The mandate of the Associate Chair, Research is to promote and facilitate research within the Department. To meet this mandate, the Associate Chair has focused on the following activities: (1) ensuring the success of junior faculty involved in research activities, (2) updating the scoring system that was implemented to quantify research output of faculty for purposes of remuneration and promotion and tenure, (3) ensuring that adequate departmental resources are earmarked for research, and (4) coordinating internal peer review of tri-council grant submissions.

The Associate Chair, Research meets with all new recruits and provides feedback to the Department Chair regarding their research potential. Those selected for faculty appointments in the research stream meet with the Associate Chair on a regular basis for mentorship and advice regarding grant applications, funding and career planning. The Associate Chair also provides advice to department members regarding new funding opportunities and research strategies.

The Associate Chair, Research serves as a member of the Departmental Executive, Research Executive, Promotion and Tenure, Finance, and Alternate Funding Plan Committees. The role of the Associate Chair on these committees is to advise and advocate for research.

The Department of Medicine offers Internal Career Awards for new faculty members. These awards have tenure for up to three years and are granted on a competitive basis. Awards are available for both research and education and are aimed at fostering the next generation of researchers and educators. Funding from this source can be used to offset clinical expenses, thereby increasing protected time for research. The Associate Chair, Research is a member of the committee that reviews and prioritizes the application for Internal Career Awards.

The Department of Medicine continues to be a major contributor to the research productivity of McMaster University. The amount of research funding for 2014-15 was just over $38 million. The majority of this funding came from peer-reviewed sources. In fact, 39% was from tri-council, 12% from National Centres of Excellence, 4% from the Heart & Stroke Foundation of Canada and 7% from other disease-specific funding agencies. Members of the Department of Medicine also received a considerable amount of funding from industry. These funds are mainly administered through the hospitals. The research accomplishments of the department are particularly noteworthy given the increasing emphasis on clinical productivity and the competitive nature of the grant review process.

“...researchers in the Faculty of Health Sciences, and its academic hospital partners, oversee $240 million in research funding a year, placing McMaster among the top four universities in Canada for biomedical and health research.”

— Dr. Patrick Deane

Steinberg lab

"Our groundbreaking studies make international headlines"
— Dr. Patrick Deane
The Population Health Research Institute (PHRI) was established in 1999, having evolved from the highly successful Preventive Cardiology and Therapeutics Research Program that was initiated in 1992 by Dr. Salim Yusuf. It has been ranked in the top 10 research institutes in the world. The primary objective of PHRI is to lead international health research focused on the causes of chronic diseases and their prevention or treatment.

In addition to being Executive Director for his 3rd term (reappointed in July 2014), Dr. Salim Yusuf is also currently the President of the World Heart Federation (January 2015 to December 2016).

PROGRAM AREAS

PHRI continues to be at the forefront of research in a number of areas with 370 publications in 2014-15 (with 15 in NEJM, 10 in Lancet and 4 in JAMA). Our areas of research include:

- **Core and Maturing Expertise**
  - CVD Prevention and Treatment
  - Arrhythmia
  - Acute Coronary Syndromes
  - Perioperative Ischemia
  - Global Health
  - Diabetes
  - Stroke
  - Thrombosis
  - CV Surgery
  - Neglected Diseases (Chagas, TB pericarditis and rheumatic heart disease)

- **Emerging and Developing Expertise**
  - Obesity and Bariatric surgery
  - Population Genomics
  - Cardio-Oncology
  - Environmental and chronic diseases
  - Health systems/CVR Knowledge Translation
  - Early life influences on CVD
  - Acute and chronic kidney diseases
  - Epidemiology of chronic obstructive airway disease

PHRI scientists also collaborate extensively with other researchers in over 80 countries and with many other research groups in Hamilton.

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PRoGRaM aReAs

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PHRI also holds its first internal funding competition with six award recipients (from 13 applications) being reviewed by external reviewers internationally. The award recipients and their research are:

- **InterBleed**
  - Led by J. Eikelboom, this is a case-control study of patients with cardiovascular disease receiving antithrombotic therapy who are admitted to hospital because of bleeding.

- **Island ACS**
  - JD Schwalm is in collaboration with lead PI Noah Ivers at Uof T, to conduct a randomized trial to compare the effectiveness and the cost of strategies to improve adherence to proven therapies by providing reminders to cardiac patients and their primary care providers in the year following ACS.

- **Radical PC**
  - Led by D. Leong in collaboration J. Pinthus and with it is a prospective observational study of cardiovascular outcomes in men with prostate cancer.

- **Research Led by Associate Professor Jeff Healey**
  - Suggested that defibrillator testing during certain types of heart surgery is not helpful and could possibly be harmful.

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PHRI scientists also collaborate extensively with other researchers in over 80 countries and with many other research groups in Hamilton.
The scientific productivity and impact of the PHRI has grown significantly with the expansion of existing programs and the development of new areas for research. PHRI is one of the world’s highest impact health research institutes. We are grateful to the hospital, the university and the broader Hamilton community for their support.

The Thrombosis & Atherosclerosis Research Institute (TaARI), occupies three floors of the David Braley Research Building at the Hamilton General campus. This state-of-the-art research institute has facilitated the melding of basic and clinical research, thereby enabling a seamless “bench to bedside and back again” approach to complex health care problems. Our laboratories have enabled new collaborations that extend to all hospital sites as well as national and international research collaborations. TaARI remains focused on its mission to reduce death and disability from thrombotic diseases by conducting research into the pathogenesis, prevention, diagnosis and treatment of thrombosis and vascular disease.

Dr. Jeffrey Weitz, Executive Director, continues to provide leadership to the core research programs at TaARI which include:

- Experimental Thrombosis and Atherosclerosis (ETA) Program, which under the directorship of Dr. Weitz conducts fundamental research on the interplay among thrombosis, atherosclerosis, diabetes, obesity, cancer, and inflammation.
- Clinical Thromboembolism Program (CTP), led by Dr. Sam Schulman and performs research on the treatment of patients with thrombotic problems, as well as research in knowledge translation aimed at optimal transfer of this information to the bedside and the community. This city-wide program includes all Hamilton Health Sciences hospital sites as well as St. Joseph’s Healthcare and provides clinical care to patients in the hospital and in the community who have, or are at risk for, thrombotic disorders.
- Comparative Medicine Program, which is led by Dr. Shawn Petrik and focuses on the translation of basic research findings into clinically relevant models prior to evaluation in humans.
- Biometrics Group, which is led by Professor Robin Roberts and provides biostatistical support for all faculty and students in the various TaARI programs. Professor Roberts also leads the statistical core for the Neonatal Research Program, which is led by Dr. Barbara Schmidt.

TaARI holds an annual strategic planning retreat which includes the four programs to ensure that the mission and goals of the research institute are being met. The retreat provides a venue to identify strengths, weaknesses, opportunities and threats of TaARI. The Director has built a “consensus-building” process in which to identify strengths, weaknesses, opportunities and threats for the Research Institute. The retreat also provided an opportunity to develop 5-year priorities for the Thrombosis & Atherosclerosis Research Institute. These priorities include (a) creating translational research rounds to foster collaboration between basic and clinical researchers, (b) targeted recruitment to build critical mass, (c) create an Endowed Chair as a vehicle for succession planning, (d) explore new avenues of funding to build collaborations and to diversify research investments, and (e) expand training opportunities by creating a Royal College of Physicians of Canada Certificate of Special Competence in Adult Thromboembolism.

TaARI has been referred to as an “education engine”. Consistent with its academic mission of providing an excellent environment for learners, during 2014-15, TaARI faculty has trained 16 M.Sc. students, 9 Ph.D. Students and 8 postdoctoral fellows. In addition, the facility also has provided many undergraduate students with a site to conduct their fourth year thesis projects. During 2014-15, TaARI maintained its research funding support at approximately $5.5 million in external support. Hamilton Health Sciences and McMaster University continue to provide valuable support to help fund faculty and students, as well as operational funding for infrastructure and funding for endowed chairs.

Financial expenditures from research funding by source: 

Federal/Tricouncil – 50% 
Industry – 22% 
HSF/C – 12% 
Endowed Chairs – 4% 
Other – 2% 
Regional/Internal – 6% 

TaARI aims to continue its mission of providing an excellent environment for learners during 2015-16. During this time, TaARI will continue to build on its strengths, focus on its core mission, and develop new priorities to ensure the long-term success of the institute. TaARI will also continue to explore new avenues of funding to build collaborations and to diversify research investments, while expanding training opportunities through the creation of new academic training opportunities.

**THROMBOSIS & ATHEROSCLEROSIS RESEARCH INSTITUTE (TAARI)**
RESEARCH INSTITUTES

FIRESTONE INSTITUTE FOR RESPIRATORY HEALTH

The Firestone Institute for Respiratory Health (FIRH) has been a world-renowned centre for the investigation and treatment of respiratory diseases for more than four decades. FIRH scientists and clinicians have and continue to contribute to groundbreaking respiratory research with global impact. FIRH faculty members have been at the center of developing the Aerocizer for inhaled drug delivery to the respiratory system, the methacholine challenge test to assist in the diagnosis of asthma, and the exploration of sputum eosinophilia as biomarker for asthma management.

FIRH provides comprehensive inpatient and outpatient respiratory care as the regional respiratory centre for the City of Hamilton and the Hamilton Niagara Haldimand Brant Local Health Integrated Network. FIRH has a unique Chest Program that encompasses the spectrum of respiratory medicine together with affiliated head-and-neck and thoracic surgery services; all are located on one site.

Clinical, research and educational activities are integrated and collaborative within FIRH. The intent is to provide exemplary clinical care, in tandem with basic and translational research inquiry, while educating and mentoring health care professionals to treat, research, teach, and lead. The strength of FIRH continues to be its focus on improving patient outcomes.

FIRH’s patient-centred focus on care is achieved through the tremendous efforts of allied health care professionals, including nurses, respiratory therapists and technicians, and through the efforts of FIRH’s administrative staff. In 2014-2015, Firestone had 43,863 registrations including Sleep and Tuberculosis clinic patients. Over 22,020 of these patients underwent over 36,000 clinical tests during their visits with their physicians. The remaining patients seen in the clinic were referred from the community for pulmonology or allergy testing, without specialist consult. The total number of procedures performed, as testing may involve multiple procedures, is well in excess of 79,000.

In 2014-2015, the Firestone Institute for Respiratory Health was proud to have hosted numerous successful educational programs including the First Annual Firestone Institute for Respiratory Health Day, the Michael T. Nosehew Lecture, the 3rd Frederick E. Hargreave Lectureship and the Aerosol School. These educational programs and lectures were extremely well received and provide current and up-to-date information for healthcare professionals in the discipline of respirology. The Firestone faculty and staff also participated in Hamilton’s Around the Bay Race and raised over $12,000 which will help support St. Joseph’s Foundation and research at our institute. Further, the Firestone Institute for Respiratory Health hosted and organized the 18th International Colloquium of Lung and Airway Fibrosis in Mont Tremblant, QC. This is the worldwide highest valued scientific conference dedicated to lung fibrosis and it attracted more than 300 of the best scientists and clinicians working in that field.

The McMaster University Adult Respirology Training Program, in association with FIRH, also provided training to 9 respirology residents, 51 residents (on rotation), 28 medical students and 9 clinical fellows. FIRH research faculty supervised 10 full-time graduate students (candidates for Masters and for PhD) along with 4 postdoctoral fellows. In addition, FIRH

Intestinal microbiota can down regulate or exacerbate gluten-induced immunopathology. A mechanism that can influence influence celiac disease risk in a susceptible host.


a) Lack of commensal bacteria (germ-free mice) exacerbate gluten-induced immunopathology in a susceptible host (HLA-DQ8 mouse).

b) Colonization with anti-inflammatory bacteria attenuates gluten immunopathology.

c) A microbiota that harbours pathobionts (Enterobacteria) increases gluten immunopathology.

d) Supplementation of anti-inflammatory bacteria with a pathobiont (E. coli ENT CAI:5) isolated from celiac patient increases gluten immunopathology.

Verdu Lab

...mentoring health care professionals to treat, research, teach, and lead...
who contributed to support our clinical, research and educational initiatives this past academic year. 

In particular, we thank the St. Joseph's Healthcare and its Foundation and the many people Faculty and staff wish to acknowledge and thank those who continue to support the efforts of the McMaster University.

Providing leadership and strategic direction for the Firestone Institute in 2014-2015 were Dr. Paul O’Byrne, Chair of the Department of Medicine at McMaster University; Dr. Martin Kolb, Division Director of Respiratory Medicine; Dr. Rebecca Amer, Program Director for Adult Respiratory Residency training at McMaster University.

Faculty and staff wish to acknowledge and thank those who continue to support the efforts of the Institute. In particular, we thank the St. Joseph’s Healthcare and its Foundation and the many people who contributed to support our clinical, research and educational initiatives this past academic year.

FIRH research is wide-ranging, from studies of smooth muscle physiology and intracellular signalling through experimental disease models to clinical trials and extends to population health and policy. The research productivity of FIRH is attributed to by the high quality and impact of the peer-reviewed publications. In 2014, FIRH faculty were listed as authors on 142 peer-reviewed publications, including several in high impact international publications. Since 2009, current FIRH faculty were listed as an author on over 500 peer-reviewed publications and presented their research at over 100 conferences and events throughout the world.

Faculty have been very successful in obtaining major operating grants. Dr. Malcolm Sears was successful in obtaining a 5-year $1.027M grant to the Canadian Healthy Infant Longitudinal Development study (CHILD) which is now beginning evaluation of the cohort at age 5-years for the primary outcome of childhood asthma. Dr. Martin Kolb was awarded a 5-year CIHR grant of $791,000 to study the role of abnormal matrix in the progression of pulmonary fibrosis. Dr. Luke Janssen was successful in obtaining a 5-year CIHR grant of $895,000 to study calcium-signalling and gene expression human fibroblasts. Dr. Parameswaran Nair received funding for a project that will develop a test that will allow phenotype specific therapy in asthma. Dr. Nair’s study received a $200,000 CIHR grant. Dr. Kjetil Ask was awarded $506,000 to put in place equipment that will allow for gene specific analysis of patient tissue sample and digital storage of high resolution microscopic images. Paul Forsythe received funding from the US Office of Naval Research to study the impact of different foods on the gut flora and how this can be used to manage allergic diseases in the airway. Christian Finlay has received $374,000 from the Canadian Partnership against Cancer to study the early detection of lung cancer. Several other international, national and local team projects in interstitial lung disease, pulmonary fibrosis (and related immune diseases.

AllerGen was established in 2004 by Industry Canada through the Networks of Centres of Excellence (NCE) Program. It is hosted at McMaster University and led by Scientific Director and CEO Dr. Judah Denburg, Professor of Medicine and Director, Division of Clinical Immunology and Allergy. AllerGen gratefully acknowledges ongoing support from McMaster University and especially Dr. John Kelton, Dean & Vice-President, Faculty of Health Sciences and the Michael DeGroote School of Medicine; Dr. Mo Elbestawi, Vice-President, Research and International Affairs; Dr. Stephen Collins, Associate Dean, Research; and Dr. Patrick Deane, President and Vice-Chancellor, and Board of Directors member of AllerGen.

Led by internationally recognized Canadian researchers with expertise across almost 50 disciplines, AllerGen’s 38 active research projects and strategic initiatives employ cross-sectoral, multi-disciplinary approaches to accelerate the development of new diagnostic tests, better medications, accessible patient education tools and effective public policies relevant to allergic disease.

In 2014–2015, AllerGen engaged 95 Network Investigators and collaborators, 353 students, new professionals, research associates and technicians, and 133 partner organizations across academia, industry, not-for-profit and government.

Since 2005, AllerGen has provided education, training and capacity-building to over 1,300 students, trainees and new professionals, and awarded $2.7 million in trainee awards, grants and fellowships.
ALLERGEN LEGACY PROJECT #1
THE CANADIAN HEALTHY INFANT LONGITUDINAL DEVELOPMENT (CHILD) STUDY
Led by Dr. Malcolm Sears, Professor, Department of Medicine, McMaster University

The CHILD Study is a national birth cohort study that explores the role and interplay of genes and early-life environmental exposures in the development of asthma, allergy and other chronic immune/inflammatory diseases.

Launched in 2008 with $12 million from AllerGen and the Canadian Institutes of Health Research (CIHR), the CHILD Study is assessing over 3,500 children and their environments by collecting detailed housing, dietary and socio-economic information, household dust, and biological samples such as breast milk, blood, urine and feces.

Researchers are analyzing the samples and data to examine the potential health effects of many early-life factors, including: the infant microbiome, household phthalate exposure, maternal stress and anxiety, maternal and infant diet, the presence of pets and siblings, and antibiotic use.

Additional CHILD Study participants from McMaster University include Drs. Judah Denburg, Paul O’Byrne, Sonia Anand, Russell de Souza and Joseph Macri.

2014-15 research findings based on CHILD Study data showed that exposure to outdoor air pollution in a baby’s first year of life increases allergy risk, and identified differences in infant gut bacteria predictive of future food allergy and asthma.

ALLERGEN LEGACY PROJECT #2
THE CLINICAL INVESTIGATOR COLLABORATIVE (CIC)
Led by Dr. Paul O’Byrne, Professor and Chair, Department of Medicine, McMaster University

The CIC is a multi-centre Canadian-based Phase II clinical trials group enhancing drug discovery for allergic diseases from proof-of-concept to use in patient populations.

The CIC has positioned Canada as a leader in the discovery, development and commercialization of new tests and treatments for the benefit of individuals suffering from allergic airway diseases.

With expertise in allergic asthma, severe asthma and allergic rhinitis, the CIC offers biotechnology and pharmaceutical companies an opportunity to evaluate promising new drug molecules for the treatment of allergic diseases in both the upper and lower airways.

Researchers and McMaster University faculty involved in the CIC include Drs. Gail Gauvreau, Parameswaran Nair, Mark Larché, Paul Keith, Susan Waserman and Helen Neighbour.

Since 2005, the CIC has created 40 jobs, conducted 21 clinical trials and attracted over $22 million in R&D investment, leveraging AllerGen’s investment at a ratio of 1:4.7.

ALLERGEN LEGACY PROJECT #3
THE CANADIAN FOOD ALLERGY STRATEGIC TEAM (CanFAST)
CanFAST is a national, multi-centred, transdisciplinary research consortium that produces new knowledge of food allergy and translates it into clinical and public health practice.

2.5 million Canadians are affected by food allergy, according to 2015 estimates by CanFAST researchers. Their survey on food allergy prevalence in Canada is the largest to date; its results will be compared with future surveys to gauge changes in prevalence over time. This survey also provides the first estimation of prevalence among vulnerable Canadians, finding that those with lower education, and those who immigrated to Canada within the previous 10 years, have fewer food allergies than the general population.

In 2014-15, CanFAST’s Cross-Canada Anaphylaxis REgistry (C-CARE) generated new findings that will inform future clinical management and inform public health standards.

McMaster University allergy specialists involved in CanFAST research program are Drs. Susan Waserman and Manel Jordana.

C-CARE studies found that almost half the adults seen in an emergency department for an anaphylactic reaction are not given epinephrine in or outside of the hospital, and that the incidence of recurrent anaphylaxis in children is 29%.

Further information and copies of AllerGen’s Success Stories, a publication that makes Network research accessible to the public, are available at www.allergen-nce.ca.
The Farncombe Family Digestive Health Research Institute was opened in January 2009 following donations in 2004 and 2008 totalling $18.5 million from the Farncombe family. The gift endowed two chairs and a transition award. It also provided funds to build Canada’s first germ-free mouse facility and to establish a metagenomic/DNA sequencing unit. The Institute contains a mixture of basic and clinical scientists and has a close affiliation with the division of gastroenterology in the Department of Medicine. The establishment of the Institute was the culmination of 25 years of successful research in digestive diseases, initiated in 1983 by the establishment of the Intestinal Diseases Research Unit following acquisition of external competitive funding. The Institute is currently under the directorship of Dr. Stephen Collins and the Institute’s executive consists of Drs. Paul Moayyedi, Elena Verdu and Michael Surette from the Department of Medicine.

The Institute’s primary goal is to better understand the etiology and pathogenesis of chronic intestinal inflammatory and functional conditions that are highly prevalent in Canadian society. These include Crohn’s disease, ulcerative colitis, irritable bowel syndrome and celiac disease. Our research focuses on the role of the intestinal microbiota and dietary factors in these conditions. As psychiatric comorbidity is common in patients with chronic GI disease, our research also embraces a better understanding of gut-brain interactions and how these are influenced by the microbiota. Recent advances in understanding microbiota-to-brain communication have extended the Institute’s research into the domain of primary behavioral disorders including depression and anxiety. Acknowledging advances in understanding microbiota-to-brain communication have extended the Institute’s research into the domain of primary behavioral disorders including depression and anxiety. Understanding the role of the microbiota and dietary factors in these conditions.

The Institute's research is funded from external sources that include CIHR, Crohn’s and Colitis Canada and private sector sources that include Nestlé. The Institute contains a mixture of basic and clinical scientists and has a close affiliation with the division of gastroenterology in the Department of Medicine. The establishment of the Institute was the culmination of 25 years of successful research in digestive diseases, initiated in 1983 by the establishment of the Intestinal Diseases Research Unit following acquisition of external competitive funding. The Institute is currently under the directorship of Dr. Stephen Collins and the Institute’s executive consists of Drs. Paul Moayyedi, Elena Verdu and Michael Surette from the Department of Medicine.

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The objectives of the CRC are:
1. To provide a stimulating environment to create new research collaborations which culminate in acquiring peer review grants, industry funding and private/corporate funding;
2. To provide core faculty with infrastructure to acquire and analyze their data, and;
3. To promote mentoring and training of students at all levels including undergraduate, graduate, and post-doctoral fellows.

Faculty members who participate in centre research include:
Dr. Sonia Anand (Director, Department of Medicine and Epidemiology), Dr. Joseph Beyene (Department of Epidemiology), Dr. Russell deSouza (Department of Epidemiology), Dr. David Meyre (Department of Epidemiology), Dr. Guillaume Pare (Department of Pathology), and Dr. Zena Samaan (Department of Psychiatry).

Associate Faculty include:
Dr. Judah Denburg (Medicine), Dr. Mark Loeb (Pathology and Molecular Medicine), Dr. Andrew Monte (Epidemiology), Dr. Malcolm Sears (Medicine), Dr. Mike Surette (Medicine), Dr. Gita Wahi (Pediatrics).

Current Research Projects at the Chanchlani Research Centre:
- Aboriginal Birth Cohort (ABC) – PI’s Dr. Sonia Anand, Dr. Gita Wahi
- Canadian Alliance for Healthy Hearts & Minds (CVCO Alliance) – PI’s: Dr. Sonia Anand, Dr. Russ deSouza
- Diet and Gene Interaction Study (DIGEST) PI: Dr. Russ deSouza
- GENOA (Genetics of Addiction) – Dr. Zena Samaan
- Dengue Population Genomics study – Dr. Gui Pare, Dr. Mark Loeb
- South Asian Heart Risk Assessment Project (SAHARA) PI’s: Dr. Sonia Anand
- South Asian Birth Cohort (START) PI: Dr. Sonia Anand, Dr. Russ deSouza
- Nutrition and Genetic Interactions Birth Cohort (NutriGen) Alliance PI’s Dr. Sonia Anand, Dr. Russ deSouza, Dr. David Meyre, Dr. Joseph Beyene, Dr. Gui Pare

Grants and Awards:
In 2014-15, faculty within the CRC supervised a total of 8 junior faculty, 10 post-doctoral fellows, 16 PhD, 16 Masters, and 26 undergraduate students. The CRC faculty received 29 grants from peer review sources, private donors, and industry totaling approximately $7,355,700 during 2014 as averaged over the full funding grant period.

In 2014-15 (Jan 2014–Sept 2015) PGP faculty have published 36 papers in peer-reviewed journals.
Introduction
Since its foundation in 2013, the GERAS Centre has emerged as an international leader in fractures, frailty, and dementia research. The Centre, based out of St. Peter’s Hospital (SPH) in Hamilton, aims to “advance health care through education and research. This aim is operationalized by linking research, practice, and education to realize point-of-care improvements for seniors. Strong partnerships with the St. Peter’s Centre for Healthy Aging, the Health TAPESTRY primary care initiative ($8.7 million in funding from Health Canada), the Canadian Multicentre Osteoporosis Study (CaMos), Osteoporosis Canada, the Hamilton Arthroplasty Research Group, and Medical Pharmacies (Canada’s leading pharmacy specializing in services to long term care and retirement homes) support the success of the GERAS Centre’s activities.

Strategic Plan
The strategic goal of the GERAS Centre is “to provide excellent care for the people and communities we serve and to advance health care through education and research.” To achieve this goal, GERAS has set out three strategic directives: 1) innovative research targeting improved quality of life, 2) advancing interprofessional education in the care of seniors, and 3) developing educational and health promotion strategies for seniors and families. All of the Centre’s activities are focused on the three core themes: frailty, falls, and fractures, dementia and delirium, and end-of-life care and dementia.

Leadership and Team
Dr. Alexandra Papaioannou leads the GERAS Centre as the Scientific Director. She is a Professor of Medicine at McMaster University, a geriatrician at Hamilton Health Sciences (HHS), and the Canadian Institutes of Health Research (CIHR) Eli-Lilly Research Chair. Other core members include:

- Dr. Sharon Marr, Associate Professor of Medicine at McMaster University; Division Director of Geriatric Medicine for the Regional Geriatric Program (RGP)
- Dr. Brian Misiaszek, Chief of Geriatric Medicine at SPH of HHS; Associate Professor of Medicine at McMaster University
- Dr. Christopher Patterson, Professor of Medicine at McMaster University; Chief of Geriatric Services at HHS
- Dr. Tricia Woo, Associate Professor of Medicine at McMaster University, Geriatrician at HHS

Past Recipients include:

2015: Professor Ab Osterhaus, an esteemed virologist, and Head of the Department of Virology of the Erasmus MC Rotterdam presented his lecture entitled “From Zoonosis to Pandemic in a Changing World” on February 23, 2015.

2014: Dr. Hans Rosling, PhD, MD
Professor of International Health, Karolinska Institute, Co-founder & Chairman, Gapminder Foundation

2012: First Annual Chanchlani Global Health Research Award Recipients:

Dr. Madhukar Pai, MD, PhD
Associate Professor of Epidemiology, McGill University
“The freakonomics of TB control in India”

Dr. Nikika Pant Pai, MD, MPH, PhD
Associate Professor of Medicine, McGill University
“Point-of-care tests for HIV: innovation, synergy and impact”

Global Health Research Award:
In addition to their generous gift for the Centre, the Chanchlani Global Health Research Award was created by the Chanchlani Family and McMaster University in 2012 to recognize a leading scholar in the area of Global Health. The Scholar is selected based on their scholarly contributions to Global Health. Each year a discipline within Global Health (i.e. Determinants of Health, Policy Development, Innovative Solutions) is chosen, and an internal review committee at McMaster reviews leading candidates.

STRATEGIC DIRECTIVES:
1. Innovative research targeting improved quality of life,
2. Advancing interprofessional education in the care of seniors, and
3. Developing educational and health promotion strategies for seniors and families.

Upcoming Recipient in 2016: Dr. Vikram Patel – Centre for Global Mental Health

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Associate Professor of Medicine, McGill University
“Point-of-care tests for HIV: innovation, synergy and impact”
An algorithm has been developed that will enable the identification of subgroups of long-term care residents at increased risk of fractures. The first of its kind, this tool could be adopted internationally as a novel approach to preventing and ultimately reducing the incidence of fracture in long-term care.

Contributing factors to caregiver stress are being identified in this study to inform future interventions that support formal and informal caregivers in the community.

Long-term care homes in the education intervention group saw a 15% improvement in Vitamin D prescribing and reported implementing several process and policy changes with regard to fracture prevention practices after participating in the study (JAMDA 2014).

Through education sessions, participants learned about key components of the fracture prevention guidelines, including the recognition of high-risk residents and the use of calcium and Vitamin D, hip protectors, and pharmacological therapies. Content includes the identification of high-risk factors leading to fracture in the first three months of admission to long-term care, and how frailty status is dynamic and can be improved over time. (Age and Ageing, 2014; Osteoporosis Int., 2014).

In partnership with the CaMOS study, GERAS researchers are examining behavioral, pharmacological, and biological risk factors as predictors of prospective frailty change. Using the CaMOS longitudinal data, the team has established how various fracture types impact the onset and course of frailty over a ten-year period.

The Artful Moments program engages persons in acute care with middle- and late-stage dementia and their families in art appreciation and art making in a way that is designed to measurably improve their quality of life in the moment as well as reduce caregiver stress.

The focus of this work, funded by the Hamilton Niagara Haldimand Brant (HNHB) Local Health Integration Network (LHIN), is to develop and evaluate a clinical pathway that will support best practice of IV treatment delivery in long-term care and avoid unnecessary emergency transfers and hospitalizations.
The Actavis Chair in Rheumatology for Better Bone Health has been used to further our research interests in both the effective transfer of guidelines to practice, and osteoporosis through the support of George Ioannidis and Dr. Andy Kin On Wong in their research endeavors in rheumatology.

Dr. George Ioannidis has continued his work with CaMos, GLOW, and ViDOS (Vitamin D and Osteoporosis in long-term care) and osteoporosis guidelines in long-term care projects. In the past year, he has been part of a team, led by Dr. Alexandra Papaioannou, which has examined osteoporosis care in the long-term care setting, the impetus for the development of guidelines. They have published on the care gap, attitudes about osteoporosis in front line care givers and vitamin D and pharmacologic therapy in long-term care and the impact that ViDOS has had in improving the care of patients at risk for fractures. In addition to his research, Dr. Ioannidis has contributed to the education of interns, residents, undergraduate as well as graduate students.

Dr. Andy Kin On Wong, a past Vanier award winner, has focused his research work on bone structure and, more recently, on the effects of muscle and fat on bone structure and fractures. Andy has been responsible for the successful CIHR grant on bone quality that was awarded to our group. His work has focused on improving the reliability of pQCT-derived muscle area and density measures using a watershed algorithm for muscle and fat segmentation. A trimodality comparison of volumetric bone imaging technologies using pQCT, HRpQCT and pMRI was conducted. Short-term precision and validity, one year change, long-term precision, and least significant change were established and their association with fragility fractures has been published.

The overall goal of Dr. Austin’s research program is to better understand the underlying cellular stress pathways that contribute to cardiovascular disease and vascular calcification. His other interests include the identification of genetic and cellular factors that contribute to diabetes and obesity. This
ANDREW BRUCE DOUGLAS CHAIR IN NEUROLOGY

Dr. John Turnbull

The Andrew Bruce Douglas Chair in Neurology was established in March 2006 to further the clinical, educational, and research aspects of Amyotrophic Lateral Sclerosis (ALS) at McMaster, and this report is for the year 2014-15. With respect to clinical activities, we have established and maintained a position as a premier clinical site in Canada for the treatment of ALS, and patients come to the clinic from South Central Ontario, and indeed, all of Ontario and beyond. We remain grateful to Hamilton Health Sciences for their ongoing support of the clinic. The ALS team is multi-disciplinary, and includes respiratory technology, speech and language support, social work, seating and mobility support, equipment loans (with the ALS Society of Ontario), and is ably coordinated by Ms. Jane Allan. Ms. Shelley Curry provides the logistic and secretarial support, and Dr. Daniela Trapa is the research coordinator. We have close collaborations with Dr. Bruno Salena and Dr. John Cunnington for gastrointestinal and respirological issues, respectively, and Dr. Peter Varey for Physiatry. With respect to education, medical students, neurology residents, and fellows rotate through the clinic. With respect to research, we are participating in a research trial on the experimental drug tisemtiv sponsored by CytoKinetics, another on Withania, another fact-finding trial (ONDRI), and I was on the Independent Drug Monitoring Committee of another ALS trial sponsored by GSK that wrapped up spring 2015. We have undertaken two in-house trials looking at the activity of certain compounds in CSF from ALS patients and controls, and a genetic mutational analysis of ALS patients. Our basic research continues to evolve and we are working on the possibility that ALS terminally involves de-differentiation of motor neurons.

ASTRAZENECA CHAIR IN RESPIRATORY EPIDEMIOLOGY

Dr. Malcolm Sears

Dr. Sears continues to direct the Canadian Healthy Infant Longitudinal Development (CHILD) Study, a large national longitudinal epidemiological study involving some 40 investigators across Canada. The study was initiated in 2008 with funding by CIHR and the Allergy, Genes and Environment (AllerGen) Network of Centres of Excellence. After recruiting 3,624 pregnant mothers and 3,542 infants, who met inclusion and exclusion criteria at birth, they are being followed to age 5 years. CHILD was designed as an intensive investigation of factors responsible for development of allergy and asthma, with a particular emphasis on gene-environment interactions. A very broad definition of the environment including not only indoor and outdoor air, but psychosocial environment including maternal stress, infections and nutrition, has allowed expansion of the scope of the study to include the early origins of obesity, metabolic diseases including diabetes, and cardiovascular disease. The eldest children are now aged 7 years, and the assessments of 5 year olds will be complete in 2017.
Accomplishments

Patient quality management
We continued our work on enhancing quality management of IBD by drafting a protocol on validating a standardized patient record form and measuring its impact on the outcome of patients with IBD. The proposal was submitted to Crohn’s Colitis Canada and subsequently shortlisted. As a result of the review process, I succeeded to unite the Canadian authors of the other 4 shortlisted proposals into a working group by combining our efforts into a single jointed proposal which is now running under the title of PACE. The group is striving for a sponsorship of 3M CAD to develop the first national program on quality management in IBD. This achievement is an important first step towards the constitution of a Canadian IBD study group.

We also furthered our interest in developing valid paradigms for an early diagnosis of Crohn’s disease. This lead to two recent publications dealing with the role of patient reported outcomes and signs of inflammation for the diagnosis of IBD. In another manuscript under submission we report from an international collaboration the delineation of a simple scoring system for the diagnosis of Crohn’s disease based on features from ileocolonoscopy and cross-sectional imaging. We hope to deliver a universally applicable gold-standard for the diagnosis of Crohn’s disease.

Clinical Research
The consolidated IBD working group was carried forward and a number of sponsored interventional trials initiated. Dr. Smita Halder was invigorated in the position of a principal investigator. I presented the results from a multi-center placebo controlled trial of an anti-MadCAM antibody as a late breaker at the Digestive Disease Week in Washington in May 2015. Manuscripts on previous trials with that antibody are in preparation for submission to the New England Journal of Medicine.

Translational Research
I continued my efforts to establish a translational IBD in particular exchanges with Drs. Waliul Khan, Elena Verdu, and Michael Surette. Experiments on recovering calprotectin, an inflammatory biomarker derived from neutrophils, from stool after titration of isolated neutrophils are close to finalization and aimed to establish the validity of a novel APP-based reader for fecal calprotectin that can be used remotely used by patients with IBD.

With the increasing global importance of biosimilar infliximab for the treatment of inflammatory disease I sought the collaboration with AMGEN in order to develop a study plan on the ex vivo assessment of its adalimumab biosimilar on isolated peripheral blood mononuclear cells from healthy individuals and patients with Crohn’s disease. More recently, the study was approved by the IRB and funded by a grant by AMGEN of USD 180K.
Dr. Moayyedi, Surette and Lee have conducted a study of fecal microbiota transplant therapy in ulcerative colitis. This has been very successful in a proportion of patients and I have provided some novel ideas to develop this therapy to the next level and make it even more effective. These ideas will be evaluated in a randomized trial that has just received funding from the Hamilton Academic Health Sciences Organization (HAHSO).

As the Division Director of General Internal Medicine, I have been successful in recruiting four academic general internists last year. These individuals will continue to be involved clinically at the academic teaching hospitals. Dr. Jason Cheung will be completing his Masters in Business Administration from DeGroote School of Business in addition to doing clinical and educational activities. Dr. Samir Raza, who completed his Masters from Oxford has joined us and will be continuing his scholarly activities. Dr. Abraaz Wyne completed his extra training in Obstetrical Medicine and will be combining General Internal Medicine and Obstetrics Medicine and Dr. Daniel Brantid Vegas, whose focus will be in education.

The last twelve months have been very active in organizing and monitoring the function of Boris Clinic and I hope in the next twelve months, we will have outcome measures of our activities.

One of the major objectives of The Boris Clinic is that we will create innovative models of care in education. The Boris Clinic will also be a hub of critical research in exploring and researching different models of healthcare delivery.

I continue to be the Division Director of General Internal Medicine at McMaster University and have been actively involved in the recruitment of academic Internal Medicine specialists, who in addition to doing in-patient activities on the Clinical Teaching Unit, would be involved in out-patient teaching activities in the new Ambulatory CTU at The Boris Clinic. One of the gaps in the Internal Medicine training program has been out-patient training for our learners and we believe The Boris Clinic would be an ideal hub to train and educate learners in management of ambulatory and out-patient patients.

I am happy to inform you that since the opening of Phase I of The Boris Clinic, we have had visits from healthcare professionals, both out of the city and out of the country, to see the layout and the functioning of the clinic. We are receiving positive feedback from patients who have visited The Boris Clinic. The areas that people have positively commented on are the general ambiance and structure of the clinic, friendliness of the staff and the efficiency and team approach in patient care.

I am actively involved in the physician resource planning and recruitment of clinician educators and clinician researchers for the Division of General Internal Medicine and for the Department of Medicine, and I am happy to inform you that we have been fortunate in recruiting highly trained academic internists who will be working in The Boris Clinic. I should also mention that our Ambulatory CTU is the first of its kind in the country and we have already submitted a paper describing the concepts and the structure of the clinic to a medical journal.

In my capacity as the GIM Division Director, I have been involved in organizing a large Internal Medicine Review Course which was held in April 2014 and had 750 physicians from across the country and internationally attending the three day-to-day issues in the clinic.

As the recipient of the Boris Family Chair in Education and Internal Medicine, I continue to be the Medical Director of The Boris Clinic and I have provided some novel ideas to develop this therapy to the next level and make it even more effective. These ideas will be evaluated in a randomized trial that has just received funding from the Hamilton Academic Health Sciences Organization (HAHSO).

I am pleased to provide a brief report of the activities with regards to the Boris Family Chair in Education and Internal Medicine.

Since the last report, Phase II of the Boris Clinic was completed in July 2015. We now have fully operating Ambulatory Clinical Teaching Unit, Diabetic Clinic, Multispecialty Clinics and Medical Daycare.

The Boris Clinic continues to see patients in the Ambulatory CTU, Diabetic Clinic, Multispecialty Clinics and have day procedures done in the Medical Daycare. At any one point in time, there are about 12 - 15 specialties present in the Boris Clinic. Our patients and all healthcare providers working in Boris Clinic have given us positive feedback and we are in the process of collecting data on patient, physician and allied health satisfaction surveys. We hope to present the results in the next few months.

The Boris Clinic is an academic ambulatory clinic and research activities are an integral component of the clinic. We have recruited two leaders in the Boris Clinic and these are Dr. Jason Cheung, who will be in charge of measuring quality outcomes in the clinic, and Dr. John You, whose responsibility will include coordinating research activities in the clinic.

Dr. Mohamed Panju and his group have submitted a scholarly paper describing the activities of the Ambulatory Clinical Teaching Unit and we have had positive feedback over the last six months from the learners rotating through the clinic. The results were extremely positive and we feel that we have accomplished the goals that we had set prior to opening the clinic.

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day event. This was our 6th Review Course and we have planned our 7th Annual Internal Medicine Review Course, which will occur in March 2015.

I look forward to the next 12 months and will be happy to report the successes of the initiatives in my next year’s report.

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**ELI LILLY CANADA CHAIR IN OSTEOPOROSIS**

**Dr. Alexandra Papaioannou**

Dr. Papaioannou is a Professor in the Department of Medicine at McMaster University with joint appointment in the Division of Rheumatology. Dr Papaioannou is an Associate Member in the Department of Clinical Epidemiology & Biostatistics, and Medical Sciences. She is a Geriatrician at Hamilton Health Sciences and Scientific Director of the Geriatric Education and Research in Aging Sciences (GERAS) Centre at St. Peter’s Hospital. She is a member of the Scientific Advisors of Osteoporosis Canada and the International Osteoporosis Foundation (Elected), and past Chair of the Scientific Advisory Council of Osteoporosis Canada (IOC) and past Chair of the Board. She was lead author of the Osteoporosis Canada Guidelines published in the Canadian Medical Association Journal (September 2015 and October 2010). She has authored over 250 peer reviewed publications. She is the project lead for the Ontario Osteoporosis Strategy for Fracture Prevention in Long-term Care and Co-Director of the Hamilton Canadian Multi-Centre Osteoporosis Study.

Dr. Papaioannou received funding in the amount of $297,362 from Hamilton Health Sciences (RFA Program) for the project “Expanding the Frailty-Sarcopenia Collaborative at GERAS”. This study is aimed at reducing unnecessary hospitalizations and adverse events and improving health outcomes and quality of life for frail seniors and their families. As well, she received funding from The Hamilton Niagara Haldimand Brant Local Health Integration Network’s Emergency Services Steering Committee in the amount of $110,390 for the project “Evaluating Long Term Care Homes’ IntraVenous Therapy Experience (LIVE) Study”.

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**DAVID BRALEY AND NANCY GORDON CHAIR IN THROMBOEMBOLIC DISEASE**

**Dr. Jeffrey Ginsberg**

Established in 2004 via a generous gift from Mr. David Braley and Mrs. Nancy Gordon, the goal of the David Braley and Nancy Gordon Chair in Thromboembolic Disease is to contribute significantly to the body of scholarship on thromboembolic disease; to mentor and train the next generation of physician scientists in thrombosis research; to develop, implement and evaluate curricular innovations in undergraduate (MD), postgraduate and Continuing Education; and to undertake quality research in thromboembolic disease.

The major foci of my research have evolved over the last couple of years. I have re-aligned my research so that I co-supervise a student who is seeking her master’s degree in Health Research Methodologies, as well as co-supervising (along with Drs. Eikelboom and Hirsh) the research fellows that have come to McMaster. The fellows include not only local trainees but also trainees from Australia, China, Belgium, Holland, etc.

During 2014-15 a number of publications were made in peer reviewed journals, as well we have twice weekly phone calls with trainees to intensely help with their research. In the coming year we will continue to place a strong emphasis on continuing with the very rigorous training program.

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ELI LILLY CANADA/MAY COHEN CHAIR IN WOMEN'S HEALTH

Dr. Shannon Bates

I am very honored to have held the Eli Lilly Canada/May Cohen Chair in Women’s Health since January 2014. Dr. Cohen, a former Associate Dean and Professor in the Faculty of Health Sciences well known for her leadership in the field of women’s health and contributions to gender equality within the medical profession, is an important role model for me and for other women in medicine. The Eli Lilly Canada/May Cohen Chair in Women’s Health was established in 1998 with funding from Eli Lilly Canada Inc. The Chair is responsible for developing an awareness of the current activities in women’s health that are in place in the broader academic and health network and for the promotion of McMaster as a leader in women’s health. The Chair will make contributions to the education programs of the faculty, remain a leader in the field and, where appropriate, be involved in clinical work that informs the research agenda.

The support of the Eli Lilly Canada/May Cohen Chair in Women’s Health has been instrumental in allowing me to pursue my interests related to women’s health. My clinical and academic work focusses on women’s issues in thrombosis and anticoagulant therapy, especially as they relate to pregnancy, assisted reproduction, and hormonal therapy. My goal is to enhance the care of women in these settings through physician and patient education, development and dissemination of evidence-based practice guidance, advocacy, and participation in related research.

This year, I had the opportunity to present educational sessions on thrombosis and women’s reproductive issues at annual meetings of the American Society of Hematology, the North American Society for Pediatric and Adolescent Gynecology, and Thrombosis Canada and to chair a scientific session related to this topic at the XXVI Congress of the International Society on Thrombosis and Haemostasis. I worked with colleagues from the United States, the Netherlands, the United Kingdom and elsewhere in Canada to complete work on a guidance document sponsored by the Anticoagulation Forum that provides practical recommendations on the prevention and management of pregnancy-related venous thromboembolism and started work as Chair of an international panel developing evidence-based guidelines on the diagnosis, prevention and treatment of venous thromboembolism in pregnancy for the American Society of Hematology. I continued to serve on the Medical Advisory Committee of the Foundation for Women and Girls with Blood Disorders.

My co-investigators (including Dr. Gordon Guyatt) and I presented one poster and published one manuscript from our PSI Foundation-funded international multicenter cross-sectional interview study examining women’s willingness to receive low molecular prophylaxis during pregnancy to prevent recurrent venous thromboembolism and the determinants of that decision. Another manuscript has been submitted for publication and we are planning a follow-up study to explore the discrepancies in responses we received in our first study.

GLAXOSMITHKLINE CHAIR IN GASTROENTEROLOGY

Dr. Stephen Collins

This Chair supports the laboratory of Dr. Stephen Collins and Dr. Premysl Berck in the Farncombe Institute, of which the chair holder is the Director. This year, the laboratory has received a CIHR Foundation grant valued at $2.54M over seven years (Collins & Berck co-PI’s), as well as an NIH grant (Berck PI, Collins Investigator) valued at $2.13M USD over five years to study the impact of intestinal microbiota on gut and brain in the context of functional gastrointestinal disorders as well as primary psychiatric disorders such as major depression and anxiety. The laboratory also receives funding from the Nestle Research Centre in Switzerland to study mechanisms underlying the ability of probiotic bacteria to influence gut and brain function. Our work focuses on the role of the intestinal resident bacterial population (known as the microbiota or microbiome) on gut and brain function in health and disease. Work in this lab is translational, starting with proof of concept studies in animal models, taking advantage of the Institute’s unique germ-free mouse unit, and extending findings into man, in conjunction with the clinical division of gastroenterology and the Department of Psychiatry. In our recent publication in Nature Communications, we showed that the expression of depression in a widely used animal model is critically dependent on the microbiota. Furthermore, a just completed placebo controlled pilot study illustrated our ability to move from mouse to man by demonstrating that a probiotic bacteria, shown to improve behaviour in mice, significantly reduced depression in patients with Irritable Bowel Syndrome – a highly prevalent condition in which psychiatric comorbidity is very common. The lab’s work also explores mechanisms underlying microbiota effects on the gut and brain, with emphasis on metabolic and immunological mechanism, utilizing institutional expertise in the areas of metabolomics, immunology and the availability of mice with a humanized immune system in collaboration with Dr. Ali Askari.

The overall aim of this work is to better understand the pathophysiology of functional gastrointestinal disorders as well as certain psychiatric disorders such as anxiety and depression, with a view to developing novel therapies and developing biomarkers that will help stratify patients for microbiota-directed therapies.
The Hamilton Hospital Assessment Centre Endowed Professorship in Neuromuscular Disease has permitted continued productivity in the Neuromuscular Clinic. We have completed manuscripts for publication in areas of CMT, including a familial report of a novel heterozygous SKOTC2-mediated form of CMT type 4C. I have also published the first case report of Transient Neonatal Autoimmune Autonomic Ganglionopathy in the journal Neurology: Neuroimmunology and Neuroinflammation. Additionally, in collaboration with Dr. Tamopolsky and a trainee, Dr. Wu, we reported, in the Canadian Journal of Neurological Sciences, the first report of statin associated autoimmune necrotizing myopathy undergoing a pathophysiologic transition to inflammatory myopathy upon repeat biopsies during clinical follow-up. These findings challenge the categorical distinction of these immune mediated neuropathies. I am planning on screening these patients who manifested transitioning myopathies phenotypes to see if they harbor the anti-IMMG CoA reductase antibody that has recently been reported. I have also been asked by Dr. John Mancini to return as a panel member of the Canadian Working Group Consensus update on prevention and management of statin adverse effects and intolerance. Dr. Robert Rosenson also invited me to participate in the Expert Muscle Panel, which is part of the National Lipid Association Working Group on the management of statin related side effects.

We continue to explore the potential salutary effects of physical exercise in individuals with hereditary neuropathies such as CMT. My clinical work has disclosed novel rare mutations in genes such as VCP, SCHN11A, IGHMBP2, RG4, SE7X, GJB1 and PMP22. Whole exome sequencing has also identified novel extremely rare phenotypes of hereditary recessive (SGMAB1) and dominant (NEFH) forms of ALS. An equally rare form of hereditary upper and lower motor neuron degeneration was identified in the AAS/AADIN gene. This is quite possibly the first case of Allgrove Syndrome in Canada. I have also found clinically that vascular endothelial growth factor receptor 2 may be an earlier serological marker for the devastating disorder called PEOSM as opposed to the traditionally ascat VEGF levels. I have also identified perhaps the second seropositive case of anti-glycine receptor positive PIRM (progressive encephalomyelitis rigidity and myoclonus syndrome). These will represent case report content for trainees such as residents in the coming academic year. Dr. Adrian Opala, a PGY4 resident working under my supervision, has analyzed the effects of IVIg therapy with regards to nerve conduction studies and strength data in a cohort of CIDP patients. This abstract was presented at the most recent meeting of the Canadian Federation for Neurological Sciences in Toronto. Another medical student, Michael Catapano, also presented work exploring the question as to whether or not anti-nerve autoantibodies are present in individuals with Charcot Marie Tooth Disease. Collaborations with Dr. Matthew Miller regarding novel compound heterozygous mutations in distinct genes that have DNA helicase activity and are likely to have manifested as a congenital demyelinating neuropathy are being planned. Additionally, Dr. Gianni Parise and I will address the effects of statins on skeletal muscle satellite cell function.

I am also collaborating with Octapharma as a major Canadian site Principle Investigator investigating clinical effects and tolerance of Octagam 10% in patients with chronic inflammatory demyelinating polyneuropathy (CIDP) and multifocal motor neuropathy (MMN).
Dr. Steinberg's research studies the fundamental mechanisms regulating energy metabolism and how this can contribute to common chronic diseases including type 2 diabetes, cardiovascular disease, sarcopenia and cancer. Highlights in 2014-15 that were supported by the endowed chair include the discovery that the hormone serotonin controls energy use in brown adipose tissue; findings which may have important implications for the treatment of obesity, type 2 diabetes and non-alcoholic fatty liver disease. His laboratory also discovered that when two commonly used medications are applied together they have synergistic effects to inhibit the synthesis of fat. These findings may have important implications for preventing cancer cell division and diabetes. Lastly, his work identified a new molecular pathway that may be effective to prevent aging-induced muscle weakness (sarcopenia).

Dr. Anand received the Heart and Stroke Foundation / Michael G. DeGroote Chair in Population Health Research at McMaster University in 2008, and it was renewed in 2013. The mandate of this Chair is to improve research in population health as it relates to cardiovascular disease. Dr. Anand's research focuses on understanding the contribution of environmental and genetics factors on the development of cardiovascular risk factors and cardiovascular disease. She has a particular interest in conducting intersectoral research including ethnicity, sex/gender, and social factors. Dr. Anand is currently: 1) investigating the role of genetic and epigenetic factors and type 2 diabetes and MI risk in various ethnic populations, 2) evaluating the effectiveness of culturally-tailored multimedia intervention to modify risk factors for cardiovascular disease in the South Asian population (SAHARA trial), and 3) has initiated two birth cohort studies in the South Asian and Aboriginal communities in Ontario to determine the early life determinants on the development of adiposity and related metabolic factors in high risk populations.

Recently, Dr. Anand has teamed up with Dr. Jack Tu (ICES) and Dr. Matthias Friedrich (Montreal Heart Institute) to lead the Canadian Alliance of Healthy Hearts and Minds Study funded by the Canadian Partnership against Cancer. This study aims to recruit 9,700 adults from across Canada to understand the community and individual level determinants of cardiovascular disease and cancer including a new Aboriginal Cohort in 10 communities across Canada.

Dr. Kearon's research focuses on clinical trials designed to optimize the diagnosis and treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE), which are collectively referred to as venous thromboembolism (VTE). Two ongoing CIHR-funded diagnostic studies are evaluating new ways to use D-dimer blood tests to help rule out DVT and PE, with the goal of reducing the number of ultrasound and CT pulmonary angiogram examinations that are required. Instead of using the same cut-off value to categorize D-dimer results as positive or negative, these studies are testing the safety of ruling-out thrombosis using a higher D-dimer value when clinicians decide that the clinical suspicion for thrombosis is low. These studies also use a very high D-dimer level to decide which patients need to return for repeat testing after a week.

A further CIHR-funded study is testing if D-dimer levels can be used to decide which patients with an unprovoked VTE need to stay on anticoagulant therapy for life because they have a high risk of recurrent thrombosis, and which patients can safely stop anticoagulants after 3 months. A HSF-funded substudy is exploring if subclinical inflammation is contributing to recurrent thrombosis in these patients. An NIH-funded trial is comparing removal of DVT using a catheter with just using anticoagulant therapy, hoping to show that active removal of thrombosis reduces the risk of patients being left with a chronically sore and swollen leg. A third study is determining if one of the new and very convenient anticoagulant drugs is an effective way to treat superficial vein thrombosis.

Dr. Kearon continues to lead an international panel that is developing guidelines for the treatment of VTE. He is program director for McMaster’s Clinician Investigator Program.
JOHN G. KELTON CHAIR IN TRANSLATIONAL RESEARCH

Dr. Donald M. Arnold

Dr. Donald M. Arnold is the inaugural chairholder of the John G. Kelton Chair in Translational Research. Dr. Arnold’s research focus is on immune-mediated platelet disorders including primary immune thrombocytopenia (ITP), a common acquired bleeding disorder characterized by low platelet counts and bleeding. The focus of Dr. Arnold’s research is to combine basic and clinical studies in order to bring scientific discoveries from the laboratory directly to patient care in the clinic. His research group is working on identifying a reliable diagnostic test for ITP, which is a fundamental gap in the current management of patients who are often mislabelled as having another platelet disorder. This work includes identifying novel targets for the ITP autoimmune and investigating the role of cytotoxic T-cells in the development of thrombocytopenia. Dr. Arnold’s research group has developed a novel, human, autologous model to study megakaryocytes, the platelet-precursor cell in the bone marrow, to understand why normal platelet production is impaired in patients with ITP. Dr. Arnold’s work has led to the discovery that ITP is not just one disease, but represents a number of related disorders, each with its own underlying pathophysiology. Ultimately, this research will allow for more targeted treatments tailored to individual patients. Dr. Arnold’s group continues to lead multicentre randomized trials in ITP therapies and new management strategies. To understand the clinical features, biomarkers and genetic underpinnings that define different subsets of ITP, Dr. Arnold is leading the McMaster ITP Registry, the largest prospective cohort study and biorepository of ITP patients in Canada.

LEO PHARMA CHAIR IN THROMBOEMBOLISM RESEARCH

Dr. Mark Crowther

Dr. Crowther is currently Chair and Professor in the Department of Pathology and Molecular Medicine and a Professor in the Department of Medicine. He also holds the positions of Chair, Research Advisory Committee, the Heart and Stroke Foundation of Ontario; President, The Anticoagulation Forum; Chair, Scientific and Standardization Subcommittee on Control of Anticoagulation, The International Society on Thrombosis and Haemostasis; Chair, American Society of Hematology’s (ASH’s) Quality Committee (he also oversees ASH’s guideline development program). Dr. Crowther holds a Career Investigator Award from the Heart and Stroke Foundation of Canada and the Leo Pharma Chair in Thromboembolism Research at McMaster University. His research focus is on studies designed to improve the quality of anticoagulant care and his endeavors include a wide variety of projects examining various aspects of anticoagulant care and control. His work also extends to other areas of benign hematology including evaluation of patients with immune mediated hematologic disorders and porphyria. He is principal investigator on a Heart and Stroke Foundation of Canada-funded project examining whether rivaroxaban reduces the risk of recurrent thrombosis in patients with antiphospholipid antibodies. Dr. Crowther has more than 402 peer-reviewed publications with an H-factor of 81, and more than 556 invited national and international speaking opportunities.

MARTA AND OWEN BORIS CHAIR IN STROKE RESEARCH & CARE

Dr. Ashkan Shoamanesh

Dr. Shoamanesh’s main research focus is the characterization of hemorrhage-prone cerebral small vessel disease (CSVD), namely, hypertensive arteriopathy and cerebral amyloid angiopathy, and the optimization of clinical care in this patient population. In particular, he is interested in elucidating the impact of subclinical neuroimaging markers of CSVD, such as cerebral microbleeds, on vascular cognitive and functional impairment, as well as the potential for these markers to predict future clinical outcomes and guide therapeutic decisions in stroke patients. His research has entailed characterizing the neuropathology of cerebral microbleeds visualized on magnetic resonance imaging and validating the predictive value of the Boston Criteria for cerebral amyloid angiopathy (CAA) in both hospital and population-based cohorts. Additionally, his work has demonstrated an inverse relationship and distinct apolipoprotein E genetic correlates between cortical superficial siderosis and cerebral microbleed in patients with advanced CAA. His findings suggest that cortical superficial siderosis may arise from vasculopathic mechanisms that are fundamentally different from those causing CAA-related microbleeding. This work was further developed to propose the existence of distinct CAA phenotypes. His research within the Framingham Heart Study has demonstrated the possibility of differing inflammatory pathways in the pathophysiology of ischemic and hemorrhagic markers of CSVD. Furthermore, Dr. Shoamanesh conducted the first systematic review establishing an association between cerebral microbleed burden on pre-treatment MRI and post-thrombolysis symptomatic intracerebral hemorrhage and took a leading role in a recent meta-analysis confirming the therapeutic effect of antiplatelet therapy for secondary stroke prevention following lacunar strokes. Lastly, Dr. Shoamanesh’s ongoing work within the Secondary Prevention of Small Subcortical Strokes (SPS3) and the Antihypertensive Treatment of Acute Cerebral Hemorrhage II (ATACH-II) trials will define interactions between study interventions and neuroimaging markers of CSVD.
Dr. Mark Larché was appointed to the McMaster University/GSK Chair in Lung Immunology at St. Joseph’s Healthcare in March 2008. This Chair was renewed in 2013 for a further 5-year term. Funding in 2014-2019 to support research activities associated with this Chair at St. Joseph’s Healthcare comes from CIHR, the National Institutes of Health (USA), the Immune Tolerance Network (USA), Adiga Life Sciences Inc., St. Joseph's Healthcare, Michael G DeGroote Postdoctoral Fellowship and the Scleroderma Group (Ontario) (SSO). Active areas of research within the laboratory are (1) the role of T lymphocytes in the pathogenesis of asthma/allergic Airways disease; together with Dr. Gail Gauvreau, Dr. Paul O’Byrne and Dr. Mark Inman; NIH, (2) mechanisms of peptide-induced immune tolerance (with Dr. Elena Tonti; NIH, Adiga Life Sciences), (3) the development of novel allergen challenge models (together with Dr. Helen Neighbour; AllerGen NCE, Immune Tolerance Network), (4) the pathogenesis and treatment of scleroderma (systemic sclerosis; with the Hamilton Scleroderma Group; SSO), (5) development of peptide immunotherapy for peanut allergy (together with Dr. Manel Jordana and Dr. Susan Waserman); (6) pathogenesis and treatment of rheumatoid arthritis (with Dr. Maggie Larché, Dr. Derek Haaland & Dr. Elena Tonti; CIHR, Michael G DeGroote Fellowship, Adiga Life Sciences) and (7) investigation of structural characteristics that make the ragweed allergen Amb a 1 particularly allergenic. Collaborative projects are currently underway with other faculty at St. Joseph’s Healthcare within the Firestone Institute for Respiratory Health, the Division of Nephrology, the Division of Hematology & Thromboembolism, the Division of Gastroenterology and the McMaster Immunology Research Centre within the Department of Pathology & Molecular Medicine at McMaster University.

Endowment Chairs

MCMASTER UNIVERSITY / GLAXOSMITHKLINE CHAIR IN LUNG IMMUNOLOGY AT ST. JOSEPH’S HEALTHCARE

Dr. Mark Larché

Dr. Deborah Cook

End-of-life care is a crucial domain of medicine, often forgotten in technological, efficiency-driven environments such as the ICU. While dying is a universal life passage, it creates a major existential crisis for most dying persons and their families. When critical illness is no longer responsive to treatment, or when life support will likely result in outcomes incongruent with patients’ values, clinicians should ensure that patients die with dignity. For family members of dying or deceased critically ill patients, depression, anxiety and post-traumatic stress disorder are common. Clinicians can develop vicarious traumatization and compassion fatigue.

A major initiative of the 21-bed ICU at St. Joseph’s Hospital is the 3 Wishes Project, to try to bring peace to the final days of a dying critically ill patient’s life and to ease the grieving process. Our objectives are: 1) for patients, to dignify their death and celebrate their lives; 2) for family members, to humanize the dying experience and create positive memories; and 3) for clinicians, to foster patient-family-centered care and inspire a deeper sense of our vocation. To honor each patient, a set of 3 wishes is generated (e.g., to have a charity of significance, unsolicited family donation to this project). The origin of the wishes was initially assigned to the patients’ values, clinicians should ensure that patients die with dignity. For family members of dying or deceased critically ill patients, depression, anxiety and post-traumatic stress disorder are common. Clinicians can develop vicarious traumatization and compassion fatigue.

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This work has been a major focus of the McMaster / St Joseph’s Academic Chair for the last two years, in addition to many observational studies and randomized trials that are local, provincial, national or international. During this time, 159 of 163 (98%) of elicited wishes were implemented - at least 3 for each patient/family dyad. We classified wishes in 5 categories: humanizing the environment (e.g., favourite flowers, bringing cherished moments into the room), personal tributes (e.g., tea party, tree planting in the patient’s name), family reconnections (e.g., locating a lost relative, sponsoring a memorial meal), rituals and observances (e.g., blessing, renewal of wedding vows, firework display) and ‘paying it forward’ (e.g., organ donation, contribution to a charity of significance, unsolicited family donation to this project). The origin of wishes was clinicians (52%), the family (39%), patient (7%) and others (3%). Wishes were implemented antemortem (52%) and postmortem (48%), like palliative care itself which extends beyond death.

Semi-structured interviews of 40 family members and 120 clinicians (including trainees, nurses, chaplains, etc) were transcribed verbatim and analyzed using qualitative description. The central theme from 160 interviews was how the 3 Wishes Project personalized the dying process. For patients, eliciting and customizing the wishes honours them by celebrating their life and dignifying their death. For the family, it helps to create enduring positive memories, countering the negative visual, auditory and tactile stimuli propagated by technology. For clinicians, it promotes inter-professional care and humanism in practice. Most wishes were simple and inexpensive, yet often described as invaluable.
ENDOWED CHAIRS

MICHAEL G. DEGROOTE CHAIR IN INFECTIOUS DISEASES
Dr. Mark Loeb

Dr. Loeb has been focusing his research on viral infections that include influenza and dengue. His research includes understanding how influenza virus is transmitted through communities and the effect of vaccination. Dr. Loeb is the Principal Investigator of a randomized controlled trial comparing influenza vaccine to placebo to reduce adverse vascular events. This trial was funded in 2015 by the Joint Global Health Trials competition of UK MRC Wellcome Trust for £5,916,700 and will be conducted in nine countries. Dr. Loeb has completed the third year of a 4,600 participant CIHR-funded randomized controlled trial in the Hutterite community comparing live influenza vaccine to inactivate vaccine in order to assess the effect of herd immunity. This is a major study and the results have important implications for public health practice. He has presented findings to CDC in the U.S and to WHO. Dr. Loeb continues to conduct a randomized trial of 1,200 children in Vietnam who have been randomized to either vitamin D or placebo to reduce respiratory tract infections. Dr. Loeb has taken on the role of Taskforce Lead of the WHO Working Group on Pregnancy and Influenza and presented findings of a systematic review.

Dr. Loeb continues to lead a large NIH study to assess genetic variants associated with severe dengue infection. This study is being conducted in nine countries in central and south America as well as in southeast Asia. In 2014, Dr. Loeb awarded a CIHR grant for a clinical trial to assess whether oseltamivir can prevent complications in a high risk population. This pilot was completed and the full trial is ongoing. Dr. Loeb assumed the role of Chair of the Data Safety and Monitoring Board of an important NIH vaccine trial on influenza H7N9 which was first reported to infect humans in March 2013. He was an invited speaker at an NIH meeting on population genetics.

MICHAEL G. DEGROOTE CHAIR IN STROKE PREVENTION
Dr. Robert G. Hart

Established in 2003 with a generous gift from Mr. Michael G. DeGroote and subsequently converted to a Chair with funds from the Department of Medicine, the goal of the Michael G. DeGroote Chair in Stroke Prevention is to contribute significantly to the body of scholarship in the area of stroke prevention.

In 2014, we proposed a new clinical entity called “embolic strokes of undetermined source” (ESUS). This has garnered international attention and prompted the organization of a large international randomized clinical trial called NAVIGATE ESUS led by the McMaster / Hamilton Health Sciences Stroke Program. This trial, sponsored by Bayer Healthcare, is currently being carried out at 480 international stroke research centers in 31 countries. This novel paradigm is likely to revolutionize management of cryptogenic stroke, comprising about one-quarter of all strokes, and has elevated McMaster University into the international spotlight as a leader of innovative stroke research.

Much of my time and effort has been devoted to establishing an academic and scholarly culture to attract young stroke-oriented physicians to join the program and to allow them to flourish. In 2014, we recruited two outstanding young stroke program faculty members, one primarily a clinician-researcher (from Harvard University) and one mainly a clinician-teacher. When I arrived at McMaster in 2011, there were but three fellowship-trained stroke faculty members. Now we are nine, having recruited outstanding young stroke-oriented faculty members. The Stroke Fellowship Program was initiated in 2012, and currently we have five stroke fellows in-training. I have devoted considerable effort to fostering an academic culture among our 14 stroke program faculty and fellows, co-authoring several peer-reviewed publications with junior faculty and fellows and mentoring research projects.

I have continued to publish regularly in the peer-reviewed stroke literature, including several invited commentaries on major issues in stroke management and research.
thought to be possible mediators of allergic inflammation. This included humanized monoclonal antibodies directed against a number of cytokines to be beneficial in this clinical model. Other studies have focused on treatment to inhibit the production of cytokine receptors which was shown to work. These studies include the first documented evidence of anti-sense drugs in asthma, as well as the mechanisms by which established drugs inhibit inflammation as a mechanism to study the potential efficacy of new the clinical models of allergen-induced airway responses and airway cells in the airways. In addition to this, Dr. O’Byrne’s laboratory has used trafficking of dendritic cells, which are the professional antigen-presenting cells, including mast cells, release a group of mediators known as cysteinyl leukotrienes, which Dr. O’Byrne’s research group has demonstrated to be critical mediators for a number of allergen-induced responses including bronchoconstriction, the further influx of inflammatory cells, and the trafficking of dendritic cells, which are the professional antigen-presenting cells in the airways. In addition to this, Dr. O’Byrne’s laboratory has used the clinical models of allergen-induced airway responses and airway inflammation as an mechanism to study the potential efficacy of new drugs in asthma, as well as the mechanisms by which established drugs work. These studies include the first documented evidence of anti-sense treatment to inhibit the production of cytokine receptors which was shown to be beneficial in this clinical model. Other studies have focused on humanized monoclonal antibodies directed against a number of cytokines thought to be possible mediators of allergic inflammation. This included

**ENDOWED CHAIRS**

**MICHAEL G. DEGROOTE PROFESSORSHIP IN STROKE MANAGEMENT**

Dr. Demetrios (James) Sahlas

Dr. Sahlas rapidly established the Hamilton General as the North American leader in recruitment for the CLOTBUST ER study, which examined transcranial Doppler to augment stroke thrombolysis, while also contributing to the investigator-driven SPOTLIGHT study, using factor VIIa for hemostasis in the hyperacute treatment of intracerebral hemorrhage. Research by Dr. Sahlas and his colleagues also demonstrated poorer functional outcomes in tissue plasminogen activator (tPA) overdose in stroke patients who were not weighed prior to dosing, promoting a change in best practice.

Most recently, he is developing a research team infrastructure for clinical trials exploring vascular cognitive impairment, and together with Dr. John Turnbull, co-led McMaster University’s involvement as part of the Ontario Neurodegenerative Research Initiative. Dr. Sahlas and his colleagues also obtained a grant from the CIHR for a multicenter study entitled DOC-Utility: Simple screening of Depression, Obstructive sleep apnea and Cognitive impairment to Identify Stroke Clinic Patients at Risk of Adverse Outcomes. He continues to promote best practice through interdisciplinary research in carotid artery disease and stroke prevention clinical pathways.

**MORAN CAMPBELL CHAIR IN RESPIRATORY MEDICINE**

Dr. Paul M. O’Byrne

Dr. Paul O’Byrne has had a longstanding research interest into the causes and treatment of asthma. In particular, his research is focused on the roles of environmental allergens in causing airway inflammatory responses and the associated changes in physiological responses of the airways, which are a hallmark of asthma. These studies have demonstrated mechanisms by which the airways signal the bone marrow to increase production of eosinophils and dendritic cells, which then traffic into the airway to participate in allergen-induced responses. Eosinophils and other airway cells, including mast cells, release a group of mediators known as cysteinyl leukotrienes, which Dr. O’Byrne’s research group has demonstrated to be critical mediators for a number of allergen-induced responses including bronchoconstriction, the further influx of inflammatory cells, and the trafficking of dendritic cells, which are the professional antigen-presenting cells in the airways. In addition to this, Dr. O’Byrne’s laboratory has used the clinical models of allergen-induced airway responses and airway inflammation as a mechanism to study the potential efficacy of new drugs in asthma, as well as the mechanisms by which established drugs work. These studies include the first documented evidence of anti-sense treatment to inhibit the production of cytokine receptors which was shown to be beneficial in this clinical model. Other studies have focused on humanized monoclonal antibodies directed against a number of cytokines thought to be possible mediators of allergic inflammation. This included

**POPULATION HEALTH INSTITUTE CHAIR IN DIABETES RESEARCH AND CARE**

Dr. Hertzel Gerstein

This chair was established in 2001 to provide broad support for research activities focused on the prevention and treatment of dysglycemia and its serious consequences. Dr. Gerstein is pursuing these goals through a broad range of research-related activities at the international, national and local levels. Some of these activities include his role as an international PI and leader of: a) the 10,000 person REVINO trial of a GLP-1 analog on serious health outcomes in people with diabetes; b) a proteomic and (together with Dr. Pare) genomic analysis of 8000 participants followed for up to 9 years in his ORIGIN trial and ORIGINALE follow-up study, that is identifying novel mechanisms and cardiovascular risk factors in people with dysglycemia; and c) ongoing analyses of epidemiologic and genetic data from the NIH-funded 10,000 person ACCORD passive follow-up study of the short and long-term role of glucose, blood pressure and lipid management in people with type 2 diabetes. He is also directing epidemiologic and ancillary analyses of data collected in a variety of these and other completed global trials and epidemiologic studies addressing various aspects of dysglycemia. Most recently, Dr. Gerstein designed and is co-leading 2 trials of novel approaches to inducing a diabetes remission. In addition to these clinical research activities, he continues to collaborate with colleagues at McMaster in research using animal and cellular models of dysglycemia to identify the mechanisms underlying the development of diabetes, and the relationship between dysglycemia and cancer, cognitive decline, and cardiovascular diseases. Dr. Gerstein’s research is currently funded by CIHR, NIH, CDA, and industry, and much of his clinical research is accomplished through the Population Health Research Institute, where he is Deputy Director.

During the 2014-2015 academic year, Dr. Gerstein published more than 25 articles and editorials in major peer-reviewed international medical journals; was interviewed on several occasions by national and international medical and general news publications; and presented data and perspectives as an invited guest speaker or faculty member at more than 20 national and international meetings.
The Salim Yusuf Chair in Cardiology supports the activities of the Director of the Division of Cardiology at McMaster University, currently Dr. Stuart Connolly.

Clinical Activities:
We continue to develop and improve the efficiency of delivery of care on our cardiology services at Hamilton Health Sciences and at St. Joseph’s Healthcare. Notable changes include a restructuring of the Coronary Care Unit (CCU) Physician Service model, which will become more streamlined beginning in April 2015. We continue to develop the cardiology service at St. Joseph’s Hospital with greater participation of cardiologists on the day to day management of acute cardiac care. At the Juravinski Hospital, the perioperative service managing cardiovascular risk continues to expand.

Educational Activities:
The Cardiology Training Program continues to flourish under the leadership of Dr. Nicholas Valettas. Currently, we have 12 trainees in the program and we are hoping to increase to 13 to be able to provide a uniformed and consistent level of training on all three of our cardiology teaching services. Having completed our internal review last year, we are anticipating a successful external review in the spring 2015.

Research Activities:
The cardiology division continues to flourish in the realm of research with a wide variety of strong programs. The Division Director has played a role in supporting many programs.

As Dr. Stuart Connolly’s second term draws to a close, he will be stepping down from the role of Division Director and relinquishing the Chair in Cardiology. He expresses his gratitude for the support he has received over the past 10 years.
ST. PETER’S / MCMASTER CHAIR IN AGING
Dr. Sharon Marr

With the growing demand on “Ontario’s health, social, and community human resources” (Sinha S, 2013), the Chair has continued to play a central role in capacity building and promoting evidence-based practice to seniors, caregivers, and community partners. Her focus has been the following: inter-professional geriatric capacity building programs; enhancement of human resources and skills not only within academic health care centres but also within long term care communities and underserviced areas; and development of novel and creative approaches to patient care, education, and research through collaboration, integration, and inter-professional partnerships.

The highly successful inter-professional education program has continued annually with the support of the Chair, GERAS, Division of Geriatric Medicine and other faculty members with well over 350 each year in attendance and a sold out crowd this past year. For the 5th Update in Geriatric Education, the theme was “Frailty, Falls, and Fractures: “Living Well with Frailty”.” The keynote speaker was Dr. John Young, Geriatrician from Bradford Teaching Hospitals Head Academic Unit Elderly Care & Rehabilitation Unit, University of Leeds, and the National Clinical Director for the Frailty Elderly & Integration, NHS England. The “Life Long Achievement Award” recipient was “Ms. Suzanne Labarge who was an ideal recipient of the award given her selflessness, generosity, and commitment to lifelong learning which have truly been inspiring. She has contributed in numerous ways to the study of optimal aging and has helped to ensure that the quality of life of our community’s aging population continues to improve. Under her leadership, the McMaster Optimal Aging Portal has ensured that aging Canadians, as well as health care professionals, have access to reliable and trustworthy health information.” (McMaster News 2015)

In 2013, the Geriatric Certificate Program (GCP) consortium, which the Chair supports with the RGP Central, Division of Geriatric Medicine, and expert clinician educators across Canada, has successfully developed an integrated and inter-professional educational certificate program that provides health care providers and students with the core geriatric competencies to care for our seniors and to equip clinicians with evidence based approaches. Currently there are 300 clinicians (regulated and non-regulated) registered for GCP and thus far 53 clinicians have successfully completed and graduated from the GCP. The GCP consortium is committed to excellence and the highest quality of educational programming and will invest in the development and incorporation of e-learning modules, which will be disseminated and evaluated nationally and internationally.

Research projects to improve care, self-management, social interactions and health behaviours for our seniors within the community and acute care hospitals are supported by the Chair, including the “Learn, Live Well” study which has the goal of teaching older adults how to confidently use an iPad by completing a training program, using volunteers, and to reduce social isolation and loneliness that some seniors may be experiencing. Above all, the main objective is to improve the wellbeing of older adults through mentorship and the use of technology. Another research project supported by the Chair and the RGP is the “Sensors and caregivers perspectives on transitions from the emergency department (ED) and the community” study. Information from patient and caregiver surveys and telephone interviews will provide valuable information to better understand patient and caregiver perspectives of their ED visit, discharge planning and experiences upon return to the community.

The Chair has continued foster interest in the care of seniors and the development of clinical and research expertise within the field of geriatrics. She has continued to support researchers and scholars including: Dr. George Ioannidis, a member of Dr. Papaioannou’s GERAS research team, who has taken on a senior lead role in the “Gaining Optimal Osteoporosis Assessments in Long Term Care” and “Diabetes and Fracture” risk studies; Dr. Justin Lee, a Clinician Investigator Program (CIP) research fellow, and Dr. Mimi Wang, a Clinical Scholar completing her MEd degree.

In recognition of Dr. Christopher Patterson’s research accomplishments in aging, primary care diagnosis and management of patients with dementia, the “Dr. Christopher Patterson Internal Medicine Resident Research Grant in Seniors Care” was developed. This past year the grant was awarded to Dr. Eric Wong for his quality improvement initiative to improve the diagnosis of delirium during the postoperative period for orthopaedic patients.

Over the coming year, the goal of St. Peter’s/McMaster Chair of Aging will be to identify and disseminate key capacity building programs and innovative research findings to a broader spectrum of health care providers, seniors, and community at large nationally and internationally. The Chair will promote, develop and collaborate with patients and their caregivers, clinicians, researchers, and educators to provide evidence based, accessible and novel educational programs that improve functional independence, social isolation, and quality of life of our seniors. With our growing aging population, health care providers with geriatric expertise are essential and key to ensuring quality based care for our frail seniors.

The Chair is very appreciative for the mentorship, generous support, and leadership from the following: St. Peter’s Hospital Foundation/ Hamilton Health Sciences, Dr. Paul D’Byrne and the Administration staff in the Department of Medicine, Dr. John Kelton, Kevin Sulewski, Dr. A.Papaioannou, Faculty of Health Sciences & members of the Division of Geriatric Medicine, Regional Geriatric Program Central, Lynn Pacheco, David Jewell, Anisha Patel, Lily Consoli and Ryan Liddell.
I am privileged to hold the William J. Walsh Chair in Medical Education. Dr. Walsh was my Program Director when I first joined McMaster as a General Internal Medicine trainee and he was a superb role model. My sincerest thanks to the DeGirolami family for their support in creating this Chair a reality and to Drs. Kelton, O’Byrne and Panju for their mentorship.

My clinical, research and teaching activities for the 2014-2015 academic year did not change significantly from previous years. I provided approximately 30 weeks of inpatient healthcare delivery and six weeks of outpatient coverage. I provided clinical supervision and teaching to medical students and postgraduate trainees from McMaster University, other Canadian universities and to Canadians studying medicine abroad. During the past academic year, I served as a student advisor, clerkship tutor, CASPer assessor, medical student electives coordinator and medical student research supervisor. I continue to serve as the Associate Chair, Education for the Department of Medicine, the Director of the Clinical Teaching Unit at the Juravinski Hospital and an Ombuds for the Postgraduate Office. I contributed in the admissions process for both the core Internal Medicine and General Internal Medicine Training Programs as a file reviewer and interviewer. I continued my mentorship of trainees in the core and General Internal Medicine Training Programs as well as several trainees who have graduated and are establishing their own community and academic careers at other universities and hospitals.

At the hospital level, I continued my activities as one of three co-chairs of medicine for the Juravinski site and the physician lead at the Juravinski Hospital for the Physician Assistant Program.

On a national level, I continued my contributions to the Royal College of Canada, Canadian Society of Internal Medicine and the Ontario Chapter of the American College of Physicians. I contributed as a Planning Committee member for the Canadian Society of Internal Medicine Annual Meeting and the McMaster University Annual Review Course in Internal Medicine. My contribution to faculty development included delivery of two faculty development workshops, the “Clinical Scholarship” and “Orienting New Learners” workshops. I also contributed as a member of the Department of Medicine Faculty Development Committee. I supervised residents undertaking research projects that were presented at the Department of Medicine Research Day, the Ontario Chapter American College of Physicians Annual Meeting, the Canadian Society of Internal Medicine Annual Meeting and the International Conference on Residency Education. In 2014, I was an author on four abstracts and six peer reviewed publications. In the first six months of 2015, I was an author on two abstracts and two peer reviewed publications.

I continue as a site co-investigator for two international multi-centre trials: HIP ATTACK and MANAGE. I am also a co-principal investigator on an end of life study, ACCEPT 360, and will be a site investigator on a pilot study with two sites (London Health Sciences and Hamilton Health Sciences) examining standard versus parenteral nutrition in hospitalized medical patients. This study will start enrolling in late 2015 or early 2016.

During the 2014-2015 academic year, I sat on multiple hospital and university committees. This past academic year saw all of our training programs undergo Royal College accreditations. I was very active in contributing to the document preparation for the core Internal Medicine and General Internal Medicine Programs and served as a resource for the other subspecialty programs.

The number of high profile peer-reviewed papers has also increased during 2014 to more than 600 separate publications.

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Dr. Judah Denburg

Dr. Denburg continues to actively contribute to clinical, educational and research endeavours in academic internal medicine. He attends one of the largest and most intensive specialist academic internal medicine practices in Canada. Specializing in immune aspects of disease affecting many organ systems, Dr. Denburg sees patients, most with complex medical problems, through his referral-based outpatient and inpatient consultations. He also continues his involvement in clinical trials studying these disorders.

Dr. Denburg’s primary research thrust examines the mechanisms of allergic inflammation, with particular emphasis on hematopoietic cytokines and their role in activating the differentiation and recruitment of inflammatory cells such as eosinophils, basophils and mast cells. This inquiry includes an exploration of the growth and differentiation of human basophil and eosinophil precursors, with the development of in vitro assays to monitor clinically relevant fluctuations in these cells during allergic responses in allergic rhinitis, nasal polyposis and asthma. His research has established the biological importance of hematopoietic mechanisms in allergic inflammation and emphasizes important, now globally recognized links, among rhinitis, asthma and other allergic disease manifestations (“allergy as a systemic disease”). Findings have been published in high-impact journals, and are the subject of ongoing peer-reviewed and industrial grants.

As founder, Scientific Director and CEO of AllerGen NCE Inc. for the past decade, Dr. Denburg has forged a strong national research and training community in allergic disease, uniting academics, researchers and students from 46 disciplines and 21 universities and hospitals in multisectoral partnered teams, now with international connections and visibility in several continents. The Walsh Professorship has been a critically important asset in support of Dr. Denburg’s role in developing and maintaining AllerGen’s activities. For a summary of AllerGen’s major accomplishments over the past year, see the report included in this publication.
Dr. Sonia Anand

In April 2011, Dr. Anand received the Canada Research Chair in Ethnic Diversity and Cardiovascular Disease. The goal of the chair includes:

1. Identifying health behaviours (dietary and activity) and genetic determinants of abdominal obesity in related cardiometabolic risk factors in adults of diverse ethnic origin,
2. Evaluating interventions aimed at lowering CV and diabetes risk in high risk ethnic groups.
3. Investigating the impact of the in utero environment, maternal fetal-genetics and epigenetics together with early life behaviours on the development of cardiometabolic traits among South Asian and Aboriginal people.

In 2013, Dr. Anand and her colleagues received a grant from CIHR Institute of Nutrition, Metabolism and Diabetes aimed at understanding the early origins of chronic diseases by studying the nutritional, genetic, epigenetic, and microbiome associations with cardiometabolic phenotypes and allergic disorders among 5,500 newborns from the CHILD, FAMILY, START and ABC birth cohort studies. They are now actively analyzing these data and are currently applying for DoHAD Team Grant to leverage the success of this collaboration.

Dr. Deborah Cook

I have been working concurrently on many projects throughout the year, with a mix of local, provincial, national and international collaborators. Some projects take two years to complete and others much longer. One example is the completed 14-center pilot randomized trial testing the effect of probiotics vs. placebo on nosocomial infection rates in critically ill patients. This binational pilot trial focused on feasibility has allowed the decision to be made to proceed to a large rigorous trial to evaluate this inexpensive modification of the microbiome as a possible therapeutic intervention for vulnerable ICU patients whose microbiome is deranged by critical illness, ubiquitous antibiotics and acid suppressants.

In 2015, my scientific contributions have been recognized by McMaster University, Department of Medicine in the form of the honour of Distinguished Professorship this year, granted to 2% of all university professors. For my dedication to improving the dying process in the technologic ICU setting, I was honoured to receive the Elizabeth J Latimer Prize in Palliative Care in 2015. With colleagues in spiritual care, palliative care and critical care, our team of collaborators were honoured with the Group Research Award for the 3 Wishes Project in 2015 by the Canadian Association of Spiritual Care in 2014. Another team award received was the Professional Practice Award of Excellence for an in bed cycling project led by Dr Michelle Kho, called TryCYLE, in 2014. My work in improving end of life care led to an international honour in 2014, the Grenvik Family Award for Ethics from the American College of Critical Care Medicine and the Society of Critical Care Medicine. As further evidenced by how my research has made an impact, this past year I was humbled to be named an Officer of the Order of Canada.

Dr. Mark Larché

Dr. Larché was appointed Canada Research Chair in Allergy and Immune Tolerance in September 2008. This Chair was renewed in 2013 for a further 7 years. Dr. Larché’s group is based at both McMaster University Medical Centre and St. Joseph’s Healthcare. For the 2014/2015 period the group consisted of 20-25 researchers including postdoctoral fellows, project managers, technicians, graduate students, undergraduate thesis/summer students, clinical study coordinators and five associated faculty members. The laboratory continues to investigate the pathogenesis and treatment of a variety of chronic inflammatory diseases including allergic rhinitis and asthma, peanut allergy, rheumatoid arthritis, scleroderma, transplant rejection (graft versus host disease) and autoimmune thrombocytopenia. Funding has come from the National Institutes of Health (USA), Scleroderma Society of Ontario, AllerGen NCE, Adiga Life Sciences Inc. and St. Joseph’s Healthcare. Dr. Larché continues to develop and evaluate peptide therapies for allergic disease in close collaboration with Adiga Life Sciences, a joint venture between McMaster and UK-based Circassia Pharmaceuticals PLC. Circassia is currently conducting clinical trials of peptide-based therapies for cat allergy (Phase 2 and Phase 2 pediatric), house dust mite allergy (Phase 2) and grass allergy (Phase 2), all of which were developed in the Larché laboratory. The laboratory phase of mechanistic studies designed to determine the mechanisms of action associated with these therapies has been completed and data analysis is underway. The results will inform design of future interventions and may identify biomarkers of efficacy.

Further therapies are under development for birch tree pollen allergy, Japanese Cedar allergy and mould allergy. Dr. Larché’s group continues active collaborations with other researchers based at McMaster University and St. Joseph’s Healthcare including members of the Department of Biochemistry & Biomedical Science, the Department of Pathology and Molecular Medicine and the Department of Medicine (Divisions of Clinical Immunology & Allergy, Rheumatology, Nephrology, Respiratory and Hematology).
Inflammation is a key component of many autoimmune diseases such as asthma and COPD. The CRC-funded research program established methods to measure airway inflammation in sputum. The methods helped identify the types of inflammation and are now leading to identifying specific therapies for the different types of inflammation. This has now been recommended by Canadian and international guidelines to treat asthma, chronic cough and COPD. The research also demonstrated that such treatment strategies are more effective and less expensive than the currently available strategies. The program has identified new targets for drug development. Currently, we are exploring proteomic and genomic technologies to identify new biomarkers in sputum. The Chair, originally awarded in 2005 was renewed for five years in 2010.

A large part of this year’s activity was to develop a point of care test to detect different types of bronchitis. We are delighted that we have a prototype of a bioactive paper that can detect eosinophil and neutrophil activities in sputum. The other major focus was to identify the reason why some patients with severe asthma have persistent airway eosinophilia despite being on high doses of prednisone. We were able to identify two novel mechanisms by which a new immune mechanism in the lung can contribute to this and a novel mechanism by which infections can directly contribute to reduced sensitivity of corticosteroids.

Another important development was the discovery that by combining metformin (the most commonly used type 2 diabetes medication) with salicylate (the active ingredient in Aspirin or salsalate) you could dramatically suppress the synthesis of lipids in liver cells. This, in turn, resulted in reduced liver lipid accumulation and improved insulin action in mice and humans with pre-diabetes. Remarkably, this treatment also dramatically slowed the growth of lung and prostate cancer cells which rely heavily on the synthesis of fat to allow them to grow and divide. These data indicated that by using these very safe and commonly used medications we may be able to treat and/or prevent NAFLD and adenocarcinomas of the lung and prostate.

Lastly, an important area of study for the lab continues to involve understanding mechanisms regulating skeletal muscle metabolism. For the last 40 years, the glucose-alanine cycle has been recognized as an important mechanism by which the glucose level is maintained during prolonged fasting; however, the molecular mechanism underlying this pathway was not fully understood. This year, the Steinberg lab discovered that in order to maintain blood glucose during fasting, the ancient energy sensor AMPK is required to switch on a pathway called autophagy. They also discovered that this pathway was vital for delaying age-induced sarcopenia. These findings have important implications as they suggest that therapies aimed at switching on AMPK in muscle (either through therapeutics or intense exercise) may be effective for preventing muscle weakness with aging.

The human body is host to numerous complex microbial communities that comprise the human microbiome. These microbes and their dynamic interactions within these communities, and with the host, play critical roles in human development and health. Although considered primarily beneficial, bacteria within the microbiome also contribute to disease. The human microbiome is a reservoir of potential pathogens and antibiotic resistance genes, specific interactions of seemingly benign commensal organisms with pathogens in polymicrobial infections can enhance virulence, and changes in the composition of the microbiome (dysbiosis) contribute to chronic inflammatory disease. The lab is focused on understanding microbe-microbe interactions and microbe-host interactions of the microbiome and in polymicrobial infections. The research combines high throughput molecular approaches to studying the microbiome. While it is often stated that most of the microbiome is not accessible by laboratory culturing methods, the Surette lab has challenged this assumption and...
developed methods that allow for comprehensive culturing of the human microbiome with a focus on the respiratory and gastrointestinal tracts. This allows a greater depth of analysis in metagenomic studies and more importantly opportunities to explore the full therapeutic and pathogenic potential of the microbiome to modulate the host. Dr. Surette’s research targets the microbiome of the gastrointestinal and respiratory tracts with specific projects investigating cystic fibrosis respiratory infections, asthma, allergy, pneumonia, sepsis, ulcerative colitis, irritable bowel syndrome, metabolic syndrome, and influence of the microbiome on psychological disorders. Additional research is focused in characterizing the development of the microbiome in infants and changes that occur with aging. His research is supported by operating grants from CIHR, Cystic Fibrosis Canada and Crohn’s and Colitis Foundation of Canada. Dr. Surette has a highly collaborative research program as a co-applicant on eight other collaborative team research grants. Dr. Surette is co-director of the McMaster Genome Center. He is chair of the Research Subcommittee of Cystic Fibrosis Canada, a member of the Steering Committee of the Genetics, Environment, Microbial (GEM) Project, and on the editorial board of the Journal of Bacteriology and Journal of Biological Chemistry. Dr. Surette has a highly collaborative research program as a co-applicant on eight other collaborative team research grants. Dr. Surette is co-director of the McMaster Genome Center. He is chair of the Research Subcommittee of Cystic Fibrosis Canada, a member of the Steering Committee of the Genetics, Environment, Microbial (GEM) Project, and on the editorial board of the Journal of Bacteriology and Journal of Biological Chemistry. Dr. Surette is co-director of the McMaster Genome Center.

Dr. Eva Szabo

As an assistant professor in McMaster University’s Departments of Medicine & Biochemistry and Biomedical Sciences, Dr. Eva Szabo’s research program focuses on how metabolic shifts regulate development of obesity and downstream complication of type 2 diabetes (T2D), cardiovascular disease and neuronal degeneration using patient specific stem cell models. Over the past year, Dr. Szabo has embarked on a number of cutting-edge research initiatives that have a strong translational potential. One of the most exciting initiatives being the establishment of a partnership between clinical teams and the Stem Cell and Cancer Research Institute (SSC-RI) investigators towards development of a collaborative research program that examines the molecular and functional pathways that are regulated during obesity, diabetes and chemotherapy induced peripheral neuropathy and CNS neural degeneration using in-house patented reprogramming technologies. To this end, her group derives neural stem cells and central and peripheral nervous system specific mature neurons from patient's peripheral blood, which is then used to understand disease development and for the development of a high throughput drug-screening platform. The patient specific central and peripheral neurons are used to screen for drugs that prevent or protect against neural damage or have the capacity to promote regeneration of the nervous system. This project not only offers an avenue to understand how the disease develops at a basic science level, but also provides an opportunity to establish alternative treatment strategies and improve quality of life of the patients.

Another research avenue that Dr. Szabo’s group is investigating includes modeling obesity using patient specific adipose tissue derived stem cells. This project examines mechanisms that promote metabolic stress in obesity. Dr. Szabo has established a phenotypic and functional drug-screen platform using healthy and obese stem cells and is hoping to identify drugs that either promote energy expenditure by shifting white adipocyte differentiation towards brown adipocytes that are known to burn fat or reduce insulin resistance. Dr. Szabo has also formed a strong collaboration with Dr. Guillaume Pare’s group and they are in the midst of running the DECODE project that aims to identify genetic determinates of early onset of cardiovascular artery disease (EOCAD). To this end, the exome sequencing studies performed by the Pare lab has identified a number of pathogenic variants within the patient cohort. Dr. Szabo’s lab is examining the functional role of the pathogenic genetic variants in EOCAD development using patient specific peripheral blood derived induced pluripotent stem cells that were differentiated towards endothelial and smooth muscle cells. The novel approach to dissecting EOCAD development using reprogramming together with genome editing technologies, will generate important insights into human endothelial development and dysfunction providing potential novel therapeutic and risk management avenues for EOCAD that are required in the clinic.

Dr. Szabo’s research is supported by CIHR, 2014 Maud Menten New Principal Investigator Prize (clinical stream), OCRIT (Global Leadership Round in Genomics & Life Sciences grant (GLL)), Canada Foundation for Innovation (CFI) fund and Brain Canada Platform Support Grant.

Dr. Elena F. Verdú

Dr. Verdú has had a long-standing interest in the pathophysiology of inflammatory and functional gastrointestinal disorders, with particular focus on host-microbial and dietary interactions. Her CRC program explores the mechanisms underlying gluten-related disorders, including celiac disease and non-celiac gluten sensitivity, and investigates the potential role of intestinal microbiota as modifier of disease risk.

Dr. Verdú’s lab has recently shown (Am Journal of Pathology 2015, in press) that there is a complex modulation of host responses to gluten by microbiota. Both in the absence of bacteria (germ-free state) and in mice that are colonized with pathobionts isolated from celiac patients, immune responses to gluten are dysregulated and enhanced compared to mice that are colonized with a benign microbiota devoid of opportunistic pathogens.
The results indicate that a balanced microbiota can downregulate immune responses to gluten. On the other hand, her group identified bacteria belonging to the phylum Proteobacteria and other opportunistic bacteria, as enhancers of immune responses to gluten. The work will be highlighted in a press release by the Am J Pathol and in an editorial commentary. It has also resulted in several invited review articles such as *Nature Reviews in Gastroenterology and Hepatology 2015*. The work has been presented at the major celiac international symposium in Prague (June 2015) and the Freston Symposium in Chicago (August 2015) organized by the American Gastroenterology Association. More importantly, new unexpected discoveries related to the gluten metabolic activity of microbiota have recently been made which constitute a main objective of her current and future research program. In collaboration with Drs. Michael Surette (McMaster Microbial Metagenomic Unit) and Nathan Magarvey (Analytical Chemistry, McMaster), Dr. Verdu’s group is currently analyzing the specific glutenasic activity of particular human small intestinal bacterial strains and how this microbial metabolism influences host immunopathology.

Dr. Verdu’s research has had public impact as well, and she has been invited to present regularly at patient based organizations, such as the Canadian Celiac Association (Hamilton chapter as well as national meetings) as well as to a meeting organized by the UK Celiac Association in 2015. Dr. Verdu’s research has been featured in media interviews and her lab highlighted by CIHR news in 2015. This activity has been important to inform the public of proven issues related to gluten and health, as opposed to non-evidenced based opinions and misinformation that could lead the general public to adopt unhealthy diets when there is no medical need.