RESEARCH REPORT 20

CROHN'S AND COLITIS CANADA

Make it stop. For life.

Report period: January 1 to December 31, 2020 | Pictured: Dr. Elena Verdú

Crohn's and Colitis Canada
Crohn et Colite Canada

A MESSAGE TO THE COMMUNITY

It is safe to say this year has been anything but predictable. The COVID-19 pandemic has changed our lives in so many ways.

Amidst all of the uncertainty, our close-knit community of volunteers, donors, healthcare providers, researchers, colleagues, and members of communities from coast to coast rallied together to navigate these challenging times.

From virtual chapter meetings to weekly webinars hosted by our COVID-19 Task Force of leading inflammatory bowel disease (IBD) experts, we turned to each other in one way or another for support – lifting each other's spirits and ensuring we were all well informed. All part of our steadfast commitment to our promise to discover cures and improve quality of life for everyone affected by Crohn's disease or ulcerative colitis by fundraising and investing in research that gave us hope for the future.

Within this report, you will find details about the life-changing research projects that are underway – all thanks to your support. You enabled us to invest $4.7 million into 50 promising research projects and initiatives over the past 12 months, which means that we have been able to invest over $135 million into crucial research since our founding in 1974.

Along with providing a look at the research that we fund, the report delves into the latest finding from the world-renowned GEM Project, sheds light on the recent insights into the origins of ulcerative colitis, and highlights a powerful project dedicated to empowering and supporting parents of children with IBD.

As the future is bright for IBD research, we look forward to seeing where these projects take us.

With our 2016-2020 Strategy coming to a close, we are proud to share the tremendous progress that we made in better understanding these diseases and supporting the community. A few notable accomplishments include the initiation of the PACE network that elevates the standard of care received by people with IBD and our enhanced support programs that meet the community's education and advocacy needs.

As we announce our new strategy in 2021, we remain committed to being a global force for advancing transformational research. We will continue to build momentum on our efforts to date by investing in a vast research portfolio with projects led by prominent researchers from across the country.

With 1 in 140 Canadians living with IBD, we must continue to forge ahead – side by side – in our relentless mission to discover cures and improve quality of life for the 270,000 Canadians facing these diseases.

By continuing to work together, we can create a future free of IBD.

2020 VISION

Crohn's and Colitis Canada is a global force advancing transformational research and activating our community to improve the lives of people affected by Crohn's and colitis in Canada.

LEGEND

- Generate new science, knowledge and treatments for Crohn's and colitis through a diverse research portfolio
- Create an open conversation about Crohn's and colitis and grow our profile as leaders
- Diversify and grow our fundraising
- Improve the quality of life and day-to-day experience of people living with or affected by Crohn's or colitis
- Support high performance and strategic action across the organization

FUELING RESEARCH BY

ADVANCING DISCOVERY

Powering the research discovery process that is driving new treatments and cures.

FINDING CAUSES AND TRIGGERS

Uncovering the multiple triggers that predict or lead to the onset of the disease.

- Discovering environmental triggers
- Discovering markers

DISCOVERING NOVEL TREATMENTS

Discovering new ways to block inflammation, treat complications, improve therapy, and create a healthy gut.

- Blocking inflammation
- Creating healthy gut ecosystems

SUPPORTING EARLY CAREER IBD RESEARCHERS

Providing funding to up-and-coming researchers to help advance their careers.

- Fellowships
- New investigator awards

IMPROVING LIVES

Getting the best care and symptom management into the hands of Crohn's and colitis patients.

HELPING MANAGE SYMPTOMS

Finding the best ways to get novel treatments into the hands of patients.

- Treating complications
- Predicting disease course

GETTING THE BEST CARE

Exploring new ways to provide the best treatments and multidisciplinary care to patients.

- Creating health service models
- Promoting evidence-based practice

EDUCATING PROFESSIONALS

Ensuring that healthcare professionals have access to the very latest and best information.

- Hosting medical conferences
- Supporting IBD nurses
- Supporting women in the IBD field

RESEARCH HIGHLIGHTS

OVER $135 MILLION
invested in more than 350 research projects since our founding in 1974

IN 2020:

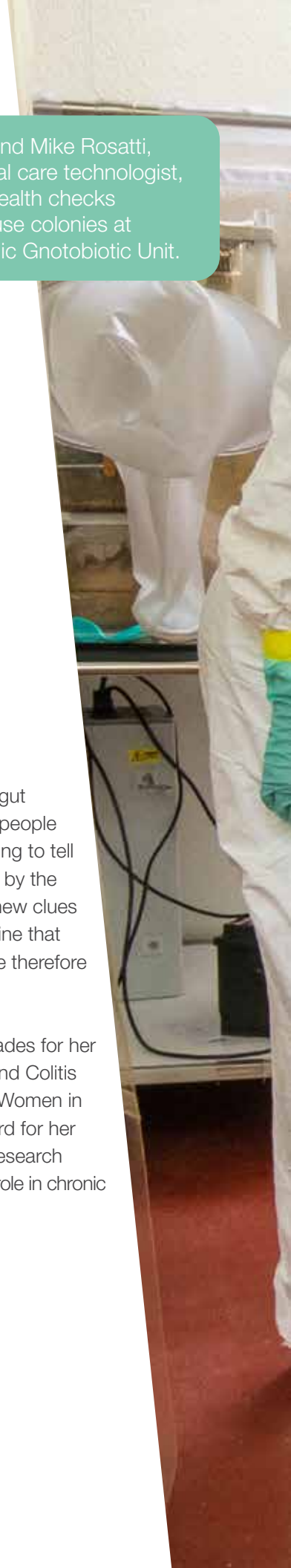
- $4.7 million invested in research
- 100% of grants featured collaborations among leading scientists and partners across Canada
- 50 research projects and initiatives supported
- For every $1 we invested, $10 were leveraged from government and industry
- 17 major hospitals and universities supported
- Over 2,962 articles and book chapters published by our researchers
- New findings:
  - GEM Project linked leaky gut to Crohn's disease
  - Increased gut bacteria protease activity linked to ulcerative colitis
- First ever Women in IBD Awards given to two outstanding researchers
- Over 430,000 people supported through programs
- Comprehensive COVID-19 and IBD response

ATTENDED THE MEETING OF THE MINDS CONFERENCE

- 97 MDs
- 48 Nurses
- 13 Fellows
- 15 Allied Health Professionals (Pharmacists, Dietitians, and Research Coordinators)
- 38 Faculty Members

55 NURSES ATTENDED THE ANNUAL CANIBD CONFERENCE

Funded Investigator Shines New Light on How the Gut Microbiome Can Cause Ulcerative Colitis



Dr. Elena Verdú and Mike Rosatti, gnotobiotic animal care technologist, are conducting health checks of germ-free mouse colonies at McMaster's Axenic Gnotobiotic Unit.

A new study funded by Crohn's and Colitis Canada has uncovered inflammatory bacterial changes in the gut that happen before ulcerative colitis begins. This unique discovery, led by Dr. Elena Verdú from McMaster University, means a potential new way to monitor people at-risk, and deploy precision drugs in the future.

The gut microbiome consists of bacteria and other microscopic life forms that inhabit the gastrointestinal tract. While examining bacteria in the microbiome, her team honed in on microbes that produce proteases. These enzymes digest proteins – and may be responsible for causing inflammation and damaging the mucus that covers the gut lining.

In this study, which leveraged the world-renowned GEM Project, they first found that people with ulcerative colitis had a different bacterial composition and gene activity. Strikingly, they then found functional differences in the gut of people long before they developed the disease. These differences included a unique inflammatory activity reflected by high activity of proteases in the stool, and a change in the bacteria genes that produce proteases.

Most of what we know about the gut microbiome and IBD comes after people are diagnosed, making it challenging to tell if changes in the gut were caused by the disease. However, here we have new clues to functional changes in the intestine that precede ulcerative colitis – and are therefore part of how the disease develops.

Dr. Verdú has earned many accolades for her work, most recently the Crohn's and Colitis Canada and Pfizer Canada 2020 Women in IBD Outstanding Researcher Award for her exceptional contributions to IBD research through studying the microbiome's role in chronic intestinal inflammation.

Award-winning research made possible by you

The grants that Dr. Verdú received from Crohn's and Colitis Canada in both 2016 and 2019 helped make the discovery of these new insights into ulcerative colitis possible.

It is through your ongoing support that we can support novel research led by prominent Canadian scientists, like Dr. Verdú, who are uncovering original ideas in the quest for new treatments and ultimately, the cures.

FUNDED RESEARCH

FINDING CAUSES AND TRIGGERS

*Grant started in July 2019

What causes Crohn's and colitis? What are the triggers that worsen symptoms? These questions drive our researchers as they examine environmental triggers and genetic markers responsible for IBD.

A UNIQUE MODEL FOR STUDYING HOW STRESS INFLUENCES CROHN'S DISEASE

Dr. Brian Coombes
McMaster University
Year 1 of 3 | $125,000 | $375,000

People with Crohn's disease have higher levels of adherent-invasive E. coli (AIEC) bacteria, but we do not know why. One possible relevant trigger is the impact of prolonged stress. To this end, Dr. Coombes has designed a unique new model to study how stress causes Crohn's-like changes in the gut – including higher levels of AIEC and other bacteria.

In this study, he aims to characterize how stress affects the body's immune response and microbiome – and find new ways to reverse these changes and halt inflammation at its source.

INVESTIGATING HOW THE LYMPHATIC SYSTEM MODULATES CROHN'S DISEASE

Dr. Pierre-Yves von der Weid
University of Calgary
Year 1 of 3* | $120,000 | $370,000

Research shows that gut inflammation is linked to an abnormal lymphatic system, the one that transports and induces specialized immune cells to attack invading viruses and bacteria. New imaging techniques show that the lymphatic system plays a role in IBD. If the system does not work well, it may trigger or worsen conditions in the gut.

Dr. von der Weid is testing if a dysfunctional lymphatic system impairs the immune response and contributes to gut inflammation in mice with Crohn's disease. If the link is clear, researchers can pursue lymphatic-targeted therapies for Crohn's disease.

UNDERSTANDING A NEW TARGET TO ALLEVIATE CHRONIC IBD PAIN

Dr. Christophe Altier
University of Calgary
Year 2 of 3 | $125,000 | $375,000

People with IBD often live with persistent abdominal pain for which treatments are only modestly helpful. That is because the factors that cause such pain, and how it accelerates from acute to chronic, are not well known.

Dr. Altier previously discovered that, in colitis, spinal cells called microglia are linked to pain signals coming from the gut. In this important next step, he will define how microglia interact with nerve cells – providing a new window into potentially more effective drugs to relieve abdominal pain.

NOVEL PEPTIDES TO ENHANCE MUCOSAL HEALING

Dr. Wallace K. MacNaughton
University of Calgary
Year 2 of 3 | $125,000 | $375,000

How our bodies heal damage to the intestinal lining is complex and not well understood. In those with IBD, this repair process stalls and results in pain, inflammation, and a compromised intestinal barrier.

Dr. MacNaughton is using state-of-the-art techniques to study certain enzymes, proteins, and peptides involved in inflammation in a bid to understand how this repair process works. In doing so, he will test specific molecules as potential new therapies for IBD, or ways to keep people in remission.

E. COLI MAY YIELD ANSWERS TO PREVENTING CROHN'S DISEASE

Dr. Brian Coombes
McMaster University
Year 3 of 3 | $125,000 | $375,000

What causes Crohn's disease remains poorly understood. Researchers believe the answers can be found in the gut microbiome where, for example, we have seen links between Crohn's inflammation and growth of adherent-invasive E. coli (AIEC) bacteria.

Using a special model, Dr. Coombes is closely studying how AIEC triggers chronic inflammation and fibrosis, the scarring and stiffening of intestinal walls. By investigating how the bacteria lingers in an inflamed gut, he is targeting new answers in how AIEC influences the development of Crohn's disease. These answers may spark new therapies to prevent the disease in at-risk Canadians.

TARGETING A NEW PATH TO BLOCKING INTESTINAL FIBROSIS

Dr. Simon Hirota
University of Calgary
Year 3 of 3 | $125,000 | $375,000

People with IBD often have fibrosis – scarred and stiffened intestinal walls that cause obstruction and incontinence. Within 20 years, half of these people will need surgery to repair the damage.

Dr. Hirota is seeking a new treatment path by studying a sensor called pregnane X receptor (PXR), which is linked to IBD. So far, its role in fibrosis is unknown. In this study, he is investigating whether PXR has therapeutic potential for intestinal fibrosis and, if so, how scientists can target new molecules to control PXR and prevent this problem altogether.

FUNDED RESEARCH

DISCOVERING NOVEL TREATMENTS

*Grant started in July 2019

These grants discover new ways to block inflammation, treat complications, improve therapy, and create a healthy gut.

ANALYZING DRUGS FOR THEIR POTENTIAL TO STRENGTHEN THE INTESTINAL WALL

Dr. François Boudreau
Université de Sherbrooke
Year 1 of 1 | $50,000

Defects in the epithelium, our intestine's cellular wall, are well implicated in IBD. We can hinder disease progression by finding molecules that strengthen this barrier and cut inflammation.

Dr. Boudreau's team is identifying drugs that can boost the activity of a protein (HNF4A) that they found maintains the epithelium. Using advanced cell models and analysis tools, they are screening over 1,500 already approved drugs to identify which ones reinforce the work of HNF4A. When they find one, the next step is a clinical trial.

DELIVERING PEPTIDES IN AN ORAL PILL TO TREAT IBD

Dr. Harry Brumer
University of British Columbia
Year 1 of 1* | $50,000

Small fragments of proteins called peptides have promise in reducing inflammation caused by IBD. Yet, the use of peptides is currently limited by a lack of effective ways to deliver them where they are needed in the lower gut.

Dr. Brumer's lab is developing a new technology that packages these peptides in an oral pill that allows release only at the right place. The hope is that this will make peptide treatments easier and more accessible to people with IBD.

LRRK2 GENE VARIANT MAY OFFER A NEW THERAPEUTIC TARGET FOR CROHN'S DISEASE

Dr. Dana Philpott
University of Toronto
Year 1 of 3 | $125,000 | $375,000

As genomic research grows, so do the opportunities for finding the underlying causes of IBD. Few studies have closely examined the promising leucine-rich repeat kinase 2 (LRRK2) gene variant linked to Crohn's disease and Parkinson's disease – conditions that seem unrelated but, at a genetic level, may not be.

Dr. Philpott discovered that LRRK2 disrupts the body's white blood cells from properly fighting infections and inflammation. Her lab is studying how LRRK2 affects intestinal inflammation – and if drugs that target this gene can help to heal damage there and treat Crohn's disease.

NEW ENZYME MAY OFFER A NEW BIOLOGICAL APPROACH TO TREAT IBD

Dr. Jean Sévigny
Université Laval
Year 1 of 1* | $50,000

How does gut inflammation begin, persist, and develop into IBD? Understanding these pathways is critical to finding new treatments. Often, those treatments can be based on compounds inside our bodies.

Dr. Sévigny's lab specializes in extracellular nucleotides, molecules that coordinate how cells communicate with one another – and how they trigger inflammation. In mice, they were able to prevent colitis by blocking these nucleotides at the intestinal surface. They also found an enzyme, NTPDase8, that destroys them. They are now exploring this enzyme's potential to treat IBD and reduce inflammation.

PURSUING NEW CROHN'S THERAPIES LINKED TO SHIP DEFICIENCY

Dr. Laura Sly
University of British Columbia
Year 1 of 3*| $125,000 | $375,000

Some individuals with Crohn's disease have low levels of a protein called SHIP, a trait that is linked to gut inflammation. For them, there exist no reliable therapies that are known to work, a major gap this study addresses.

Dr. Sly is testing a new immune-based approach to halt inflammation in cells missing SHIP, in mice missing SHIP, and in blood samples from people with Crohn's disease who have low SHIP activity. The goal: to identify new treatment options for those who do not respond well to current biologic therapies.

EXPLORING THE THERAPEUTIC POTENTIAL OF CELLS THAT SUPPRESS INFLAMMATION

Dr. Theodore Steiner
University of British Columbia
Year 1 of 1 | $50,000

Dr. Steiner and his team are pursuing a new treatment for Crohn's disease by using anti-inflammatory type-1 regulatory (Tr1) cells that are proven to have a unique effect on the gut.

They have discovered that putting Tr1 cells into mice that are missing an immune protein called SHIP1 protects against a disease similar to Crohn's disease. Some people with Crohn's disease have defects in this same SHIP1 protein. Now they will conduct larger experiments to confirm this effect, with an eye toward potential Tr1 therapy for people with Crohn's disease.

UNDERSTANDING HOW BACTERIA CONTROL THE GUT ENVIRONMENT IN IBD

Dr. Carolina Tropini
University of British Columbia
Year 1 of 3*| $125,000 | $375,000

People with IBD have dramatically altered gut environments where bacteria function differently. We still need answers about how, for instance, the gut's acidity, mineral balance, and temperature affect these microbiomes in people with this disease.

Dr. Tropini is using experimental and computational methods to study these connections, including how bacteria modify their environment – with an eye to restoring a healthy gut. She seeks effective new IBD therapies that are individualized for each person's condition.

EXPLORING HOW E. COLI DAMAGES THE GUT AND DEVELOPING NEW DRUGS TO CLEAR THEM

Dr. Bruce Vallance
University of British Columbia
Year 1 of 3*| $125,000 | $375,000

Researchers have found that dangerous forms of E. coli operate in many people with ulcerative colitis, sticking to intestinal walls and releasing a poison that damages the gut. In cell and animal models, this study is tracking how, exactly, this happens and causes inflammation in both cell and animal models.

Dr. Vallance's project will identify what features of the gut make someone more susceptible to this type of infection, and define E. coli's role in ulcerative colitis. His team seeks possible new therapies that would entirely clear these dangerous bacteria from the guts of ulcerative colitis patients.

INVESTIGATING NEW IBD ABDOMINAL PAIN RELIEF DRUGS WITH MINIMAL SIDE EFFECTS

Dr. Stephen Vanner
Queen's University
Year 1 of 3* | $125,000 | $375,000

One of the greatest unmet needs for people with IBD is management of abdominal pain. Conventional opioid-based pain relievers are the most effective drugs available, but carry troubling side effects that limit their use.

Using innovative molecular strategies, Dr. Vanner is studying how novel, effective painkillers with minimal side effects can target G-protein-coupled receptors (GPCRs) in the gut to stop pain signals from reaching the brain. The goal is to develop promising pain therapies that will be testable in clinical trials.

INVESTIGATING GUT BACTERIAL FUNCTION FOR NEW ULCERATIVE COLITIS TREATMENTS

Dr. Elena F. Verdú
McMaster University
Year 1 of 3* | $125,000 | $375,000

The function of certain bacteria in the stool of people at risk for IBD is altered and may be linked to disease onset. Using stool samples from specific groups of patients, Dr. Verdú's team is determining why some who carry these bacteria develop ulcerative colitis, and why others do not. The latter may yield new clues as to which bacteria are working against the disease-causing microbes.

Understanding how the microbiome promotes or reduces inflammation before disease activity begins is vital for creating new specialized drugs or probiotics that influence bacterial function and prevent ulcerative colitis.

DESIGNING NEW PRODRUGS TO SAFELY REPAIR AND PROTECT THE INTESTINAL LINING

Dr. Robert Young
Simon Fraser University
Year 1 of 3* | $125,000 | $375,000

In IBD, inflammation compromises the intestinal lining. IBD treatments can in fact disrupt the body's ability to repair that lining, so new options are needed.

EP4 receptors interact with prostaglandins in the body, and that helps repair sites of infection or injury. EP4 agonists drugs have shown early success in protecting the gut lining – but have side effects. Dr. Young's team is designing a new class of EP4 agonist that delivers active drug in the gut, while keeping it out of the bloodstream. Potential is high to relieve symptoms and protect people with IBD.

A NEW MOLECULAR PURSUIT TO PUT IBD INTO REMISSION

Dr. Fernand-Pierre Gendron
Université de Sherbrooke
Year 2 of 3 | $125,000 | $375,000

Dr. Gendron's team has uncovered certain molecules involved in the body's immune response to IBD. They also found a specific type of receptor within cells called P2Y6R that respond to these molecules. Could it help prevent inflammation and even put IBD into remission?

In this study, they are targeting P2Y6R activity from three approaches, including promising possible drugs, in a bid to develop new molecules that will block inflammation and promote healing in the gut. A successful candidate could keep IBD in remission.

CREATING PRO-HEALING IMMUNE CELLS TO TREAT IBD

Dr. Derek McKay
University of Calgary
Year 2 of 3 | $125,000 | $375,000

Macrophages are large immune cells that engulf and destroy specific cells the body deems a threat. Early research shows that by treating them with the IL4 molecule, the macrophages are reprogrammed into a type that promotes wound recovery and reduces inflammation.

In this new study, Dr. McKay is exploring how to achieve such an immune-based healing effect in human cells. This will lay the groundwork for new individualized drug therapies to be developed for IBD.

TESTING HOME-BASED ORAL CAPSULE FECAL TRANSPLANTATION THERAPY FOR ULCERATIVE COLITIS

Dr. Theodore Steiner
University of British Columbia
Year 2 of 3 | $125,000 | $375,000

It is believed that ulcerative colitis involves an imbalance of bacteria in the gut. Stool transplants from healthy screened donors have proven to be an effective treatment to help some people find disease remission but, despite high demand, it remains largely unavailable to Canadians, and its role alongside other treatments remains unknown.

Dr. Steiner is testing if freeze-dried stool transplants can be safe and effective, and ultimately used by people in their own homes. This would improve accessibility to this valuable therapy to Canadians anywhere, helping them achieve remission and a better quality of life.

USING NANOMEDICINE AS A NOVEL APPROACH TO TREAT AND PREVENT COLITIS

Dr. Pere Santamaria
University of Calgary
Year 3 of 3 | $125,000 | $375,000

How can we block immune responses that cause inflammation in the gut yet preserve the body's overall immune function? One answer may be nanomedicine: drugs made of tiny particles that target white blood cells specific to certain diseases – while leaving others alone.

Dr. Santamaria is using this approach to attempt to stop the body's irregular immune response to bacteria in the gut, which causes IBD. He uses nanomedicines that selectively target IBD-causing white blood cells to reset a healthy balance in the gut, and induce an environment that protects against colitis.

FUNDED RESEARCH

HELPING MANAGE SYMPTOMS

*Grant started in July 2019

These grants focus on treating complications and predicting the disease course of IBD.

ONLINE TRAINING AND SUPPORT FOR PARENTS OF CHILDREN WITH IBD

Dr. Sara Ahola Kohut
The Hospital for Sick Children
Year 1 of 1* | $50,000

Supporting children with IBD means supporting their primary caregivers as well. Parents face higher risks of anxiety, depression, and financial hardship due to their child's care, but accessible support programs are hard to find.

In a group of 45 parents, Dr. Ahola Kohut is assessing the power of online workshops designed to help them respond flexibly to often-difficult circumstances – in an effort to reduce stress, improve mental health, and promote mindfulness. She will analyze data before and after these sessions to see if their abilities to cope have improved.

IMAGING THE BRAIN TO UNDERSTAND DEPRESSION, ANXIETY, AND FATIGUE IN IBD

Dr. Charles Bernstein
University of Manitoba
Year 2 of 3 | $125,000 | $375,000

Depression, anxiety, and fatigue are more common among people with IBD, dampening quality of life and affecting the disease course. Little is known about this link, but we do know that IBD may change the brain's structure and how it functions.

Dr. Bernstein is using advanced brain imaging in people with IBD who experience depression, anxiety, and/or fatigue to search for any functional or structural changes. This research may unearth possible targets that could help spot these conditions early, and facilitate effective treatment plans.

TARGETING VITAMIN D TREATMENTS TO PREVENT RELAPSES IN CHILDREN WITH CROHN'S DISEASE

Dr. Prévost Jantchou
CHU Sainte-Justine
Year 2 of 3 | $125,000 | $375,000

The number of Canadian children with IBD has climbed 50 percent in only 15 years. There is an urgent need to identify what risk factors are causing this alarming trend and ways to improve patients' lives.

We know that Crohn's disease is more common in children who live in northern communities. From this clue, Dr. Jantchou is studying whether treatment that includes high doses of vitamin D, which we usually get from sun exposure, can help children with Crohn's disease avoid relapses and experience a higher quality of life. This ongoing multicenter trial includes seven pediatric Canadian centers.

EXPLORING THE MEDITERRANEAN DIET TO HELP MANAGE ULCERATIVE COLITIS

Dr. Deanna Gibson
University of British Columbia
Year 3 of 3 | $125,000 | $375,000

Few researchers have found a particular food or dietary approach that either mitigates or exacerbates IBD. People with IBD are eager for evidence-based nutritional guidance and a better understanding of the effects of various dietary fats on IBD, which can affect intestinal inflammation.

Dr. Gibson is studying whether the well-known Mediterranean diet can deliver on its anti-inflammatory claims. She is testing the effects of monounsaturated and saturated fats combined with fish oil with higher fiber intakes in people with ulcerative colitis to uncover new dietary treatments and strategies for managing IBD.

FUNDED RESEARCH

GETTING THE BEST CARE

*Grant started in July 2019

People living with Crohn's or colitis need access to the best treatments. These projects are looking to create evidence-based health service models to ensure patients receive the best care.

iPEER2PEER PROGRAM: ONLINE PEER MENTORING FOR TEENS WITH IBD

Dr. Sara Ahola Kohut
The Hospital for Sick Children
Year 3 of 3 | $115,000 | $360,000

Children with IBD not only live with pain, but may also struggle to manage their emotions because it can be harder to see friends and take part in regular activities. As teenagers, they can start taking control of their disease management and make decisions about their health. Empathy and support from other young people living with IBD can help with coping and disease management skills.

Through the iPeer2Peer program, teens with IBD connect weekly over video conferencing with young adult mentors who have learned how to manage their disease. Dr. Ahola Kohut is measuring how the program improves the teens' confidence, symptom levels, ability to take care of their IBD, and quality of life.

USING MASS SPECTROMETRY TO FIND NEW BIOMARKERS FOR IBD

Dr. Jean-François Beaulieu
Université de Sherbrooke
Year 1 of 1* | $50,000

While doctors have more non-invasive techniques to monitor for gut inflammation, it is hard to accurately assess IBD because symptoms can be subtle and atypical. The key is to find new biomarkers of disease that can be tested and measured in people at risk for IBD.

Dr. Beaulieu is using mass spectrometry – a modern molecular technology – to analyze stool samples from 50 people with Crohn's disease, 50 people with ulcerative colitis, and 50 people without IBD. He is hunting for new biomarkers that can diagnose IBD earlier and lead to new, targeted, personalized therapies.

USING POPULATION DATA TO STUDY TRENDS IN CANCERS, SURGERIES, AND HOSPITALIZATIONS IN CANADIANS WITH IBD

Dr. Sanjay Murthy
Ottawa Hospital Research Institute and University of Ottawa
Year 1 of 3 | $125,000 | $320,000

Intestinal cancers and disease-related hospitalizations and surgeries may be declining among people with IBD due to treatment advances over time. Conversely, growing use of immunosuppressive therapies may be causing rates of other cancers, such as skin cancers and lymphomas, to rise in IBD patients. Dr. Murthy and his team of investigators will analyze data from 75 percent of all Canadians with IBD to study trends in these health events over time and the impact of newer therapies on disease outcomes. Their findings will improve decision-making about treatments among people with IBD and their physicians.

An E-Program to Support and Empower Parents of Children with IBD

To improve quality of life for children with IBD, it is essential to provide support to a critical member of their healthcare team: their parents.

Yet, accessible programs that assist parents in navigating their child's journey are challenging to find – despite facing higher risks of anxiety, depression, and financial hardship.

"If a caregiver is under distress, they may struggle to navigate the healthcare system and their child's at-home care, which could negatively impact their child's health," says Dr. Sara Ahola Kohut, pediatric psychologist in the IBD Centre at The Hospital for Sick Children (SickKids), and assistant professor of psychiatry at the University of Toronto.

With a grant from Crohn's and Colitis Canada, Dr. Ahola Kohut is studying how a new online Acceptance and Commitment Training (ACT) workshop series – iACT-P – can reduce stress, improve mental health, and promote mindfulness among a group of 45 such parents. The workshops use cognitive behavioural therapy to change the way they relate to difficult thoughts and feelings.

"This approach teaches parents how to work with unwanted thoughts and feelings, which can enable them to respond flexibly to life in meaningful ways," Dr. Ahola Kohut says.

She will analyze data before and after these sessions to see if parents feel tangible differences in their ability to cope. If the workshop proves to be effective, Dr. Ahola Kohut hopes to build a workshop manual for use at IBD centres around the world.

"Mental health support is not only helpful for the caregiver, but also has a trickle-down effect for the child," she says. "Parents who care for themselves and model good coping skills will help support the development of these skills in their children."

Dr. Ahola Kohut also received a Crohn's and Colitis Canada research grant in 2017 for an online peer mentoring program that connected teens with IBD to young adult mentors who have experience managing their disease. Demonstrating the value of sharing lived experiences, the "iPeer2Peer" program acted as a catalyst for the iACT-P study, as the workshop series dedicates time to group discussions and for parents to ask each other questions.

Ultimately, Dr. Ahola Kohut hopes to fill an important gap in care by helping parents to better manage the stress, worries, or fears that are a part of being a parent, especially to a child with IBD.

Pictured: Dr. Ken Croitoru

GEM Study Links Leaky Gut to Crohn's Disease

"Why does one person develop Crohn's disease and not someone else?" A new discovery from the world-renowned Genetic, Environmental, Microbial (GEM) Project steered by Dr. Ken Croitoru at Mount Sinai Hospital in Toronto, Ontario is moving us closer to the answers.

Launched in 2008, the GEM Project is the world's largest clinical study investigating the possible triggers of Crohn's disease. The study has 107 global recruitment sites with locations in Canada, Israel, Australia, New Zealand, and the United States. Over its course, the GEM Project has provided new clues to what causes Crohn's disease and even ulcerative colitis, pointing the way to more targeted treatments and long-awaited cures for both diseases.

For 12 years, researchers have monitored thousands of healthy individuals who have a sibling or parent with Crohn's disease to see if they would also develop the disease. Researchers are tracking their diet, immune function, intestinal barrier, microbiome, genetics, and environment in hopes of pinpointing the triggers of Crohn's disease in participants who become diagnosed with the disease.

THE EMERGING IMPORTANCE OF THE "LACMAN" RATIO

To date, 95 of the project's 5,085 participants have developed Crohn's disease – and their histories are yielding new clues to its origins. Of them, 50 participated in a recent "gut barrier analysis" that measured their lactulose to mannitol (LacMan) ratios. Lactulose is a large sugar that normally does not cross the gut barrier. If there are higher levels in urine, it may mean someone has a "leaky gut" – a breakdown of the gut barrier.

While researchers have long thought this condition could incite gut inflammation, they have never proven a leaky gut is involved in the future development of Crohn's disease – until now.

The 50 individuals who developed Crohn's disease did in fact have abnormal LacMan ratios years earlier, when they were first recruited into the study. This is the first large prospective study to show abnormal barrier function years before the onset of Crohn's disease – proving that abnormal LacMan ratios may predict its development.

From this important new finding, the race is on to develop diagnostic tests that could identify healthy people at higher risk of developing IBD, long before symptoms appear.

Crohn's and Colitis Canada is thankful toward their donors and to The Leona M. and Harry B. Helmsley Charitable Trust for believing in research like the GEM Project, and to the participants and researchers who make these advancements possible.

The PACE Network

The Promoting Access and Care through Centres of Excellence (PACE) network brings together leading IBD centres from across the country to improve health outcomes, address gaps in care, and develop solutions that can create changes in the public healthcare system.

IMPROVING RURAL CARE

Dr. Geoffrey Nguyen and his team at Sinai Health System reduced wait times and improved access to essential care services in Ontario by using telemedicine video appointments to connect people with IBD who live in rural areas with a gastroenterologist.

DIGITAL HEALTH

Dr. Neeraj Narula and Dr. John Marshall at McMaster University Medical Centre are using a digital health mobile application to improve access to information and healthcare providers. The application, called MyGut, not only supports individuals living with IBD in understanding and following their illness, but also improves communication with their healthcare providers by allowing users to share their health information in-between appointments. The MyGut application has the potential to reduce emergency department visits and unplanned hospitalizations for individuals living with IBD.

STANDARDIZING CARE: TREATMENT DECISIONS

Dr. Karen Kroeker at the University of Alberta as well as Dr. Remo Panaccione and Dr. Cynthia Seow at the University of Calgary developed a collection of clinical care pathways – plans that detail the diagnosis and treatment process – to ensure people with IBD receive the same care across Alberta and prevent unnecessary use of steroids. All of the clinical care pathways are downloadable from the University of Alberta IBD Clinic website ibdclinic.ca.

MEASURING HEALTHCARE DELIVERY

Dr. Alain Bitton and his team at the McGill University Health Centre have developed a web-based self-assessment tool, called an IBD global rating scale, for healthcare providers to measure the care they provide and identify areas of improvement.

Leveraging Donor Dollars and Resources

To help donor dollars go even further, Crohn's and Colitis Canada collaborates with patient organizations, funders, and research teams that share our commitment to finding the cures for Crohn's disease and ulcerative colitis, and improving quality of life for Canadians affected by these diseases.

These collaborations take a number of forms. Crohn's and Colitis Canada partners with foundations and government funders, such as the Canadian Institutes of Health Research (CIHR), to leverage its funds to support cutting-edge research.

LEVERAGING FUNDS IN SUPPORT OF GOVERNMENT-FUNDED RESEARCH PROJECTS

Crohn's and Colitis Canada provides financial and in-kind contributions to government-funded research projects that support our Promise.

YEAR	GRANT PROGRAM	RECIPIENT	INSTITUTION	PROJECT
5 of 5	CIHR Programmatic Grants in Environments, Genes, and Chronic Disease	Dr. Alain Stintzi	University of Ottawa	The diet-microbiome-gut axis in pediatric IBD
5 of 5	CIHR Programmatic Grants in Environments, Genes, and Chronic Disease	Dr. Ken Croitoru Dr. Jennifer Gommerman	University of Toronto	Elucidating the gene-environment interactions that drive autoimmune disease among South Asian Canadians (The GEMINI Program)
1 of 4	CIHR Institute of Infection and Immunity Human Immunology Initiative Team Grant	Dr. Aleixo Muise	University of Toronto	Defining the immune dysregulation underlying pediatric IBD to better diagnose and treat patients

IN-KIND COLLABORATIONS

Crohn's and Colitis Canada collaborates on research projects that support our Promise. As a collaborator, Crohn's and Colitis Canada represents the IBD community, ensuring the needs and experiences of people with Crohn's disease or ulcerative colitis are represented. By doing this, we also ensure that research initiatives that could bring benefits to people with Crohn's disease or ulcerative colitis become available to the community.

ACCOMMODATING AND COMMUNICATING ABOUT EPISODIC DISABILITIES (ACED)

Project Director: Dr. Monique Gignac, Institute for Work & Health and the University of Toronto

Accommodating and Communicating about Episodic Disabilities (ACED) is a five-year research project bringing together researchers and community partners to develop evidence-based workplace tools and resources to support the sustained employment of people with episodic disabilities.

CANADIAN GASTRO-INTESTINAL EPIDEMIOLOGY CONSORTIUM (CANGIEC)

Chair: Dr. Eric Benchimol, University of Toronto

The Canadian Gastro-Intestinal Epidemiology Consortium (CanGIEC) is a pan-Canadian network of clinicians, researchers and methodologists that work together to provide the evidence required to improve outcomes and healthcare services for Canadians with IBD using population-level data. Crohn's and Colitis Canada has provided both cash and in-kind support to CanGIEC.

INFLAMMATION, MICROBIOME, AND ALIMENTATION: GASTRO-INTESTINAL AND NEUROPSYCHIATRIC EFFECTS (IMAGINE) – STRATEGY FOR PATIENT ORIENTED RESEARCH (SPOR)

Lead Principal Investigator: Dr. Paul Moayeddi, McMaster University

The IMAGINE Chronic Disease Network involves 17 hospitals and universities and 75 researchers across Canada who study the interactions between the inflammation, microbiome, diet, and mental health in patients with IBD and irritable bowel syndrome. This network is one of five chronic disease networks in the SPOR initiative.

SEROLOGICAL TESTING TO OUTLINE PROTOCOLS FOR COVID19 IN INFLAMMATORY BOWEL DISEASE: STOP COVID-19 IN IBD

Lead Principal Investigator: Dr. Gilaad Kaplan, University of Calgary

This study is measuring the prevalence of COVID-19 antibodies in people with IBD without a known diagnosis of COVID-19, following a COVID-19 infection, and after vaccination. Based on the team's findings, they will develop serologically based guidelines for Canadians with IBD and their healthcare providers.

SOLUTIONS FOR KIDS IN PAIN

Lead Principal Investigator: Dr. Christine Chambers, Dalhousie University

Solutions for Kids in Pain (SKIP) is a knowledge mobilization network based at Dalhousie University in Halifax, Nova Scotia and co-led by Children's Healthcare Canada that seeks to bridge the gap between current treatment practices and available evidence-based solutions for children's pain in Canadian health institutions.

EDUCATING PROFESSIONALS

Crohn's and Colitis Canada contributes to strengthening the Canadian IBD research ecosystem in a number of ways in addition to providing research funds. We support the Canadian IBD healthcare and research community with education, training, and leadership opportunities.

CANADIAN IBD NURSES

Supported by Crohn's and Colitis Canada, the Canadian IBD Nurses (CANIBD) is a national community of practice of the Canadian Society of Gastroenterology Nurses and Associates (CSGNA). CANIBD was established in 2015 to help meet the need for an IBD nursing network where best practices in IBD care could be shared. Through CANIBD, nurses in IBD attend a national conference and webinars. They can also access a nursing fellowship program and research and travel grants.

CANADIAN IBD RESEARCH CONSORTIUM

The Canadian IBD Research Consortium (CIRC) is a national consortium of IBD clinicians committed to leveraging the existing Canadian clinical trial research infrastructure. The goal? To increase the number of clinical trials available to people with IBD in Canada.

MEETING OF THE MINDS

In partnership with leading IBD specialists and educators, Crohn's and Colitis Canada hosts Meeting of the Minds, a national annual event where Canadian researchers, gastroenterologists, nurses, and allied healthcare professionals convene to broaden their knowledge of IBD and share practical applications of the latest research. This flagship educational event includes Mentoring in IBD, an intensive day of lectures, case-based workshops, and open discussions that are accredited as continuing medical education, and the Canada Future Directions in IBD conference, a forward-looking series of research-based presentations on hot topics and the latest scientific evidence on IBD.

WOMEN IN IBD

Crohn's and Colitis Canada's Women in IBD initiative is committed to supporting women specializing in IBD at various stages in their careers to achieve leadership positions reflective of their expertise and qualifications. Since 2017, we have hosted several meetings and workshops to support women gastroenterologists in developing strong leadership skills.

To recognize the valuable contributions of outstanding women leaders in the field of IBD research, Crohn's and Colitis Canada and Pfizer Canada Women in IBD Awards provided $25,000 through the Outstanding Researcher Award and $15,000 through the Emerging Researcher Award to support the research programs of the two recipients.

2020 Outstanding Researcher Award Recipient: Dr. Elena Verdú, McMaster University
2020 Emerging Researcher Award Recipient: Dr. Vivian Huang, Sinai Health System

Supporting Early Career IBD Researchers

Advancing IBD research requires retaining talent, and the greatest risk of losing talented researchers is during the early stages of their careers. Crohn's and Colitis Canada provides funding to up-and-coming researchers to help advance their careers.

YEAR	PARTNER	RECIPIENT	INSTITUTION	TYPE OF SUPPORT
1 of 1	Fonds de la recherche en santé du Québec (FRQS)	Dr. Sonya Nassari	Université de Sherbrooke	Postdoctoral Training Award
5 of 5	Canadian Institutes of Health Research / Canadian Association of Gastroenterology	Dr. Amy Metcalfe	University of Calgary	New Investigator Award
2 of 2	Canadian Institutes of Health Research / Canadian Association of Gastroenterology	Dr. Cristian Hernandez	Sinai Health System	Fellowship Award

Your Donation Drives Crohn's and Colitis Research in Canada

When you donate to Crohn's and Colitis Canada, you are making a life-altering impact as your donation makes Canadian IBD research possible. The number of research projects that we fund each year is dependent on the total amount of donations we receive.

To fund the best and most promising research, we use a rigorous grant review process. Researchers, clinicians, IBD nurses, and people with IBD evaluate the research proposals submitted through our grant competitions. This peer review process ensures the research proposals that we receive are reviewed by individuals with the appropriate expertise and without conflicts of interest.

We hold some of our grant competitions annually, such as our Grants-in-Aid of Research and Innovations in IBD Research competitions, while others are priority-driven, such as when we are seeking a new PACE project to address a gap in care.

It is all thanks to your generosity that we have been able to invest over $135 million in promising research since our founding in 1974. By working together to fund projects led by the brilliant minds in the IBD research community, we have made great strides towards achieving our mutual goals of improving quality of life for people living with IBD and discovering cures.

We extend our deepest appreciation and gratitude for your ongoing support.

COVID-19 Task Force Delivers Evidence-Based Support for Canada's IBD Community

In response to the escalating pandemic and concerns about how COVID-19 may affect people with IBD, we rapidly assembled a COVID-19 Task Force to support the needs of the IBD community.

The 20-person task force brings together leading gastroenterologists, researchers with expertise in epidemiology and infectious diseases, an IBD nurse, and patient advisors. With an eye on the rapidly changing data, the task force collaborates to develop and share evidence-based information.

Since its formation, task force members have hosted over 20 COVID-19 and IBD webinars, answering the most pressing questions from the community. To ensure continuous access to the latest recommendations and information about COVID-19 and IBD in-between webinars, the task force guides the development of resources available on our website. They have also hosted four webinars for healthcare providers, providing a shared space to engage in discussions about how to best provide care during the pandemic.

Crohn's and Colitis Canada in collaboration with the task force worked with patient support program providers to ensure infusion clinics remain safe for people with IBD, and with provincial governments to recognize infusion clinics as an essential service to ensure that patients had access to the infusion clinics during government-mandated lockdowns. Our advocacy also extended to holding discussions with members of the National Advisory Committee on Immunization (NACI) on their recommendations.

Crohn's and Colitis Canada extends a sincere thank you to all of the members of our COVID-19 Task Force for their efforts and ongoing commitment to ensuring the health and well-being of Canadians from coast to coast as we navigate the COVID-19 pandemic.

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Crohn's and Colitis Canada

The only national, volunteer-based charity focused on finding the cures for Crohn's disease and ulcerative colitis and improving the lives of children and adults affected by these diseases. We are one of the top two health charity funders of Crohn's and colitis research in the world, investing over $135 million in research since 1974, leading to important breakthroughs in genetics, gut microbes, inflammation and cell repair research as well as laying the groundwork for new and better treatments. We are transforming the lives of people affected by Crohn's and colitis (the two main forms of inflammatory bowel disease) through research, patient programs, advocacy, and awareness.

Crohn's and Colitis Canada funds research projects and patient programs that fight Crohn's and colitis today, while working towards a future free of these diseases. Your donations fuel our efforts.

GEM PROJECT
CROHN'S AND COLITIS CANADA

PACE
ADVANCING PATIENT CARE BY CROHN'S AND COLITIS CANADA

CANIBD
Canadian IBD Nurses

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