



Peace of mind
Canada safeguards
intellectual property



Right to the point
Why vaccine research
proves to be vital

**MEDIA
PLANET**

September 2011

RESEARCH EXCELLENCE

3
ELEMENTS
OF A SUSTAINABLE
HEALTH CARE
SYSTEM

ADVANCING CANADIAN HEALTH CARE

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life-changing innovations

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CHALLENGES



Canadians enjoy a health care system that is enviable across the globe—made possible due to the innovations occurring daily in labs nation-wide.

A not-so-delicate imbalance

Health research in Canada has an illustrious and internationally acclaimed track record.

Why should we care?

Each one of us depends on health care that keeps us and our loved ones well, and saves or prolongs our and our loved ones' lives. This care, on which we rely, does not spontaneously emerge. It comes from research. Today's treatments are yesterday's discoveries.

We cannot afford not to care.

Our health research enterprise is inventing the future of the health care on which we, our children and subsequent generations can rely. It works. Rates of illness and death caused by disease have dramatically dropped over the last 20 years. We're living longer, and better. That's because we're discovering the root causes of disease, enabling the creation of better treatments and technologies.

Over the last decade, due to siz-

able investment in Canada's health research agenda, we have become globally competitive. Federal investments in infrastructure and people have been mirrored at the provincial level, and have boosted philanthropy, largely through charities and hospital and university foundations. Because of this, Canada now boasts a critical mass of internationally renowned health scientists and state-of-the-art research labs and facilities.

So what's the problem?

Liken Canada's health research enterprise to a Formula One team, with a fleet of the best cars piloted by the best drivers. We've achieved this goal in Canada, thanks to our government's commitment to attracting scientists and building research infrastructure. However, we can't win a race if we don't have gasoline to fuel the cars. That's the problem: we're out of gas.

In the last 10 years annual applications to federal agencies that fund health research have doubled, from 1,200 to almost 2,500. Investment in the work scientists do has not kept pace with that in infrastructure or attracting the best minds; rather, it



“Our health research enterprise is inventing the future of health care on which we... can rely.”

Michael Julius , Ph.D
Past Chair, Research Canada: An Alliance for Health Discovery

has flat-lined. Scientists aren't getting the funds they need to do their day-to-day work.

The result? A grave imbalance.

Now, let's temper this bad business planning, or indeed lack of planning, with other concerns we, as taxpayers, should have. All Canadians and all sectors must share in the pain derived from the deepest global economic recession since the 1930s. The federal government's approach first to manage our national debt is common sense. Clearly, it's not the right time to ask for more money!

How, then, to fix this imbalance? We can fix the problem with the money we have—we just have to spend it better! This includes not just tax dollars, but those of the private sector, key partners in our research enterprise. This requires a reassessment of the full spectrum of Canada's R&D spending, with a view to deciding what we should and should not support. We are not doing this, and we must. We need to start doing better business better. We need a plan.

Vaccines: Life-saving prevention

Innovative vaccines have proven their value time and again through the prevention, and in some cases eradication, of infectious diseases in Canada and around the world.

There are many diseases that currently have preventative vaccines, including cholera, polio, rabies, tetanus and hepatitis B, among others. Incidence rates and deaths are in decline thanks in part to these innovations and vaccination programs. Measles deaths worldwide have dropped 68 percent between 2000 and 2006 thanks to vaccination efforts.

Canada is a major player when it comes to research and development in this field, with Canada being

ranked in the top 6 internationally in research and development in microbiology, immunology and virology. The University of Saskatchewan recently opened the International Vaccine Centre - a state-of-the-art vaccine research centre that is the largest of its kind in North America.

“More and more people are articulating the benefits of prevention in general, pointing to vaccination programs,” says Mark Lievonen, President of Sanofi Pasteur Limited, a company devoted to vaccine research and development. “We've made great strides with the human papilloma virus (HPV), meningitis, dengue fever and even HIV/AIDS, but there's still a lot to be done.”

The power of prevention

Vaccination and immunization prevents three million deaths around the world and there is hope that research may ultimately bear fruit for vaccines that can prevent various forms of cancer, the leading cause of early deaths in Canada.

“When we talk about a cancer vaccine, what we mean initially is a vaccine that stimulates the immune system to respond to cancer as being a foreign part of the body, so that cells attack those cancer cells like they would any other virus or bacteria,” Lievonen explains.

Natural barriers

Work continues on finding a way to augment natural barriers in the

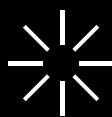
immune system to attack these cancerous cells. But vaccines and immunization efforts have worked well for pandemics like H1N1 and the flu, says John Dorsey, Vice-President and Head, Vaccines and Diagnostics at Novartis Pharmaceuticals Canada. These immunization efforts help prevent the virus from spreading and keep Canadians out of hospitals, and the future of these preventative tools is promising says Dorsey.

“With the technological advancements that are going to be made in the future, it's only a matter of time before we start to see vaccines for diseases that have taken so many lives.”



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WE RECOMMEND



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Remedying research dollars
The scientific strides that made Canada a healthcare frontrunner.

“Our scientists and research community is excellent. Many people see our health care as something that should be duplicated.”

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How the VIDO-InterVac program at University of Saskatchewan is creating change.

Connecting the dots p. 7
New innovations for Parkinson's create new hope.



RESEARCH EXCELLENCE
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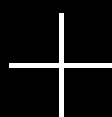
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DON'T MISS!



Smart thinking for brain research advancements

In June, Finance Minister Jim Flaherty pledged up to \$100 million in federal-matched funding for a public-private partnership to advance brain research in Canada. The partnership, led by Brain Canada, will fund some of the most excellent and innovative research in the world.

Using a uniquely Canadian model of interdisciplinary, multi-institutional collaboration that has already produced important breakthroughs in brain research. Wherever possible, Brain Canada will partner with Voluntary Health Organizations, the Canadian Institutes of Health Research, provincial initiatives, universities and research institutes, all with a view of maximizing the tremendous opportunity the federal government commitment has made possible. Brain Canada is the successor to NeuroScience Canada, a national, charitable organization that develops multi-institutional research across the neurosciences.

SOURCE: BRAIN CANADA

INSPIRATION

We live in an information-rich age, yet much of the information doctors require for accurate patient diagnosis and treatment is still obscured.

TIP

1

INVEST IN A LONG TERM PLAN

A MARKED IMPROVEMENT ON DIAGNOSIS

Gordon Allan, 58, was born with a congenital heart defect that deteriorated sharply in his 40s, requiring him to undergo both a heart and a kidney transplant about 10 years ago.

However, it is not the surgeries that stand out in his mind as much as the numerous biopsies he had to endure, which he describes as “traumatic”. “The procedures are invasive and made an already stressful situation even more stressful,” he says. Equally overwhelming for him was the specialized equipment set-up and the number of healthcare professionals in the room for each biopsy.

While tissue biopsies may never be totally done away with, exciting new research is pointing the way to a gentler, more precise way of reading the body’s signals, according to doctors.

Biological signposts

Disease prediction or diagnosis often starts with a laboratory test that is usually applied to a blood, urine, saliva or tissue sample. However, the challenge is assessing the sample so sensitively and specifically that it truly reflects the key workings of a patient’s health, explains Dr. Bruce McManus, director of the Centre of Excellence for Prevention of Organ Failure (PROOF Centre), based at St Paul’s Hospital.

This is where biomarkers come in.

A biomarker is a biological indicator that can be measured reliably, sensitively and specifically to detect or monitor changes in patient health, says McManus. Examples of biomarkers are genes, proteins or other molecules.

A staggering amount of research is going into identifying improved, clinically relevant biomarkers, and this has intensified in the last decade. In the research units of B.C. universities and hospitals alone, at least \$50 million has been deployed to investigate biomarkers. This figure does not take into account research efforts in the private sector.

Not all transplants are problematic

Contrary to popular opinion, not everybody rejects transplanted organs and not everybody rejects severely.

The PROOF Centre has been tasked with identifying the individuals who are susceptible to, are living with, or responding to, care strategies for heart, lung and kidney failure. It has already successfully identified immune rejection biomarkers in transplantation. These biomarkers are so sensitive that they can differentiate sharply between acute, treatable rejection and its absence, says McManus.

Other markers can distinguish between those patients with longer

term, smouldering rejection and those without.

Such markers will be assessed for clinical value in B.C. beginning in January 2012.

The financial perspective

Allan is involved in the financing of investment of real estate and fund management services. He is also on the Translation Advisory Committee (TAC) to the PROOF Centre board of directors. The TAC reviews all proposals submitted to the PROOF Centre to assess if they can be commercialized and translated through the health care system.

If a simple blood procedure testing for certain markers can yield even more targeted information than a biopsy, then that is a no-brainer for Allan. Equally attractive for the businessman in Allan is that, for an overstretched health sector that siphoned of 11.7 percent of the country’s GDP in 2010, blood tests are a lot cheaper than biopsies.

The ultimate goal

Ultimately, better biomarkers will reduce the direct and indirect costs to patients and to society. “Multiply this effort across a myriad of diseases that cause heart, lung and kidney failure and one gets an indication of how important this field of research is, not just in terms of savings, but also for



MAPPING THE BODY
McManus at work.
PHOTO: BRIAN SMITH

the individual person and their health outcomes. We do stand on the promise of breaking through to a whole new level of understanding,” says McManus.

“The ultimate vision is to have the most cost-effective, widely available lab test that can give very

personalized information on each patient. That’s the PROOF Centre’s dream, not just for Canadian medicine, but globally.”

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Vaccine and Infectious Disease Organization – International Vaccine Centre
www.vido.org

At the forefront of vaccine discovery

The University of Saskatchewan is taking vaccine development to the next level with the opening of the most advanced containment level 3 facility in the world—the International Vaccine Centre (InterVac).

InterVac marks an exciting new era at the U of S. Having this state-of-the-art facility at VIDO will ensure scientists and students from around the world are collaborating and receiving the latest training to address human and animal infectious diseases.

With support from the Government of Canada, Government of Saskatchewan and the City of Saskatoon, InterVac will produce the next generation of vaccine researchers, strengthen Canada’s reputation as a leader in vaccine development, and improve the health of families and animals around the world.

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INSPIRATION



Canada’s health care system is envied world-wide—did you know that advancements over the past 75 years have increased the life expectancy of the average Canadian by 30 percent?

STRENGTHENING HEALTH CARE THROUGH INNOVATION

HOW WE MADE IT

If you’re Canadian, chances are somewhere within driving distance of your home is a pharmacy full of shelves lined with medicines. Have you ever thought about where those medicines come from?

Russell Williams, President of Canada’s Research-Based Pharmaceutical Companies (Rx&D) says innovation is the key. “It’s research and discovery. By bringing a new molecule from the lab to the patient, we create new medicines and vaccines, strengthen our health care and help ensure our prosperity.”

“If you go back 10 years and look at what medicines were available and look at it now, the improvement is astounding,” says Williams. “Our companies have discovered and developed the cutting edge medicines, vaccines and diagnostic tools used today. Imagine the innovation and progress we will have in the next 10 years!”

For the past 100 years Rx&D has been operating as the voice for research-based pharmaceutical companies. The community represents

15,000 men and women working for 50 member companies and invests \$1.3 billion in research and development each year to fuel Canada’s knowledge-based economy.

A history of innovation

Over the past 75 years, these new discoveries have been one of the major contributing factors in increasing the life expectancy of the average Canadian by 30 percent. Over the past 30 years our system has witnessed a tidal wave of positive development and health care solutions—partly as a result of Rx&D members’ innovation.

The number of children dying from cancer has dropped by 50 percent since 1975. Medicine and treatment has also lengthened the amount of time children with Leukemia live.

80 percent of heart attack patients admitted to a hospital now survive and deaths from heart attacks are down by 66 percent.

Deaths from asthma, bronchitis and emphysema have dropped 90 percent and hospitalization for respiratory ailments was down 45 percent. Over the last thirty years deaths from chronic liver disease has decreased by 45 percent.



Russell Williams
Canada’s Research-Based Pharmaceutical Companies (Rx&D)

“Our scientists and research community is excellent. Many people see our healthcare as something that should be duplicated.”

Innovative diabetes treatments have reduced hospitalization by 30 percent and HIV/AIDS hospitalization has been reduced by 57 percent.

“When it comes to life science research, innovation saves lives,” says Williams. “Research and innovation gives hope to Canadians that the illness they’re dealing with can be treated and better managed. With an aging

population, new medicines and vaccines will also help sustain our health care system by reducing demand for costly hospital visits and surgeries.”

“Canadians understand the value and the effectiveness of vaccines and new medicines,” he says. “They also understand that research is essential to a strong health care system and better health care outcomes.”

Feeling the effects

In late September, Nanos Research released a public opinion poll of 1200 Canadians about vaccine access and healthcare. The poll found that 93 percent of the respondents agree or somewhat agree that new medicines and vaccines improve patient’s quality of life.

Williams says the major challenge is getting the medicines from the idea stage to your pharmacy shelves. “The recent International Report on Access to Medicines shows Canada lags behind other countries, ranking 23 out of 29 OECD countries in terms of access to the latest treatments,” says Williams. “We also have an approval process that takes longer than other countries.”

“The international competition for research dollars is fierce,” says Williams. “We must ensure Canadians have rapid access to innovative medicines and vaccines and adopt policies like competitive intellectual property protection that will encourage innovation and the development of the next generation of medicines. The next important step will be to include world class IP within the Comprehensive Economic Trade Agreement with the European Economic Union.”

Williams says if we adopt the right choices we can be a world leader in health research. “Each year, the Life sciences industry invests approximately \$ 100 billion in research annually. If we can increase our share, we’ll not only generate medical discoveries which will save lives, but also provide opportunities for our young people by strengthening our hospitals, universities and research communities.”

ANDREW SEALE
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Every 5 minutes another Canadian is diagnosed with dementia
By 2038, it will be 1 every 2 minutes

Isn’t it time we find a cure? Invest in research today

Société Alzheimer Society

INSPIRATION

TIP

2

CONTINUE TO
SUPPORT
ETHICAL
INNOVATION



A NEW ERA
E-health will completely
change health care. It is
one of the fastest-growing
fields of health care today.
PHOTO:MARTIN DEE

Treating patients the e-health way

Electronic medical records (EMR), though promising to revolutionize medicine, still do not have a robust following in Canada.

Unlike New Zealand, where almost 100 percent of doctors are electronically connected, only a third of Canadian doctors use EMR. However, the figure is higher in B.C. —almost 60 percent. More than 90 percent of larger practices with at least six doctors have EMR, according to Jeremy Smith, program director at the Physician Information Technology Office (PITO), a \$108 million partnership between the provincial government and the B.C. Medical Association to support and implement IT planning.

Harries, of Penticton in the South Okanagan Valley, says that despite the B.C. government funding 70 percent of parts of the EMR bill, it still cost his three-physician practice about \$20,000 after the rebate. It took six months for the system to be integrated into the workflow, during which time patient volume fell by a quarter, despite doctors working longer hours. “We lost about \$75,000 in revenue. The stress was massive,” recalls Harries.

Furthermore, laboratories, imaging clinics and hospitals need to be included in the electronic network as well. Hospitals have been notoriously slow to change their system, preferring the less expensive option of sending out paper reports to external doctors, according to Harries.

The art of medicine

Despite the initial start up issues in EMR, great strides have been made in electronic medicine. E-health is a very broad term, covering data collation and storage via EMR in the doctors’ offices, hospital electronic records, or a patient’s personal health record, Telehealth (the actual delivery of a medical service), and knowledge management. The last refers to the analysis of health data to guide medical decision making, explains Dr. Kendall Ho, the director of the e-Health Strategy Office at the Faculty of Medicine, University of British Columbia.

E-health is not new—B.C. emergency room doctors have relied on Pharmanet, which tracks patients’ prescription history, for 20 years, points out Ho. The goal is now to capitalize on data collection and storage. This involves changing

medical education. “Medical students today are using digital technologies,” Ho says. “We need to think about using it to enhance clinical acumen. We are talking about the art of e-medicine.”

Telehealth points the way

St Paul’s Hospital is trialling two web-based programs targeting heart patients in less urban settings. Each web program costs roughly \$100,000 to develop, a boon to a financially stretched health system.

According to Dr. Scott Lear, chair of cardiovascular prevention research at St Paul’s Hospital, heart rehabilitation programs are usually based in large, urban hospitals. In 2004-05, St Paul’s decided to compress its heart disease rehabilitation program into a web-based program. Patients

upload their weight, heart rate during and after exercise and blood pressure results into the program. They also have a monthly chat with the nurse, dietician and exercise specialist.

One program is focused on heart disease patients who have had heart attacks, and the second program helps patients with progressive heart failure. Both are presided over by a nurse and the patients are connected with other health professionals like dietitians and exercise specialists.

The general practitioner remains the lynchpin in the patient’s care plan, stresses Lear. So far, patient results have been “encouraging.”

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Parkinson’s... A degenerative brain disease.

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INSIGHT

The University of Saskatchewan’s Vaccine and Infectious Disease Organization (VIDO) is setting the standard for research and development facilities around the world.

Bright minds paving the way

While explaining what it’s like to lead an organization of brilliant, leading edge scientists, Dr. Andrew Potter sums it up in two words: “Incredibly humbling.”

As the Director and Chief Executive Officer of The University of Saskatchewan’s Vaccine and Infectious Disease Organization (VIDO-InterVac), including its newly opened International Vaccine Centre (InterVac), Potter says his leadership is focused on fostering innovation.

“Innovation is a very tough thing to both encourage and to foster within any organization. My job really is one of a facilitator, making sure the people here have everything they need in order to innovate. After all, this facility is just bricks and mortar. Innovation and good research doesn’t come out of bricks and mortar. It’s the people that make this place tick.”

A chemical attraction

And it’s the people and the environment that have kept Potter at the lab for 26 years. When he arrived in Saskatoon from Ottawa as a research scientist, he intended to stay three years maximum, but, “it was a fun, stimulating place to work and we got things done and it’s been that way ever since.”

Part of the VIDO-InterVac facility’s mandate is to train and educate students and they’ve been able to learn from groundbreaking work at the labs. Eight commercially available vaccines have been produced at VIDO-InterVac over the years; six of them were the first of their kind in the world, including one that protects against a strain of e-coli. “People said there was absolutely no need for food safety vaccines, that there was no gap to fill in the market place and it turns out they were wrong,” says Potter.

Increased awareness

In fact, it was the higher visibility of potential contamination in the food chain, such as Mad Cow Disease (BSE), Bird flu and SARS, which prompted VIDO-InterVac to seek the funding to build the new InterVac addition. “We saw these sorts of things were on the horizon and thought that we’d better get the capacity built to do something about them.”

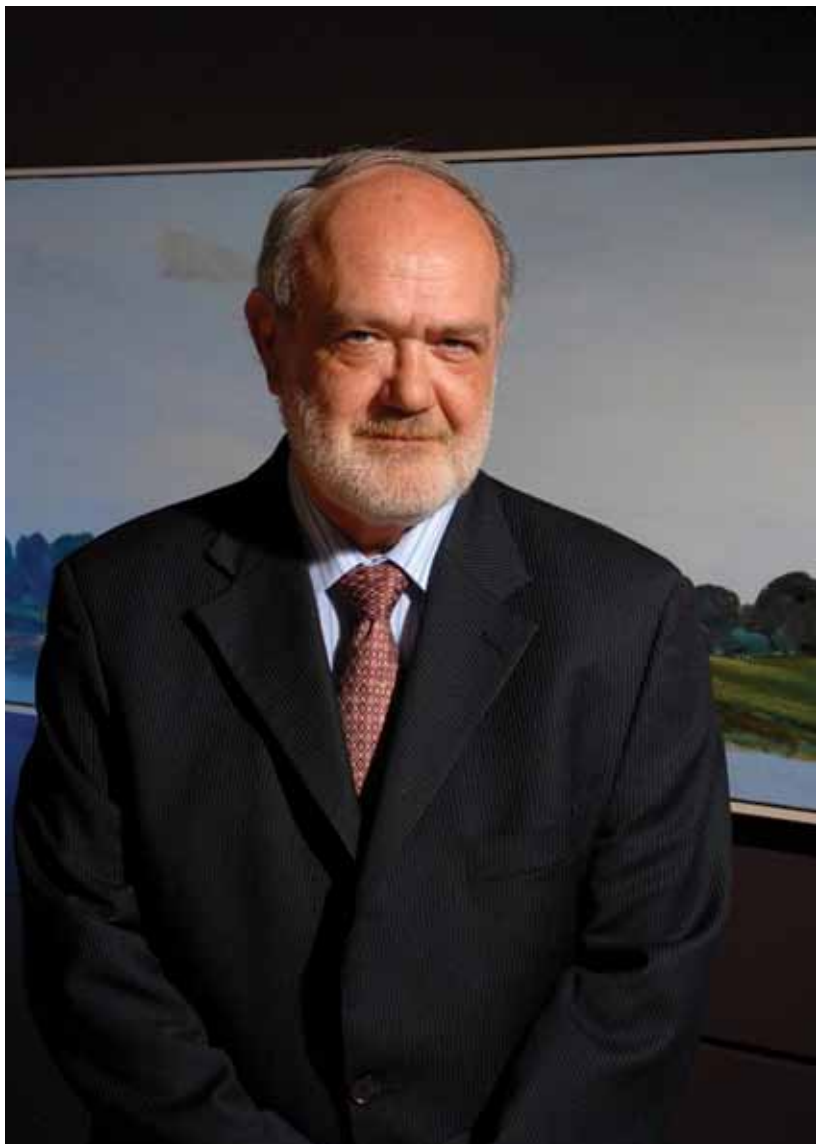
InterVac’s new capacity includes a Level-Three containment facility, the second of its kind in Canada. The \$141-million InterVac facility was opened in September. It enables scientists to work safely with some of the most dangerous pathogens on earth. At the moment, Potter says it has no equal, anywhere. “It is the most advanced facility in the world. No question about it. But that will be short lived because the next one to be built will incorporate a lot of the

things that we have done here.”

Contributing to the country

InterVac not only sets new standards for facilities—it will also help Canada maintain its decades-long leadership in the development of life-saving vaccines. “Canada in the vaccine field has always punched well about its weight,” says Potter. “If you look at the accomplishments over the years, from the work of Connaught laboratories in the polio vaccine development, to the National Research Council in meningococcal vaccines we’ve done phenomenal things on a global basis. What InterVac is going to do is take that to the next level. It will not only protect that competitive advantage we’ve had, but it will enhance it in the future to tackle these new targets that couldn’t be done in our prior facility.”

It will also increase the number of potential partnerships for VIDO-InterVac. Scientists from around the world are welcome to investigate their ideas in the new containment facility. Over time the labs have partnered with 85 different companies in the area of animal and human health. And with new partnership agreements waiting to be signed, Potter expects to see even more Canadian innovation in vaccines moving from the lab to the marketplace.



Dr. Andrew Potter
Director, Chief Executive Officer,
Vaccine and Infectious Disease Organization (VIDO-InterVac)
The University of Saskatchewan

VITO CUPOLI

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Do you believe

that Canada can be a world leader in generating jobs and investment in life sciences and the knowledge economy?

To do this, we need Canada to be one of the leading places where more new medicines and vaccines are developed to treat and prevent cancer, diabetes, Alzheimer’s, heart disease and other conditions.

We need better tools, including world-class intellectual property protection that can help us turn innovative ideas into the next generation of new life saving or life enhancing medicine.

These new cutting edge medicines will also help by reducing surgery, hospital visits and other health costs.

Canada is currently negotiating a comprehensive trade agreement with the European Union (EU) that would put us in the unique position of being the only country in the world to have favoured trading status with both the Europeans and the U.S.

An internationally competitive intellectual protection regime for Canada is part of the discussions. A deal with the EU will preserve and create jobs in life sciences and provide a \$12 billion boost to the Canadian economy while increasing our bilateral trade by 20%.*

By opening the doors to innovation, we improve the quality of life of all Canadians.

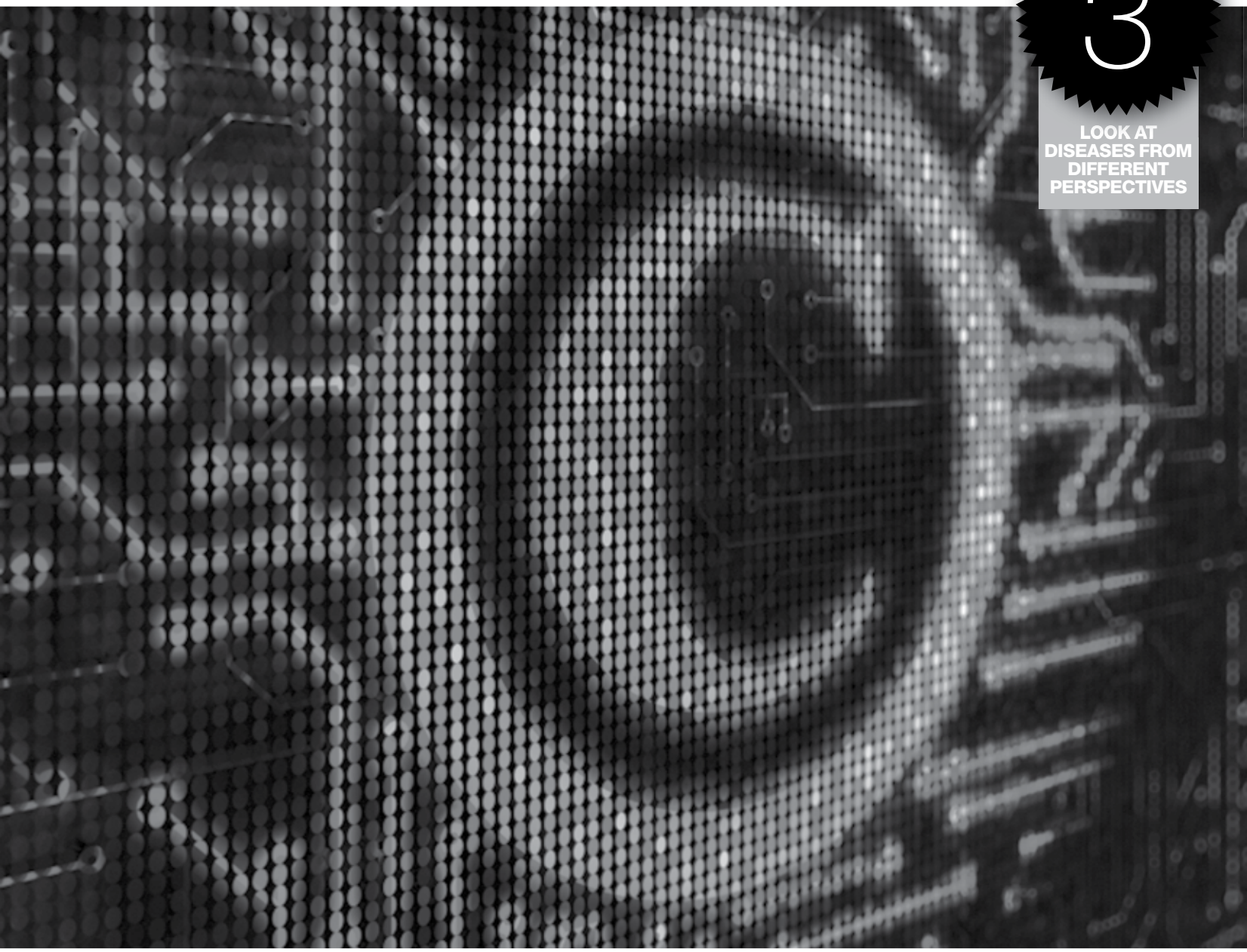
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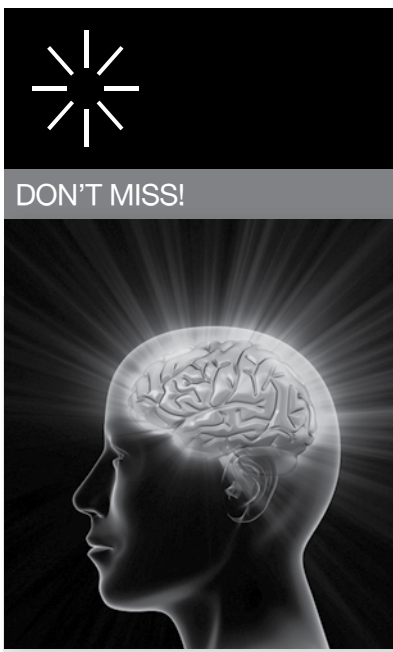
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TIP
3
LOOK AT
DISEASES FROM
DIFFERENT
PERSPECTIVES



DON'T MISS!

Connecting the dots with Parkinson's
Canadian researchers are breaking new ground in Parkinson's disease research, connecting the dots between ideas old and new.

Dr. Edward Fon is an associate professor at the Montreal Neurological Institute and Director of the McGill Parkinson Program and National Parkinson Foundation Center of Excellence. He is a Chercheur National of the FRSQ and Chair of Parkinson Society Canada's Scientific Advisory Board.

"We're really starting to connect the dots," says Fon. "Ideas we thought were antiquated, are coming back." Over two decades ago scientists discovered that mitochondria, the cellular power plants, were defective in patients with Parkinson's disease. However, in the 1990's when genes responsible for familial PD were discovered, interest in mitochondria faded because there was no obvious link between the genes to mitochondrial function. In the last five years, the research has come full circle with several discoveries linking the PD genes to mitochondria. So in a way, we've managed to connect the dots in a profound way, which may begin to provide a unifying theory of what goes wrong in the brain cells of people suffering from PD.

Sweating the small stuff

Fon's research focuses on the molecular events leading to the degeneration of dopamine neurons in Parkinson's disease. One of the genes of interest is Parkin, which works to monitor the health of mitochondria. When mitochondria in the cell "go bad," Parkin helps rid the body of them so that new mitochondria can take over. Although researchers believe the causes of Parkinson's aren't completely familial—unlocking the mysteries behind the 10 to 15 percent of cases that are is a "foot in the door to understanding the disease." Fon says he is hoping that the research on those select few cases will provide clues that could help develop therapeutic programs. The ultimate goal is to understand more about how brain cells die in PD in order to develop new treatment strategies. Fon's colleague at McGill, Dr. Ronald Postuma is looking at sleep abnormalities and their link to the disease. According to Postuma, a large percentage of people who have REM sleep behaviour disorder are at high risk of developing Parkinson's.

For decades, much of the research has focused on dopamine. However, it is now clear that many other types of brain cells are affected in PD, sometimes earlier than the dopamine neurons.

A forward focus

Traditionally, Canada has a long history of Parkinson's research. "In Parkinson's in particular, some of the really big discoveries were Canadian," says Fon. "Even today we see some of the top (researchers) in the world in Canada." In July, the Parkinson Society Canada granted \$1.5 million for research over the next two years. This money will help researchers look into more novel ideas about Parkinson's.

Safeguarding Canada's intellectual property

■ **Question:** What measures are being taken in Canada to ensure intellectual property is being adequately protected?

■ **Answer:** A new report by the Canadian Intellectual Property Council has outlined the true definition of IP.

Unless Canada upgrades its intellectual property (IP) protection laws soon, the country's pharmaceutical sector could be left behind in the competitive landscape for global investment in medical research and innovation, say industry leaders.

Paul Lucas, chair of the Board for Canada's Research-Based Pharmaceutical Companies (Rx&D) and president and CEO of GlaxoSmithKline Inc. (GSK), sees the ongoing trade negotiations between Canada and the 27 countries of the European Union (EU) towards a Comprehensive Economic and Trade

Agreement (CETA) as a unique opportunity to upgrade the country's IP laws to match those of the EU, United States and Japan.

"If we don't seize this opportunity through the CETA negotiations to upgrade the IP laws, Canada will continue to be a laggard in the life sciences sector," says Lucas. "If we're not willing to improve our IP laws on one of our key knowledge-based sectors, it will put us at a significant disadvantage and be a clear signal to global companies that we're not interested in being competitive on the IP front."

A global frontrunner

Canada has a proud history of medical research and development which has yielded significant achievements like the discovery of insulin and the revolutionary HIV/AIDS treatment known as 3TC. But future breakthroughs could be in jeopardy if the federal government doesn't take the opportunity to update IP laws, says Lucas.

Previous improvements to our IP

regime have paid huge dividends for Canada by increasing pharmaceutical investment in research and development exponentially, he says. Canada's pharmaceutical sector's share has increased from less than \$100 million in the 1980s to more than \$1.5 billion today.

"It's essential that Ottawa adopts policies that will strengthen data protection measures and stimulate Canada's knowledge-based economy to attract investment and allow Canadian businesses to grow and flourish," says The Honourable Perrin Beatty, president and CEO of the Canadian Chamber of Commerce. "We remind the Canadian government of the importance of increasing the protection of IP rights, without which the livelihoods of Canadian businesses would be put at risk."

Peace of mind—and property

The Canadian Intellectual Property Council (CIPC), which is supported by the Chamber of Commerce, has published reports highlighting the IP pro-

tection gap. One of its goals has been to increase public awareness of what IP really means, and how it ties in to IP concerns in sectors like technology, arts, music and entertainment.

In a recent report, the Chamber of Commerce suggested Canada implement a five-year patent term restoration (PTR) system to compete with other G7 countries. The status quo makes it tougher to attract investment, particularly since companies don't have a right of appeal when a court rules on a patent challenge, the report says.

"The reality is that all other Western countries have stronger IP protection than Canada," Lucas says. "Stronger IP would support Canada's research-based pharmaceutical companies' collective ability to invest and innovate, partner with governments in their goal to lower health care costs and create good jobs in the long run."

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New research creates new hope for dementia

For more than 25 years, Alzheimer research has focused on a potentially threatening protein called A-beta which accumulates in the brain. A-beta is produced by being split off from a much larger "parent" protein with the abbreviated name APP.

It's now been found that the toxic actions of A-beta on the surrounding nerve cells occur only after individual A-beta molecules have begun to stick together in twos and threes to form "oligomers." The on-going aggregation of the A-beta molecules results eventually in the depositing of the tiny microscopic "plaques" scattered throughout the Alzheimer brain, plaques which Dr. Alois Alzheimer himself reported over 100 years ago. The dominant research strategy has been to design drugs that prevent the splitting of the A-beta from the APP, drugs that stop the A-beta molecules from sticking together and becoming toxic and finding ways of eliminating the excess A-beta before it begins to aggregate.

The good news is the development of dozens of promising drugs and vaccines. Some have proven ineffective in clinical trials, but there is hope for others that are still in the trial phase.

Forward thinking

If we do find a drug or vaccine that really works, will this be the long-sought cure? In the affected person, memories have disappeared, along with the ability to drive one's car or make dinner. To cure the patient as well as the disease we have to not only stop it, but we have to reverse what's happened and retrieve lost functions. The affected nerve cells in the brain are initially sick, but they may take years to die, presenting a huge window of opportunity for their rescue. Moreover the symptoms of Alzheimer's disease emerge not because the nerve cells die, but some two to three years earlier when the sick nerve cells start losing their ability to communicate. Halting the disease process is important but rescuing sick nerve cells and restoring their connectivity is equally important.

The first step is to provide drugs that mimic certain of the properties of, or even consist of, one or other of the substances that are continuously being made in the normal brain called "growth factors." These factors encourage growth, and also confer a disease-resistant character on the cells, and in particular, stimulate branching followed by the creation of new contacts with downstream cells. We need drugs that, like the growth factors, will enhance connectivity by strengthening existing connections. Some of these drugs are already being tested and results are expected within the next five to seven years.

Exercising the mind

Moreover, increased connectivity can be further bolstered by moderate regular exercise and by "environmental enrichment," a condition provided by increasing socialization and brain-stimulating activities such as games and puzzles.

These activities have already been shown to slow the progression of Alzheimer's disease, and even to reduce one's chances of getting it in the first

place. Finally, animal studies in which brain cells were destroyed experimentally are suggesting that increased connectivity (in this instance promoted by environmental enrichment), can lead to the recovery of long-term memories that couldn't be accessed or retrieved because too many connections had disappeared. These new research findings provide tomorrow's research challenge. The Alzheimer Society Research Program is meeting this challenge by emphasizing the training of graduate students and post-doctoral fellows. They are tomorrow's researchers that are poised to finding the breakthroughs into the biomedical aspects of Alzheimer's disease and improving the quality of life of people living with the disease and their caregivers.

To learn more, visit www.alzheimer.ca

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INSIGHT



A new time frame for cancer research and drug development

In the last 30 years, cancer drug development and marketing duration ranged between 10 to 12 years. Recently this timeline has been significantly shortened to about four to seven years due to increased efficiencies in drug development process, rapid patient enrollment through globalization of clinical studies and the introduction of fast track review by some Health Authorities.

Therapeutic clinical trials are necessary to improve current available therapies particularly of serious illnesses such as cancer (oncology). Every year, several hundreds of different clinical studies in oncology are performed in Canadian Cancer Centers bringing

several hundreds of millions of dollars in research income, and job creation, into these centers. Some of these studies have been driven by International and National cooperative groups but the largest number remains those financed by the pharmaceutical industry as a sponsor for registration of new drugs. All clinical trials performed in Canada in oncology represent between 15 to 20 percent of the overall available cancer patient's pool.

Reasons for relocating

Canadian physicians and investigators have been renown in delivering high quality and quantity of clinical data supporting study completion with the standards expected by major health authorities (US, Canada, EU). Some of the main drivers of their success in bringing the clinical studies

in Canada were related to the high quality of our Canadian investigators' work, skills and then lower drug development costs. Because of these key factors, Canadian investigators earned even greater respect and exposure for their clinical expertise from their International peers while publishing their research in Medical Journals.

Widespread research

From a pharmaceutical perspective, there is a fixed global budget allocated to study and bring a drug onto the international market with the highest quality expected by the health authorities for their approval. With the availability of new emerging countries such as China, India and Eastern Europe, it is now easier to recruit faster the number of patients

required to complete large registration studies for drug approval and at lower cost to the Pharmaceutical company. Similar clinical services are provided at a lower cost per patients enrolled, Hospital administrative fees, and exchange rates, when compared to the United States, Canada and some of the EU countries. Canadian investigators are slowly being displaced for newer studies, by these investigators from emerging countries contributing to accelerating the process of pushing out Canada's participation in new innovative studies. As an immediate consequence on Canadians, are the opportunity limitations for patients, investigators, provincial governments, hospital / cancer centers, and Academia, to benefit from studying new innovative drugs in Canada, benefiting from early access

to new drugs in development.

By reducing the Pharmaceutical sponsored clinical studies in Canada, the tax payers, will have to pay significantly more to sustain an already overwhelmed healthcare system. The Provincial financial burden in treating cancer patients will increase as those costs, no longer taken care by the pharmaceutical research, will be passed on to Governments.

It is time for our Canadian political Leaders to re-assess some new strategies on how to ensure that new clinical research is not displaced outside of Canada, and offering more attractive options other than the current tax credit offered to the Pharmaceutical Industry.

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LIVING WITH PARKINSON'S

Our movements are normally controlled by dopamine, a chemical that carries signals between the nerves in the brain.

When cells that produce dopamine die, Parkinson's symptoms appear. Typically, that includes tremors, slowness and stiffness, impaired balance, and rigidity of the muscles. Other symptoms can also appear, like fatigue, soft speech, problems with handwriting, a stooped posture, and sleep disturbances.

As the disease progresses, some people with Parkinson's may experience depression, difficulty swallowing, cognitive changes, or sexual problems. For Lawlor, the toughest part was coming to grips with "The knowledge that I have something that is continually creeping, unstoppable, like a wet sack enveloping me, and I can't really do anything about it."

A slow decline

People can live with Parkinson's for years, but the disease will worsen over time notes Parkinson Society Canada (www.parkinson.ca). Most people with Parkinson's manage their symptoms through medication. A small percentage may benefit from surgery, such as deep brain stimulation (it targets areas that may control tremors or involuntary movements). Other ways to manage symptoms: physical therapy (for mobility, flexibility and balance); occupational therapy (help with daily activities); speech therapy (for voice control); and exercise (helps muscles and joints, and improves overall health). There's no known

single cause for Parkinson's, though researchers are studying many theories, like the role of genetics and environmental exposure. Currently, there's also no cure.

Increasing with age

Most people diagnosed with Parkinson's disease are over 65. Parkinson's isn't a normal part of aging, but the incidence increases with age. "With the percentage of Canadians over 65 growing, Parkinson's cases are expected to rise dramatically," says Marjie Zacks of Parkinson Society Canada. Yet Parkinson's doesn't just strike people in their sixties and up. About 20 percent of people with Parkinson's are under 40 when diagnosed.

Dan Sellers of Calgary was 38 when he experienced tremors in his right hand and felt unsteady on his right foot. After being diagnosed with Parkinson's, Sellers, a web software developer, kept working hard for four years. "My attitude was this can't affect me," says Sellers. "I was Superman, and Parkinson's wasn't going to bring me down." But stress and fatigue only made his symptoms worse. At 42, Sellers had to go on disability. He now takes medication to replenish his dopamine levels, and though he had to cut out work, Sellers, now 45, is busy. He volunteers his web expertise to non-profit groups, including the Parkinson Society of Southern Alberta, and learned to fly. This May, after

losing 90 pounds in a year, he'll tackle his first triathlon.

The power of preventative measures



AN AGE-OLD ISSUE
Though not a natural part of aging, Parkinson's becomes prevalent in older age.

Depending on your age at the disease's onset, how you manage symptoms, and your general health, you can live an active life with Parkinson's. But the disease takes its toll in many ways. Zacks describes one woman who goes to bed wearing clothes and makeup, to avoid struggling in the morning to get ready for work. As people age and the disease progresses, there are also increased risks. For example, impaired balance can cause falls, and swallowing problems can lead to pneumonia. Other impacts of the disease can be just as difficult, notes Parkinson Society Canada—the stigma when you're in public (not being able

to control how your body moves); the burden on caregivers; early retirement for some (and the financial stress that comes with that); the need to schedule everything around medication; and lifestyle changes.

With no cure, a Parkinson's diagnosis means learning to live with it. "Parkinson's disease has taught me to not get disappointed because I can't reach a goal," says Sellers, "but rather to adjust the goal to make it more realistic." There's also great hope. "The research that's going on in Canada is very promising," says Zacks. For example, with grants from Parkinson Society Canada recent research has focused on such

diverse areas as genetic markers (so people can receive appropriate drug therapy sooner), which enzymes are most important in the brain, and even the role of gum in helping people with Parkinson's to swallow better (the chewing might improve their sensory motor memory). For people with Parkinson's disease, the steps are encouraging. "As a child," Lawlor says, "I had friends who had polio, and I never thought there would be a vaccine for it. I'm hoping for a similar breakthrough for Parkinson's."

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