

Canada Gairdner Awards honour exceptional medical research

The Gairdner Foundation has announced the eight star researchers from around the world who will receive the 2014 Canada Gairdner Awards, Canada's most prestigious prize for biomedical research. The winners, who will each receive \$100 000, were honoured for their innovative contributions to various fields of medicine, including cancer, cardiovascular disease and immunotherapy.

Ontario researcher Dr. Salim Yusuf received the Canada Gairdner Wightman Award, given to Canadians who have shown outstanding leadership throughout their careers. Yusuf, director of the Population Health Research Institute and professor of medicine at McMaster University in Hamilton, Ontario, is best known for changing how cardiovascular disease is treated and prevented through large-scale clinical trials.

"He has conducted huge international trials in the most careful manner. He has been a leader in the world and there is enormous respect for him," says Dr. John Dirks, president and scientific director of The Gairdner Foundation, founded in 1957 to honour research that makes a major impact on treating disease and alleviating human suffering.

Recognizing research that advanced health in the developing world, the Canada Gairdner Global Health Award went to Satoshi Omura, distinguished emeritus professor in the Department of Drug Discovery Sciences at Kitasato University in Tokyo, Japan. Omura discovered the microorganism *Streptomyces avermitilis*, which led to the development of a successful treatment

for many parasitic diseases, including river blindness and elephantiasis.

The remaining winners received Canada Gairdner International Awards

the Beth Israel Deaconess Medical Center in Boston, Massachusetts, found that the protein was released by most malignant tumours, enabling them to grow and spread. Dr. Napoleone Ferrara, senior deputy director for basic science at the University of California, San Diego's Moores Cancer Center, discovered an antibody that blocked the protein and slowed tumour growth.

Their work eventually led to the commercial development of bevacizumab (Avastin), a drug now used worldwide to treat colorectal cancer, renal cell carcinoma, glioblastoma and other forms of cancer. Although expensive (about \$40 000 a year), the drug has vastly improved the progression-free survival of patients whose malignancies have already spread.

"This is a major, major change in human medicine," says Dr. Philip Marsden, co-chair of the medical review panel for The Gairdner Foundation.

A similar drug has also revolutionized the treatment of wet macular degeneration, a major cause of vision loss associated with the growth of

abnormal blood vessels in the eye. "Now there is a treatment. It's imperfect, but before we had no treatment, so this is a real benefit, a direction we might not have taken," says Dirks.

Another discovery with a major clinical impact is a therapy that blocks tumour necrosis factor, a cytokine that contributes to inflammation and is found in abundance in the joints of people with rheumatoid arthritis. Sir Marc Feldmann, head of the Kennedy Institute of Rheumatology in Oxford,



Dr. Napoleone Ferrara discovered an antibody that slowed tumour growth and led to the commercial development of a blockbuster cancer drug.

for seminal discoveries in their fields. "Here we have six winners who are all coming out of basic science and are all making huge impacts," says Dirks.

Two researchers were honoured for their individual contributions to discovering and inhibiting vascular endothelial growth factor, a protein released by tumour cells that promotes the formation of new blood vessels. Dr. Harold Dvorak, founding director of the Center for Vascular Biology Research and a professor of pathology at

United Kingdom, and Sir Ravinder Maini, emeritus professor of rheumatology at Imperial College London in the United Kingdom, found an antibody-based treatment that inhibits the cytokine. Their work enabled the development of several successful therapies for arthritis and other chronic inflammatory diseases.

“This serves, in my mind, as a wonderful example of bench-to-bedside research,” says Marsden. “It was a ground-breaking discovery.”

The two other 2014 Gairdner winners are James Allison, chair of the immunology department at the University of Texas MD Anderson Cancer Center in Houston, and Titia de Lange, head of the Laboratory of Cell Biology and Genetics at The Rockefeller University in New York City, New York. Allison was recognized for introducing the concept of treating the entire immune system rather than individual tumours to fight cancer.

De Lange received the award for discovering how the ends of chromosomes,

or telomeres, contribute to genome integrity. Her work has furthered the understanding of how genetic instability contributes to disorders and disease.

“She has done a beautiful piece of work showing how the ends of chromosomes are protected and how they repair themselves,” says Dirks. “This is at the very heart of it, where it all begins and where diseases get started.”

— Roger Collier, *CMAJ*

CMAJ 2014. DOI:10.1503/cmaj.109-4769