world problems.

### First in Their Field

British Columbia has an enviable record of applying knowledge and translating it into practice. B.C. was the first province to establish a cervical screening program

that has reduced the incidence of cervical cancer by more than 75 percent. B.C. also developed a life-saving bone-marrow transplantation technique for leukemia patients and a new protocol for Hodgkin's lymphoma.



Dr. Miriam Rosin, senior scientist, BC Cancer Agency, demonstrates the VELscope.

More recently, the BC Cancer Agency's Genome Sciences Centre was the first in the world to sequence the coronavirus which causes SARS.

"Being the first in the world to sequence the coronavirus showed us speed does matter," says Dr. Victor Ling, Vice-President, Discovery, BC Cancer Agency. "We were able to sequence the virus quickly because we have the technology, the people and the

## BC Cancer Agency

The BC Cancer Agency provides a comprehensive cancer control program for the people of British Columbia, including prevention, screening and early detection programs, research and education, and care and treatment. This integrated system is credited for better patient outcomes and lower mortality rates than the rest of the country.

The BC Cancer Agency's mission is to:

- reduce the incidence of cancer
- reduce the mortality rate of people living with cancer
- improve the quality of life of those living cancer

The Agency's research arm – which includes nine specialty laboratories, including the world-renowned Terry Fox Laboratory – conducts scientific research into the causes and cures for cancer.



BC Cancer Agency's Research Centre



Dr. Victor Ling, vice-president, Discovery, BC Cancer Agency, in front of the BC Cancer Agency's Research Centre

## BC Cancer Agency: TRANSLATING NEW DISCOVERIES INTO CLINICAL PRACTICE

*(Continued)*

knowledge. We can apply these same principles to our core business...cancer research and get the same results.”

Research scientists at the BC Cancer Agency bring in more than \$50 million in research funding annually, and are highly successful in competing for grants from the Canadian Institutes for Health Research (CIHR), the National Cancer Institute of Canada, and the National Institutes of Health in the United States.

Moreover, the Agency has had overwhelming success competing for CIHR proof-of-principal or “pop” grants – those grants given to help an academic institution or researcher move a discovery/invention further down the innovation pipeline into clinical practice.

In the previous two rounds of CIHR competitions, researchers received funding for 10 out of 14 project submissions. That is an average of more than 70 percent – well above the national success rate.

“We try not to duplicate other research in the world,” says Dr. Ling. “Our approach is to make use of knowledge from elsewhere and funnel it into our work. One research focus is on pre-cancer and early stage cancer because we believe it will impact patient outcomes in a major way.”

### Improving the Health of Canadians

One such discovery was made by BC Cancer Agency scientists in the early detection and testing of lung cancer. Lung cancer is often a fatal disease, with less than a 15 per cent five-year survival rate. **LIFE-lung** (LIFE stands for light induced fluorescence endoscope) is roughly three times more sensitive than conventional methods at identifying and locating abnormal tissue.

LIFE-lung consists of a sophisticated camera, computer and video monitor,

and a source of blue light. The equipment plugs into a standard bronchoscope, a tiny fiberoptic probe the physician inserts into the lungs by way of the nose or mouth. The blue light activates the natural fluorescence of the tissue. Cancerous tissue shows red, normal shows green. Concealed early cancers are now visible to the physician's eye. LIFE-lung is now routinely used by the BC Cancer Agency as well as in over 150 medical centres around the world.

Taking a page from the LIFE-lung device, scientists at the BC Cancer Agency's Oral Cancer Prevention Program are using a technique involving a special dye that turns cancerous or precancerous lesions the colour blue. Researchers discovered that toluidine blue-stained lesions became squamous cell carcinomas more quickly than lesions that did not stain.

The same researchers also developed a hand-held visualization system called a VELscope that produces a blue light that can reveal details of existing cancerous tissue not visible in ordinary light. The blue light directed by the hand-held, portable device helps dentists to define the borders of a cancerous lesion that would be otherwise invisible under white light.

The findings are among the first steps in designing and implementing an imaging screening program that dentists and oral hygiene professionals can use to make front-line decisions about early stage biopsies and referrals for anti-cancer related care. Oral cancer is often not identified until the later stages, when it is frequently not amenable to successful intervention and favourable outcomes. Among those patients diagnosed with oral cancer, up to 50 per cent die within five years. But when oral cancer is detected early, patients have an 80 per cent chance of survival.

These are just two examples of innovative new technologies developed by BC Cancer Agency scientists aimed at

## BC Cancer Agency: TRANSLATING NEW DISCOVERIES INTO CLINICAL PRACTICE

(Continued)

catching cancer during its earliest stages, when it is most treatable. Dr. Ling attributes the success of the BC Cancer Agency's translational research program to old-fashioned collaboration.

"Our strength is the team approach we use to finding answers – from a 360 degree perspective. It is a real partnership. We have engineers, physicians, molecular biologists, psychologists, mathematicians, genome scientists and many others working together with a single focus in mind: to improve outcomes, and to make an impact on the lives of cancer patients, and those who may be at risk."



BC Cancer Agency dentist Dr. Michele Williams examines a patient after applying a blue dye to check for abnormal lesions in the patient's mouth.

### Market Report Highlights

#### **The Cancer Market Outlook to 2011**

*Business Insights - 2006*

[View Table of Contents \(PDF\)](#)

#### **U.S. Cancer In-Vitro Diagnostics Markets**

*Frost & Sullivan - 2006*

[View Table of Contents](#)

#### **Emerging Therapeutics in the U.S. Colorectal Cancer Markets**

*Frost & Sullivan - 2006*

[View Table of Contents](#)

#### **Malignant Melanoma Decision Resources**

*Pharmacor - 2006*

[View Table of Contents](#)

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or call 204-984-6027.

### Interesting Links

#### **National Cancer Institute of Canada**

[Visit the site](#)

#### **NCIC - Canadian Cancer Statistics**

[View the PDF](#)

#### **NCIC - Canadian Cancer Statistics - Special Topics**

[Visit the site](#)

#### **Canadian Cancer Society**

[Visit the site](#)

#### **Health Canada - Diseases & Conditions - Cancer**

[Visit the site](#)

#### **OncoLink**

[Visit the site](#)

#### **FDA's Dr. Kessler To Chair Global Task Force For Harmonization Of Medical Device Practices**

[Visit the site](#)

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# Perceptronix

Perceptronix Medical Inc. is a Vancouver-based, privately owned cancer diagnostic company founded in June 1999 as a spin off from the BC Cancer Agency. The Company's mission is to commercialize effective technologies to improve the *early detection, localization, diagnosis and follow-up* of cancer with an initial focus on lung cancer. This disease has reached epidemic proportions and typically has a poor outcome (five year survival rate is less than 15%) because symptoms are not usually present until the disease is in an advanced stage.

The Perceptronix suite of services and technologies is aligned with the current cancer diagnostic path used by physicians. Perceptronix services

and products offer an improvement over the existing detection and localization technologies, thereby providing physicians with increased options for prolonging patients' lives and improving their quality of life.

The ClearSign™ sputum test is easily applied to the first step of cancer detection, ClearVu™ and ClearVu™ Elite endoscopy systems (still in development) will assist with accurate localization and ClearCyte™ and ClearPath™ quantitative cytology and pathology workstations contribute to the definitive diagnosis of early lesions and to prognosis.

Each of these services and products is designed to be adopted individually to work with other

technologies applied to cancer, or can be adopted together to form an integrated solution for cancer management.

ClearSign™, ClearCyte™ and Clear2C® (quantitative DNA staining kit) have recently received Canadian and European regulatory approvals while Clear2C® has also received US FDA clearance. Perceptronix currently offers ClearCyte™ tests through its new Quantitative Cytology Laboratory located in Vancouver, BC, Canada and recently opened its first sputum induction facility in Vancouver for Perceptronix's ClearSign™ sputum test. Completion of ClearVu clinical trials is expected in early 2007 with product launch expected in 2008.

Product	Target Cancer	What it does	What it is (Health Canada Risk Classification)	Intended benefits	Product Pipeline
ClearSign™	Lung	Early Detection	Cytometry-based sputum cell DNA test (Class III)	Non-invasive test for early lung cancer detection; add-on to standard diagnosis	Licensed for sale in Canada & EU
ClearVu™	Lung, oral, bladder, cervix, GI, etc.	Early Localization	Simultaneous fluorescence and white light endoscopy system (Class II)	Finds early cancer lesions; reduces procedure time and physician learning curve	In development (R&D), license not yet issued
ClearVu™ Elite	Lung		Real-time spectral analysis endoscopy system (Class III)	Further aids finding early cancer lesions with fewer unnecessary biopsies	In development (Clinical), license not yet issued
ClearPath™	Lung, cervix	Early Diagnosis & Prognosis	Quantitative pathology system indexes to reference biopsy image database (workstation) (Class II)	Aids pathology diagnosis of pre-invasive and early invasive cancer	In development (Clinical), license not yet issued
ClearCyte™	Lung, oral, bladder, breast, uterine, etc.	Early Diagnosis & Prognosis	Quantitative high throughput, highly automated cytology system (workstation) (Class II)	Aids early cancer diagnosis & prognosis quickly, easily & in large volumes	Licensed for sale in Canada & EU
Clear2C®		Reliable specimen staining	Consumable - Quantitative DNA staining kit (Class I)	Quality, convenience, price	Licensed for sale in Canada, EU & USA
Services					
Clinical Laboratory	Offers ClearSign™ & ClearCyte™	Unique service in Canada for diagnosis and prognosis of lung, bladder, oral, breast, uterine & other cancers			

Website: [www.perceptronix.com](http://www.perceptronix.com) Tel: 604.629.8779 / 888.629.8779

ClearSign™, ClearCyte™ and Clear2C™ are medical devices licensed in accordance with the Food and Drugs Act (Canada) license numbers 72090, 70362 & 70361 respectively, and all three products have the European C Mark - EU Directive 98/79/EC. Clear2C™ has the US FDA Medical Device Listing. For other countries, these devices may be subject to different regulatory requirements. ClearVu™, ClearVu™ Elite, and ClearPath™ devices are in the developmental stage only and have not yet been licensed in accordance with Canadian, or foreign, or international law. Prior to the devices being advertised, sold or distributed for any investigational testing, authorization must be obtained in accordance with the provisions of the Food and Drugs Act (Canada).

# Resonant Medical... Radiotherapy's new "image"

In 2002, estimates from the World Health Organization put the number of cancer cases at over 22 million for that year. Approximately ten million new cases of cancer are being diagnosed worldwide each year - with 1.3 million of those from the U.S. alone. This upward trend is expected to increase steadily throughout the next decade and to reach an estimated total of 15 million new cases per year by 2020. Approximately 50% of cancer treatments dispensed today use radiotherapy.



**Resonant Medical**, a privately-owned medical device company based in Montreal, intends to play an important role in the innovative medical technology developments that are required to address the increased need for increasingly precise radiotherapy treatment of cancer in the decade to come and beyond.

Although radiotherapy treatment is making major inroads in the fight against cancer, totally clear and

consistent definition of tumours is still on the wish list of cancer professionals.

Resonant Medical was founded in 2000 by four co-founders: Dr. Tony Falco, Frederic Francis, Luc Sirois, and Francois Perraton. Their goal was to revolutionize cancer treatment with an image guidance platform based on the innovative ideas of Dr. Falco, who was a medical physicist with the McGill University Health Centre.

RESTITU™, a 3D ultrasound image-guided radiotherapy product,

was the result. With its unique imaging capabilities and ability to fuse different medical imaging modalities, RESTITU™ displays tumours with an unparalleled level of definition and ensures radiation correctly hits the targeted tumour each time.

RESTITU™ is the ultrasound (U/S) solution to the problem of poor soft-tissue visualization encountered on conventional CT scans, which are the mainstay of radiotherapy

treatment planning at present, yielding higher definition contours. The accurate and higher definition of the target organ or a tumour's volume is critical to the success of radiation therapy.

Other initiatives have used magnetic resonance imaging (MRI) and contrasting agents to obtain higher definitions. However, MRI equipment is impractical for treatment planning purposes and contrast agents can be problematic. Alternatively, ultrasounds are readily accessible, user-friendly, and offer superior imaging capabilities.

Combining the imaging results of one modality, typically CT, with U/S, RESTITU™ yields significantly improved visibility of the targeted tumour. As a result, succeeding radiation treatment can better target the tumour, saving healthy tissue from radiation while focusing on the cancerous tissue.

RESTITU™ technology introduces several breakthroughs and integrates seamlessly with existing equipment. The interactive screen introduces unique zero-footprint ergonomics intended to facilitate the activities and movements of cancer professionals and patients alike.

RESTITU™ also introduces other improvements including 3D reconstructed images instead of the standard 2D views. The technology platform also allows monitoring of organ displacement over time and uses algorithms to determine the shifts in treatment beam trajectory to compensate for such organ movements between treatment fractions. This capability adds to the precision targeting capacity of the product.

A number of the functionalities required for RESTITU™ had never



## Ask an Investor . . . .

**Q** How do I estimate the market share of my product?

**A** While market share estimates are by their very nature uncertain and at best educated guesses, it is important to have an understanding of the overall market that you anticipate selling into before defining what is feasible for your product. Some factors to consider are the percent of patients who are diagnosed, treated and compliant; essentially who knows they have a problem, who's doing something about it and who cares enough about the problem (or the solution is convenient/cheap enough) to do continue doing something about it.

Other important factors are the rate of change in the market size, trends in the market (and related markets that might affect your market) and how your product will be sold and the amount of effort that will be put into selling it. It is important to understand who is going to be purchasing your product (end users, hospitals, insurance companies, etc) and what factors they consider when making a purchase (eg. cost, quality, speed, reputation, etc.). If you are creating a market that is not currently being served, remember that some people who may have the problem your product solves, may choose not to solve it. And if you create a lucrative market, others will be sure to follow you into it, so it is prudent to always be conservative in market estimates.



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## Upcoming Event . . . .

### Annual Conference on Health Technologies

Under the theme Technology Serving Health, the Conference will hold some fifteen plenary sessions and discussion workshops, led by specialists who are well known in Quebec and on the international scene. Some of the subjects up for discussion are:

- Medical training in a technological era
- The Digital Hospital: a winning bet for the patient
- Round table on the interoperability and integration of technologies
- Innovation, evaluation and marketing of health technologies
- Digitized and protected medical information in Quebec and internationally
- Obtaining health supplies on-line: impacts and consequences
- Success stories of our members

The Conference will attract an influential audience composed of more than 300 key players from the health milieu:

- Heads of health technology firms
- Buyers and directors of hospitals
- Government representatives
- Academics
- Researchers and scientists

Registration	Member Rate	Non-Member Rate
Complete event	\$495	\$595
Cocktails and dinner-gala (at all times)	\$150	\$185

Registration to the complete Conference includes:

- the conferences
- the documentation handed out to the participants
- all the meals and breaks
- the cocktail and dinner-gala of March 15th

For more information visit [www.aitis.ca](http://www.aitis.ca)