

A large, stylized graphic on the left side of the page, composed of thick, curved lines. The top portion is orange and the bottom portion is dark grey, matching the colors in the logo and text.

# Occupational Cancer Research Centre

**Towards** a cancer-free workplace

# Towards... ■■■

Occupational  
Cancer  
Research  
Centre



# Towards a cancer-free workplace

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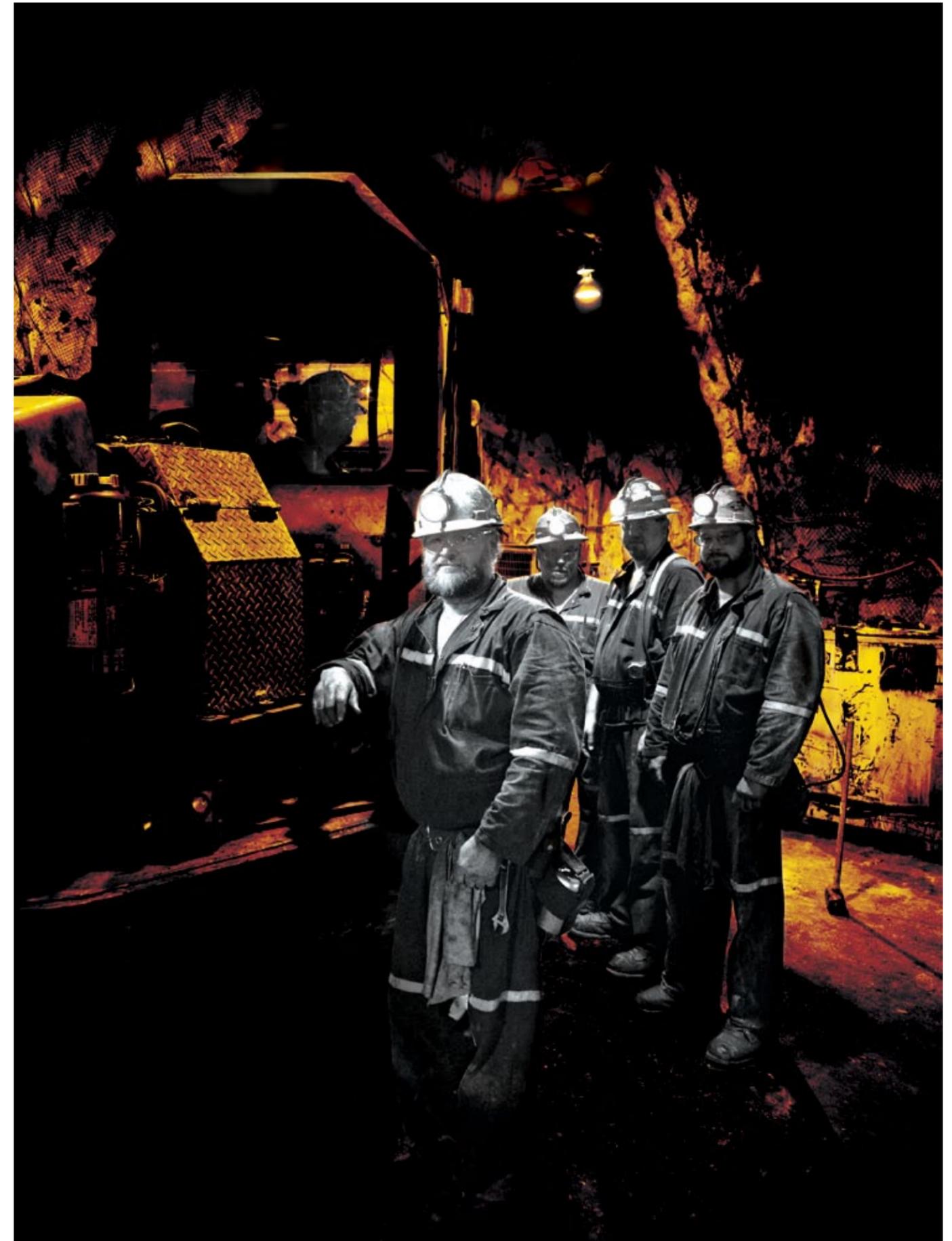


## About the Occupational Cancer Research Centre

The Occupational Cancer Research Centre (OCRC) was established in 2009, and is the first research centre of its kind in Canada. It was established to fill gaps in our knowledge of work-related cancers and to translate these findings into preventive programs to control exposures and improve the health of workers. It is jointly funded by Cancer Care Ontario, the Workplace Safety and Insurance Board, and the Ontario Division of the Canadian Cancer Society, and was developed in collaboration with the United Steelworkers.

The OCRC is led by Dr. Paul Demers, the director, Dr. Desre Kramer, the associate director, a Steering Committee with representatives from the funders and key stakeholders, and a Scientific Advisory Committee comprised of experts in the field. The Centre's projects are led by a dedicated group of researchers, based both within Cancer Care Ontario, where the Centre is housed, and in other academic and government institutions. These researchers contribute to the scientific direction of the Centre and in mentoring our junior researchers and students.

The OCRC, although relatively new, is receiving attention from researchers and stakeholders alike. This is due to both its mandate to research new ways to prevent workplace cancers, and its ability to attract new researchers to this critical field. Though located in the heart of downtown Toronto, the Centre's initiatives have a broad scope through our national and international collaborations.



# A Message from Jean-Yves Savoie

*Chair of the OCRC Steering Committee and past chair of the Workplace Safety and Insurance Board's Research Advisory Council*

Occupational cancer has always been a concern for workers, employers, policy-makers, cancer organizations, and the public. The Research Advisory Council of the Workplace Safety and Insurance Board (WSIB) had a vision to create a research centre that could address this issue. They brought Cancer Care Ontario and the Ontario Division of the Canadian Cancer Society on board, and together with the United Steelworkers, created the Occupational Cancer Research Centre. The Centre links together the needs of the community and the vision of the funders.

After only three years we have a fully operational Centre; this is an amazing accomplishment considering the scarcity of resources in this field! We were very fortunate to attract Paul Demers as Director. He is one of the best researchers in the field and he has attracted other top researchers to the OCRC as collaborators. The number of projects and interactions that have been initiated is amazing. Researchers dream all their lives of creating such a stimulating research environment.

The Centre engages in research into the causes of occupational cancer, identifies which jobs and industries are at highest risk and will support the prevention of those risks. It attracts researchers into the field and is grooming new students. It has become a hub for the world's knowledge and information.

But it's not only research that we need to do – the community needs to see that the research is useful. We need to create a seamless connection between our research and policy, industry, and organized labour. To do this, we interact with workers, employers, unions and policy-makers. Our engagement with stakeholders is embedded in the way we do our research.

At times, we may raise controversial issues and what we have to say is not necessarily welcome. In times of difficult decisions, even though we may not have the final answer, we bring what is known from our research to the decision-making process. We are credible and we are listened to. In this way, we have defied the odds and have ensured that occupational cancer research is on the radar for the benefit of all.



***D**r. Savoie was inspired by his postdoctoral studies in immunochemistry at the University of Alberta to apply chemistry to the world of toxicology and occupational health. In 1980, he took part in the creation of the Institut de recherche Robert-Sauvé en santé et en sécurité du travail. He is a passionate promoter of research within Canada's workers' compensation boards and was active within Canada's health research institutes, chairing the Advisory Board of the CIHR Institute of Population and Public Health (2000-05). He chaired the Research Advisory Council of the WSIB, fostering the creation of new centres such as the OCRC. Now retired, he remains involved in the promotion, organization and evaluation of research.*

# A Message from Paul Demers

*Director of the Occupational Cancer Research Centre*

When I was offered the position as Director of the OCRC, I saw it as an opportunity to help create something of lasting importance. In three years, we have already made contributions to the field of cancer research, and are raising awareness in Ontario workplaces. With hard work, we can continue to influence the field of occupational cancer research and workplace health and safety. I was excited to be able to bring my expertise and the network I developed as an occupational health professor at the University of British Columbia and as the Scientific Director of CAREX Canada to enhance the growth of the Centre.

I see Canada, and specifically Ontario, as an ideal location for a centre like the OCRC. Canada has a rich history of occupational cancer research and researchers from Ontario have played a key role. Canada is an ideal place to conduct this research with our national network of strong tumour registries, our well-established ability to link administrative records, and our tradition of collaboration by employers, organized labour, and government in conducting research.

However, occupational cancer research has been in decline in recent years. I was drawn to the OCRC by the incredibly strong commitment of our funders and stakeholders to reverse this trend and to ensure that Ontario takes a leading role in this essential area of research. Going forward, I envision a continued expansion of the Centre's mandate. The OCRC has grown significantly in the last few years, both internally and in terms of our network across Canada and internationally. We now have the size and expertise to make a significant impact in the field of occupational cancer.

I want to see us increase the number and scope of our projects, collaborate more with other researchers and institutions, and to raise awareness and promote prevention in our stakeholder community. I want our research to have an immediate impact on the health of workers. The OCRC has an opportunity to lead the way to a cancer-free workplace, and I am honoured to be a part of that.



**D**r. Paul Demers comes to the OCRC from the University of British Columbia, where he was a Professor in the School of Environmental Health. As well as being Director of the OCRC, he is also a Professor with the University of Toronto's Dalla Lana School of Public Health, and the Scientific Director of CAREX Canada, a national surveillance program for occupational and environmental carcinogenic exposures. He has an MSc in Industrial Hygiene and a PhD in Epidemiology from the University of Washington. Paul is internationally recognized for his expertise on the health effects of workplace exposures and has sat on many expert panels, including the International Agency for Research on Cancer working groups that evaluated carcinogens such as dusts and fibres, firefighting and formaldehyde.

The image shows two men in industrial settings. They are wearing white hard hats and safety glasses. The man on the left is wearing a dark jacket with a name tag that says 'alan'. They are both looking at a document held by the man on the left. The background is filled with complex industrial machinery, including pipes, valves, and gauges, illuminated with a warm, reddish-orange light. The overall scene suggests a technical or safety inspection in a factory or refinery.

*The OCRC seeks input from stakeholders in a variety of industries in order to set research priorities for carcinogens and occupations at risk.*

**Desre Kramer, Associate Director**  
Occupational Cancer Research Centre

*As a leader in the fight against cancer, the Canadian Cancer Society funds world-class research, advocates for public policies that protect the health of Canadians, and provides services for those living with cancer. We are committed to preventing cancer and decreasing the number of people who die from the disease, including reducing exposure to cancer-causing substances at work.*

*The Society is excited to see the progress that has been made since we established the OCRC in advancing its research agenda, and we look forward to its continued success.*

**Martin Kabat**

CEO, Canadian Cancer Society, Ontario Division



## Occupational Cancer Research

There are approximately 60 definite or probable workplace carcinogens, and over 100 workplace exposures that have been classified as possibly carcinogenic to humans. There are even more substances with too little information available for evaluation. Although only a small fraction of occupational cancer is recognized or compensated, in Ontario the annual number of accepted claims for workplace fatalities due to cancer is higher than those for traumatic injuries. Furthermore, the number of claims for workplace fatalities due to cancer is still increasing. The need for research into the causes of occupational cancers in order to minimize exposures is therefore critical for improving workplace health and safety.

The OCRC has **three** major research focus areas:

- 1)** identification of causes of cancer in the workplace;
- 2)** surveillance of occupational cancers and workplace exposures; and
- 3)** intervention research to develop and evaluate prevention and exposure reduction strategies.

The Centre has developed a very diverse set of research projects that reflect both the priorities of our stakeholder community and the occupational cancer research priorities of internationally respected agencies such as the International Agency for Research on Cancer and the U.S. National Institute for Occupational Safety and Health.

Many of the Centre's projects are collaborative in nature, such as our work on pesticides with the U.S. National Cancer Institute or our work on lung cancer with researchers in Quebec and across Europe. Although our primary focus is on epidemiology, our team is very interdisciplinary and some projects focus on exposure, while others apply qualitative methods. A major goal for all the research projects is to generate research findings that can be of use in preventing cancer in the workplace, and to facilitate the use of these findings to effect workplace change.

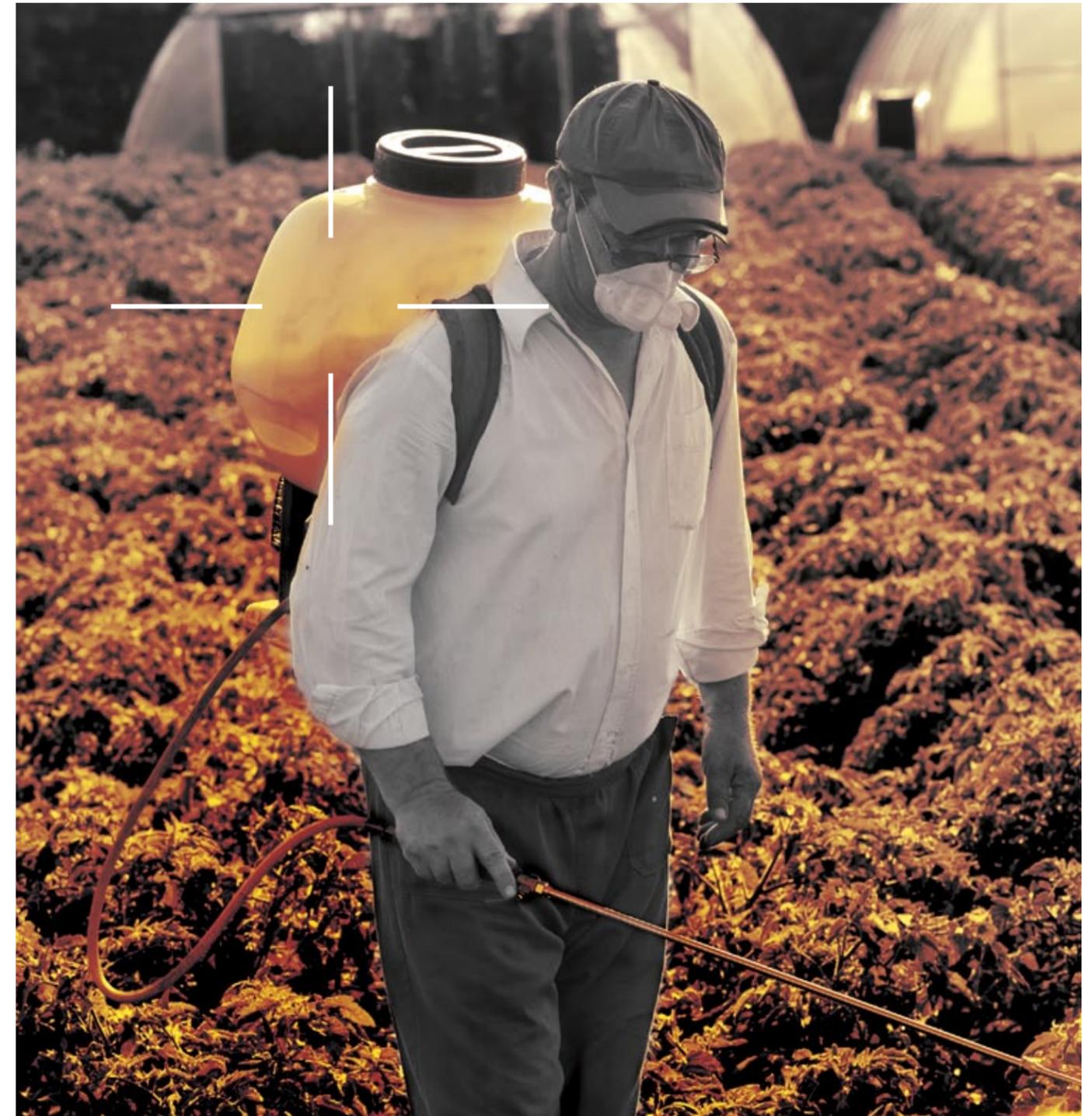
## Identifying the Causes of Cancer

Epidemiologic methods form the core of many of our research projects in which we identify the causes of occupational cancer. In these studies, we use statistical analysis to determine if exposure to a certain substance in the workplace leads to an increased risk of cancer. These studies help us determine what substances are occupational carcinogens, what types of cancer they cause, and the level of exposure at which they become hazardous.

For instance, OCRC researchers are investigating the link between pesticide exposure and cancer to determine if exposure to multiple pesticides increases the risk of Hodgkin and non-Hodgkin lymphoma, multiple myeloma, and soft tissue sarcoma. This research is being done in collaboration with researchers in Saskatchewan, British Columbia, and the United States.

We are exploring the causes of lung cancer using a Toronto lung cancer case-control study. This study was designed to examine the interactions between smoking, workplace carcinogens, and lung cancer. The Centre is also contributing data from this study to the Synergy project, a 14-country effort coordinated by the International Agency for Research on Cancer. By pooling data and the expertise of researchers from many studies, this international collaboration will be able to examine new and important issues.

Other ongoing projects at the OCRC include analyses of occupational exposure to diesel and gasoline emissions and the incidence of colorectal and bladder cancer, an updated analysis of the risk of cancer disease among Ontario uranium miners, the risk of breast cancer in young women due to exposure to environmental contaminants, and a study of the health risks among nuclear workers in Ontario who are exposed to internal sources of ionizing radiation.



*OCRC fills a gap by providing objective research into occupational cancer. There have been so many achievements in such a short time, just three years. In the long run OCRC efforts will save lives. With a well-developed vision and the excellent leadership that is in place, good things will come and we look forward to supporting the work and working with OCRC in the future.*

**Keith McMillan,**  
National Representative - Health and Safety for the Communications,  
Energy and Paperworkers Union of Canada

## Surveillance of Occupational Cancer

The OCRC conducts surveillance research to examine the cancer patterns and trends among people employed in different industries and occupations. We also look at current and historical exposure levels to known and suspected carcinogens to identify potentially high risk groups to target for prevention or further study.

We are working with Statistics Canada and Health Canada on an important new linkage of the 1991 Canadian Long-form Census data to the Canadian Cancer Registry. This collaborative project combines occupation and industry data from the long-form census with cancer information from the registry to create a dataset that includes over two million people. This linkage will allow us to investigate many associations between jobs or substances and cancer, such as cancer among wood workers, firefighters, shiftworkers, and agricultural workers.

We have begun a project to develop a new model of occupational cancer surveillance for Ontario using the Workplace Safety and Insurance Board's lost time claims. These claims will be used to link occupational information to Ontario's tumour registry to create a large database of workers in the province and will increase our ability to examine the risk in Ontario industries.

We are increasing our work in the area of exposure surveillance. We are analyzing data collected by the Ministry of Labour to determine historic patterns and trends of exposure to many known and suspected carcinogens such as asbestos, benzene, tetrachloroethylene, silica and wood-dust. As well, OCRC researchers are collaborating closely with CAREX Canada to investigate new occupational exposure issues. For example, we are investigating the locations in Ontario where over 150,000 tonnes of asbestos-contaminated vermiculite from Libby, Montana were shipped during the 1970s and 1980s to determine how this hazardous substance was used in this province.



## Prevention Research: Towards a Cancer-Free Workplace

One of goals of the OCRC's research program is to perform intervention research to develop and test prevention and exposure reduction strategies. While all of the research performed at the OCRC adds to the pool of knowledge that can be used to target intervention strategies, the OCRC has a number of initiatives aimed more specifically at workplaces and workers. As change can be initiated from many levels, these projects have broad goals that include raising awareness among workers and employers, hosting events to highlight research findings, instigating policy changes, and actively testing practical primary strategies to implement change.

The OCRC works with many different groups to raise awareness of the risks of occupational cancer and available prevention methods. We are involved with workers from many different industries, such as mining, construction, and manufacturing, who have been occupationally exposed to asbestos, and are identifying the barriers to applying for workers' compensation. We are beginning to work with nurses and pharmacy workers exposed to antineoplastic agents to identify and minimize their exposure. We host public events each year to highlight different areas of occupational cancer research. Our strong ties to unions, employers, health and safety professionals, healthcare workers, and researchers ensure that our message reaches a wide audience.

The OCRC also instigates policy change by communicating our research findings to policy-makers and government. For instance, the Centre has recently performed a comparison of Ontario's Occupational Exposure Limits for Carcinogens (OELs) to those of other jurisdictions in Canada and elsewhere. OELs protect workers' health by setting the maximum allowable concentrations of hazardous substances in workplaces. A report on our findings was submitted to the Ministry of Labour in order to implement a revision of the current OELs.

Another major intervention project with policy implications is focused on estimating the human and economic burden of occupational cancer in Canada in collaboration with the Canadian Cancer Society. By producing estimates of the human impact (deaths, sickness, and reduced quality of life) and the economic costs specifically associated with exposure to occupational carcinogens, the OCRC will provide evidence on the importance of workplace exposures as a significant causal factor in many Ontario cancer cases. Most significantly, these estimates will help to focus on priority areas where the greatest number of people will be impacted by intervention efforts.



***D**r. Desre Kramer is the associate director of the OCRC, and spearheads many of the intervention projects. She comes from the OCRC's sister organization, the Centre of Research Expertise for the Prevention of Musculoskeletal Disorders. Her research has been in the construction, transportation, and manufacturing sectors. She focuses on the diffusion of innovations and the transfer of evidence-based knowledge on occupational health and safety to workplaces. Recently, she has been examining the link between physicians taking work histories and patients with lung cancer submitting claims for compensation. She has adjunct status at the University of Waterloo, Ryerson University, and the Institute for Work & Health.*

## OCRC Scientists

Dr. Shelley Harris is an Associate Professor at the Dalla Lana School of Public Health at the University of Toronto, and a scientist at Cancer Care Ontario. She first became interested in occupational and environmental health while travelling in India and Jamaica as part of her undergraduate minor in International Agriculture, where poor working conditions led to exacerbated risk for serious acute illness due to environmental and occupational exposures. Now focusing on chronic disease in Canada and the United States, Shelley adds rigor and immense field-specific knowledge to the OCRC team, attracting both students and collaborating researchers to the Centre.



Dr. Loraine Marrett is a senior scientist and Director of the Surveillance Unit at Cancer Care Ontario, and a Professor at the Dalla Lana School of Public Health at the University of Toronto. She was thrust into the field of occupational cancer research during her first position as a cancer epidemiologist shortly after completing her PhD, and has maintained an interest throughout her career. She played a critical role in the development of the OCRC, advocating for a dedicated research environment to revitalize and advance of the field. Her work at OCRC centers around finding novel ways to make use of existing data sources including the Ontario Cancer Registry, existing cohorts, population-based surveys and census data to answer questions about exposures, causal relationships and trends in incidence for workplace-related cancers.



Dr. John McLaughlin is a senior investigator at the Samuel Lunenfeld Research Institute at Mount Sinai Hospital, a Professor at the Dalla Lana School of Public Health at the University of Toronto, and a founding Director of the Ontario Health Study. He is a leader in Canadian cancer research. He leads interdisciplinary teams in large population-based studies that aim to discover environmental and genetic factors involved in the development of cancers, such as colorectal, ovarian and lung, and to determine the impact of these factors across the population.



Dr. Minh Do is an epidemiologist at the Public Health Agency of Canada, a research fellow at the R. Samuel McLaughlin Centre for Population Health Risk Assessment at the University of Ottawa, and a Junior Scientist at the Occupational Cancer Research Centre. Minh's primary research interest is in the area of environmental and occupational epidemiology. He is currently working with the OCRC on two research projects: one assessing cancer risk in Ontario uranium miners; and the other looking at nuclear workers who have been exposed to ionizing radiation. Minh first became involved in occupational cancer research in 2002 when he joined the Occupational Cancer Research and Surveillance Pilot Project at Cancer Care Ontario.



## OCRC Affiliated Scientists

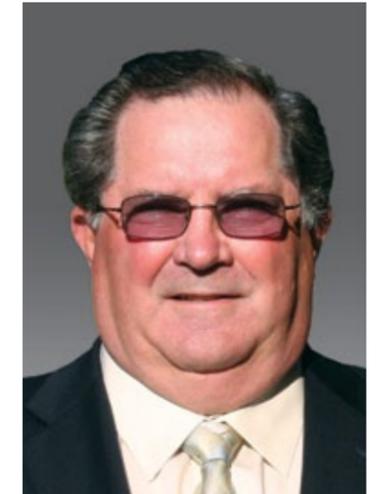
Dr. Kristan Aronson is a Professor at Queen's University in Kingston, Ontario in the Department of Community Health and Epidemiology, and in the School of Environmental Studies, and is also a member of the Division of Cancer Care and Epidemiology at the Cancer Research Institute. Dr. Aronson completed her PhD in epidemiology and biostatistics at the University of Toronto, followed by a post-doctoral award at the International Agency for Research in Cancer in Lyon, France. At Queen's University since 1995, Dr. Aronson works with collaborators around the globe to examine the relative contribution of environmental, occupational and genetic factors in the etiology of cancer.



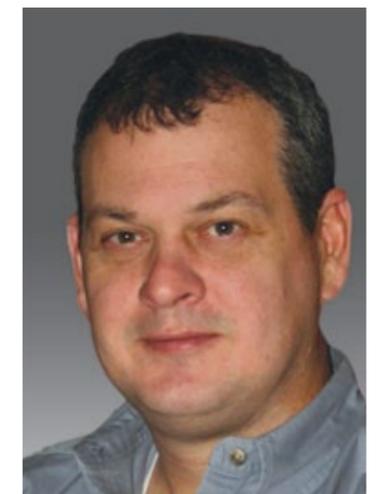
Dr. Jack Siemiatycki is a Professor of epidemiology at the University of Montreal. He holds the positions of Canada Research Chair and the Guzzo-SRC Chair in Environment and Cancer, and is a member of the Canadian Academy of Health Sciences. He has served on over 100 national and international expert advisory bodies for academic and government agencies in Canada, the US and Europe. Most of his research has been in the area of environmental and occupational etiology of cancer. He is known for having developed novel and influential research methods in occupational etiology of cancer, and for results concerning a wide variety of possible environmental carcinogens. Dr. Siemiatycki has been an invited speaker at over 100 meetings or seminars throughout the world, including for President Clinton's Cancer Panel and as a Distinguished Lecturer at the U.S. National Cancer Institute.

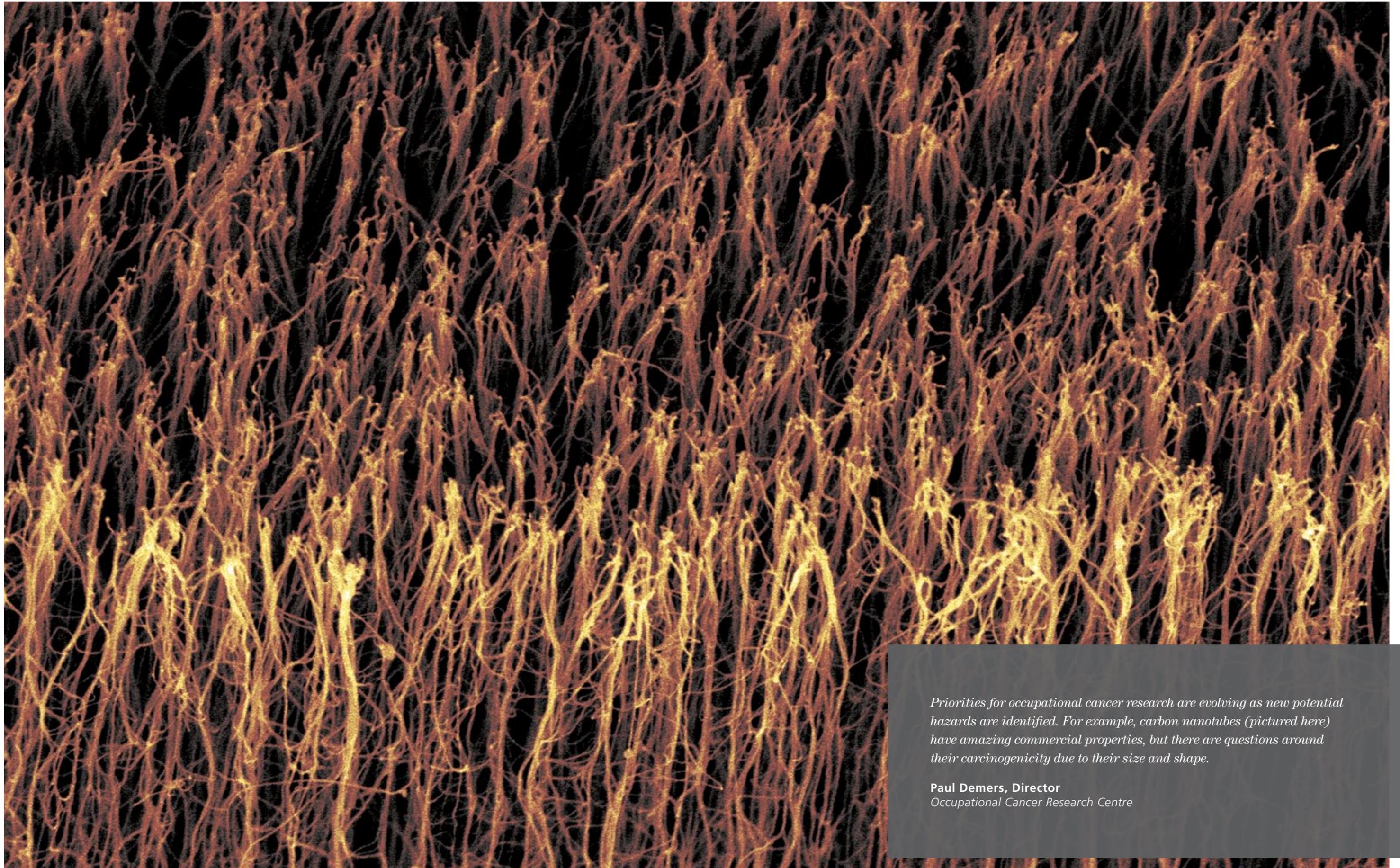


Like many in the field, Dr. Aaron Blair took an unexpected route toward occupational cancer research. After finishing his PhD in genetics, he taught biology and genetics at a small college in North Carolina. In preparation for a human anatomy and physiology course he was to teach, he took a course on human physiology offered by the University of North Carolina School of Public Health. In learning more about the field of public health, he became interested in researching what causes disease – it wasn't until then that he understood this practice to be 'epidemiology'. Having grown up in a rural farming community, it was natural for Aaron to build his research career in epidemiology with a focus on agricultural exposures. He was the Interim Director of OCRC from 2009 to 2010, bringing international credibility and expertise, and providing invaluable guidance as the groundwork for the Centre was laid.



Dr. Paul Villeneuve graduated from the Department of Public Health Sciences, University of Toronto in 2000, and has been accredited as a Professional Statistician by the Statistical Society of Canada. Paul has long been involved in epidemiological studies dating back to his time spent at the Laboratory Centre for Disease Control at Health Canada in 1988. His main research interests are environmental and occupational epidemiology. He has actively been involved in evaluating the relationship between occupational exposure to radon and lung cancer among Newfoundland fluorspar miners over the span of almost two decades. Paul provides epidemiological and biostatistical expertise to many of the research activities of the OCRC.





*Priorities for occupational cancer research are evolving as new potential hazards are identified. For example, carbon nanotubes (pictured here) have amazing commercial properties, but there are questions around their carcinogenicity due to their size and shape.*

**Paul Demers, Director**  
Occupational Cancer Research Centre

## Steering Committee

Jean-Yves Savoie	Steering Committee Chair
Sarah Bouma	Senior Manager of Research, Public Affairs, Canadian Cancer Society Ontario Division
Dafna Carr	Director, Policy, Planning and KTE, Cancer Care Ontario
Wolodymyr (Wally) Lewyckyj	Manager, Workplace Safety and Insurance Board Research Secretariat
Andy King	Former National Health and Safety Director, United Steelworkers
D. Linn Holness	Director, Centre for Research Expertise in Occupational Disease Professor and Director, Occupational and Environmental Health, Dalla Lana School of Public Health and Department of Medicine, University of Toronto Chief Department of Occupational Health, St. Michael's Hospital
H. Roland Hosein	Vice President, GE Canada Adjunct Professor, Occupational and Environmental Health, Faculty of Medicine, University of Toronto Vice Chair, Canadian Standards Association Global Board
Gary Liss	Medical consultant, Ontario Ministry of Labour Assistant Professor, Dalla Lana School of Public Health, University of Toronto Researcher, Centre for Research Expertise in Occupational Disease Affiliate Scientist, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto
Anthony B. Miller	Professor Emeritus, Dalla Lana School of Public Health, University of Toronto

Rowena Pinto*	Vice President, Public Affairs and Strategic Initiatives, CCS Ontario Division
Luba Slatkovska*	Senior Manager of Research (acting), Public Affairs, CCS Ontario Division
Paul Demers	Director, Occupational Cancer Research Centre Scientific Director, CAREX Canada Professor, Dalla Lana School of Public Health, University of Toronto

(\*acting Steering Committee members for the Canadian Cancer Society)

*Cancer caused by chemicals is a concern for everyone. Many chemicals that were discovered to cause cancer in workers are now causing cancer among people in the community. Today research is showing that workers are suffering from cancer due to shiftwork and other causes. These cancers are preventable because the cause can be removed from the work process when identified.*

*The Occupational Cancer Research Centre is an important vehicle for shining a light on the causes of cancer and what can be done to prevent them. Working with government, cancer agencies, unions and industry we have a better chance to identify and eliminate cancer suffering due to exposure at work with the help of OCRC.*

**Andy King**

*former National Health and Safety Director for the United Steelworkers*

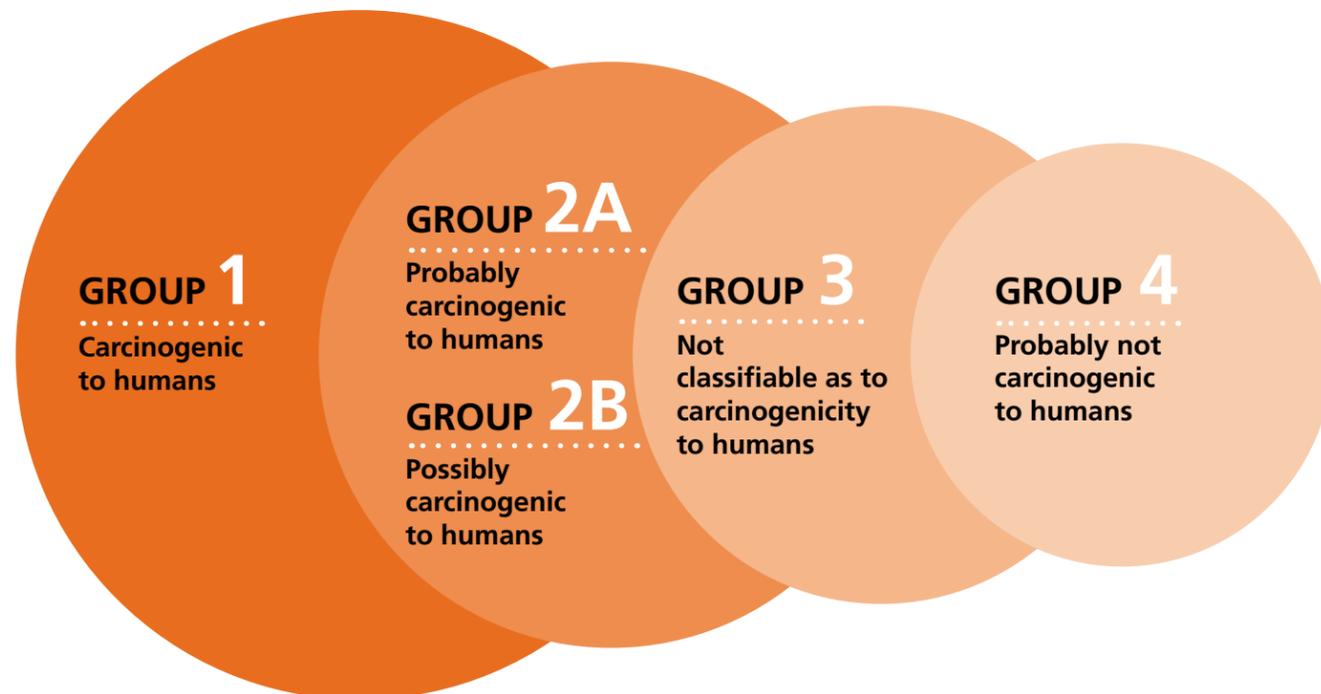
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## Key Terms in Occupational Cancer Research

**Carcinogen:** Any substance that is directly involved in causing cancer or increases the risk of developing cancer. Occupational carcinogens fall into many categories, such as metals (e.g. nickel), dusts and fibres (e.g. asbestos), chemicals (e.g. benzene), and radiation (e.g. radon and UV radiation).

**International Agency for Research on Cancer (IARC):** A specialized agency of the World Health Organization that has the most widely recognized program of evaluating suspected human carcinogens. IARC classifies each agent or exposure into one of five groups according to the strength of scientific evidence for carcinogenicity, as follows:



**Occupational Exposure Limits (OELs):** An OEL is an upper limit on the acceptable concentration of a hazardous substance in workplace air. OELs are set by national or provincial regulators to protect occupational safety and health.

**Epidemiology:** Epidemiology is the study of the patterns and causes of disease and other health-related factors in large groups of people with the goal of controlling relevant health problems. It helps inform policy decisions and evidence-based medicine by identifying causes of disease and targets for prevention. Occupational cancer epidemiology is multidisciplinary in nature and epidemiologists work closely with scientists from a number of other scientific disciplines. In particular, exposure assessment and social science disciplines play a crucial role in understanding the causes of cancer in the workplace, their measurement, and the context in which the disease process develops.

**Surveillance:** Surveillance refers to the systematic and ongoing collection, analysis, interpretation, and timely dissemination of health and exposure data. Some of the main goals of disease surveillance are to identify pattern of disease and exposure occurrence, in order to target prevention efforts or to evaluate the effectiveness of interventions.

*Workplace Safety & Prevention Services is committed to putting the most current and effective health and safety solutions within reach of every employee and employer in the province. To do this, we rely on relationships that enable us to extend our reach and enrich the value that we deliver to our customers. Our work with the Occupational Cancer Research Centre has done just that. We are working together, along with many other stakeholder groups, to bridge the gap between the research and business communities to ensure that research is utilized and integrated into prevention practices and the solutions we provide to our customers.*

**Elizabeth Mills**

*President and CEO of Workplace Safety & Prevention Services*

# OCRC

## Staff and Students



*Back Row (from left): Priyanka Raj, Linda Kachuri, Manisha Pahwa, Paul Demers, Shelley Harris, Joanne Kim, Trevor van Ingen, Anne Harris*

*Front Row: Ann Del Bianco, Marcella Jones, Marjorie Pagcu, Kate Jardine, Desre Kramer, Garthika Navaranjan, Kris Moore, Jill Hardt*

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