THE INSTITUTE

DISCOVERY THAT MATTERS

OUR 2030 VISION

ANNUAL UPDATE — 2025

Centre universitaire de santé McGill
Institut de recherche

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Research Institute

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INTRODUCTION

As 2025 draws to a close, The Institute would like to reflect on the incredible progress it has made towards realizing the **2030 Vision**.

In 2024, The Institute launched its ambitious 6-year strategic plan: to position itself as a globally recognized leader in transformative discoveries and innovations that advance precision health throughout the life course.

Accordingly, 2025 marked the first full calendar year of implementing targeted deliverables to achieve the priorities and objectives set forth therein. This annual update highlights key achievements that have been spearheaded across The Institute's administrative and research divisions to advance the 2030 Vision.

OUR RESEARCH PRIORITIES

1. EXPAND MECHANISTIC AND MULTIOMIC RESEARCH TO UNDERSTAND HEALTH AND DISEASE
2. DEVELOP PRECISE AND EFFECTIVE PREVENTIVE, DIAGNOSTIC, AND THERAPEUTIC STRATEGIES
3. INTEGRATE DATA SCIENCE AND DIGITAL TECHNOLOGIES ACROSS RESEARCH
4. ADVANCE CLINICAL TRIALS THROUGH NOVEL METHODS TO INFORM AND IMPROVE PATIENT CARE AT ALL AGES
5. INCORPORATE DETERMINANTS OF HEALTH AND DISEASE TO REDUCE DISPARITIES

KEY ACHIEVEMENTS ACROSS ALL RESEARCH PRIORITIES

Formalized a Research Strategy Office

The Institute's new Research Strategy Office sits within the Division of Research Services and reports to the Executive Director and Chief Scientific Officer (ED/CSO). Its mandate is to support the Institute-wide endeavours that underpin the 2030 Vision and its corresponding implementation plans.

Selected Research Priority Leaders

One Research Priority Leader was selected for each of the five research priorities through a competitive application process. Reporting to the ED/CSO, each leader is responsible for spearheading the development of cross-programmatic and transformative research initiatives that both advance precision health across the life course and align with the leader's specific research priority.

Established Research Priority Advisory Committees

Each Research Priority Leader established a formal advisory committee that includes cross-programmatic representation of fundamental and clinical scientists, administrative staff, and trainees. Together, these committees provide their recommendations with respect to the operational needs of the research community to overcome priority-specific challenges, and propose transformative research initiatives, to advance their respective priority.

RESEARCH PRIORITY I

EXPAND MECHANISTIC AND MULTIOMIC RESEARCH TO UNDERSTAND HEALTH AND DISEASE

2030 VISION OBJECTIVES

- Increase researchers' abilities to functionally access and leverage **multiomic data** and analytical tools
- Develop **alternative preclinical models** of disease to drive discovery and test therapeutics
- Broaden research **collaborations and partnerships** for modelling human disease

KEY ACHIEVEMENTS

Acquired and installed the state-of-the-art ASTRAL proteomics instrument

IMPACT: The revolutionary ASTRAL instrument can characterize the entire cellular proteome at an unprecedented speed and resolution. Through generous support from the MUHC Foundation, this advanced instrument became fully functional within The Institute's Proteomics and Molecular Analysis Platform this Fall. The first-of-its-kind in Montreal, more than 20 projects have already benefited from this technology, representing an important step towards enhancing the research capabilities to enable transformative multiomics research.

Established a synergistic research partnership with Allumiqs to expand multiomic capacity

IMPACT: A new institutional partnership with Allumiqs integrates The Institute's expertise in proteomics with Allumiqs' strengths in metabolomics and lipidomics, providing researchers access to the full spectrum of multiomic analyses. This collaboration enhances data integration, attracts large-scale external projects, and positions The Institute as a key hub for advanced multiomic research.

Submitted a large funding application to advance multiomic research at The Institute

IMPACT: Julia Burnier, PhD (Research Priority Leader 1) assembled a multidisciplinary team of researchers and submitted an application to a CIHR Team Grant competition entitled, "Improving early detection, risk reduction, and personalized prevention strategies in HPV-driven cancers through liquid biopsy."

RESEARCH PRIORITY 2

DEVELOP PRECISE AND EFFECTIVE PREVENTIVE, DIAGNOSTIC, AND THERAPEUTIC STRATEGIES

2030 VISION OBJECTIVES

- Develop and apply advanced **biomarker approaches** to predict disease progression and validate therapeutic efficacy
- Enhance capabilities in **cell, RNA, and regenerative therapy**
- Increase the use of, and pioneer new, **biomedical technologies**

KEY ACHIEVEMENTS

Launched a novel Theranostics Research Program

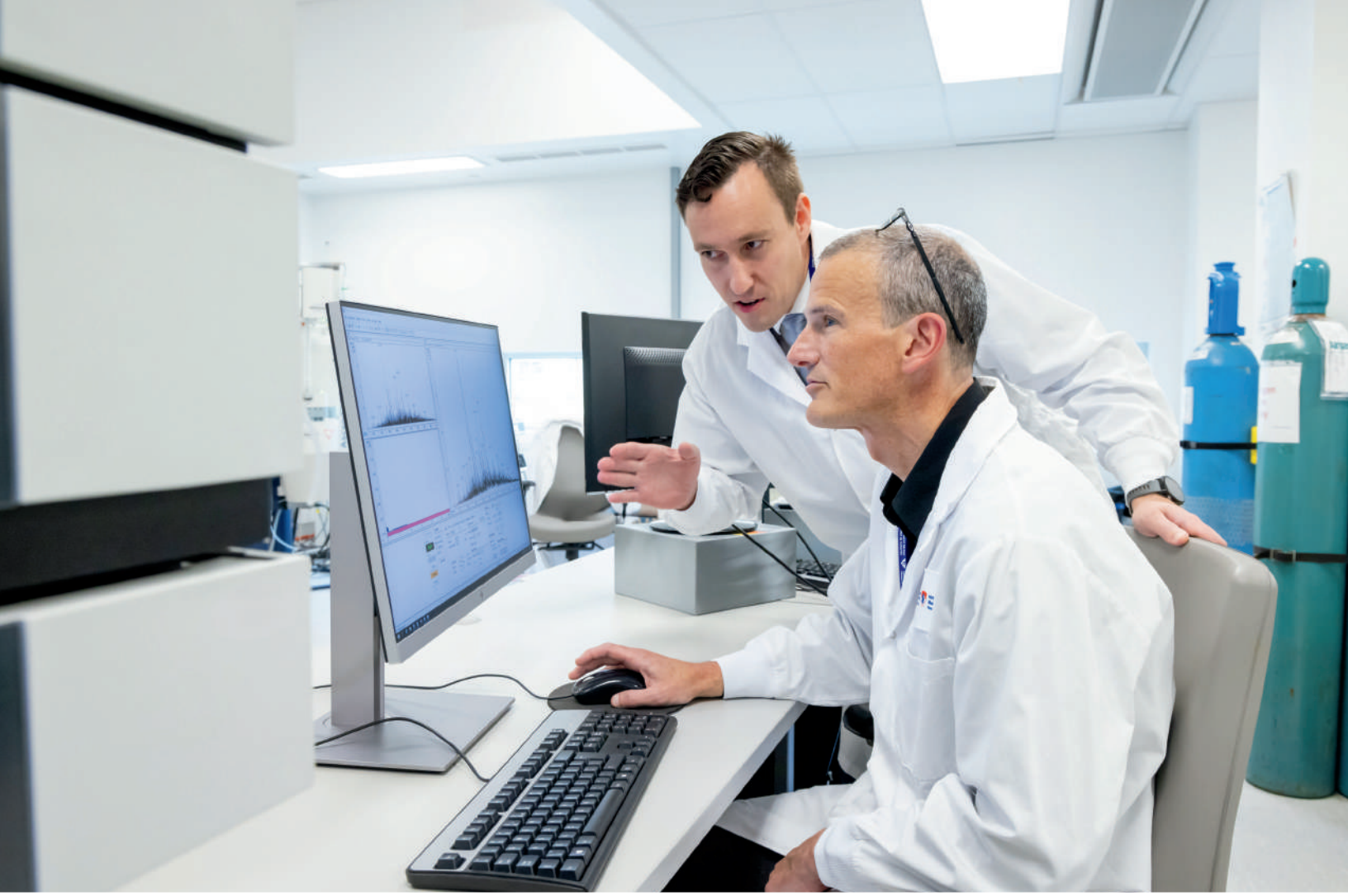
IMPACT: The Institute's Centre for Translational Biology (CTB) collaborated with the University of Alberta to initiate a novel Theranostics Research Program that integrates molecular imaging and targeted therapy development. More specifically, the CTB has established an R&D pipeline whereby The Institute's researchers can send an antibody or therapeutic to the University of Alberta for radiolabeling: these substances can be labeled with radioisotopes that are either designed to ablate the target tissue (e.g., tumor), or to enable high resolution imaging of the target tissue. The radiolabeled therapeutics are then returned to the researchers to be tested in vivo. This newly established pipeline supports innovation in radio-ligand therapy, representing a true precision medicine approach with the potential to drive translational research across The Institute.

Installed the Cobas Roche System to support advanced chemistry and immunoassay testing

IMPACT: The Cobas Roche System, which was loaned to Dr. Abhinav Sharma (Research Priority Leader 2) and Dr. Nadia Giannetti as part of the Courtois Signature Project, is now strategically housed within The Institute's Proteomics and Molecular Analysis Platform; as such, it is now available for investigator-driven clinical projects across The Institute that require advanced chemistry and immunoassay testing. The acquisition of the Cobas Roche System expands the platform's analytical range and complements existing equipment to enable integrative, multiomic research that will drive the development of new preventive, diagnostic, and therapeutic strategies.

Bridging clinical needs with technological innovation

IMPACT: To strengthen collaboration across disciplines, Dr. Abhinav Sharma (Research Priority Leader 2) represented The Institute at McGill's Biomedical Engineering Retreat, with the goal of fostering partnerships to develop diagnostic and therapeutic technologies that address unmet clinical needs. The Institute's Business Development Office joined McGill's Office of Innovation and Partnerships, Tech Transfer Office, and the Dobson Centre at an inaugural meeting to align commercialization support and accelerate bioengineering innovation, establishing next steps to better connect scientific discovery with economic impact.



RESEARCH PRIORITY 3
INTEGRATE DATA SCIENCE AND DIGITAL TECHNOLOGIES ACROSS RESEARCH

2030 VISION OBJECTIVES

- Harness **artificial intelligence (AI) and data science** tools and techniques for research and discovery
- Apply **digital tools and therapies** to enhance patient health and wellness
- Advance **centres of excellence in digital health** research

KEY ACHIEVEMENTS

Enhanced capacity to collaborate globally

IMPACT: The Institute has signed a Memorandum of Understanding with the University of Bordeaux (France) to strengthen collaborations in digital public health and oncology data integration. This collaboration includes the project, "Enabling Oncology Clinical Trials through Multi-Modal Data Integration," led by Dr. David Buckeridge (Research Priority Leader 3) in partnership with Bordeaux teams. This initiative seeks to translate the data housed within the MUHC Data Warehouse to the Observational Medical Outcomes Partnership Common Data Model (OMOP CDM) to advance the use of standardized data for cancer research.

Hosted the 'Digital Health Symposium - From Research Infrastructure to Clinical Care'

IMPACT: In November, The Institute's Centre for Outcomes Research and Evaluation (CORE), in collaboration with the Réseau santé numérique (RSN), D2R-HeDS, SD4H, and C3G, hosted a two day symposium focused on exploring how data science, technology, and healthcare innovation intersect.

RESEARCH PRIORITY 4

ADVANCE CLINICAL TRIALS THROUGH NOVEL METHODS TO INFORM AND IMPROVE PATIENT CARE AT ALL AGES

2030 VISION OBJECTIVES

- Increase the number of RI-MUHC **investigator-led and Phase I** clinical trials
- Broaden awareness of, and access to, the **Centre for Innovative Medicine (CIM)**
- Facilitate innovation in **trial design methodologies**

KEY ACHIEVEMENTS

Established an Institutional Methods Hub

IMPACT: The Institute's new Methods Hub has been established to facilitate innovation in trial design methodologies. Philippe Boileau, PhD was appointed as the Hub's Director, and a supporting committee has been assembled that comprises expertise in biostatistics and trial design methodologies. The Hub has developed a standardized intake form, drawing on models from the Ottawa Methods Centre, CTN+ Network, and CORE's Biostatistics Consulting Unit (BCU) to streamline requests for methodological support. Importantly, the Hub has launched its first pilot initiative to support five clinical trials through the Accelerating Clinical Trials Consortium Clinical Trial Unit (ACT-CTU). Selected teams will be paired with a McGill-affiliated methodologist who will offer guidance on trial design approaches in preparation for the next round of CIHR grant submissions.

Launch of the Institutional Clinical Observership Program

IMPACT: An important precursor step to increasing the number of Phase 1 clinical trials taking place across The Institute is to enhance collaborations between fundamental and clinical scientists. To this end, the Clinical Observership Program was piloted at The Institute this year with a cohort of 4 trainees. This program, adapted from the University of Glasgow's model, aims to help non-clinical scientists at the postdoctoral level gain a deeper understanding of the diseases, or clinical issues, that they are researching.

Submitted a large funding application to promote more diverse participants in trials

IMPACT: A joint research collaboration was spearheaded by Dr. Sushmita Pamidi (Research Priority Leader 4), spanning Research Priority 2, 3, 4, and 5 entitled, "Representative, Equitable and Accessible Clinical Trials (REACT)". This project was submitted to the Fall NFRF Transformation competition.

RESEARCH PRIORITY 5
INCORPORATE DETERMINANTS OF HEALTH AND DISEASE TO REDUCE DISPARITIES

2030 VISION OBJECTIVES

- Increase **diversity** in research participants by broadening **stakeholder engagement** and **knowledge mobilization**
- Build research relationships with **Indigenous communities**
- Create a **Health Equity Research Hub** representative of Canadian communities
- Implement institution-wide **education and support** related to inclusive health research

KEY ACHIEVEMENTS

Conducted an Institutional Environmental Scan

IMPACT: Developed by Annette Majnemer, PhD (Research Priority Leader 5) and the Research Priority 5 Advisory Committee, a survey was disseminated to researchers across The Institute to better understand how they consider social determinants of health within their research approaches. Insights gleaned from this community engagement exercise will guide the development of targeted resources for investigators.

Hosted first Institutional summer school for trainees on inclusive research with a focus on Indigenous approaches

IMPACT: As part of the Comprehensive Mentorship for Inclusive Science (MISI) project, The Institute's Equity, Diversity and Inclusion (EDI) team and the Desjardins Centre for Advanced Training (DCAT) organized a 3-day summer school program for trainees. The goal of this program was to teach trainees about important topics that support women and Indigenous peoples' participation in health research, including but not limited to, inclusive leadership and decolonizing research. This event was attended by 20 trainees and 140 members across The Institute.

OUR ENABLING PRIORITIES

A PROVIDE AN ENVIRONMENT OF EXCELLENT SERVICE TO SUPPORT WORLD-CLASS RESEARCH

B STRENGTHEN OUR RESEARCH CAPABILITIES, TOOLS, AND PLATFORMS

C DEVELOP OUR TALENT AND REINFORCE INTERDISCIPLINARY RESEARCH NETWORKS

D INTENSIFY AND ENRICH OUR DIVERSE PARTNERSHIPS

ENABLING PRIORITY A
PROVIDE AN ENVIRONMENT OF EXCELLENT SERVICE TO SUPPORT WORLD-CLASS RESEARCH

2030 VISION OBJECTIVES

- Ensure accessible, clear, and continuous **communication**
- Establish a comprehensive **onboarding process** for new researchers and staff
- Implement robust **administrative, infrastructure, and IT support**
- Establish an eco-friendly environment that supports **sustainability**

KEY ACHIEVEMENTS

Showcased the work of The Institute's researchers and trainees

IMPACT: The Institute's Communications team continues to highlight scientific excellence across The Institute, sharing discoveries and innovations with audiences both within and beyond the research community. Through press releases, website features, newsletters, and social media outreach, the team ensures that the achievements of researchers and trainees are visible, accessible, and celebrated — strengthening engagement across The Institute and enhancing its national and international profile.

Generated a new researcher onboarding handbook

IMPACT: The Institute's People and Culture team successfully launched a standardized handbook for new researchers. This new handbook represents a holistic onboarding approach for principal investigators, with expanded onboarding materials including study design resources, workflows, submission processes, compliance and training requirements, and information about review cycles. For the first time, new researchers now have a formal and structured orientation that provides a comprehensive reference for navigating research at The Institute.

Developed an Institutional sustainability initiative

IMPACT: The Institute's newly-branded sustainability initiative, INPACT, is now prominently embedded across all operations and research activities. The sustainability team partnered with researchers in the International Laboratory Freezer Challenge where 66 Institute labs took part: one lab won the individual category two years in a row, and program-wide energy savings efforts were dramatically increased. Through INPACT, staff and researchers become eco-champions — defrosting freezers, optimizing cold-storage efficiency, monitoring energy consumption, and reducing carbon emissions — and contributed to a greener and more sustainable research environment.

ENABLING PRIORITY B
STRENGTHEN OUR RESEARCH CAPABILITIES, TOOLS, AND PLATFORMS

2030 VISION OBJECTIVES

- Improve access to, and usability of, **MUHC data** to support research
- Advance the capabilities and accessibility of our **research support and technology platforms**
- Conduct a **researcher-guided evaluation of needs and use cases** to inform additional investments

KEY ACHIEVEMENTS

Expanded imaging capabilities for preclinical studies

IMPACT: The Institute's Small Animal Imaging Laboratory (SAIL) acquired and deployed four new imaging modalities that are now available for use by, and considerably expands the research capabilities available to, its investigators and trainees. These include:

- **DXA (Dual-energy X-ray Absorptiometry):** for bone and body composition analysis
- **Bioluminescence Imaging:** for sensitive detection of molecular and cellular events
- **High-Resolution Ultrasound:** for non-invasive cardiovascular imaging; needle guided injection; shear wave elastography and tumor imaging
- **SWIR (Short-Wave Infrared) Near-Infrared Scanner:** for deep-tissue, real-time imaging

Improved access to clinical and administrative data from the MUHC

IMPACT: Together with the MUHC, The Institute has made significant advances in updating the infrastructure of the Data Warehouse, streamlining processes related to data access, implementing synthetic data access (through the MDClone initiative), and establishing software pipelines to move data from the Data Warehouse to research databases. Achievement of these milestones has improved access to, and the usability of, clinical data to support research across The Institute.

ENABLING PRIORITY C
DEVELOP OUR TALENT AND REINFORCE INTERDISCIPLINARY RESEARCH NETWORKS

2030 VISION OBJECTIVES

- Strengthen our **team science** support and interdisciplinary research Networks
- **Recruit** researchers and highly qualified personnel strategically
- Enhance **training opportunities** across targeted skillsets
- Implement high-quality **mentorship programs** for all personnel

KEY ACHIEVEMENTS

Formalized three Institutional Networks

IMPACT: The Network Competition, launched in 2023, represents an inter-programmatic and interdisciplinary initiative to support novel research that advances precision health throughout the life course. This year marked Phase 2 of this competition, where three Networks were awarded $100k/yr of seed funding for two years to generate preliminary results that will increase their chances of successfully procuring future external funding. These three Networks are the: 1. Circulating Biomarkers in Health and Disease Network (led by Julia Burnier, PhD [Research Priority Leader 1]); 2. Hypertension and Vascular Diseases Network (led by Dr. Stella Daskalopoulou); and 3. CARELeuko: Canadian Association for Research Excellence in Leukodystrophy (led by Dr. Geneviève Bernard).

Launched a new business-of-science training opportunity for The Institute's trainees

IMPACT: DCAT launched a new call for applications to support three trainees with a bursary of $5000/each to participate to the 2026 PERCER program (Parcours d'Excellence pour le Renforcement des Compétences en Entrepreneuriat et Réussite). This program supports trainees interested in developing entrepreneurial, strategic, and management skills to advance research and commercialize innovation in the life sciences.

"Future in Focus: Precision Medicine Career Insight and Discovery Program" welcomed its first cohort of 24 trainees

IMPACT: This competitively selected, 8-week program is a joint initiative between The Institute, DCAT, and the McGill-affiliated TREMPLIN Consortium, which has been made possible through the generous support of FRQ. Trainees engaged in a range of activities — including case studies, group work, and professional panels — all focused on the theme of career options in precision health. Participants also explored a variety of roles within Quebec's life sciences ecosystem, supported by DCAT's alumni network, who shared inspiring and relatable career journeys that helped the trainees reflect on and navigate their own career paths.

Increased transparency across the Animal Resources Division (ARD) to enhance patient and community understanding of animal research projects

IMPACT: The Institute's ARD has committed to, and actively progressed towards, increasing the public awareness of the important roles that animals serve in advancing science. They have demonstrated their commitment to transparency, responsiveness, and meaningful action this year through The Institute's signing of the national transparency agreement, and through public awareness initiatives such as their 2nd annual open house event.

ENABLING PRIORITY D
INTENSIFY AND ENRICH OUR DIVERSE PARTNERSHIPS

2030 VISION OBJECTIVES

- Engage **patient and community advisory groups** from the diverse locales served by the RI-MUHC and MUHC
- Enhance collaborative opportunities across the **Montreal and Quebec** health-science and research ecosystems
- Strive to integrate **national and international collaborators** in large-scale, multi-site research initiatives

KEY ACHIEVEMENTS

Established an international collaboration with University of Bologna (Italy)

IMPACT: The Institute has signed a five-year Memorandum of Understanding with the Istituto Romagnolo per lo Studio dei Tumori "Dino Amadori" (IRST), affiliated with the University of Bologna. Current collaborative work includes joint planning for the Horizon Europe call, "Innovative surgery as the cornerstone of affordable multi-modal therapeutic interventions benefitting cancer patients with locally advanced or metastatic disease," with Dr. Maria Bencivenga (University of Verona) as PI and Dr. Lorenzo Ferri as The Institute's lead PI.

Strategic engagement with Horizon Europe

IMPACT: The Institute is actively expanding its international research footprint through participation in Horizon Europe — the European Union's flagship funding program for research and innovation. The Institute is currently leading and partnering in multiple high-value applications, with funding requests ranging from €6M to €17M. As part of this effort, The Institute's researchers are collaborating with leading institutions across Europe. A notable example includes the application led by Mayada Elsabbagh, PhD, "Optimizing the WHO Caregiver Skills Training Program - Mechanisms, and Meaningful Outcomes for Autism & intellectual disability," which brings together 16 partner institutions across 10 countries. These initiatives reflect The Institute's strategic commitment to global collaboration, knowledge exchange, and securing diversified funding to support cutting-edge research and innovation.

Initiated a strategic collaboration with the Max Planck Institute for Biological Cybernetics (Germany)

IMPACT: The Institute has signed a five-year Memorandum of Understanding with the Max Planck Institute for Biological Cybernetics in Tübingen, Germany, to advance research on gut–brain interactions and related conditions such as inflammatory bowel disease, obesity, and food cravings. This collaboration leverages The Institute's imaging core facilities and infrastructure, and Max Planck's expertise in intra-organ imaging, surgical procedures in mice, and neuroscience research. The agreement includes support for visiting doctoral and postdoctoral fellows from Germany, with Max Planck covering all associated costs and committing up to €80,000 annually for The Institute's services.

Imagine thousands of the world's greatest scientific minds, all working together—right here—to serve our communities. Dynamic researchers, catalysts of change, the bold and the curious in relentless pursuit of groundbreaking discovery.

Discovery that matters. For us all.

THE INSTITUTE

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