



# IMAGINE NETWORK

YEAR TWO PROGRESS REPORT  
March 2017-March 2018

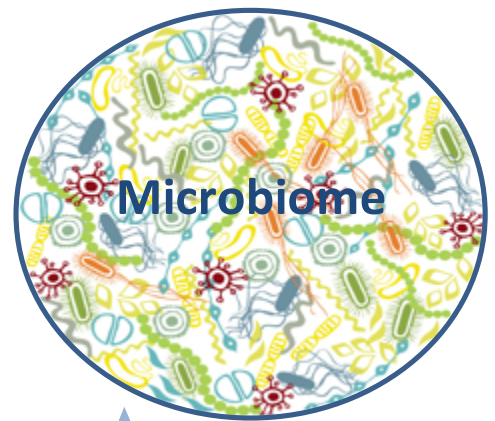


**IMAGINE**

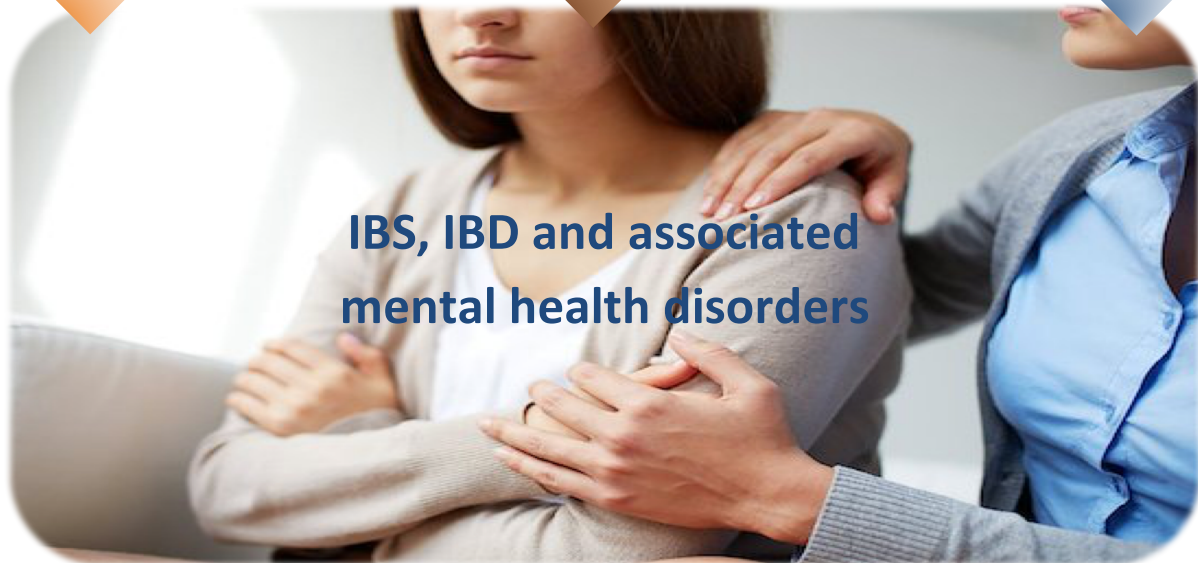
Inflammation, Microbiome & Alimentation  
Gastro-Intestinal & Neuropsychiatric Effects



## IMAGINE NETWORK Study Goal



Understand the interactions  
between diet-microbiome-host  
and find new therapies for the  
treatment of IBS, IBD and  
associated psychiatric disorders.





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# About IMAGINE

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## Who we are

The IMAGINE (Inflammation, Microbiome, and Alimentation: Gastro-Intestinal and Neuropsychiatric Effects) Chronic Disease Network is a pan-Canadian research network studying the interactions between the inflammation, microbiome, diet and mental health in patients with inflammatory bowel disease (IBD) and irritable bowel syndrome (IBS). The IMAGINE Network is based at McMaster University and co-lead by investigators at McMaster University and University of Calgary. IMAGINE is one of five chronic disease networks in the **Strategy for Patient Oriented Research (SPOR)** initiative of the **Canadian Institutes of Health Research (CIHR)** and is made possible thanks to a five-year grant from CIHR and other generous funding partners from public and private sectors across Canada.



Dr. Paul Moayyedi  
*Principal Investigator*  
*(McMaster University)*



Dr. Glenda MacQueen  
*Co-Principal Investigator*  
*(University of Calgary)*



Aida Fernandes  
*Executive Director*

## Executive Leadership

## Our Mission

Transform the management of IBD and IBS and associated mental health issues with these disorders.

## Our Goals

The overall aim of the IMAGINE Network is to understand the interactions between diet-microbiome-host and find new therapies for the treatment of IBS, IBD and associated psychiatric disorders.

- Develop innovative therapies (changes in diet, probiotics, fecal transplants or antibiotics) to improve IBD, IBS and mental health
- Improve outcomes of existing therapies through the assessment of diet-microbiome-host interactions
- Develop strategies to optimize current therapies to target those who will most benefit from medication as well as identify those in whom medication can be safely discontinued with significant personal benefit and cost savings to the Canadian healthcare system



# Message from Dr. Paul Moayyedi

IMAGINE NETWORK PRINCIPAL INVESTIGATOR

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Dear Stakeholders,


While the first year of the Network focused on establishing the necessary infrastructure to operate efficiently, this past year has primarily focused in getting the Network's main research project off the ground. The main cohort study is the cornerstone of the Network and significant progress has been made towards implementing this research program. In the previous year, the detailed work plans, research protocols, standard operating procedures for specimen collection, questionnaires, data collection instruments, and consent forms for the main longitudinal cohort study were developed. This past year the Network has successfully launched recruitment in key IMAGINE sites. This approach has enabled the Network to address issues raised by research ethics boards, pilot the database and specimen collection process before launching the study across the country.

This past year we have focused on overcoming administrative hurdles to bring new recruitment sites on board such as financial agreements, ethics approvals and research contracts. Given the restrictions of funding of CIHR to third parties, there have been additional delays to onboarding new recruitment sites that are not currently financial contributors to the IMAGINE Network due to the need of setting up additional financial and research agreements. Furthermore, given the national scope of the research project, significant amount of time and effort has been invested in addressing the specific demands of each Research Ethics Board at the different hospitals and universities.

I am proud of our progress to date but recognize we must keep our momentum in order to reach our goals. I want to thank our network members, partners and funders for their unwavering support.

I hope you enjoy learning about our work.

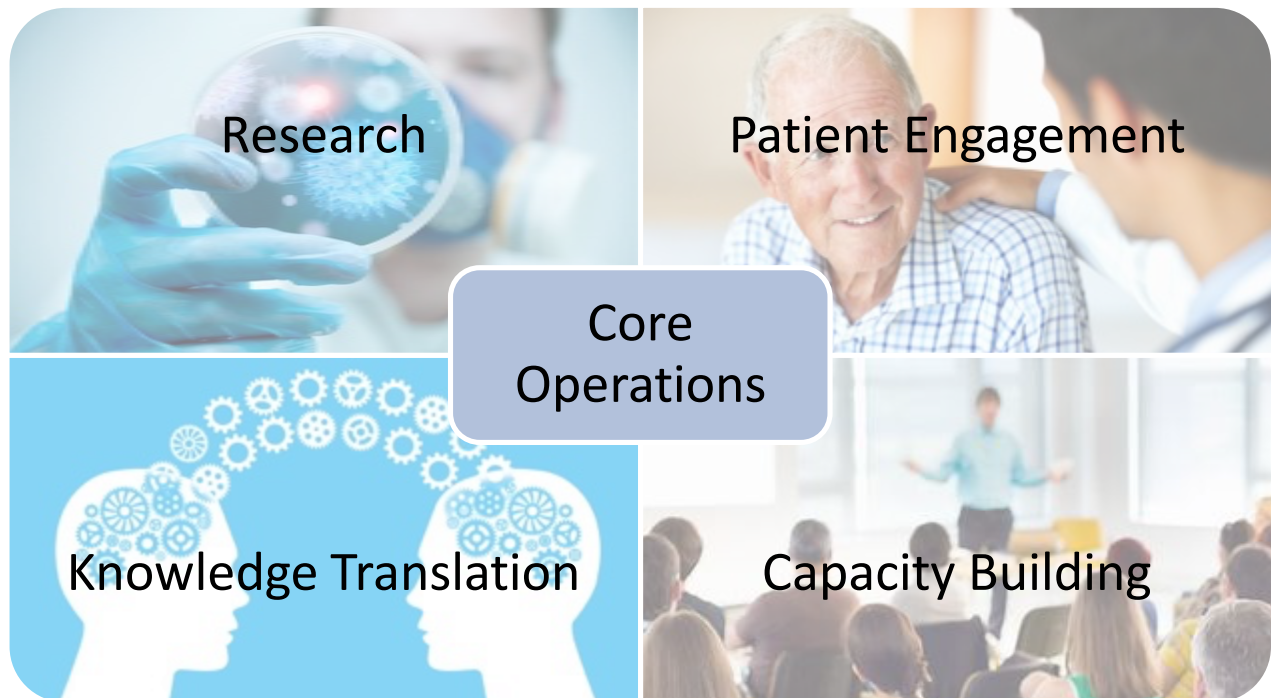
Best wishes,



Paul Moayyedi, BSc, MB ChB, PhD, MPH, FRCP, FRCPC, AGAF, FACG

# Network Activities

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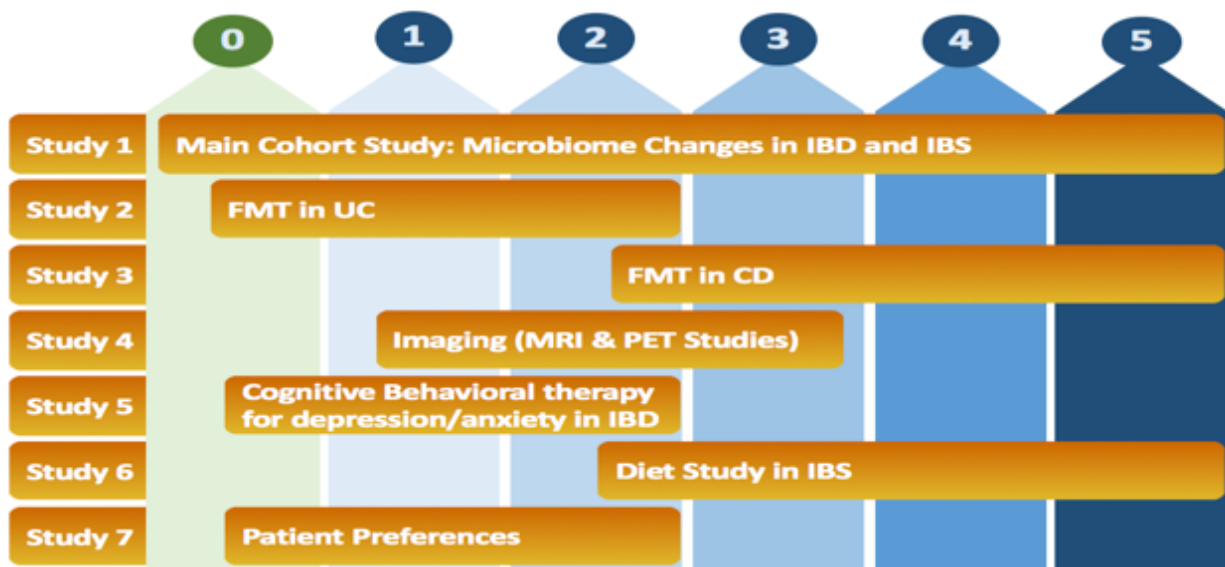


# Research Programs

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## Research Studies










### Timeline of IMAGINE Main Cohort Study and Sub-studies



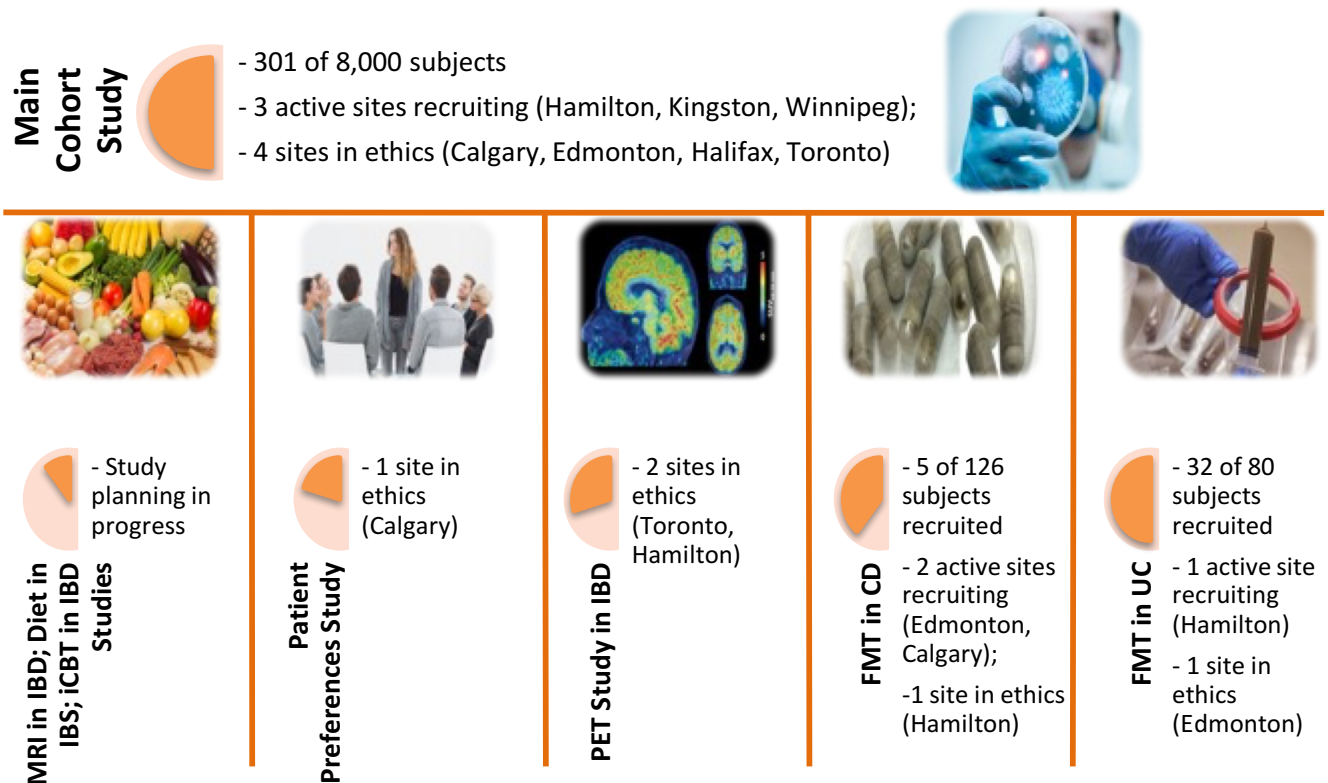


In December 2017, the External Advisory Panel (EAP), made up of internationally-recognized scientific experts, met to assess the research progress of the IMAGINE Network to date. While some research sub-studies within the Network are actually ahead of schedule, the main cohort study has experienced significant delays. In particular recruitment is falling behind schedule compared the original proposal. The key reasons for the delay have been a result of administrative, ethics and legal delays of onboarding new recruitment sites. The original proposal suggested that all 17 recruitment sites would be up and running within six months of the network initiation. In retrospect, our expectations were rather optimistic given the challenges we have had to face to initiate the study. We decided to pilot the main cohort study in a few key sites in order to work out any bugs in the system, appropriately address any concerns raised by the local research ethics board and develop the necessary research and financial agreements to enable funds to flow to recruitment sites. This pilot phase has proved extremely helpful to onboard new sites on a shorter timeline than experienced with the pilot sites. However, there still remain local issues that need constant attention with contracts offices and research ethics boards that continue to delay our recruitment progress.

### External Advisory Panel Members

<ul style="list-style-type: none"> <li>• Head of Gastroenterology &amp; Hepatology, Professor of Medicine</li> <li>• University of Leuven</li> </ul> <p><b>Dr Gert van Assche</b></p> 	<ul style="list-style-type: none"> <li>• Pediatric Gastroenterologist; Head of Division of Digestive Diseases, Hepatology &amp; Nutrition</li> <li>• Connecticut Children's Medical</li> </ul> <p><b>Dr Jeff Hyams</b></p> 	<ul style="list-style-type: none"> <li>• Head of Gastroenterology Section, Chair of Gastroenterology</li> <li>• The University of Edinburgh</li> </ul> <p><b>Dr Jack Satsanji</b></p> 	<ul style="list-style-type: none"> <li>• Professor of Medicine; Chair of Dept of Gastroenterology &amp; Hepatology</li> <li>• Erasmus University Medical Center</li> </ul> <p><b>Dr Ernst Kuipers</b></p> 	<ul style="list-style-type: none"> <li>• Pro Vice-Chancellor</li> <li>• University of Newcastle</li> </ul> <p><b>Dr Nick Talley</b></p> 
<ul style="list-style-type: none"> <li>• Associate Professor of Computational Biology &amp; Informatics</li> <li>• Harvard T.H. Chan School of Public Health</li> </ul> <p><b>Dr Curtis Huttenhower</b></p> 	<ul style="list-style-type: none"> <li>• Professor of Internal Medicine; Chairman of Dept of Clinical &amp; Experimental Medicine, Head of Clinic in Dept of Gastroenterology</li> <li>• University of Leuven</li> </ul> <p><b>Dr Jan Tack</b></p> 	<ul style="list-style-type: none"> <li>• Professor, Dept of Internal Medicine &amp; Clinical Nutrition</li> <li>• University of Gothenburg</li> </ul> <p><b>Dr Magnus Simren</b></p> 	<ul style="list-style-type: none"> <li>• Chair of Medicine in Digestive Disorders; Professor of Medicine</li> <li>• Houston Methodist; Weill Cornell Medical College</li> </ul> <p><b>Dr Eamonn Quigley</b></p> 	

## Summary of Status of IMAGINE Main Cohort Study and Sub-studies (as of Mar 31, 2018)



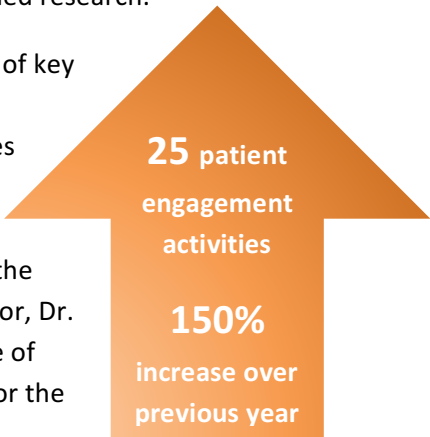
In order to maximize our recruitment efforts with current recruitment sites, our network has developed weekly recruitment reports, monthly site directors meeting, monthly research coordinators meetings, and bi-weekly meeting with our research coordinating team at the Population Health Research Institute to monitor our progress toward milestones and quickly resolve issues that impede implementation of the study.



# Patient Engagement

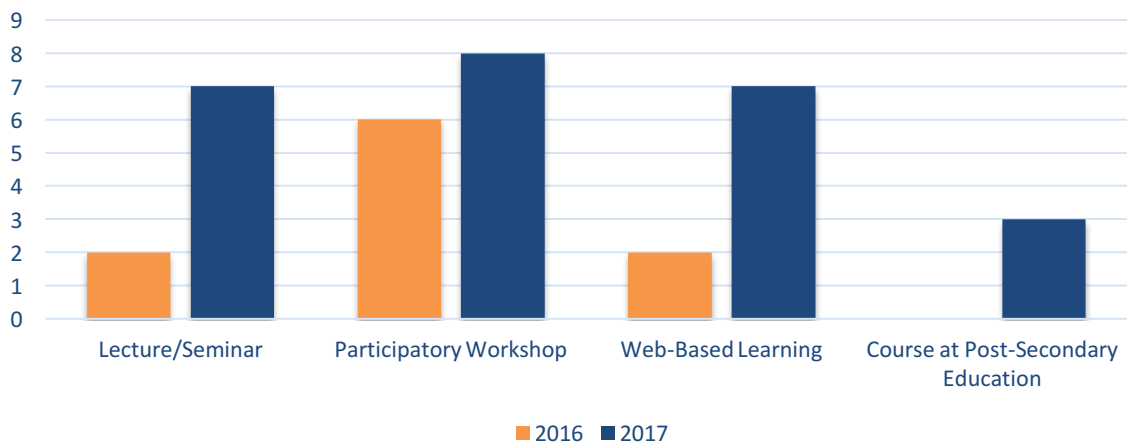
Over the past year, the IMAGINE Network has focused on building capacity in patient-engaged research. Network members participated in patient engagement training sessions held by the Ontario SPOR Support Unit (OSSU), CIHR and McMaster Health Forum. Moreover, the IMAGINE Network’s held training sessions during its annual face-to-face meeting, at post-secondary institution courses and patient education webinars through Crohn’s and Colitis Canada’s Gutsy Learning Series reaching over 500 individuals. In addition, four IMAGINE patient representatives were extensively trained in the PaCER Phase 1 internship program to learn about fundamental in patient-led research.

The IMAGINE Network also engaged patient representatives on a number of key healthcare initiatives. Through IMAGINE’s recent partnership with the Canadian Association of Gastroenterology (CAG), the IBS Clinical Guidelines Consensus Group included several IMAGINE members and a patient representative. The patient representative was a full participant throughout the clinical guidelines development process – contributing to the pre-voting process and the group discussion. IMAGINE Principal Investigator, Dr. Paul Moayyedi, also served as the methodologist for the American College of Gastroenterology (ACG)’s Task Force for their clinical practice guidelines for the management of IBS.



Furthermore, this past December, Dr. Deborah Marshall, the co-lead of IMAGINE’s patient engagement working group, was an invited speaker at the U.S. Food and Drug Administration’s Workshop to discuss the value and use of patient preference information as scientific evidence in medical product evaluation and regulatory decision making.

Number of Patient Engagement Activities



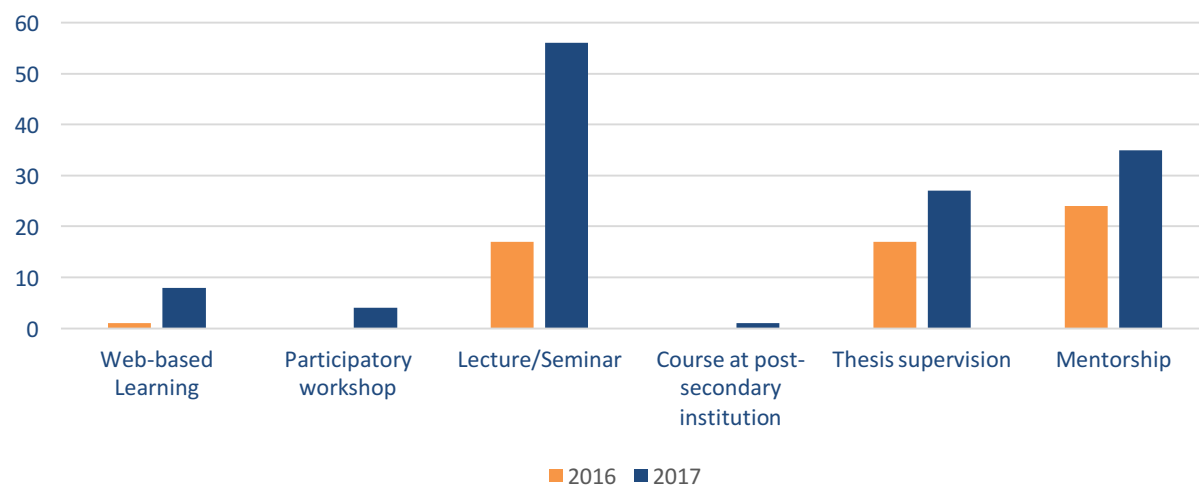
## Capacity Building

In addition to building capacity on patient-engaged research, the IMAGINE Network also built capacity in GI research community related to its mandate area. Co-investigators were responsible for mentoring trainees, supervising theses, hosting lectures/seminars and leading sessions at postsecondary institutions and web-based learning. Trainees were involved in a number of research areas including microbiome, health research methodology, predictive models of disease prevalence, metabolomics, and quality of life measures. A total of 131 capacity building activities were held in the past year (representing a 122% increase over the previous year). Moreover, IMAGINE partnered with Canadian Child Health Clinician Scientist Program to increase access to training opportunities and resources for pediatric trainees in our Network.

**131**  
capacity  
building  
activities

**122%**  
increase over  
previous year

### Number of Capacity Building Activities held by the Network

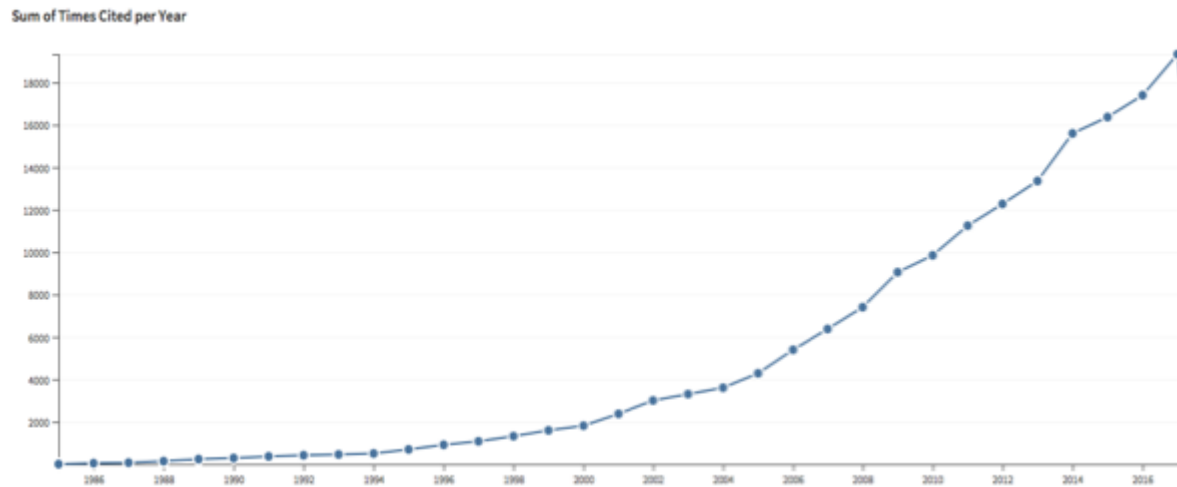


## Knowledge Translation

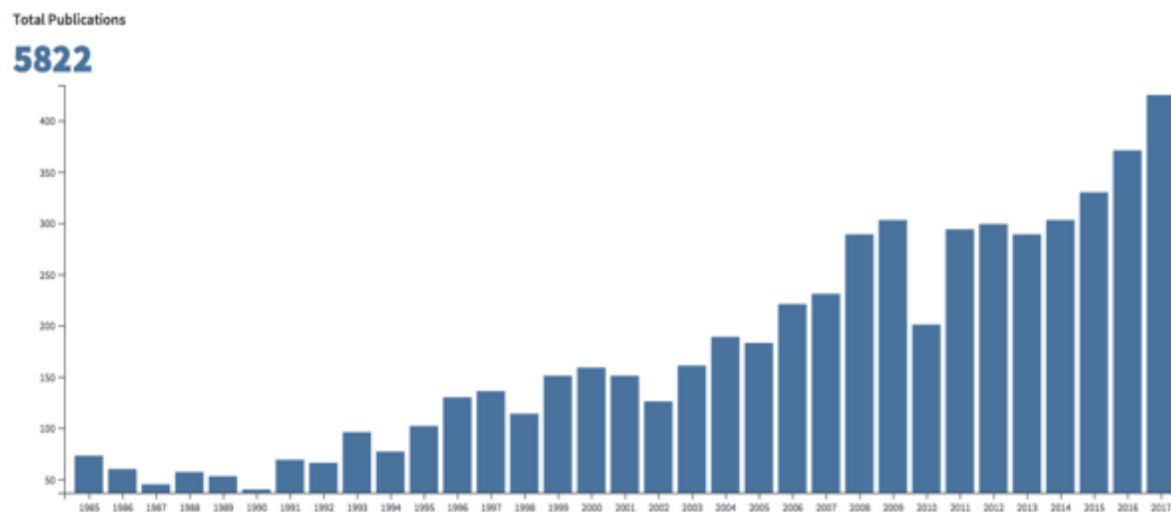
Although the IMAGINE Network is still in its early phases of research productivity, there already has been some significant activity in knowledge translation by its members. In terms of citations from authors for all papers published by IMAGINE investigators throughout their careers, in 2016 they were cited 17,402 times, and 19,377 times in 2017. The chart below highlights the growth of citations over the past few decades and the boost provided by the IMAGINE Network over the past few years.



### Growth of Citations by Year by Network investigators



### Growth of Publications by Year by Network investigators



### Number of knowledge products developed by Network team members during the reporting period

	2016	2017
Publications	241	289
Books/Book chapters	1	2
Abstracts	111	121
Presentations	21	31
Citations	385	1,224
Highly cited articles (top 1% cited in their field for citations)	12	22
Hot papers (top 0.1% cited in their field)	0	3

Network members have also produced the following book chapters relevant to the IMAGINE research mandate area:

- “The intestinal microbiota in irritable bowel syndrome” GUT MICROBIOME AND BEHAVIOR Book Series: International Review of Neurobiology Volume: 131 Pages: 247-261 Published: 2016 By: Collins, S. M. Edited by: Cryan, JF; Clarke, G
- “Gastrointestinal microbiota and the neural system” MICROBIOTA IN GASTROINTESTINAL PATHOPHYSIOLOGY: IMPLICATIONS FOR HUMAN HEALTH, PREBIOTICS, PROBIOTICS, AND DYSBIOSIS Pages: 243-247 Published: 2017 By: Philip, V.; Bercik, P. Edited by: Floch, MH; Ringel, Y; Walker, WA
- “Treatment of inflammatory bowel disease in ulcerative colitis” MICROBIOTA IN GASTROINTESTINAL PATHOPHYSIOLOGY: IMPLICATIONS FOR HUMAN HEALTH, PREBIOTICS, PROBIOTICS, AND DYSBIOSIS Pages: 343-354 Published: 2017 By: Chibbar, R.; Alahmadi, A.; Dieleman, L. A. Edited by: Floch, MH; Ringel, Y; Walker, WA

In order to reach the patient community, IMAGINE Network investigators have also presented their research in a number of public forums. In collaboration with Crohn’s and Colitis Canada, IMAGINE has participated in a number of different knowledge translation events such as the Gutsy Learning Series webinar, Chapter Education events and national volunteer training conference. A total of 31 scientific presentations (48% increase over the previous year) were held in the reporting period to a wide group of stakeholders including researchers, clinicians, trainees, policy makers and citizens.



31 scientific presentations

48% increase over previous year

## Partnerships & Collaborations

Over the past year, the IMAGINE Network has partnered with a number of organizations, patient advocacy groups and other SPOR entities to provide synergy and deliver on its mandate. IMAGINE’s executive director, academic lead and a patient representative served on a multi-SPOR Network Task Force on Patient Engagement Compensation to make recommendations to CIHR and to develop a Report and Guidelines to harmonize policies and procedures across all Networks.

For patient engagement training, IMAGINE has collaborated with the PaCER Innovates (Patient and Community Engagement Research internship program at University of Calgary) and other SPOR Networks and Support Units. For training of its research community, IMAGINE has partnered with Canadian Child Health Clinician Scientist Program (at the Hospital for Sick Children). In order to support its knowledge translation activities, IMAGINE has collaborated with a number of key patient advocacy groups including Crohn’s and Colitis Canada and the Canadian Digestive Health Foundation. As the network begins to consider its sustainability beyond the current funding period, IMAGINE has already drafted a **Sustainability Plan** where potential funding partnerships and research collaborations are further explored.

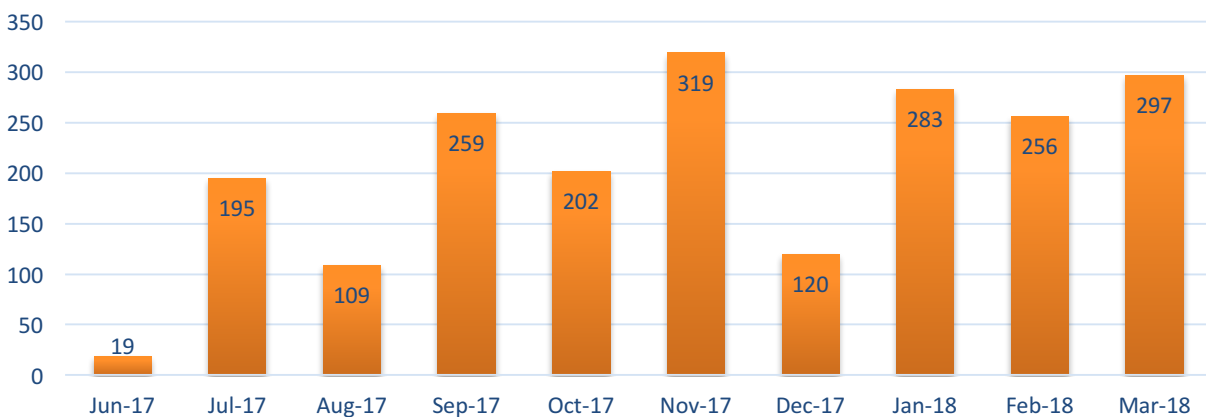
# Core Operations

## Marketing & Communications

### Website & Newsletter

The IMAGINE website was created in February 2017 and was officially launched in June 2017 with the support of the Canadian Digestive Health Foundation. Over the past year, significant work has been done to update content on the website that is useful, timely and relevant for its target audiences. The website communicates to the public and our stakeholders who we are and what we do. It also serves as a repository of information for Network members (templates, links to training materials, slide decks). Since its formal launch in June 2017, the IMAGINE website has garnered a total of 2,059 page views.

#### Number of IMAGINE Website page views during the reporting period



Over the past year, the IMAGINE Network has also produced four issues of its newsletter and disseminated to over 130 subscribers. The IMAGINE Network has also contributed two articles for CIHR's SPOR e-newsletter which reaches nearly 1,000 SPOR stakeholders.

Newsletter Issue	Sent to	Open rate	Click rate
Jun-17	114	56%	45%
Sep-17	134	47%	67%
Dec-17	134	50%	41%
Mar-18	134	50%	48%

## Social Media

IMAGINE's twitter feed and Facebook page are effective mechanisms to increase the Network's presence over social media. Twitter also serves to promote the Network as a "thought-leader" in scientific areas relevant to its mandate (microbiome health, gut-brain axis, patient-oriented research). Since its launch, IMAGINE has achieved nearly 34,000 impressions (approximately 2,500 impressions/month) through its network of 184 followers.

Facebook page



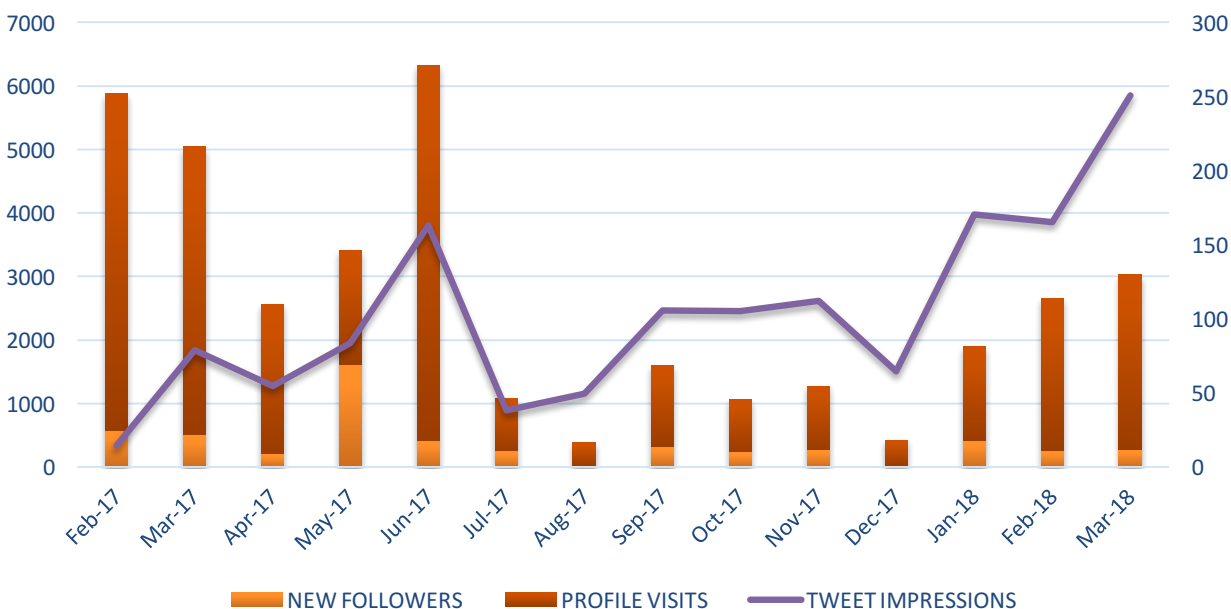
Website home page



Twitter page



## Twitter Metrics for IMAGINE Network during the reporting period



## Traditional Media

Over the past year, the IMAGINE Network has also been promoted to the general public through traditional media sources (TV, radio, print) reaching nearly an audience of nearly a 250,000 Canadians. Furthermore, the IMAGINE Network and its fecal transplantation study were included in a documentary production, expected to be released in 2019.



Dr Chris Andrews (IMAGINE Co-investigator) featured on *Calgary's Breakfast Television* for IBS Awareness Month (April 2017; 200,000+ viewers)



Dr Stephen Vanner (IMAGINE Co-investigator) featured in *The Kingston Whig Standard* (Aug 2017; circulation 25,000+)



Dr Premysl Bercik (IMAGINE Co-Investigator) featured in *Time Health* article on probiotics and depression (June 2017)



Dr Jean-Eric Ghia (IMAGINE researcher) featured in *Radio-Canada's* segment "Chronique des Epreuves et des Hommes" (Nov 2017 & Dec 2018; 10,000+ viewers)



Dr Paul Moayyedi (IMAGINE Lead PI) and Melanie Wolfe (Research Coordinator) were interviewed for a documentary on FMT (Mar 2018)



In order to ensure a consistent brand for the IMAGINE Network among its members, a number of marketing materials were developed over the past year including PowerPoint templates, scientific poster templates, and recruitment posters and flyers.



Since the establishment of the Network, a number of governance committees have been created to ensure appropriate accountability. Over the past year, the following governance activities have occurred:

- Confirmed membership of the Research Subcommittee and the Publications Subcommittee
- Established Terms of Reference for Research Subcommittee and Publications Subcommittee
- Developed Research Applications Guidelines
- Developed Publication & Authorship Guidelines
- Created Patient Compensation Policy/Guidelines
- Recruited additional patient representatives to ensure greater patient engagement on Scientific Working Groups and Expert Advisory Panel
- Hosted inaugural meeting of the External Advisory Panel

Furthermore, network members have met twice over the past year (June 2017, Feb 2018) to ensure research progress and productive collaborations continue on IMAGINE studies.

Through McMaster's Research Contracts Office, the IMAGINE Network endeavored to execute a number of contracts to support the network activities, including service agreements, the main multi-centre partner agreement, research project agreements, and site recruitment agreements. Time delays to finalize these agreements has also impacted the timeframes to initiate the research studies and also flow funding to partnering institutions.

## Finance

A high-level summary of the Network's budget and actual expenses in Year 2 can be found in the table below. Overall, the Network is 37% underspent compared to its annual budget primarily due to the ethics and contracts delays and timing issues. In particular, the costs related to the database management and specimen storage at PHRI have been incurred over the past year however payment cannot be made until the contract between PHRI and McMaster was fully executed. It is expected that a large part of the budgeted amount of the \$1.2M for will be paid by end of June 2018.

It is also important to note that the costs attributed to Research Personnel (recruitment & analysis) represents the funding that has been transferred from the McMaster's CIHR grant account to the partnering institutions to support primarily the IMAGINE research coordinators for Year 1 & 2. However, not all the funds that have been transferred have actually been spent because timing of onboarding staff has been staggered across sites due to ethics and contract delays. Going forward, monthly monitoring of subject recruitment will ensure that funding is allocated to the sites that are achieving recruitment targets and research milestones.

### Summary of Annual Budget & Actual Expenses

	Year 2			
	April 1, 2017 - March 31, 2018			
	BUDGET	ACTUAL EXPENSES	VARIANCE (\$)	VARIANCE (%)
<b>OVERALL NETWORK OPERATIONS</b>				
Admin Staff	\$ 265,000	\$ 196,412	-\$68,588	-26%
IT (Equipment/Support)	\$ 10,000	\$ 1,749	-\$8,251	-83%
Misc (office supplies)	\$ 5,000	\$ 3,169	-\$1,831	-37%
Marketing & Communications	\$ 30,000	\$ 31,567	\$1,567	5%
Travel	\$ 10,000	\$ 4,333	-\$5,667	-57%
<b>RESEARCH STUDIES</b>				
Database Management, Storage, Shipping	\$ 1,262,880		-\$1,262,880	-100%
Survey Licenses, Scans	\$ 252,161	\$ 4,568	-\$247,593	-98%
Research Personnel (Recruitment & Analysis)	\$ 3,914,679	\$ 3,442,364	-\$472,315	-12%
<b>PATIENT ENGAGEMENT</b>	\$ 50,000	\$ 37,120	-\$12,880	-26%
<b>CAPACITY BUILDING</b>	\$ 115,000	\$ 50,000	-\$65,000	-57%
<b>KNOWLEDGE TRANSLATION</b>	\$ 100,000		-\$100,000	-100%
<b>TOTAL</b>	<b>\$ 6,014,720</b>	<b>\$ 3,771,282</b>	<b>-\$2,243,438</b>	<b>-37%</b>

# Our Funding Partners

The IMAGINE Network is supported by the Canadian Institutes of Health Research under Canada's Strategy for Patient-Oriented Research Initiative. We are grateful for their generous support and all of our other partners.



Canadian Institutes  
of Health Research

Instituts de recherche  
en santé du Canada



>\$2,000,000



Crohn's and  
Colitis Canada  
Crohn et  
Colite Canada



\$1,000,000 - \$2,000,000



Research  
Manitoba



<\$1,000,000



DALHOUSIE  
UNIVERSITY



MONTREAL  
HEART  
INSTITUTE

Université  
de Montréal

# Non-Funding Partners & Supporters

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The IMAGINE Network works collaboratively with a number of other research, clinical and patient groups in order to achieve our mutual goals. We are grateful for their continued support to our cause.



**Canadian Children Inflammatory Bowel Disease Network (CIDCaNN)**

**IBD Genomic Medicine Consortium (iGenoMed)**

**James Lind Alliance Inflammatory Bowel Disease Group**

**Maternofetal outcomes research–Canadian Registry in IBD (MORe CaRe IBD)**

**CONTACT US:**

**IMAGINE Network**

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**Web: [www.imaginespor.com](http://www.imaginespor.com)**



**Inflammation, Microbiome & Alimentation  Gastro-Intestinal & Neuropsychiatric Effects**

Strategy for Patient-Oriented Research

**SPOR**

*Putting Patients First* 