



UNIVERSITY OF OTTAWA
HEART INSTITUTE
INSTITUT DE CARDIOLOGIE
DE L'UNIVERSITÉ D'OTTAWA

2021

RESEARCH - A YEAR IN REVIEW

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MESSAGE FROM DR. PETER LIU

Our research teams achieved another record year of accomplishments in 2021. The researchers achieved a number of “home runs” despite overwhelming pandemic challenges, while balancing family responsibilities and trying to maintain the spirit and mental health of the entire team.

We continued to witness outstanding peer reviewed funding success. Our researchers won grants from major funding agencies including CIHR, the Heart and Stroke Foundation and Diabetes Canada. We collaborated with our partners in the region and beyond to win large-scale funding. Our large-scale grant efforts attracted Genome Canada funding (\$6M) to validate biomarkers to improve atrial fibrillation care. We are collaborating with regional partners to build, with the support of major federal and provincial infrastructure funding, the Hub of Excellence for Cardio-Neuro-Mind Research (CFI \$5.9M, total \$14.6M), a disruptive initiative that is promised to transform patient care in the brain-heart nexus. We are making waves in all areas – from basic discoveries to clinical trials to translating findings to real-world clinical tools that will benefit Canadians.

We recognize the pandemic brings its inherent challenges – we are committed to keeping nimble to stay strong. Indeed, the implementation of Ottawa Region for Advanced Cardiovascular Research Excellence (ORACLE version 2.5) plan, in conjunction with our Heart Institute strategy “Further Together”, is gathering momentum. We are building capacity and advancing our leadership in big data science and Precision Medicine.

Our inspiration comes from the patients we serve today and tomorrow. We continue to ensure excellent alignment between our clinical care Heart Teams and the Research Innovation Hubs to address the big questions in cardiovascular health that matter to our patients.

Congratulations to our research teams on their outstanding work! Dr. Thierry Mesana, our President & Chief Executive Officer, and I are most proud of our teams’ accomplishments to date. We look forward to celebrating more impactful work with you in the years to come!

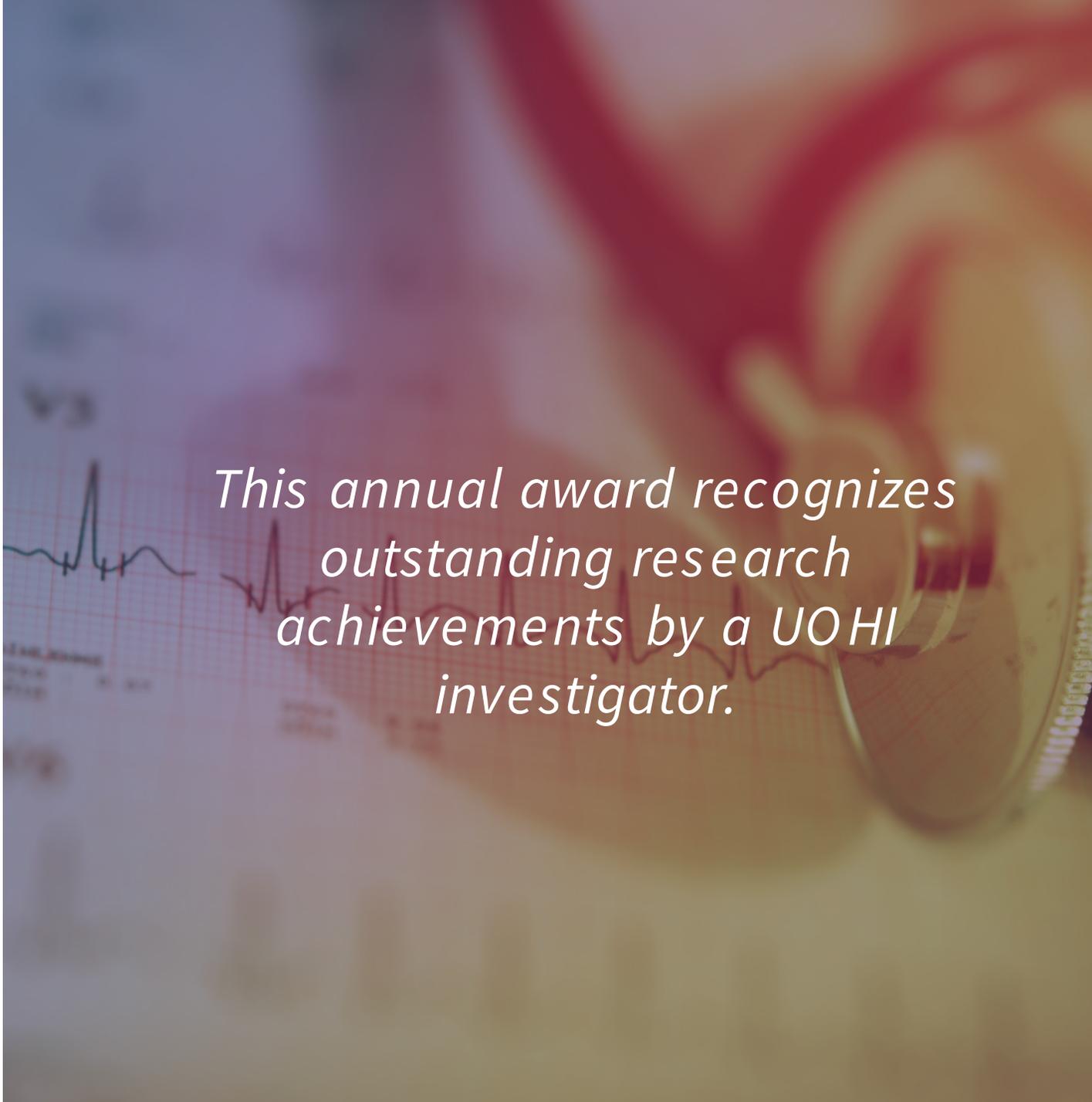


Our inspiration comes from the patients we serve today and tomorrow.

Peter Liu, MD
Chief Scientific Officer and VP Research
University of Ottawa Heart Institute

INVESTIGATOR OF THE YEAR

*This annual award recognizes
outstanding research
achievements by a UOHI
investigator.*



INVESTIGATOR OF THE YEAR: BASIC SCIENCE



Mireille Ouimet, PhD

Scientist & Director, Cardiovascular Metabolism & Cell Biology Laboratory, UOHI

Canada Research Chair (Tier 2) in Cardiovascular Metabolism & Cell Biology

Assistant Professor, Department of Biochemistry, Microbiology & Immunology, Faculty of Medicine, uOttawa



Dr. Mireille Ouimet is recognized for her outstanding research accomplishments, including peer reviewed grants and publications. Dr. Ouimet's research is focused on cholesterol trafficking and the role of autophagy in macrophage foam cell metabolism, inflammation and lipid homeostasis.

Dr. Ouimet is also recognized with the uOttawa Faculty of Medicine's Early Career Researcher of the Year Award – Biomedical.

INVESTIGATOR OF THE YEAR: CLINICAL SCIENCE



Benjamin Hibbert, MD, PhD

Interventional Cardiologist, UOHI

Assistant Professor, Department of Medicine,
uOttawa



Dr. Benjamin Hibbert is recognized for his outstanding research accomplishments, including authoring several practice-changing studies. Dr. Hibbert's program is focused on clinical outcomes research and translational science.

Dr. Hibbert is also recognized with the uOttawa Faculty of Medicine's Publication of the Year Award – Clinical.

TRAINEE OF THE YEAR

This annual award recognizes exceptional achievements by a cardiovascular research trainee in the Ottawa region.

A close-up photograph of a laboratory setting. A pipette with a white tip is dispensing a small amount of blue liquid into one of the wells of a white microplate. The microplate has several other wells, some with blue caps. The background is blurred, showing more of the lab equipment. The image has a soft, reddish-pink overlay.

TRAINEE OF THE YEAR



Adil Rasheed, PhD

Postdoctoral Fellow, UOHI



Dr. Adil Rasheed is recognized for his outstanding contributions to cardiovascular research at this early career stage, as well as exceptional leadership in the research and trainee communities. Dr. Rasheed exemplifies the next generation of research leaders.

**GLOBAL
ACHIEVEMENT
AWARD**

*This annual award recognizes
a UOHI researcher who has
exerted significant global
leadership in their sphere of
work.*

GLOBAL ACHIEVEMENT AWARD



Katey Rayner, PhD

Scientist & Director, Cardiometabolic
microRNA Laboratory, UOHI

Associate Professor, Department of
Biochemistry, Microbiology &
Immunology, uOttawa



Dr. Katey Rayner is recognized for her global leadership in cardiovascular research. She has made exceptional contributions to our understanding of the roles of microRNA and inflammation in driving atherosclerosis and cholesterol metabolism. She leads a global consortium investigating cholesterol trafficking and cellular oxidation to reverse atherosclerosis and prevent vascular cognitive impairment. She has published several high impact studies and her expertise is sought out globally.

Dr. Rayner is also recognized with the American Heart Association's Joseph A. Vita & the Department of Biochemistry, Microbiology & Immunology's Jean Himms-Hagen Awards.

DR. ROBERT ROBERTS AWARDS
FOR RESEARCH EXCELLENCE

This annual award recognizes peer reviewed publications led by UOHI investigators that have a high impact within cardiovascular science and medicine.



DR. ROBERT ROBERTS AWARD FOR RESEARCH EXCELLENCE



Dr. Erik Suuronen's study, published in Advanced Functional Materials, demonstrates that fisetin-collagen hydrogel is a promising approach to limit adverse remodeling and preserve the heart's function following myocardial infarction.



Erik Suuronen, PhD

Scientist & Director, Cardiovascular
Tissue Engineering Laboratory, UOHI

Associate Professor,
Department Cellular & Molecular
Medicine, uOttawa

DR. ROBERT ROBERTS AWARD FOR RESEARCH EXCELLENCE



The “CAPITAL CHILL” trial, led by Dr. Michel Le May and published in JAMA: Cardiology, shows that in comatose survivors of out-of-hospital cardiac arrest, a moderate target temperature (31°C) did not significantly reduce the rate of death or poor neurologic outcome compared with a mild target temperature (34°C).



Michel Le May, MD

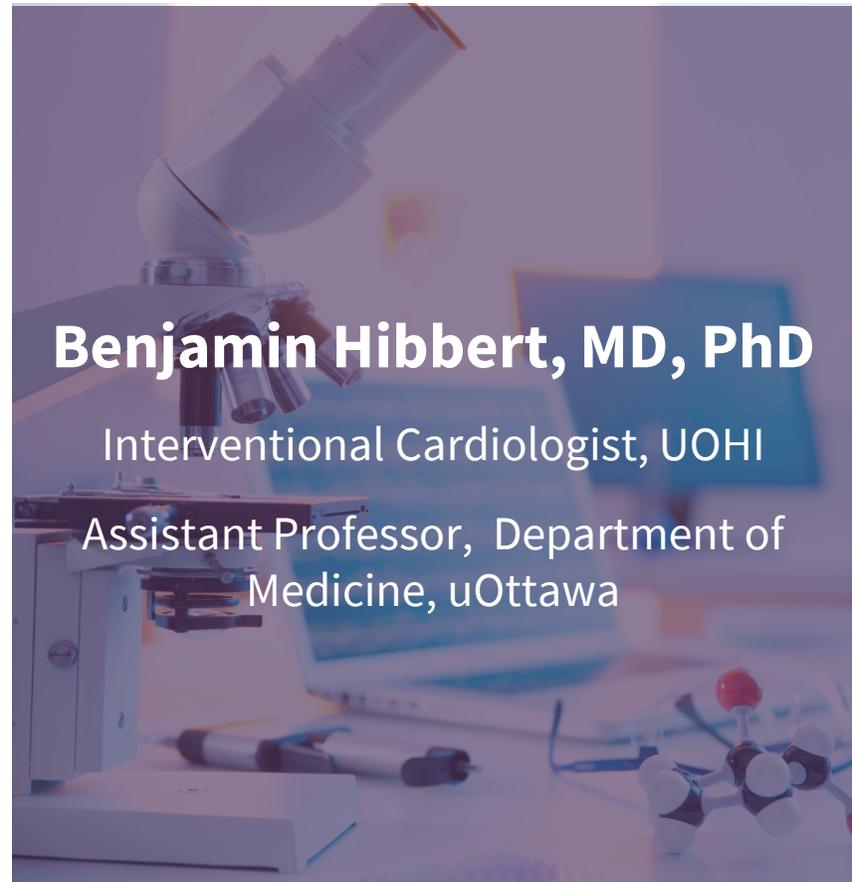
Director, Regional STEMI Program;
Interventional Cardiologist, UOHI
Professor, Department of Medicine,
uOttawa

DR. ROBERT ROBERTS AWARD FOR RESEARCH EXCELLENCE



The “DOREMI” trial, led by Dr. Benjamin Hibbert and published in the New England Journal of Medicine, found that there was no difference in outcomes between Milrinone and Dobutamine in treating cardiogenic shock.

This paper is also recognized as the uOttawa Faculty of Medicine’s Publication of the Year – Clinical.



Benjamin Hibbert, MD, PhD

Interventional Cardiologist, UOHI

Assistant Professor, Department of
Medicine, uOttawa

**DR. FRANS LEENEN TRAINEE
AWARDS**
FOR PUBLICATION EXCELLENCE

*This annual award recognizes UOHI
trainees' significant contributions to high
impact, peer reviewed publications.*

DR. FRANS LEENEN TRAINEE AWARD FOR PUBLICATION EXCELLENCE



The study by Pushpinder Kanda and Sandrine Parent et al, published in Biomaterials, shows that tuning cocoon size and cell occupancy, using a microfluidic platform, can enhance the paracrine signature and retention of transplanted cells, promoting endogenous tissue repair.

Pushpinder Kanda

MD-PhD Candidate

(Dr. Kanda has completed his MD-PhD studies)

Sandrine Parent

MSc Candidate

(Ms. Parent has completed her MSc studies)



DR. FRANS LEENEN TRAINEE AWARD FOR PUBLICATION EXCELLENCE



The study by Richard Jung and Trevor Simard, MD et al, published in JACC: Cardiovascular Interventions, found that transcatheter mitral valve repair may improve short- and intermediate-term mortality in high-risk patients with cardiogenic shock and moderate to severe mitral regurgitation.

Richard Jung

MD-PhD Candidate

(Dr. Jung has completed his PhD studies)

Trevor Simard, MD

Interventional Cardiology Fellow

(Dr. Simard is currently an Interventional Cardiologist at the Mayo Clinic in Minnesota)





ORACLE HIGHLIGHT

The ORACLE strategy pilot funding supports new, innovative projects. This pilot funding helps UOHI researchers and their teams generate novel preliminary data to be successful in national competitions. Included here is an exemplary success from 2021. With thanks to the donors to the UOHI Foundation who helped springboard these research projects to benefit patients.



Thais Coutinho, MD and team are conducting a study to develop and validate a precision model to predict risks of aortic rupture in patients with Thoracic Aorta Aneurysm.

Dr. Coutinho was awarded a **CIHR Project Grant** to expand her work from an ORACLE pilot study into a multicenter study that includes UOHI and four other hospitals across Canada. This risk prediction model will help to identify opportunities for early interventions on susceptible patients and ultimately improve Thoracic Aorta Aneurysm care.



GRANTS & AWARDS HIGHLIGHTS

UOHI researchers, from Principal Investigators to Trainees, are awarded national peer reviewed funding in support of their excellent research. Some highlights from 2021.



David Birnie, MD and team are studying cardiac sarcoidosis, an inflammatory disease that leads to arrhythmias, or abnormal electrical conduction in the heart, or heart failure. The team is conducting the world's first multicenter, randomized controlled trial (with sites from Canada, Japan, the US and UK). The trial is comparing a low dose prednisone / methotrexate to standard dose steroid treatment. Findings are expected to inform optimal treatment strategy for patients with cardiac sarcoidosis.

Dr. Birnie was awarded a **CIHR Project Grant** in support of the study; the proposal was **ranked #2** by the review committee.



GRANTS & AWARDS HIGHLIGHTS (cont.)

UOHI researchers, from Principal Investigators to Trainees, are awarded national peer reviewed funding in support of their excellent research. Some highlights from 2021.



Sabrina Robichaud is completing her PhD study, focused on the role of autophagy in atherosclerosis.

Ms. Robichaud was awarded the prestigious **Vanier Canada Graduate Scholarship** and the **CIHR Canada Graduate Scholarship – Doctoral** in recognition of her excellence.



Lara Gharibeh, PhD, is a Translational Research Fellow investigating biomarkers for the prediction of patients at risk of developing severe aortic valve calcification.

Dr. Gharibeh was awarded a **CIHR Fellowship** in support of her excellent research.



Victrine Tseung, PhD, is a Research Fellow studying the impact of digital initiatives on supporting the recovery and quality of life of people living with heart disease, stroke and vascular cognitive impairment

Dr. Tseung was awarded a **CIHR Health System Impact Fellowship** in support of her excellent research.



SELECT REGIONAL ACCOLADES

We value our collaborations with regional partners in all research activities. Included here are select examples of collaborative projects in 2021.



Peter Liu, MD (UOHI) and **Ruth Slack, PhD** (uOttawa Brain & Mind Research Institute), together with regional partners, are co-leading a disruptive initiative in the brain-heart interface. Also known as the Hub of Excellence for Cardio-Neuro-Mind Research, this inter-disciplinary team is looking at the linkages between brain and heart diseases. Brain-heart research is one of the key priorities of the UOHI's ORACLE 2 Strategic Plan.

This research will advance our understanding how brain and heart conditions co-occur and affect disease progression. The work will lead to new screening tools for early detection, new drugs and psychological therapies to treat brain-heart diseases. The aim, ultimately, is to transform the care of patients with heart, brain and mind conditions.

The Hub of Excellence for Cardio-Neuro-Mind Research was awarded a **CFI Innovation Fund** in support of this interdisciplinary platform.



Institut de recherche
sur le cerveau
Brain and Mind
Research Institute



UNIVERSITY OF OTTAWA
HEART INSTITUTE
INSTITUT DE CARDIOLOGIE
DE L'UNIVERSITÉ D'OTTAWA





SELECT REGIONAL ACCOLADES (cont.)

We value our collaborations with regional partners in all research activities. Included here are select examples of collaborative projects in 2021.

Regional Brain-Heart Seed Grants

This initiative supports innovative, interdisciplinary project in the brain-heart interface. The funding partners, UOHI, uOttawa Brain and Mind Research Institute, The Royal's Institute of Mental Health Research and the Bruyère Research Institute were pleased to support excellent projects led by the investigators listed below.

David Birnie, MD (UOHI) & **Shawn Marshall, PhD** (BRI)

Peter Liu, MD (UOHI) & **Diane Lagace, PhD** (uOBMRI)

Katey Rayner, PhD (UOHI) & **Baptiste Lacoste, PhD** (uOBMRI)

Rébecca Robillard, PhD and **Georg Northoff, MD, PhD** (IMHR) & **David Birnie** (UOHI)

Alexandre Stewart, PhD (UOHI) & **Hsiao-Huei Chen, PhD** (uOBMRI)

Lauri Tuominen, PhD (IMHR) & **Rob deKemp, PhD** (UOHI)

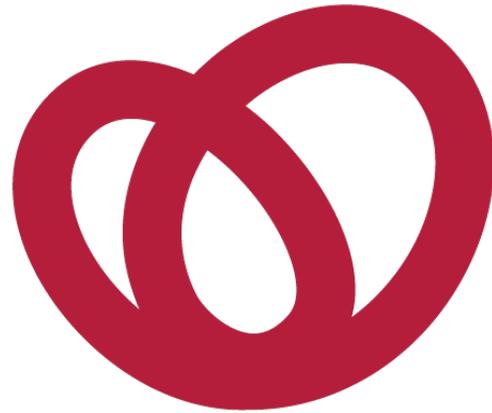
Faculty of Medicine's Path to Patenting and Pre-Commercialization Grants

This new initiative, spearheaded by the Faculty of Medicine, helps top-flight researchers translate their breakthroughs to benefit the wider world. The UOHI is pleased to join the initiative to support this critical translation of research findings into real-world tools.

Emilo Alarcón, PhD & **Marc Ruel, MD**
New materials for rapid sutureless and scarless surgical repair

Darryl Davis, MD
Exosomes to prevent post-operative atrial fibrillation

Louise Sun, MD
Cardiac surgery triaging tool



If you want to know more about **research** at the Heart Institute



ottawaheart.ca/researchers



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twitter.com/HeartInstitute