Ontario

NEWS

Office of the Premier

Ontario Announces First Phase of Research Projects to Fight COVID-19

Ontario-Based Solutions Contribute to the Global Effort against the Outbreak

May 21, 2020 1:00 P.M.

Ontario is funding the following research on preventing, detecting and treating COVID-19. These projects focus on important areas of research, including vaccine development, diagnostics, drug trials and development, and social sciences.

A Randomized Open-Label Trial of CONvalescent Plasma for Hospitalized Adults with Acute COVID-19 Respiratory Illness (CONCOR-1)

Donald Arnold, Principal Investigator

McMaster University

CONCOR-1 is a clinical trial that will collect blood plasma from individuals who have recovered from COVID-19, known as COVID-19 convalescent plasma. Convalescent plasma contains COVID-19 antibodies, proteins that help fight the virus. Convalescent plasma will be injected into patients currently fighting the infection, to test whether this is an effective treatment for the virus. This clinical trial will enrol patients 16 years of age and older admitted to hospital with COVID-19 and who require supplemental oxygen for respiratory illness.

Partners include 60 hospitals across Canada and three hospitals in New York City, the Canadian Blood Services and Héma-Québec and the New York Blood Center.

Research and Deployment of Rapid High-Throughput Diagnostic Testing for COVID-19

Marek Smieja, Principal Investigator

St Joseph's Healthcare Hamilton

This project will increase Ontario's COVID-19 testing capacity by deploying robotic liquid handling technology, specimen pooling, and efficient sample preparation, while reducing biological risk and ensuring reliable results. The Disease Diagnostics & Development group in the Research Institute of St Joe's Hamilton (RSJH) is collaborating with the Hamilton Regional Laboratory Medicine Program (HRLMP) and other clinical laboratories across the province to quickly develop, validate, and deliver high-throughput, COVID-19 testing, with the goal of testing up to 6,000 samples per lab daily.

Assay Development for SARS-CoV-2 Sero-Surveillance

Jennifer Gommerman, Principal Investigator

University of Toronto

This study will provide a better understanding of the immune response to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19. This approach aims to measure the level and/or types of antibodies induced by SARS-CoV-2 infection in the blood of acute and convalescent patients. In addition, measuring these antibodies in the saliva of asymptomatic infected subjects identified through contact tracing will provide insights into what the early immune response to the virus looks like, and how this may correlate with clinical outcome. This knowledge, as well as the development of a robust serosurveillance platform, represents a powerful weapon in our fight against COVID-19.

Multivalent Antibody Scaffold to Deliver an Exceptionally Potent and Broad Antiviral Against SARS-CoV-2

Jean-Philippe Julien, Principal Investigator

The Hospital for Sick Children

This project has the potential to develop a unique antibody-based molecule for protection and treatment against COVID-19. Molecular technology will allow these researchers to decipher the vulnerabilities of the virus with the goal of developing a potent and broad antiviral that neutralizes SARS-CoV-2 and prevents associated COVID-19 symptoms.

Developing Prophylactic Virus-Vectored Vaccines for COVID-19

Byram Bridle, Leonardo Susta and Sarah Wootton (Co-Principal Investigators, University of Guelph); Darwyn Kobasa, National Microbiology Laboratory, Public Health Agency of Canada (Collaborator) University of Guelph

This research aims to develop a vaccination strategy for COVID-19. By developing avian avulavirus (AAvV-1) and adenovirus viral-vectored vaccines expressing the SARS-CoV-2 spike protein as a target antigen, researchers will test these vaccines in mice to identify a way to induce robust protective mucosal (respiratory, gastrointestinal and urogenital tract) and systemic immunity. Mucosal immunity plays a significant role in preventing pathogens from getting into the body. Systemic immunity clears any pathogens that bypass mucosal barriers. After optimization, these vaccines will be evaluated in a hamster challenge model at the National Microbiology Laboratory in Winnipeg.

The RAPID COVID Study - Application of Point-of-Care COVID-19 Testing to Optimize Patient Care, Resource Allocation and Safety for Frontline Staff
Derek So, Principal Investigator
University of Ottawa Heart Institute
This study will determine the role of point-of-care testing (POC) as a tool to improve care of COVID-19 patients and conserve resources. A major obstacle facing hospitals during the COVID-19 outbreak is the inability to quickly diagnose who is infected with the virus. Delayed test results could mean that patients, who ultimately test negative, are treated for days utilising resources that could be better deployed elsewhere. An immediate diagnosis of COVID-19 among carriers could provide more expedient treatment, prevent clinical deterioration and help health care workers avoid unnecessary risk of exposure.

In collaboration with Spartan Biosciences, which has developed a novel point-of-care 45-minute bedside COVID-19 test, and a team of specialists from six centres in Ontario, this research will evaluate the efficacy of POC testing to determine when, how and to who it can be applied.

A Prospective, Observational Research Study on the Diagnosis of COVID-19 Infection from Stool Samples of Children and Adults
Nikhil Pai, Jeff Pernica, Marek Smieja (Co-Principal Investigators)
McMaster University
Through the development and use of a novel test to diagnose COVID-19 from stool samples, this team will assess up to 4,500 stool samples collected from outpatient clinics, emergency departments and inpatient wards across eight major Hamilton region hospitals and clinics. This work will improve COVID-19 disease detection in children and adults who lack respiratory symptoms, are asymptomatic, or are presumed to have "recovered" from past infection. The researchers hope to expand COVID-19 testing options across Canada and ultimately, better identify patients who carry high risk of community transmission than traditional respiratory testing alone.

Cellular Immuno-Therapy for COVID-19 Induced Acute Respiratory Distress Syndrome: The CIRCA-19 Trial
Duncan Stewart, Principal Investigator
Ottawa Hospital Research Institute
Through a series of trials, this research will rapidly evaluate the safety and efficacy of using

mesenchymal stromal/stem cells, or MSCs, to help treat patients with COVID-19 related acute respiratory distress syndrome (ARDS). Up to 25 percent of all patients admitted to hospital require admission to an intensive care unit, and as many as 40 percent develop severe difficulty breathing due to ARDS.

In total, 27 patients will undergo three sequential trials. The first trial, called the Vanguard study, is designed to quickly determine the optimal dosing strategy of MSCs derived from bone marrow to treat patients experiencing ARDS. The next two trials will use the optimal dose of cells determined by the Vanguard trial, but will administer MSCs derived from the umbilical cord, which is an abundant and readily available source.

Rapid Identification of Immunogenic and T-cell Epitopes to Enable Serologic Testing, Passive Immunotherapy, and Epitope Vaccine for COVID-19
Shawn Li, Principal Investigator
Western University
To curb the COVID-19 outbreak caused by the SARS-CoV-2 virus, researchers are looking to solve three critical challenges as quickly as possible - detection, treatment, and vaccination. This project will address these challenges by developing a point-of-care blood test to identify infected individuals, including those without symptoms, devising strategies for the production of virus-neutralizing antibodies to treat the severely ill, and identifying viral epitopes to inform epitope-vaccine development.

The Impact of the Coronavirus Pandemic on Children with Medical Complexity Technology Dependency: A Novel Research Cohort Study
Audrey Lim, Principal Investigator
McMaster University
This study addresses how to effectively manage pediatric patients remotely by identifying the barriers and facilitators of virtual clinics. COVID-19 is placing strain on families of children with medical complexity, medical fragility and technology dependency. Many of these children are dependent on life sustaining technology such as tracheostomy, home mechanical ventilation, and/or enteral feeding tubes. Though accounting for less than 1 percent of all children in Ontario, this group is at increased risk of multiple and prolonged hospitalizations and poorer health outcomes. Normally, these children are seen at a hospital to address their multiple complex needs, however due to COVID-19, all in-person clinic appointments have been replaced by virtual clinics. Parental satisfaction with virtual clinic healthcare teams will also be assessed using a quality improvement tool developed for this study. This research has the potential to advance virtual medicine, beyond COVID-19.

Food Retail Environment Surveillance for Health and Economic Resiliency: FRESHER Ontario

Jason Gilliland, Principal Investigator

Western University

The Food Retail Environment Surveillance for Health & Economic Resiliency (FRESHER) project is a rapid response to the widespread closures of, and modified operating conditions for, many retail food outlets. The FRESHER project will examine the economic and social impacts of COVID-19 in Southwestern Ontario by identifying what businesses modified their operations, temporarily closed or permanently closed during the outbreak and how the outbreak has affected businesses and their employees. This study will help inform policies and programs that will maintain Ontario's food security, incentivize economic growth during the recovery period, and improve resiliency among businesses during future pandemics and emergencies.

Protective Immunity in Individuals Infected with COVID-19

Ishac Nazy, Principal Investigator

McMaster University

The goal of this research is to determine the makeup, concentration, strength and viral properties of anti-SARS-CoV-2 antibodies to provide insights into the immune response of individuals infected with COVID-19. Working with Dr. Arnold (CONCOR-1 study on convalescent plasma therapy), this team will use samples from recovered patients to test whether antibodies exist, and if they are able to bind and neutralize the virus. This research will determine whether immunity is longstanding or if it wanes over time; and will inform researchers how immune-based treatments work to fight off the virus, including convalescent plasma or future vaccines.

Clinical Research on the Therapeutic Benefits of Annexin A5 in Severe COVID-19 Patients

Claudio Martin, Principal Investigator

Lawson Health Research Institute

There are currently no proven therapies to treat COVID-19. In the most severe cases, the disease is complicated by sepsis acute respiratory distress syndrome (ARDS), and multiorgan failure. Sepsis is a life-threatening condition caused by the body's response to an infection. While the body normally releases chemicals to fight an infection, sepsis occurs when the body's response to these chemicals is out of balance, triggering systemic inflammation that can damage multiple organs. Many critically ill COVID-19 patients develop sepsis 1-2 days before

ARDS, suggesting that sepsis is a major contributor to the development of organ and respiratory failure.

This clinical trial will examine the effects of Annexin A5, in treating critically ill COVID-19 patients who develop sepsis. Annexin A5 is a human protein that has potent anti-inflammatory, anti-apoptotic (cell death prevention) and moderate anticoagulant (blood clot prevention) properties. The ultimate goal of the trial is to use Annexin A5 to treat sepsis and prevent respiratory and multi-organ failure.

Novel Coronavirus Antiviral Drug Discovery Using High-Throughput Screening
Jean-Simon Diallo, Principal Investigator
Ottawa Hospital Research Institute

Using a novel bio-sensor that detects drugs that disrupt the attachment of coronaviruses to cells, this research will test approximately 1,200 approved drugs to better understand their potential to prevent viral infection in cells and their ability to block the interaction between COVID-19 and its receptor. A second phase of this study will attempt to identify novel antivirals from a small (>220,000) molecule library.

Canada's COVID-19 Pandemic Response and Impact in Low-Income and Homeless or At-Risk for Homelessness Populations in Ottawa (Canada): A Mixed Method Study
Smita Pakhale, Principal Investigator
The Ottawa Hospital Research Institute

Vulnerable populations face numerous social and health inequities that are exacerbated during times of crises. Lessons learned from previous public health crises suggest that inappropriate communication strategies jeopardize risk reduction for vulnerable populations. The objective of this research is to measure the impacts of COVID-19 public health emergency response efforts and communication strategies on Ottawa's low-income, homeless or at-risk for homelessness populations. The findings could help inform public health messaging strategies and pandemic approaches for vulnerable populations.

Ivana Yelich Premier's Office
Ivana.Yelich@ontario.ca
Chris Scott Minister Romano's Office
Chris.Scott@ontario.ca
Tanya Blazina Communications Branch
416 325-2746
Public Inquiries: 416 325-2929 TTY: 1 800 268-7095

Available Online
Disponible en Français