A large, abstract network diagram composed of numerous white and red nodes connected by thin lines, forming a complex web. The diagram is centered on the page and overlaps the main title text.

# ORACLE

**OTTAWA REGION FOR ADVANCED CARDIOVASCULAR RESEARCH EXCELLENCE**

STRATEGIC DIRECTIONS 2018-2024

ORACLE 2.0: Leading Globally, from Innovation to Impact



# TABLE OF CONTENTS

- P1** NOTE FROM OUR LEADERS
- P2** NOTE FROM VP RESEARCH,  
UNIVERSITY OF OTTAWA
- P3** STRATEGIC GOALS
- P4-7** GOAL ONE
- P8** GOAL TWO
- P9** GOAL THREE
- P10** GOAL FOUR



**We will maximize regional and interdisciplinary research to solve major health problems in cardiovascular disease prevention and treatment to accelerate our global leadership in cardiovascular innovation.**

# NOTE FROM **OUR LEADERS**



The Heart Institute, together with our regional partners, is building on a solid foundation following the implementation of the 2013-17 Ottawa Region for Advanced Cardiovascular Research Excellence (ORACLE) strategic plan. With the ORACLE 2.0 strategy, we will maximize regional and interdisciplinary research to solve major health problems in cardiovascular disease prevention and treatment to accelerate our global leadership in cardiovascular innovation.

In disease areas with the greatest patient burden, we will create and support unique Innovation Hubs of interdisciplinary research teams, who will work with our clinical care Heart Teams in addressing clinical care gaps as identified by our physicians. In connection with the goals of our Canadian Women's Heart Health Centre, we will facilitate sex and gender considerations in our research studies. We will engage our connected patient population in identifying patient relevant outcomes while supporting research that matters to the patient. We will partner equally with our regional research Institutes and faculties at the University of Ottawa, make the most of our regional state-of-the-art research facilities, and collaborate with the private and the government sector. Finally and most importantly, we will invest in talented people and their best ideas, recruiting and retaining the highest caliber investigators and we will train the next generation.

All the while we will strengthen our translational research, supported by our unique Institute model, which promotes physician and scientist interaction to stimulate bench-to-bedside, and bedside-to-bench research. We will improve our clinical research infrastructure and impact, with a critical step being our recently inaugurated state-of-the-art facility to deliver outstanding cardiovascular care.

This strategy is the result of an extensive consultation and environmental scanning process, together with specific recommendations from an International Scientific Review. We are sincerely grateful for all that contributed to defining the strategy, including our researchers, regional partners, our Board of Directors, patients, trainees and research office staff. We look forward to working with all stakeholders in the implementation of this forward-looking strategy.



A handwritten signature in black ink, appearing to read "Peter Liu".

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

A handwritten signature in black ink, appearing to read "Thierry Mesana".

**Thierry Mesana, MD, PhD**  
President and CEO  
University of Ottawa Heart Institute

# NOTE FROM **VP RESEARCH, UNIVERSITY OF OTTAWA**



ORACLE 2.0 has evolved naturally from previous iterations of the University of Ottawa Heart Institute research strategic plans. At the core of the new ORACLE strategic plan is interdisciplinary research. This is particularly fitting since the key to maintaining research excellence and fostering discovery in an increasingly borderless world is collaboration among researchers from multiple disciplines.

The University of Ottawa is proud of its tradition of excellence in cardiovascular research and of its historically strong ties with the Heart Institute. Cardiovascular disease is a priority in the health sector, one of the University's four strategic areas of development in research. An integrated approach, involving researchers from various faculties and affiliated hospital research institutes, has been vital to scientific advances in health care. The University's Brain and Mind Research Institute and the Centre for Neuromuscular Disease are but a few examples that illustrate the benefits of partnership.

Looking forward, three new centres in the faculties of Medicine and Health Sciences — the Centre for Infection, Immunity and Inflammation, the Joint Research Centre on Systems and Personalized Pharmacology and the LIFE Research Institute — hold promise for future collaborations with the Heart Institute. The Faculty of Engineering's rapidly developing expertise in artificial intelligence and medical devices could also greatly enhance research into preventing and treating heart disease.

Working together to maximize expertise and resources is essential as the Heart Institute continues to build an internationally recognized centre for cardiovascular research. ORACLE 2.0 and its plan to create hubs of interdisciplinary expertise will offer a novel means of fulfilling the Heart Institute's ambitious vision while being mindful of its ultimate goal: to improve the lives of patients, one discovery at a time.

A handwritten signature in black ink that reads "S. Charbonneau". The signature is written in a cursive, flowing style.

**Sylvain Charbonneau, PhD**  
Vice-President, Research  
University of Ottawa

# STRATEGIC GOALS

## GOAL ONE

Catalyze impactful research by creating and supporting unique Innovation Hubs of interdisciplinary research teams

## GOAL TWO

Support and enhance our fundamental and translational research enterprise

## GOAL THREE

Catalyse innovation and excellence in clinical research

## GOAL FOUR

Build cross-cutting initiatives to facilitate research

---

# SCIENTIFIC PRIORITY THEMES

Discovery to  
Translational  
Innovations

Precision  
Medicine

Big Data  
& Artificial  
Intelligence

Healthy  
Diverse  
Populations

# GOAL ONE

Catalyze impactful research by creating and supporting unique Innovation Hubs of interdisciplinary research teams

## INNOVATION HUBS

Atherosclerosis and  
Cardiometabolic  
Diseases

Arrhythmias

Heart Failure

Brain and Heart

Valvular  
Heart Disease



Interdisciplinary  
Research



Regional  
Partnership



Sex and  
Gender



Patient  
Engagement



Industry  
Engagement



Intersection with  
Heart Institute  
Heart Teams

# GOAL ONE

Catalyze impactful research by creating and supporting unique Innovation Hubs of interdisciplinary research teams



## ATHEROSCLEROSIS AND CARDIOMETABOLIC DISEASES

- Understanding triggers of atherosclerosis and cardiometabolic diseases including diabetes
- Biomarkers for risk prediction and personalized pharmacogenomics
- Personalizing intervention strategies and innovative devices and tools (including imaging)



## ARRHYTHMIAS

- Causes of atrial fibrillation and reversibility
- Early detection and proper classification
- Risk prediction rules/devices and personalizing treatment strategies e.g., 4D molecular imaging
- Prevention strategies including the impact of obesity and lifestyle interventions



## HEART FAILURE

- Improved classification and understanding of major forms of heart failure (HF)
- Novel biomarkers and treatment targets
- Personalized medicine through innovative treatment strategies and molecular imaging
- Early detection and treatment of HF, including indigenous populations and new tools
- Cardiac transplant vasculopathy



## VALVULAR HEART DISEASE

- How valvular diseases develop
- Screening for familial cases
- Personalized risk stratification for best disease management and outcomes
- Innovative surgical and transcatheter therapies



## BRAIN AND HEART

- Impact of mental illness on CV Disease
- Brain and heart axis in drug use/abuse
- Microvascular disease in stroke, dementia and cognitive impairment
- Rhythm synchrony and dyssynchrony between brain and heart
- Psychological and behavioural interventions to improve mental and CV health

## SCIENTIFIC PRIORITY THEMES

### DISCOVERY TO TRANSLATIONAL INNOVATIONS

Fast track discovery and validation into applications at the bedside. Tools/activities will include:

- Innovative imaging ligands and ultra high-resolution molecular imaging
- Genome editing to interrogate impact of a gene target
- Reprogrammed human stem cells and 3D organoid models of human disease
- Biomaterials, nanobiofilms and smart delivery vehicles for novel diagnostics and therapeutics

### PRECISION MEDICINE

Tailoring treatment to the patient's specific disease pathway signatures. Tools/activities will include:

- Next generation 'omics' technologies to validate novel biomarkers
- Integrated datasets and tailored decision algorithms
- Imaging technology to improve patient outcomes
- Incorporation of precision medicine into existing frameworks of care

### BIG DATA AND ARTIFICIAL INTELLIGENCE

Dataset linkage to probe disease profiles, patient subsets to enable precision based diagnosis and treatment strategies; clinical decision support tools for physicians and patients. Tools/activities will include:

- Linked clinical databases, through the UOHI CardioCore platform and electronic medical records
- Linkage to external administrative databases such as the Institute of Clinical Evaluative Sciences

### HEALTHY DIVERSE POPULATIONS

Effects of sex and gender on CV health, indigenous heart health and other health disparities. Tools/activities will include:

- Incorporating sex- and gender effects in all research activities
- Incentivizing and promoting research on indigenous populations

# GOAL ONE

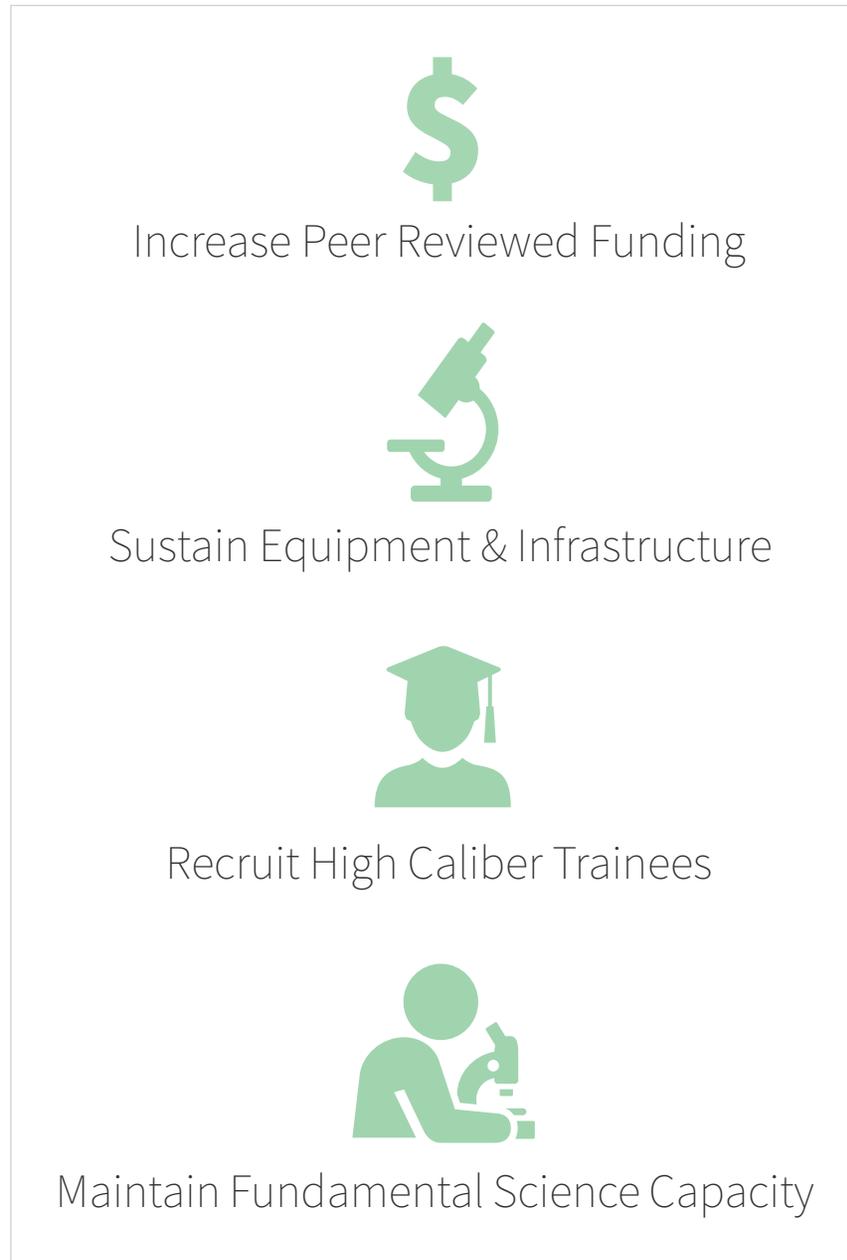
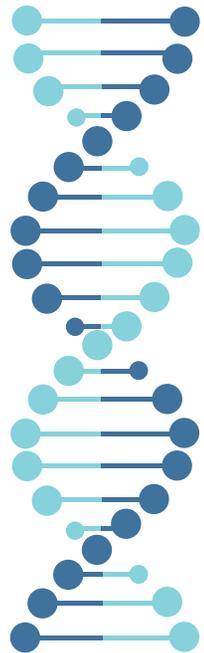
Catalyze impactful research by creating and supporting unique Innovation Hubs of interdisciplinary research teams

## LINKAGE OF INNOVATION HUBS AND SCIENTIFIC PRIORITY THEMES



# GOAL TWO

Support and enhance our fundamental and translational research enterprise



# GOAL THREE

Catalyse innovation and excellence  
in Clinical Research

Knowledge  
Content  
Experts

Methodology  
Scientists



Recognition of the value of  
clinical research



Innovative research to address  
clinical problems



Enhance infrastructure to  
facilitate clinical research



Patient Engagement

Data Science,  
Biostats

Systematic  
Reviews

Consensus  
Guidelines

Real World  
Outcomes

Patient-relevant  
Outcomes  
Research

Investigator  
Initiated Clinical  
Trials

Pharmaco-  
genomics

Industry  
Sponsored  
Trials

# GOAL FOUR

Build cross-cutting initiatives  
to facilitate research



Regional  
Partnership



Research  
Promotion and  
Communications



Recruit High  
Caliber Trainees



Grant Application  
Support



Research  
Integrity



Industry  
Engagement



Patient  
Engagement



[www.ottawaheart.ca/researchers](http://www.ottawaheart.ca/researchers)

