# The Krembil

*July 2024*

The Krembil is the official newsletter of the Krembil Research Institute, highlighting recent news and awards, innovative research and exciting events happening at Krembil.

We are working towards a communications refresh and the quarterly Krembil Newsletter will be paused. To read past issues of the Krembil Newsletter, visit www.discoverkrembil.ca.

*Dr. Jaideep Bains,*
*Director, Krembil Research Institute*
*University Health Network*

Stories in this month's issue:


- Krembil Research Day 2024
- Neuronto Research Symposium
- New to Team UHN
- Breakthrough in Parkinson's Disease

- Uncovering Regulators of Arthritis
- New Models for Eye Disease
- Building a Brain Atlas

# News

## Krembil Research Day 2024

***Exceptional trainee and staff researchers impress at Krembil Research Day.***


*This year's Research Day hosted 230 trainees, faculty and staff, and featured 9 oral and 74 poster presentations.*

Krembil's annual Research Day is a unique opportunity to exchange ideas, foster collaboration and celebrate research achievements.

This year's event, held at the MaRS Centre on Thursday, April 11, 2024, welcomed 230 trainee researchers, faculty and staff who showcased the breadth of talent within our Institute and our collective dedication to advancing scientific knowledge.

The event opened with a welcome video that shined a spotlight on what it is like to be a Krembil trainee, as well as opening remarks from Dr. Jaideep Bains, Director of the Krembil Research Institute. Dr. Bains commended trainees at all levels for their diverse talents, dedication to research and outstanding contributions to the Institute.

Throughout the event, nine trainees delivered oral presentations that highlighted achievements across the Institute's three research pillars: brain and spine, vision, and bone and joints. The event also featured more than 70 poster presentations from trainees and research staff that facilitated scientific dialogue and idea sharing. This year's Research Day also featured a special "Lunch and Learn" event.

Internationally renowned communications expert Bri McWhorter, Founder and CEO of Activate to Captivate, shared valuable insights on science communication in a talk titled, "The Art of Delivering an Unforgettable Presentation."

Trainees benefited from McWhorter's expertise in storytelling, learning strategies for creating connections with audiences, navigating key moments in talks and crafting engaging narratives.

The event concluded with a keynote address from Dr. Anne-Marie Malfait, Professor of Internal Medicine and The George W. Stuppy, MD, Chair of Arthritis at Rush University, titled "Chronic Joint Pain: Five Short Lessons from Osteoarthritis."

Click here to watch a short slideshow recapping this year's Research Day.

"Thank you to everyone who joined us for our annual Research Day. Your participation made the event an inspiring celebration of the breadth of ideas and expertise at our Institute and the collaborative spirit that fuels our success," said Dr. Bains. "I look forward to carrying this momentum forward as we plan for next year's Research Day and more opportunities for our research community to come together."

*The Krembil community thanks the many individuals who made this year's Research Day possible, including the Krembil Trainee Affairs Committee—chaired by Dr. Mary Pat McAndrews—the Krembil Communications and Administration teams, the oral presentation session Chairs—Drs. Joan Wither and Bill Hutchison—and everyone who served as judges for the oral and poster presentations.*

**Presentation Awards**

The following trainees and postdoctoral researchers received awards for best oral and poster presentations:

Poster Presentations - Graduate Student Category:
- 1st place: Zi Xuan Zhang
- 2nd place (tied): Ain Kim
- 2nd place (tied): Anca Maglaviceanu

Poster Presentations - Postdoctoral Researcher Category:
- 1st place: Laura Whitall-Garcia
- 2nd place: Icaro Oliveira
- 3rd place: Cody Wilson-Konderka

Oral Presentations - Graduate Student Category:
- 1st place: Kabriya Thavaratnam
- 2nd place (tied): Brian Nghiem
- 2nd place (tied): Pedram Mouseli

Oral Presentations - Postdoctoral Researcher Category:
- 1st place: Emily Mills

A notable addition to this year's awards was the *People's Choice Award for Oral Presentations*, received by doctoral student **Kabriya Thavaratnam** for her exceptional research and presentation skills. Judges also awarded master's student **Nikou Kelardashti** for her sex and gender-informed abstract, reflecting Krembil's commitment to promoting diversity and inclusion in research.

Congratulations to the winners and to everyone who presented their work. We look forward to seeing you at next year's Research Day!

# Neuronto Research Symposium

***Joint research event marks a milestone in uniting leading neuroscientists at UHN and SickKids.***


*The inaugural Neuronto Research Symposium hosted more than 150 faculty, staff, and trainees from UHN's Krembil Brain Institute and Donald K. Johnson Eye Institute, and the Neurosciences & Mental Health program at The Hospital for Sick Children (SickKids) Research Institute. The event featured 12 talks, 31 poster presentations, and ample opportunities for networking.*

If you want to go fast, go alone; if you want to go far, go together.

This basic truth applies to so many aspects of life, and advancing science and medicine is no exception.

To foster collaborations to drive scientific advancements, researchers from UHN's Krembil Brain Institute, Donald K. Johnson Eye Institute, and The Hospital for Sick Children's (SickKids) Neurosciences & Mental Health (NMH) program came together to participate in the inaugural Neuronto Research Symposium.

The unique event, held at the MaRS Centre on June 4, 2024, welcomed more than 150 research trainees, faculty, and staff who showcased the depth and breadth of neuroscience research being conducted at UHN and SickKids.

The symposium kicked off with opening remarks from Neuronto Co-Organizers Drs. Jaideep Bains, Co-Director and Senior Scientist at Krembil Brain Institute, and Donald Mabbott, NMH Program Head and Senior Scientist at SickKids.

“Toronto is a global hub for basic, translational, and clinical neuroscience, and there are so many opportunities for synergy between our institutions,” remarked Dr. Bains.

Throughout the event, 12 researchers gave engaging talks focused on four research themes: molecular therapeutics; brain cells, circuits, and networks; cell profiling and personalized medicine; and brain imaging and neurocomputation. Talks covered a variety of topics, including:

- The use of neuromodulation for autism, ADHD, and other neuropsychiatric condition
- Innovative approaches to diagnosing and treating glioblastoma
- Strategies to enhance neuroregeneration following spinal cord injury
- The role of glial cells and white matter plasticity in information storage, and
- The transformative potential of organoids and assembloids in neuroscience research

The event also featured 31 poster presentations from trainees and research staff that fostered in-depth intellectual discussions and idea sharing.

“The symposium was a perfect platform for researchers at all career stages to come together, share insights, and lay the groundwork for lasting scientific partnerships,” says Dr. Mabbott.

The highlight of the event was the announcement of a new scholarship program designed to provide salary support for trainees engaged in cross-institution research, called the Krembil/SickKids NMH Collaborative Studentship Award. Funded by the Krembil Foundation, this award will be available to two PhD students—one working primarily at UHN and one at SickKids—who are co-supervised by principal investigators at both institutions.

“This new scholarship is a great opportunity for us to pool our expertise and better leverage our collective resources,” says Dr. Bains. “Many of our researchers are already engaged in collaborative projects; this scholarship will provide a structured framework to nurture these existing relationships and spur new ones.”

The symposium concluded with a lively wine and cheese networking event at the Peter Gilgan Centre for Research and Learning, where attendees continued scientific discussions and explored ideas for future collaborations.

UHN and SickKids look forward to growing the Neuronto program and inviting more institutions to join us in our mission to transform neuroscience research, education, and patient care.

*The Krembil community thanks the many individuals who made this event possible, including the Krembil Research Administration and Communications teams, and SickKids Research Institute staff members Julie Ruston, Theresa Dudley, Delina Romano, and Francesca Pak. We also extend our sincere gratitude to the oral presentation session moderators—Drs. Homeira Moradi, Flavia Gouveia, Alan Diaz, and Emily Mills—and to the Krembil Foundation for their generous funding of the new graduate student scholarship.*

# *New to Team UHN*

***Alley Wilson joins the Krembil Research Institute as a Communication Specialist.***

*Alley Wilson, Communication Specialist, Krembil Research Institute.*

The Krembil Research Institute Communications team is pleased to welcome our new Communications Specialist, Alley Wilson!

Alley brings over a decade of experience in storytelling and multimedia production, with a strong background in TV, radio, and new media broadcasting. During her eight-year tenure at Global News, Alley spearheaded various high-impact projects, including the award-winning YouTube web series 'Living In Colour'. She also played a pivotal role in creating and launching the 'Perspectives' landing page on Globalnews.ca, showcasing her ability to innovate and engage audiences across multiple platforms.

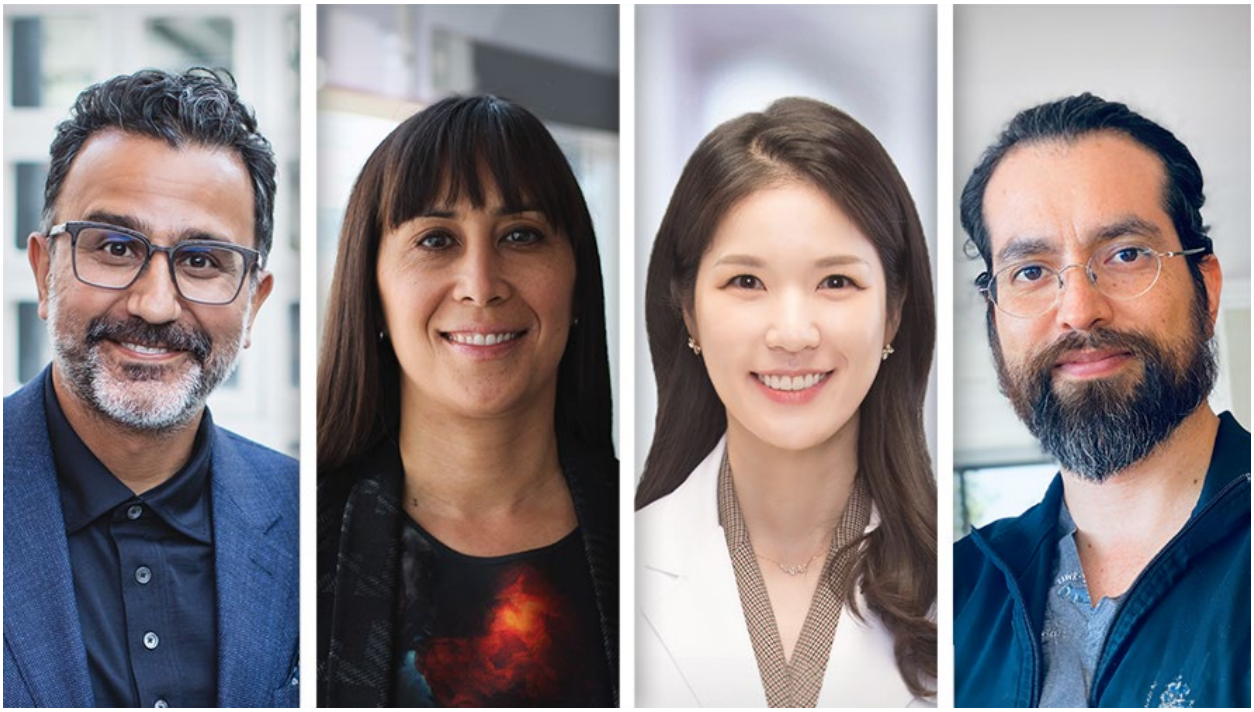
Alley will be bringing her creative skills in videography, photography, writing, and storytelling to help us find new and innovative ways of showcasing our high-impact research and clinical advances as we continue to grow the Krembil Brain Institute, Schroeder Arthritis Institute, and Donald K. Johnson Eye Institute brands and engage new audiences.

Let’s all give Alley a warm UHN welcome!

Research

# Breakthrough in Parkinson's Disease

***Deep brain stimulation may treat Parkinson's by reducing the buildup of alpha-synuclein.***



*(L-R) Dr. Suneil Kalia, Dr. Lorraine Kalia, Dr. Eun Jung Lee and Dr. David Aguirre-Padilla*

Research from UHN's Krembil Brain Institute has revealed potential disease-modifying effects of deep brain stimulation in Parkinson's disease (PD), shedding new light on an old treatment.

PD is a neurodegenerative disease that affects millions of people worldwide. The disease is characterized by motor symptoms, such as tremors, stiffness, slowed movement, and impaired balance. These hallmark symptoms are caused by a progressive loss of neurons in an area of the brain that controls movement, called the basal ganglia.

For some people with PD, severe motor symptoms can be treated with a surgical procedure known as deep brain stimulation (DBS). This therapy involves implanting electrodes into specific brain areas where they deliver electrical impulses that correct abnormal neuron activity.

Despite the known benefits of DBS for relieving PD symptoms, there are still many unknowns surrounding how the therapy works and whether it can alter the course of the disease.

In a recent study published in Brain Stimulation(link is external), Krembil Brain Institute researchers Drs. Suneil and Lorraine Kalia provided evidence that DBS may serve as more than just a symptomatic treatment—it might actually alter underlying disease processes.

“A driving factor in most neurodegenerative diseases is the accumulation of misfolded proteins within or outside of brain cells,” explains Dr. Suneil Kalia, a Krembil Senior Scientist and co-lead of the study. “In PD, we see a buildup of a misfolded form of the protein alpha-synuclein (α-Syn), which disrupts neuron communication and eventually causes neuron death.”

According to Dr. Suneil Kalia, the search is on for treatments that can disrupt α-Syn production and aggregation, thereby slowing or even preventing PD progression.

To determine whether DBS has such disease-modifying effects, the Kalia labs examined whether high-frequency electrical stimulation, akin to that delivered by DBS electrodes, alters α-Syn.

“When we stimulated cultured brain cells, we saw significantly less expression and buildup of aggregated α-Syn. Within the brain, when we stimulated a small region of the basal ganglia called the substantia nigra pars compacta, we saw a lower overall level of α-Syn and less downstream effects,” says Dr. Lorraine Kalia, a Krembil Senior Scientist, Neurologist and co-lead of the study.

These findings hint at the potential of DBS to protect neurons and slow down the disease.

Interestingly, the team saw this benefit only when they simulated the substantia nigra pars compacta and not a nearby region that clinicians more commonly target in DBS.

Dr. Suneil Kalia is also a Neurosurgeon at Krembil Brain Institute and, together with his two colleagues, performs the largest number of DBS surgeries in Canada. “We regularly apply DBS to one of three functionally connected regions of the basal ganglia, depending on the patient and their specific symptoms—most commonly the subthalamic nucleus. DBS in this region can dramatically improve a patient’s motor symptoms, so we were somewhat surprised to see that it had no effect on α-Syn levels,” explains Dr. Suneil Kalia.

“This finding tells us that the disease-modifying actions of DBS may depend to some extent on the brain region being targeted—this will be an important consideration when optimizing treatment plans for individual patients,” he adds.

Dr. Eun Jung Lee and Dr. David Aguirre-Padilla are co-first authors of the study and former Postdoctoral Researchers in the Kalia labs. “DBS has been used to treat PD since the late 1990s but it is only now that we are learning about its disease-modifying properties. Our findings underscore the potential of harnessing existing therapies for neurological diseases in new ways,” explains Dr. Aguirre-Padilla.

Although more research is needed to determine exactly how DBS alters α-Syn, this study offers hope for millions of patients and their caregivers.

“The better we understand how DBS works, the more we can refine the therapy to enhance its benefits for each patient. This approach could really change the landscape of PD treatment,” concludes Dr. Lee.

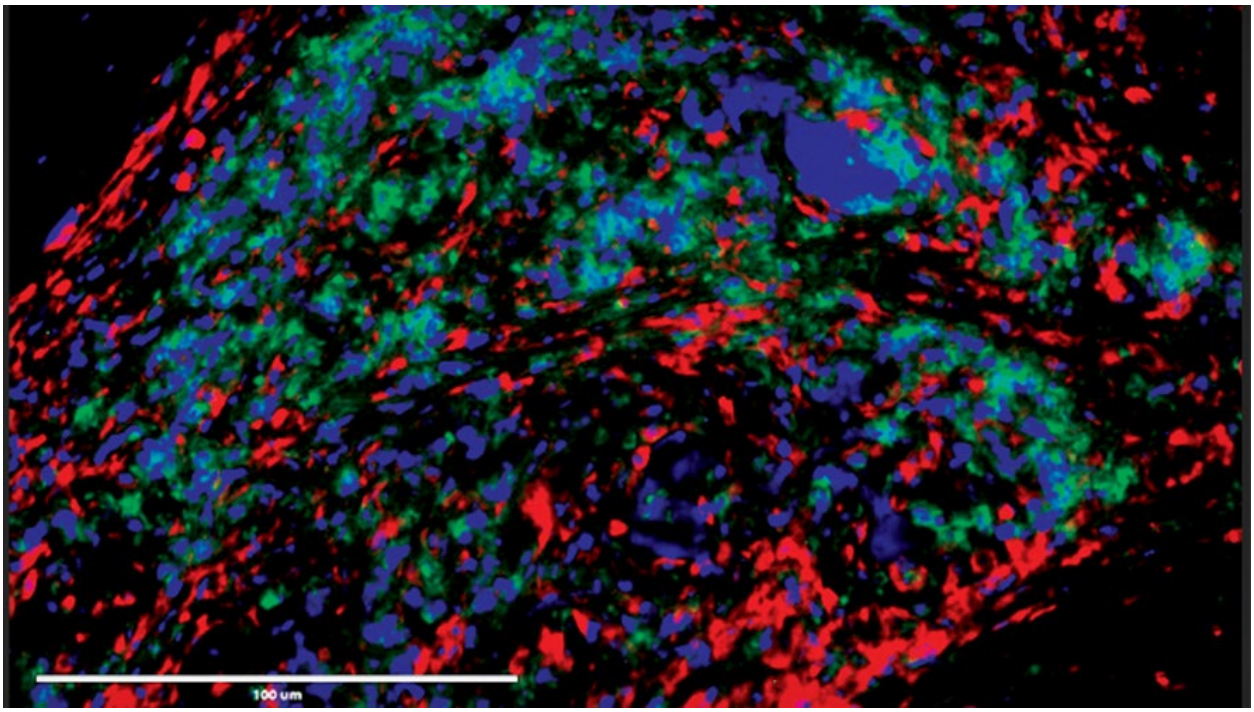
*This work was supported by Parkinson Canada, Krembil Research Institute and UHN Foundation. Dr. Suneil Kalia is an Associate Professor of Surgery and holds the R. R. Tasker Chair in Stereotactic and Functional Neurosurgery at UHN. Dr. Lorraine Kalia is an Associate Professor of Medicine and holds the Wolfond-Krembil Chair in Parkinson’s Disease Research at UHN.*

*Lee EJ, Aguirre-Padilla DH, Fomenko A, Pawar G, Kapadia M, George J, Lozano AM, Hamani C, Kalia LV, Kalia SK. Reduction of alpha-synuclein oligomers in preclinical models of Parkinson’s disease by electrical stimulation in vitro and deep brain stimulation in vivo.(link is external) Brain Stimul. 2024 Feb 10. Doi: 10.1016/j.brs.2024.02.005.*

*PD affects more than 100,000 Canadians. DBS is a valuable treatment option for a subset of patients whose motor symptoms cannot be controlled by medication alone.*

# *Uncovering Regulators of Arthritis*

***Study identifies key proteins driving inflammatory disease, potential therapeutic targets.***




*Microscope image of immune cells called neutrophils (green) and a marker of inflammation, IL-23 (red), in the joints of a preclinical model of spondyloarthritis. DNA staining is in blue.*

Researchers at Schroeder Arthritis Institute (Schroeder) have gained significant insights into the mechanisms underlying spondyloarthritis (SpA), an inflammatory disease that affects the spine and joints. The team identified hypoxia-inducible factor-1 alpha (HIF1A) as a key player in SpA, which promotes inflammation and other disease characteristics.

Two hallmarks of SpA are inflammation, where an overactive immune system causes pain and swelling, and new bone formation, which involves unwanted bone growth in inappropriate areas, leading to joint problems. The current therapies for SpA provide relief in only a proportion of patients and there is no cure. Moreover, there are several therapies that have failed. This raises the questions of what is really the cause of SpA and which major molecules are driving the disease process?

“Previous research from our lab identified a protein called macrophage migration inhibitory factor (MIF) as a driver of the disease that amplifies inflammation and new bone formation. However, the mechanisms behind this and the proteins that it interacts with remained largely unknown,” says Dr. Nigil Haroon, Senior Scientist at Schroeder and senior author of the study.

The research team aimed to bridge knowledge gaps in SpA disease development by identifying MIF-interacting molecules and examining the role of MIF-producing immune cells, called neutrophils, in disease progression.

“We identified HIF1A as a partner molecule physically interacting with MIF,” says Dr. Akihiro Nakamura, first author of the study and former clinical fellow in Dr. Haroon's lab. “We found that this interaction promotes inflammation and new bone formation in SpA.”

The team discovered that HIF1A increased the production and release of MIF and an inflammatory marker called IL-23 in neutrophils. Inhibiting HIF1A with a selective inhibitor reduced the expression of MIF and IL-23 and reduced the severity of arthritis and other SpA symptoms in pre-clinical models. They also found that increasing IL-23 levels induced SpA symptoms, while deletion of HIF1A and MIF suppressed IL-23-induced arthritis development, including new bone formation.

Overall, these results suggest a novel MIF/HIF1A regulatory network in SpA, functioning through immune response regulators such as IL-23.

This study offers significant insights into the mechanisms underlying spondyloarthritis and opens new avenues for treatment.

“These findings suggest that inhibiting HIF1A could be a novel therapeutic approach for treating SpA,” says Dr. Haroon, who is also head of the Division of Rheumatology at UHN and Sinai Health. “By understanding the roles of MIF and HIF1A, we can develop targeted therapies to alleviate symptoms and slow the progression of this chronic condition, improving the quality of life for patients with SpA.”

*This work was supported by the Canadian Institute of Health Research, Arthritis Society (Canada), Spondyloarthritis Research and Treatment Network (SPARTAN), Spondyloarthritis Research Consortium of Canada (SPARCC), University of Toronto (U of T), Krembil Research Institute, Natural Sciences and Engineering Research Council of Canada, Canada Foundation for Innovation, Government of Ontario, National Research Foundation (NRF) of Korea, the Korea Healthy Industry Development Institute, the Krembil Foundation and UHN Foundation.*

*Dr. Nigil Haroon is an Associate Professor at U of T’s Institute of Medical Sciences.*

*Drs. Akihiro Nakamura and Nigil Haroon have filed a US provisional patent on methods of treating spondyloarthtris and Dr. Nakamura has received speaker honorarium and/or consultant fees from AbbVie, JAMP, and Novartis. Dr. Haroon has received consulting fees from AbbVie, Amgen, Eli Lilly, Janssen, Merck, Novartis and UCB.*

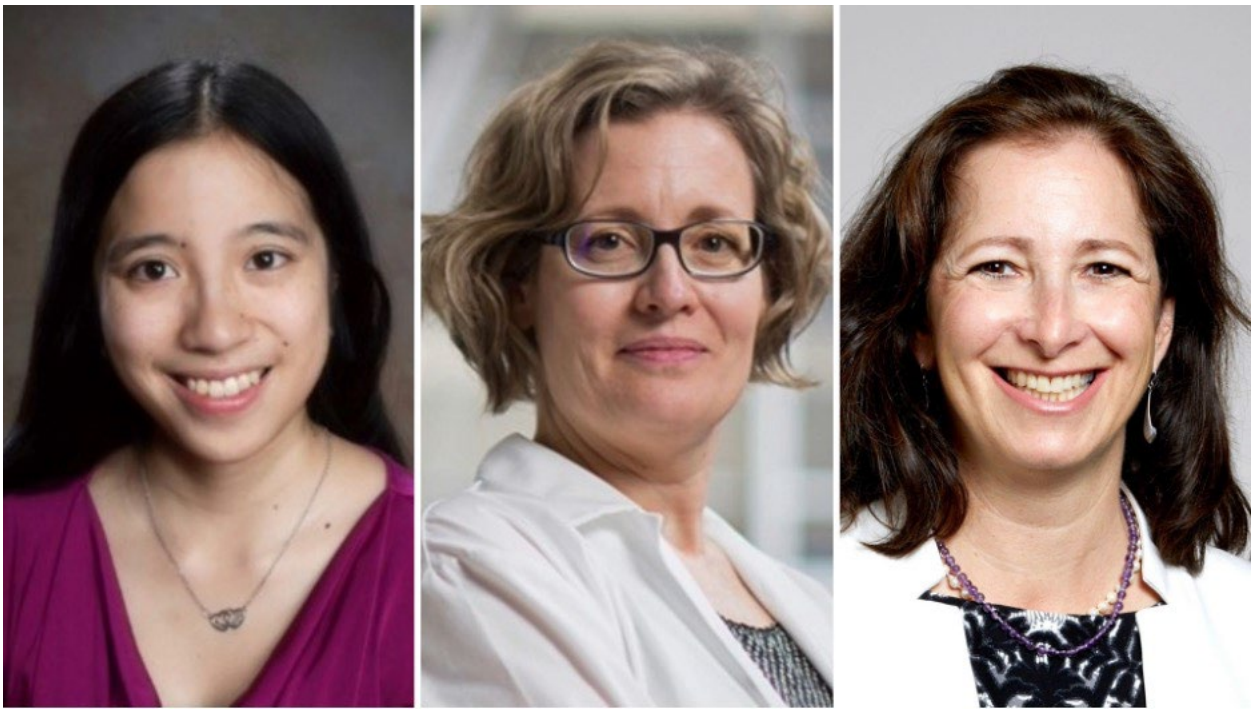
*Nakamura A, Jo S, Nakamura S, Aparnathi MK, Boroojeni SF, Korshko M, Park YS, Gupta H, Vijayan S, Rockel JS, Kapoor M, Jurisica I, Kim TH, Haroon N. HIF-1α and MIF enhance neutrophil-driven type 3 immunity and chondrogenesis in a murine*

*spondyloarthritis model*(link is external). *Cell Mol Immunol. 2024 Jun 5. doi: 10.1038/s41423-024-01183-5. Epub ahead of print. PMID: 38839914.*

*(L-R) Dr. Akihiro Nakamura, first author of the study and Dr. Nigil Haroon, senior author of the study. Both are members of the Spondyloarthritis Research and Treatment Network.*

# *New Models for Eye Disease*

***Material transfer between transplanted and host cells holds promise for vision repair.***



*(L-R) Dr. Margaret Ho, PhD candidate at the Institute of Biomedical Engineering, University of Toronto; Dr. Valerie Wallace, Senior Scientist at Krembil Research Institute; and Dr. Molly Shoichet, Professor at the University of Toronto and Pamela & Paul Austin Chair in Precision & Regenerative Medicine.*

A research team at UHN's Donald K. Johnson Eye Institute in collaboration with the Institute of Biomedical Engineering at the University of Toronto (U of T) has discovered that transplanted retinal cells can share essential materials with host cells in the lab, offering a promising avenue for delivering therapies directly to damaged areas of the eye.

The degeneration of photoreceptors, a leading cause of blindness affecting one in 2000 individuals globally, stems from the loss of light-sensing cells in the eyes. It is an irreversible condition due to the limited regenerative capacity of our central nervous system.

Cell therapy has been explored as a potential vision restoration treatment, involving the introduction of healthy donor cells into the retina to form new connections with surrounding neurons.

However, studies have shown that transplanted cells rarely form new connections. Instead, they transfer cellular materials, such as proteins, into the host retina in a process called material transfer.

“This bidirectional process has been observed mainly in experimental models,” explains Dr. Margaret Ho, a Vanier scholar, a PhD candidate at the Institute of Biomedical Engineering at U of T and first author of this study. “However, until now, it has remained unclear whether material transfer can occur between human cells.”

"We want to understand if human photoreceptors derived from stem cells can engage in material transfer, as this could be a promising pathway for targeted drug delivery to diseased cells," explains Dr. Valerie Wallace, Senior Scientist at Krembil Research Institute and a senior author of this study.

This collaborative project draws on the complementary expertise of Dr. Valerie Wallace and Dr. Molly Shoichet. Dr. Wallace specializes in material transfer, experimental models, and tissue analysis, while Dr. Shoichet focuses on in human stem cell growth and manipulation, and the creation of photoreceptors from retina tissue-like structures called retinal organoids.

"This work couldn't have been possible without the collaboration between our labs,” said Dr. Molly Shoichet, a professor at the University of Toronto and one of the corresponding authors of the research.

The researchers used two approaches to understand if human stem-cell-derived photoreceptors can transfer materials to host cells. First, they tested this by transplanting their human donor photoreceptors into experimental models with intact host photoreceptors, and then they tested species specific transfer by co- culturing donor and host cells from dissociated human retinal organoids in a lab dish.

In the first set of experiments, they tried transplanting human photoreceptors from different stages of development into experimental models with eye problems. No transfer was observed, even though both cell types survived in the eye the same amount of time.

In the second experiment in the lab, researchers observed that human donor cells could transfer their content to host cells, which has never been shown before. This phenomenon opens up an entirely new way of thinking about vision repair.

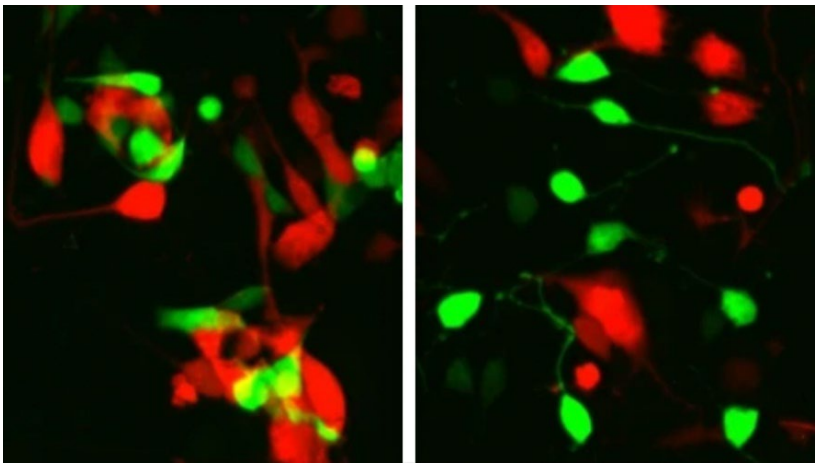
"This result suggests the importance of considering species when designing models to study material transfer in the future," emphasizes Dr. Ho.

"Photoreceptors derived from human stem cells could still hold promise for treating eye diseases in humans. We need to keep studying how to optimize cell transplants to advance treatments for eye disease and improve transplant outcomes," concludes Dr. Wallace.

These findings are a step forward in our understanding of transplant therapy for eye disease. This advancement prompts new questions about whether human eye cells possess the same capabilities, an area largely unexplored due to prior studies focusing on late-stage eye disease models devoid of host cells.

*This work was supported by Medicine by Design, The Stem Cell Network, the Natural Sciences and Engineering Research Council, the Canadian Institutes of Health Research, the Vision Science Research Program and UHN Foundation.*

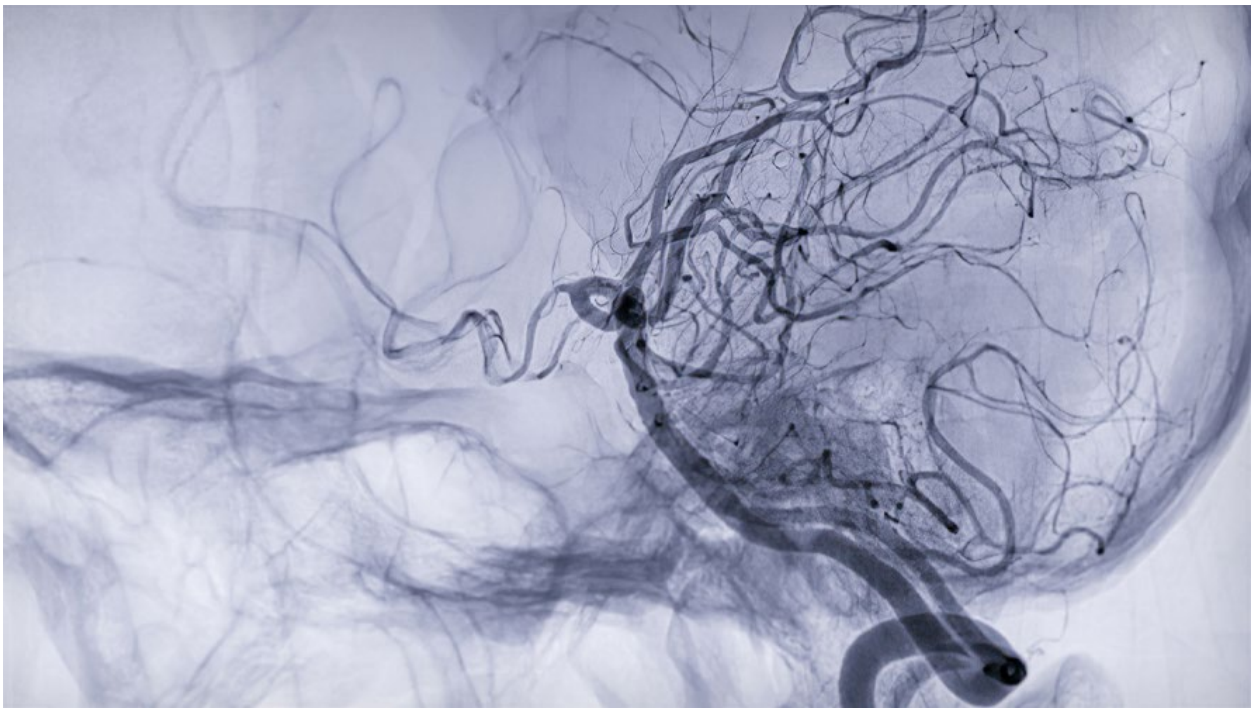
*Ho, M.T., Kawai, K., Abdo, D. et al. Transplanted human photoreceptors transfer cytoplasmic material but not to the recipient mouse retina*(link is external)*. Stem Cell Res Ther 15, 79 (2024). https://doi.org/10.1186/s13287-024-03679-3*



*Co-cultured red and green human photoreceptors (left) form tighter clusters compared to human and experimental models co-cultures (right).*

# *Building a Brain Atlas*

***The first molecular atlas of brain blood vessels from development to adulthood and disease.***



*Researchers studied the growth patterns of the brain's vasculature, the network of blood vessels in the brain, to better understand the progression of diseases such as brain tumours and brain vascular malformations—irregular blood vessel formation.*

An international team of researchers led by scientists at UHN's Krembil Brain Institute and the University of Zurich have created the first-ever single-cell atlas of the brain's blood vessels, spanning from early development to adulthood and through disease stages. This breakthrough provides unprecedented insights into the brain's network of blood vessels and how they grow, change, and function at a molecular level.

"The brain's vasculature, or network of blood vessels, cells, genes, and pathways, is crucial for the proper functioning of the developing and adult brain, as well as the progression of brain diseases such as brain tumours, stroke, and brain vascular malformations," says Dr. Thomas Wälchli, a Scientific Associate at the Krembil Brain Institute and first author of the study. "By understanding these pathways, we gain insight into the normal functioning of brain vasculature and open doors to future therapeutic options."

Researchers analyzed over 600,000 cells from 117 samples of isolated blood vessels from human developing brains, adult brains, brain tumours and brains with vascular malformation. Using advanced cell sequencing techniques, researchers constructed a comprehensive molecular atlas of the brain's vasculature.

They found that the cells lining blood vessels, which regulate interactions between the bloodstream and surrounding tissues, behave differently across various stages of brain development and may have an important role in the brain's signalling networks.

Researchers also discovered that adult brain vasculature essentially stops growing over time, while tumours and malformations reactivate growth similar to early brain development. This previously undescribed behaviour sheds light on potential therapeutic targets.

Additionally, researchers revealed how brain vasculature differs from other organs and how disease alters its characteristics, impacting immune system interactions.

Dr. Wälchli notes the potential clinical applications of these findings, "If we can detect features shared between early brain development and brain tumours, we can monitor the brain's vasculature for growth patterns, enabling earlier disease detection and improved patient outcomes."

This research marks a significant advancement in brain vascular biology, benefiting scientists across multiple disciplines and paving the way for innovative treatments for brain diseases.

*The international team includes researchers from UHN's Krembil Brain Institute, Donald K. Johnson Eye Institute, Toronto General Hospital Research Institute, and Princess Margaret Cancer Centre, the University of Toronto's Donnelly Centre, Mount Sinai Hospital's Lunenfeld-Tanenbaum Research Institute, University of Zurich, University Hospital Zurich, ETH Zurich, University of Geneva, University Hospital Geneva, as well as collaborators at Weill Cornell Medicine, and Memorial Sloan Kettering Cancer Centerin New York.*

*This work was supported by UHN Foundation, the Canadian Institutes of Health Research, The Natural Sciences and Engineering Research Council of Canada, the Ontario Institute for Cancer Research and the Canada Research Chairs program, the OPO Foundation, the Swiss Cancer Research Foundation, the Stiftung zur Krebsbekämpfung, the Kurt und Senta Herrmann Foundation, Forschungskredit of the University of Zurich, the Zurich Cancer League, the Theodor und Ida Herzog Egli Foundation, the Novartis Foundation for Medical-Biological Research, the HOPE Foundation, and the US National Institute of Health's National Center for Research Resources.*

*Dr. Ivan Radovanovic is Associate Professor at University of Toronto's Temerty Faculty of Medicine. Dr. Thomas Walchli is a consultant neurosurgeon at University College London (UCL)'s Victor Horsley Department of Neurosurgery, and an Associate Professor/Principal Clinical Research Fellow at the UCL Cancer Institute.*

*Wälchli T., Ghobrial M., Schwab M., Takada S., Zhong H., Suntharalingham S., Vetiska S., Rodrigues Gonzalez D., Wu R., Rehrauer H., Dinesh A., Yu K., Chen E.L.Y.,*

*Bisschop J., Farnhammer F., Mansur A., Kalucka J., Tirosh I., Regli L., Schaller K., Frei K., Ketela T., Bernstein M., Kongkham P., Carmeliet P., Valiante T., Dirks P.B., Suva M.L., Zadeh G., Tabar V., Schlapbach R., Jackson H.W., De Bock K., Fish J.E., Monnier P.P., Bader G.D., Radovanovic I. Single-cell atlas of the human brain vasculature across development, adulthood and disease.(link is external) Nature. 2024 Jul 10. DOI: 10.1038/s41586-024-07493-y*


*(L-R) Dr. Thomas Wälchli is a Scientific Associate at UHN's Krembil Brain Institute and a consultant neurosurgeon at University College London; Dr. Ivan Radovanovic is a neurosurgeon and Senior Scientist at the Krembil Brain Institute.*

# Spotlight

## Courtney Irwin

*Graduate student with Dr. Karun Singh and recipient of the Canadian Neurodevelopment Research Training Platform (CanNRT) Fellowship award.*

## Sarah Geahchan

*Graduate student with Dr. Karun Singh and recipient of the Canadian Neurodevelopment Research Training Platform (CanNRT) Fellowship award.*

# Kristen Ashworth

*Graduate student with Dr. Brian Ballios and recipient of the Canadian Institutes for Health Research (CIHR) CGS-Doctoral Research Award.*

# Dr. Kamil Uludag

*Senior Scientist at the Krembil Brain Institute and elected Senior Fellow of the International Society for Magnetic Resonance in Medicine.*

# Dr. Sriranga Kashyap

*Postdoctoral researcher with Dr. Kamil Uludag and elected Junior Fellow of the International Society for Magnetic Resonance in Medicine.*

# Dr. Sowmya Viswanathan

*Scientist at the Schroeder Arthritis Institute and recipient of the Natural Sciences and Engineering Research Council of Canada (NSERC) 2024 Discovery Grant Program funding.*