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YOUNG TALENT CELEBRATED FOR GAME-CHANGING INNOVATIONS

JOANNE RICHARD

Talented, young researchers across Canada are contributing to game-changing innovations including a first-of-its-kind remote robotic ultrasound system, a novel fungi-based therapeutic for neurodegenerative diseases and a rainwater-powered disinfection solution to deliver clean water to rural areas.

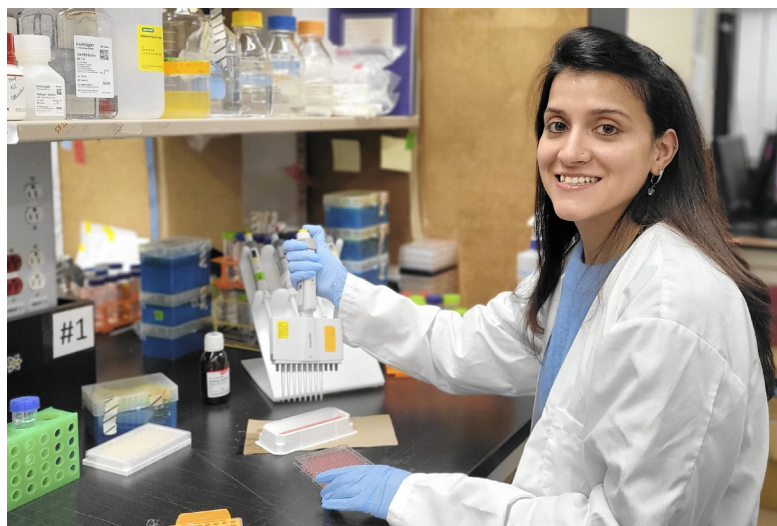
Dr. Timsy Bhando is an award-winning postdoctoral researcher at McMaster University recently recognized for her work to develop new, natural drugs to improve brain health. The novel fungi compound she discovered has huge potential for treating neurodegenerative disease and depression.

Her work with KCB-100, the lead chemical compound, has earned her a coveted Mitacs Innovation Award for Outstanding Innovation (mitacs.ca). "I've always believed that nature, especially fungi, holds untapped potential for drug discovery. Fungi are unique in their ability to produce bioactive compounds that can address complex diseases," says Bhando.

Her passion for solving healthcare challenges led her to do postdoctoral research at McMaster University, where she collaborates with Kapoose Creek Bio to explore fungi for drug discovery. Vancouver-based Kapoose is a startup focused on accelerating the discovery and development of drugs from nature.

"Natural drugs offer enhanced biological compatibility, having emerged through countless years of co-evolution within living organisms. Their unique and intricate structures can deliver therapeutic benefits that synthetic compounds often struggle to replicate," she says, adding that nature's designs can streamline the path to developing more effective and predictable treatments.

Brain health has emerged as a central focus in both health care and personal wellness: "As we gain a deeper understanding of how the brain influences everything from cognition and memory to mood and resilience, more individuals are



Dr. Timsy Bhando has discovered a novel fungi compound that has huge potential to treat neurodegenerative disease and depression. MITACS.CA

looking for ways to protect and improve their mental functioning."

With rising concerns about conditions like Alzheimer's, Parkinson's and chronic stress-related disorders, research into brain health, ranging from diet and exercise to innovative therapeutics, is advancing rapidly, says Bhando. "Safeguarding and enhancing our brain's performance is becoming a cornerstone of modern well-being, fostering innovation across neuroscience, medicine and holistic health practices."

David Black, a University of British Columbia PhD student in the Department of Electrical and Computing Engineering, also earned a Mitacs Innovation Award for his remote ultrasound system that makes it easier and more affordable for Canadians to receive ultrasound procedures without having to travel far distances to a medical centre. And it can be delivered through a trusted family or community member, or even the patient themselves!

Black's compact tele-ultrasound system allows a novice to perform an ultrasound on a patient while being guided by an expert sonographer or radiologist from a remote location. "My background is in medical robotics and imaging, and I was aware of the difficulty of providing

health care to remote locations, so at the start of my PhD, I was interested in looking into remote robotic ultrasound," says Black.

However, robots are often impractical in small communities; they are expensive, large, complex and require careful setup and calibration, says Black, so along with his PhD supervisor, Prof. Tim Salcudean, they came up with an alternative that can achieve similar performance but at much lower cost and complexity.

According to Black, the novice wears a mixed reality headset which projects a 3D virtual hologram of an ultrasound probe onto the patient. "The novice simply aligns their real probe with the virtual one and follows it as it moves around. The virtual probe's position and orientation are controlled in real time by the expert, who sees a live stream of the ultrasound image and the video from the mixed reality headset."

The expert is also in verbal communication with the novice and receives force feedback, a simulation of real-world physical touch in a VR environment, so they feel as if they are performing the scan in person, he adds.

"In our testing so far, the volunteer users had never used mixed reality before or performed an ultra-



David Black has developed a tele-robotic ultrasound system that allows Canadians to receive ultrasound procedures remotely by a novice.

sound exam." With a short five-minute introduction to the system, they performed the scan successfully, guided by an expert.

Black says that from tests in Skidegate and Haida Gwaii, B.C., the users were guided by an expert in Vancouver, over 750 km away, and 91 per cent of the desired images were successfully captured and clinically usable, which is comparable to an in-person ultrasound.

The technology is still a work in progress, he says, and their next step will be to bring the system to market and work with government and health authorities to make it available for Canadians.

Meanwhile, Dr. Paul Onkundi Nyangaresi, a postdoctoral researcher in the Civil Engineering Department at the University of British Columbia, developed a first-of-its-kind low-cost, simple water disinfection system fueled by collected rainwater that is successfully being at a school in Kenya.

He earned the Mitacs Inclusive Innovator of the Year Award. Mitacs is a leading innovation organization in Canada that connects businesses and researchers in sectors such as digital technology, artificial intelligence, energy, sustainable solutions, and advanced manufacturing.

Workers and 'time-off tax'

LINDA WHITE

On average, workers in Canada who took vacation in 2024 claim to have paid 13.6 extra hours in 'time-off tax' – the additional time worked before and after a one-week vacation – to prepare and catch up on top of regular work hours.

Also, according to the December edition of ADP Canada's monthly Happiness@Work Index, just 31 per cent of workers reported taking all their allotted vacation time for 2024, similar to 2023 yet still well below pre-pandemic figures of 48 per cent.

"By offering work-life balance options, flexible deadlines and structured hand-off processes, employees can feel more supported as they prepare and return from vacation – encouraging paid time off rather than fraying from it," says Heather Haslam, vice president of marketing at ADP Canada.

The index found boomers continued to lead as the happiest generation for almost two years, while Gen Z reported a significant decrease in sentiment and is now tied for second place with millennials. Regionally, Atlantic Canada and Quebec tied as the happiest regions, while Alberta and B.C. tied for last place. Ontario was the fourth happiest region, following Saskatchewan/Manitoba.

Workers want raises

When asked how they'd like to see their careers evolve this year, 64 per cent of workers said they'd like to see a higher salary for their position, a Robert Half survey found.

Forty-one per cent said they'd like increased flexibility to work where or when they want and 39 per cent said they'd like more responsibility and a promotion.