



December 2024 Newsletter

DIRECTOR'S MESSAGE

I begin this message on a sad note as we mourn the death of our colleague and friend, Dr. James House, a professor and former Head of the Department of Food and Human Nutritional Sciences who passed away on September 10, 2024. Jim was a professional colleague par excellence and his contributions to the research and development activities of the RCFTR in particular and the University of Manitoba in general will be remembered forever. Please see below tribute to Jim.

On November 14, 2024, the annual "RCFTR Food Technology and Research Day" was held with about 250 people in attendance. Our keynote speaker was Mike Fata, a pioneer in the currently high performing and economically successful Manitoba hemp food industry. Mike's inspirational message demonstrated the importance of economic vision and innovation, but more importantly the ability to persevere in circumstances where people do not believe in your ability to succeed. The keynote speech was followed by 19 presentations (12 industry, and 7 academic speakers) on various topics that covered food processing, nutrition, marketing, product development, and safety as well as Indigenous food systems, artificial intelligence, and water monitoring. The event also featured 48 poster displays by students with cash awards given to the top three as evaluated by judges. Our sincere thanks to all the speakers and attendees who made the event highly successful. We look forward to your presence and participation in the 2025 event.

The RCFTR recently installed a new electronic tongue that is capable of measuring bitterness and sweetness intensities of liquid samples. The system is supported by a powerful software that enables rapid and accurate data acquisition and analysis. Please contact us if you have samples that need to be tested for bitterness or sweetness intensity.

I am happy to report that several members of the RCFTR received various awards and recognitions in the past 6 months. Drs. James House, Cristina Rosell, Trust Beta, and Rotimi Aluko were all on the Stanford University's Top 2% researchers list. Dr. Aluko was also recognized as a 2024 Highly Cited Researcher, which is given to researchers with citation record in the Top 1% globally. We also celebrated Dr. Nandika Bandara who was awarded the 2024-2025 University of Manitoba Graduate Student Association

ABOUT US

The Richardson Centre for Food Technology and Research (RCFTR) is a 55,000-ft² state-of-the-art research centre within the Faculty of Agricultural and Food Sciences, University of Manitoba, located on the Fort Garry campus. Our mission is to advance food quality and human nutrition through traditional and innovative food processing techniques. Our mandate is to support the food and agriculture value chain by engaging in collaborative research and development activities with the food industry.

RISING TO NEW HEIGHTS

The University of Manitoba was recently ranked #2 in Canada and #45 globally for Food Science and Technology research impact according to ShanghaiRanking. This is UM's highest national and global ranking. RCFTR is proud to support our exceptional researchers and the future of food innovation.



(UMGSA) Teaching Award during a ceremony at the Fall convocation. Congratulations everyone.

Lastly, my tenure as RCFTR Director has been extended till May 2026 by the Dean of the Faculty of Agricultural and Food Sciences, Dr. Martin Scanlon. I am pleased at the opportunity to continue to lead the RCFTR and I look forward to working with you all.

Rotimi Aluko, PhD
Director

STUDENT CORNER

Carla Navarro Molina is a PhD student under the supervision of Dr. Martin Scanlon in the Department of Food and Human Nutritional Sciences. Carla completed her undergraduate degree in Food Science and Technology at the University of Valencia, Spain and obtained her Master's degree in Food Quality and Safety at the University of Valencia. Both of her research projects focused on designing strategies for modulating the technological and nutritional characteristics of sushi rice by varying the rice and vinegar acidity. Carla then completed an internship at the Food Institute of Agrochemistry and Food Technology (Spain) where she gained experience in food sensory analysis. Her current research program is in collaboration with the University of Valencia and the University of Manitoba. The aim of the research project is the development of functional cereal-based food products with tailored technological properties by using powders obtained from *Rhodiola rosea* and *Eleutherococcus senticosus* roots.



POST-DOC CORNER

Dr. Daniel Zogona is a Postdoctoral Fellow in Dr. Trust Beta's lab in the Department of Food and Human Nutritional Sciences, working on plant-based functional foods. Dr. Zogona earned his PhD in Food Science from Huazhong Agricultural University in China. His doctoral research explored the protective effects and underlying mechanisms of red raspberry polyphenols against alcohol-induced liver injury, gut microbiota alterations, and intestinal barrier dysfunction in mice. He holds a Master's degree in Nutrition from China Medical University in Taiwan and a B.Sc. in Food Science and Human Nutrition



from the University Joseph Ki-Zerbo in Burkina Faso. Dr. Zogona's current research focuses on characterizing bioactive compounds in cereal grains such as wild rice, as well as grain products like noodles fortified with purple/orange sweet potato powder. His work involves determining the bioaccessibility of these compounds through in vitro digestion systems and investigating their biological activities using human intestinal epithelial cells (Caco-2). His research aims to highlight the health benefits of cereal grains and grain-based products and advocate for their increased consumption to support overall health and well-being.

STAFF CORNER

Dr. Michael Janzen is Research Development Manager at the RCFTF and manages the day to day technical operations at the Centre and actively promotes the Centre's services to the food industry completing over 25 industry contracts in the past two years. Recent upgrades in the technical operations at the Centre include SFCA licensing of the Dry Fractionation Facility (2022), installing a pilot screw press equipped with steam mixer (2023), establishing the ICP-MS Facility for metal and mineral analysis (2023) and the electronic tongue for taste assessment of liquid samples (2024). In 2025, over \$1 million in pilot-scale wet processing equipment will be installed at the RCFTF providing new research opportunities for both the academic and industry sectors. Prior to joining the University of Manitoba in 2018, Michael was VP, Product Development and Scientific Affairs at Medisure Inc and prior to Medisure worked at Aoptex Fermentation Inc. Michael completed post-doctoral studies at Yale University and University of Illinois at Urbana-Champaign and received his PhD (chemistry) from Western University. Michael received his BSc (Hons) from the University of Manitoba and is very happy to work at his alma mater alongside great colleagues and friends.



AWARDS

Dr. Nandika Bandara

- 2024 IFT Outstanding Service Award, Institute of Food Technologists (IFT), 2024 IFT Annual Meeting
- 2024-2025 University of Manitoba Graduate Student Association (UMGSA) Teaching Award
- 2024 International Society for Functional Foods and Nutraceuticals Young Scientist award

Dr. Rotimi Aluko

- 2024 International Society for Functional Foods and Nutraceuticals Merit award



Dr. Nandika Bandara celebrating the UMGSA Teaching Award with fellow faculty members during the 2024 Fall convocation ceremony. From left: Drs. Trust Beta, Nandika Bandara, Rotimi Aluko, Martin Scanlon.

TENANT HIGHLIGHT

CBSAlife is a proud Canadian company founded in 2020, specializing in the production of microbiological and cell culture media, as well as DNA and RNA extraction kits designed for research and diagnostic applications. With a portfolio of over 100 high-quality products and plans for significant expansion, CBSAlife is committed to developing custom solutions through strategic partnerships with other companies. As one of the few Canadian manufacturers of culture media, CBSAlife plays a pivotal role in advancing the biotechnology and life sciences sectors within Canada. Our focus is on offering superior products at competitive prices, ensuring fast and reliable delivery to our customers nationwide.

The company's CEO, Mehdi Kargar, has a Master's of Science degree in microbiology and over 23 years of industry experience. Mehdi brings a wealth of expertise and a deep passion for the field to his leadership role. His extensive research background and dedication to education have shaped his vision for CBSAlife, where he is focused on expanding the company's global presence and ensuring the delivery of top-quality products that meet the evolving needs of international research and diagnostic markets.

CBSAlife's bacterial culture media are designed to support a wide array of research, from microbiological studies to diagnostics. These media are essential for growing and identifying bacterial cultures in laboratory settings, making them indispensable tools for medical research, environmental studies, and the food and pharmaceutical industries. By manufacturing these products locally, CBSAlife not only guarantees quality and consistency but also supports Canada's growing research infrastructure.

CBSAlife's mission is to deliver premium products that improve the efficiency and affordability of scientific research across Canada and beyond, fostering innovation and supporting economic growth in the biotechnology sector.



REMEMBERING DR. JAMES D. HOUSE

Dr. James Duncan House sadly passed away at St. Boniface Hospital on September 10, 2024, at the age of 57.

Jim joined the Department of Animal Science at the University of Manitoba with a cross appointment to the Department of Human Nutritional Sciences. He developed a very successful research program and received a Young Investigator Award from the Canadian Nutrition Society. His research was focused on three primary areas, protein quality, nutritional regulation of sulphur amino acid metabolism, and sustainable egg production. Jim trained over 40 graduate students and 16 post-doctoral fellows and research associates as well as over 40 undergraduate research assistants.

Jim was made a fellow of the Canadian Nutrition Society (CNS) and was the recipient of many awards from the Canadian Society of Animal Science, CNS, and a merit award for his administrative service from the University of Manitoba. In 2023 he received the Earl Willard McHenry Award, the most prestigious award from CNS at their Annual meeting in Quebec City. He also served as President of CNS.

In 2009 he was appointed Head of the Department of Food and Human Nutritional Sciences, a position he held



with great distinction for 11 years. Together with the late Dean Gustaaf Sevenhuysen, he played a significant role in ensuring the functioning of the department after the devastating fire in the Duff Roblin Building in 2009. As a result, disruption in research and teaching activities were minimized. He also ensured that the move and merging of the department to the Faculty of Agricultural and Food Sciences in 2014 was smooth and successful as well as the merge with Food Science in 2017.

After completing his term as Head, Jim continued his teaching and research.

Jim was appointed the new Manitoba Strategic Chair in Sustainable Protein, a position he was eminently qualified for and dedicated to in the last few months of his life.

Jim was a beloved teacher, administrator, and colleague, who was always ready to give a helping hand. His friendly demeanor was a trademark that defined his personality. Jim was blessed with a beautiful voice and performed as a soloist with the Bison Men's Chorus for several decades. He will not only be remembered as an outstanding academic, but also as a very talented and dear friend.

Jim leaves behind his wife Aileen and his daughter Meara.

RESEARCH AWARDS

Atmospheric cold-plasma modification as a sustainable clean technology for improving protein functionality, digestibility and tribological properties

Project team: Nandika Bandara (PI), Anwasha Sarkar (Co-PI) – University of Leeds, UK

Funding source: MITACS Globalink Research Award

Total funding received: \$12,000

2024/7 – 2025/7

Improving the functionality of renewable polymer-based food packaging materials by reinforcing with chemically tailored nanomaterials

Project team: Nandika Bandara (PI), Tizazu Mekonnen (Co-PI) – University of Waterloo, Canada

Funding source: Natural Sciences and Engineering Research Council of Canada (NSERC) Alliance International Collaboration Grant

Total funding received: \$74,000

2024/7 – 2026/7

Unlocking Canola Meal: The Key to sustainable growth and reduced greenhouse gas emissions in Canadian agricultural practices

Project team: Nandika Bandara (Co-PI and Theme Lead), Kevin D France (PI) – Queens University, Canada

Funding source: Natural Sciences and Engineering Research Council of Canada (NSERC) NSERC-SSHRC Sustainable Agriculture Research Initiative (SARI)

Total funding received: \$3,200,000

Portion of funding received: \$300,000

2024/5 - 2028/4

Improving techno-functional properties of dry fractionated lentil and lupin protein concentrates with non-thermal technologies

Project team: Nandika Bandara (PI), Jim House, Rotimi Aluko

Funding source: Manitoba Agriculture and Food Sustainable Canadian Agriculture Partnership Program (SCAP) – Research and Innovation Stream

Total funding received: \$142,000

2024/4 - 2025/3

Capacity building for downstream processing of Canola meal and other agricultural byproduct streams - Applications in sustainable polymers, nanomaterials and platform chemicals

Project team: Nandika Bandara (PI), Rotimi Aluko

Funding source: Manitoba Agriculture and Food Sustainable Canadian Agriculture Partnership Program (SCAP) – Research and Innovation Stream

Total funding received: \$108,000

2024/4 - 2026/3

CAPACITY HIGHLIGHT

The RCFTF recently installed an electronic tongue for the taste assessment of water soluble compounds. This technology is based on potentiometric measurement using sensing electrodes that are cross-sensitive to different molecules responsible for the taste. It assesses the overall taste profile, ideal for comparison. Applications of the electronic tongue include the following:

- Food taste quality inspection
- Food market preferences assessment, trend analysis
- Taste (bitterness, sweetness) masking for food and pharmaceutical markets
- Stability study of different formulas under natural aging and accelerated aging
- Statistics of taste spectrum charts of foods and production of taste characteristic maps of products

Please contact us if you have samples that need to be tested for bitterness or sweetness intensity.



Autosampler



Sensors (x7)

RCFTR FOOD TECHNOLOGY AND RESEARCH DAY

On November 14, about 250 people attended RCFTR Food Technology and Research Day with 19 presentations from across academia, government, and industry. The event was moderated by Dr. Aluko and was a great opportunity for industry to engage directly with RCFTR researchers and discuss collaboration opportunities. We were thrilled to have Mike Fata, co-founder of Manitoba Harvest, as our keynote speaker. A student poster competition was held with 48 submitted posters. Congratulations to all participating students on their excellent poster presentations. Award recipients and poster titles are listed below.

- **Carla Molina** (1st place): Unlocking the nutritional and bioactive potential of *Rhodiola rosea* and *Eleutherococcus senticosus* roots
- **Jiayi Chen** (2nd place): Evaluating lysine damage in yellow peas and their derivatives across different processing technique
- **Onesmus Maithyaa** (3rd place): Transforming canola meal into high-value biobased adhesive through chemical and hydrothermal processing



(l to r) Poster award winners: Onesmus Maithyaa, Carla Molina, Rotimi Aluko (RCFTR Director), Jiayi Chen

Congratulations to the following students and post-doctoral fellows on their selection to present oral presentations:

- **Isanka Gimhani:** Impact of alpha-amylase activity on the microstructure of wheat kernels under different germination conditions
- **Siwen Luo:** Advancing high-protein snack production: Unlocking the potential of nitrogen gas assisted extrusion with x-ray and high-speed imaging
- **Dr. Indhurathna Swaminathan:** Evaluating the impact of flour protein content on the quality of wholegrain refrigerated dough
- **Dr. Daniel Zogona:** Red raspberry polyphenols alleviate ethanol-induced damage in HepG2 cells



FUNDING OPPORTUNITY FOR CANADIAN SMEs

Are you a Canadian small-to-medium size enterprise looking for financial support to assist your food ingredient R&D program?



If so, you may be eligible for up to \$5,000 in funding via a National Research Council of Canada Industrial Research Assistance Program (NRC-IRAP) supported program for work performed at the University of Manitoba's Faculty of Agricultural and Food Sciences and Richardson Centre for Food Technology and Research.

The Contribution to Organization (CtO) program helps build and integrate innovation capacity in Canada and encourages investment in research and development activities that have clear commercialization goals.

Application is two pages in length and review time is one week.

Since April 2022, RCFTR completed more than 20 NRC-IRAP funded projects from food companies across Canada.

Core areas of expertise at the RCFTR include the following:

1. Pilot scale milling, air classifying, dehulling in a SFCA licensed facility
2. Lab- and pilot-scale oilseed screw pressing in a SFCA licensed facility
3. Protein quality testing
4. Food functionality testing
5. Sustainable packaging
6. Cooking extrusion
7. Flour quality and bakery applications
8. Human nutrition testing
9. Phytochemical testing
10. Lab-scale supercritical fluid extraction with CO₂ and/or ethanol
11. Metal and mineral testing using ICP-MS techniques
12. Particle size distribution testing

The CtO program is a great way to connect with world class faculty and staff in food ingredient testing, processing and applications. For more information, contact Dr. Nazim Cicek at agresearch@umanitoba.ca.

MYERA GROUP, UM LEADING GROUNDBREAKING RESEARCH

RCFTR is excited to highlight UM's first-ever New Frontiers in Research Fund (International) grant. This award marks a milestone in UM's history, as it leads a global initiative to study the ecological, health, and cultural values of fish, wild rice, and other traditional foods. The project aims to enhance nutrition security and preserve traditional food systems and medicinal practices for Indigenous and marginalized communities affected by climate change. Including partner contributions from over 5 countries, the total project funding exceeds \$6 million.

The project leverages the work of Bruce Hardy, CEO of Myera Group Inc., creating food system technologies with Indigenous communities. The Manitoba-based company's innovative technology and relationships with Indigenous communities will be used to apply Indigenous circular bio-economy strategies to fish farming, wild rice and other traditional medicinal foods to directly meet the needs of vulnerable groups.

This interdisciplinary research effort brings together an exceptional team of experts, including Dylan MacKay, Rotimi Aluko, Trust Beta, Cristina Rosell, and Filiz Koksel, all from the Department of Food and Human Nutritional Sciences. These researchers, in addition to an international team from Canada, Germany, India, Norway, South Africa,



Photo: P. Bhowmik

the United States, Australia, Vanuatu, Morocco, and the United Kingdom, will use Indigenous and local knowledge to improve access to traditional foods and support climate change-mitigating and adaptive food production systems.

UM researchers are already making significant contributions to the project. Trust Beta, for example, has been working closely with Myera and Indigenous communities to develop noodles made from wild rice, a culturally significant crop. This project will extend that research to incorporate bioactives from the Limpopo region in South Africa, such as purple cassava, to enhance the nutritional value of these foods. Meanwhile, Filiz Koksel's lab is exploring the development of extruded snacks and meat analogues, providing healthier, sustainable food alternatives for vulnerable populations.

MANI WHEAT PROJECT

Are you a Manitoban wheat farmer and are interested in participating in a local research study?

The "Mani Wheat Project," led by Dr. Cristina Rosell, is collecting wheat samples from Manitoban farmers to investigate the impact of pre-harvest sprouting, an issue resulting from adverse weather conditions such as heavy rains and high humidity prior to harvest.

Pre-harvest sprouting activates enzymes in wheat kernels that degrades starch and protein, leading to lower quality grain and economic losses for farmers. The team hopes to identify specific wheat varieties in the Canadian Western Red Spring (CWRS) class that show resistance to pre-harvest sprouting and are better suited to Manitoba's shifting environmental conditions.

The research team is searching for Manitoban farmers willing to donate samples of all varieties of CWRS wheat from 2023 and 2024 crop years. CWRS is the most widely grown class of hard wheat in Western Canada and is commonly regarded for its superior milling and baking quality.

Participants will be sent prepaid shipping envelopes and instructions to submit their samples. Farmers interested in participating should email ManiWheat@umanitoba.ca.

WHEAT SAMPLES NEEDED
FOR A RESEARCH STUDY

MANI WHEAT PROJECT

University of Manitoba | Sustainable Canadian Agricultural Partnership | MANITOBA CROP ALLIANCE

Partnering with Manitoban Farmers

Our team is looking for Manitoban farmers willing to donate CWRS wheat samples (300 g) from the 2023 and /or 2024 crop year.

This research project aims to understand the mechanisms involved in pre-harvest sprouting in wheat. Our goal is to provide Manitoban growers with information to be considered in breeding programs for increasing wheat resistance to climate impact and reducing losses related to pre-harvest sprouting.

Interested in participating in our project?
Please contact us at ManiWheat@umanitoba.ca

STEP 1: Fill provided bag with CWRS wheat (300g)

STEP 2: Provide contact information, wheat variety and crop location

STEP 3: Send it to our team! (Shipping is on us!)