
RNA CANADA ARN 2024: THE FUTURE OF RNA TECHNOLOGY

Dear RNA CANADA ARN Members,

Join us in Ottawa for the historic inauguration of RNA Canada as we unite for this one-time event to shape the future of RNA research in Canada! Together, we'll celebrate our achievements, network with fellow members, and chart a course for ground-breaking discoveries. Don't miss this opportunity to be at the forefront of innovation and collaboration in RNA biology. See you in Ottawa!

[Registration](#) for RNA Canada ARN 2024: The Future of RNA Technology is now open!

REGISTER HERE!

This event will showcase the latest RNA science from some of Canada's and several other countries' top RNA scientists. It will be an opportunity to learn the ways in which RNA research will play a vital role in biotechnology and therapeutics to improve the lives of Canadians. Click [here](#) to visit the meeting website!



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Dear Members of RNA Canada ARN,

As we step into this exciting chapter of RNA Canada ARN, it is with a profound sense of responsibility and anticipation that I reach out to you through our newsletter. Our collective dedication to advancing RNA research and innovation shapes our journey forward, and I am privileged to serve as your President during this critical time of establishing RNA Canada ARN as the voice of RNA researchers and a base for collaboration and networking.

Congratulating Our Newly Elected Board of Directors and Chair

First and foremost, I would like to extend heartfelt congratulations to our newly elected Board of Directors, our Chair of the Board, and members of the Executive Committee. Your election stands as a testament to the trust and expectations our community place in you. On behalf of all members, I express our enthusiasm and support as we embark on this journey together, steering RNA Canada ARN towards new heights.

Progress and Anticipated Key Events:

After three years of thorough deliberation and planning, RNA Canada ARN is now a legally registered not-for-profit corporation equipped with a pan-Canadian Board of Directors, six distinct standing committees, and over 600 registered trainees, research professionals, and principal investigators. The Board of RNA Canada ARN held its first regular meeting on April 24, 2024, during which it approved the [RNA Canada ARN EDI policy and guidelines](#) and ratified the operational structure along with the immediate goals for the next six months.

Mark Your Calendars: RNA Canada ARN Meeting in Ottawa

I am thrilled to invite you to the RNA Canada ARN Meeting, a one-time event scheduled for September 30 to October 4 in Ottawa. This gathering is a cornerstone of our community, offering a dynamic forum for sharing cutting-edge research, networking with colleagues, and exploring new collaborations. By gathering all Canadian scientists in one place, we signal to all Canadian and international partners the strength and potential of our community. Your participation is crucial to the meeting's success, and I look forward to engaging with many of you there.

Strategic Positioning and Government Engagement

RNA Canada ARN is strategically positioning itself to initiate substantive dialogue with



the government, aiming to establish a strong, influential voice in the shaping of scientific policies in Canada. The process has started and will pick up speed as we approach the RNA Canada ARN meeting date. Our efforts are directed towards ensuring that the concerns and potentials of our community are adequately represented at national discussions.

Membership Structure: A Work in Progress

We are in the process of refining our membership structure to better meet the diverse needs of our community across different career stages. This initiative is still underway, and we aim to roll out a comprehensive and beneficial membership system soon.

Acknowledging Our Committees and Chairs

I want to extend my heartfelt gratitude to the chairs, vice chairs and members of the abovementioned standing committees for their unwavering dedication and hard work. Your contributions are the backbone of RNA Canada ARN, driving our initiatives forward and ensuring our community not only grows but thrives. Your innovative approaches and commitment are greatly appreciated.

Call to Action

As we continue to strengthen our foundation and expand our impact, I encourage each of you to actively participate in our upcoming meeting in Ottawa, engage with our initiatives, and contribute to our committees. Your involvement is key to our success in advancing RNA research across Canada and beyond. You can help by [donating](#) to RNA Canada ARN; joining a standing committee; promoting RNA Canada ARN during meetings; encouraging colleagues, research staff and trainees to join; mentioning RNA Canada ARN to your member of parliament; and sending us advice and suggestions to better position RNA Canada ARN in the research funding landscape and as a service provider to RNA researchers at all stages of their careers.

I encourage you to regularly consult the RNA Canada ARN website for new opportunities, services, and news.

Thank you for your continued support and dedication to RNA Canada ARN. Together, we are forging a path that will not only advance our scientific endeavors but also enhance our national and international presence in the RNA field.

Warmest regards,
Sherif Abou Elela
President, RNA Canada ARN



RNA Canada ARN values the diversity of its membership and recognizes the importance of equity, diversity, and inclusion (EDI) as core pillars. To demonstrate its commitment to establishing equitable, diverse, and inclusive environments as a foundation of all its endeavours, activities and interactions, RNA Canada ARN adopted an EDI policy this Spring. The policy and guidelines are available on the [RNA Canada ARN website](#).

Why is EDI important?

Ensuring equity, diversity and inclusion in our organization strengthens our sense of community and fosters environments where everyone feels welcome, safe and listened to, increasing our capacity for creativity, innovation and impact in our research and providing opportunities to all our members.

Who is the policy for?

All members and entities of RNA Canada ARN are concerned by the policy and EDI will be best served if all work together. RNA Canada ARN recognizes the unconscious and systemic barriers faced by underrepresented and disadvantaged groups including but not limited to women, Indigenous Peoples (First Nations, Inuit and Métis), persons with disabilities, members of visible minority/racialized groups and members of the 2SLGBTQIA+ (Two-Spirit, Lesbian, Gay, Bisexual, Transgender, Queer and/or Questioning, Intersex, Asexual) communities and aims to ensure every member is treated with respect.

How will RNA Canada ARN promote and ensure EDI?

RNA Canada ARN will actively monitor the composition and activities of its committees to promote best EDI practices and a good representation of the RNA community in Canada. The EDI committee will ensure the reviewing and updating of this policy and organize annual learning opportunities for members. EDI considerations will be taken into account in all activities of RNA Canada ARN. RNA Canada ARN will use inclusive language and images in all communications.

What are your responsibilities as a member?

All members are expected to contribute to promoting inclusive environments for RNA research in Canada. Members are expected to take action when they witness disrespectful behavior and lead by example. They should also actively learn about barriers towards equity, diversity and inclusion and best practices to foster inclusive environments within RNA Canada ARN and in their workspaces.



The policy is accompanied by two series of guidelines to provide advice and direction for the implementation of EDI in setting up and running RNA Canada ARN committees and for conference and event organization by RNA Canada ARN.

Any feedback on the policy and the guidelines is welcome. The RNA Canada ARN EDI committee can be reached at edi@rnacanada.ca.

The next EDI learning activity of RNA Canada ARN will take place on Wednesday October 2nd 2024 during the [RNA Canada ARN / RiboClub meeting](#) in Ottawa (at the Ottawa Conference and Event Centre). Dr Imogen Coe (Professor at Toronto Metropolitan University) will lead an EDI workshop. Registration to the workshop is free for all registrants of the meeting.



DR HAISSI CUI



Dr. Haissi Cui, University of Toronto, Department of Chemistry

Dr. Cui is originally from Germany, where she performed her BSc, MSc, and PhD. Dr. Cui has had the opportunity to study several different aspects of RNA biology, from her PhD in the University hospital Munich Rechts der Isar, where she worked on noncanonical functions of a protease inhibitor in cancer that she ultimately found to modulate a miRNA, to her postdoc at the Scripps Research Institute where she studied aminoacyl-tRNA synthetases, mRNA splicing, and mRNA translation. She started her lab at the University of Toronto in July 2022, where her team is broadly interested in RNA processes in mammalian cells

Currently, they are focused on understanding the subcellular localization and organization of tRNA aminoacylation, how this might be changed in disease, and developing new tools and models. In simpler terms, the lab studies how the language of RNA gets decoded into the language of proteins in cells; in fact, you can think of tRNAs as the “secret decoder ring” of molecular biology! This process of making proteins from RNA is fundamental for all cells and organisms, and because of its importance, it is highly complex and regulated, leading to lots of new avenues for research and application. In a great example of the research the Cui lab is undertaking on, Dr. Cui’s postdoctoral research was recently published: <https://www.nature.com/articles/s41556-023-01118-8>. In this work, she demonstrated that Arginyl-tRNA synthetase re-localized from the cytoplasm to the nucleus in response to arginine fluctuation, where it surprisingly influenced splicing and modulated gene expression. Understanding such unexpected functions of tRNA synthetases in response to environmental cues provide clues about our cell’s responses to stress and disease states.

Dr. Cui considers herself fortunate to have experienced so many different facets of RNA biology throughout her training. This diversity of experience and knowledge allows Dr. Cui and her team to use many different approaches in their research, and, let’s face it, that just makes their work more fun!



When asked about her favorite RNA-related topics that aren't tRNA-related, Dr. Cui said that “miRNAs will always have a special place” in her heart, and that she finds mRNA splicing to be very interesting. These days, she finds passaging tissue culture cells to be a form of meditation, and, while she sincerely enjoys grant writing—especially collaborative grants—she would be happy to spend more time on her own experiments again! Dr. Cui's advice for the RNA Canada ARN community is more of a reminder “tRNAs are super interesting” and “don't forget about them when you think of translation!” (stated with a wink and grin).

In addition to grant writing, Dr. Cui greatly enjoys interacting with the students on her team and in the greater Toronto RNA community. When she's not busy passaging cells, mentoring students, and finding cool new roles for tRNA biosynthetic enzymes, Dr. Cui has been reveling in exploring her new city. She loves how the neighborhoods all have their own distinct personalities, with plenty of new things to see and new foods to try! We agree: Toronto, and Dr. Cui's lab are great places to do science, and if you'd like to learn more about the Cui lab, you can follow Dr. Cui on X (formerly Twitter) [@HaissiCui](https://twitter.com/HaissiCui), and check out the lab's website: <https://haissicui-lab.ca/>

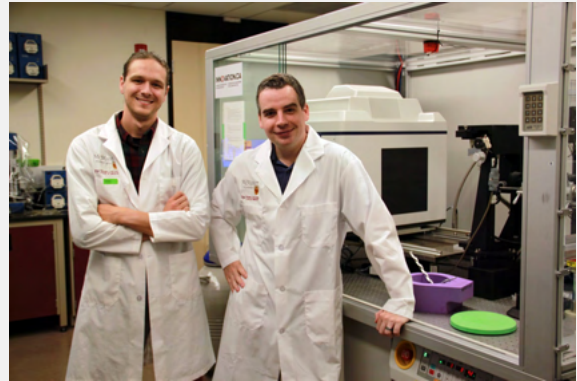


Scan me !



RNA Canada ARN Publication Highlight: [An ADP-ribosyltransferase toxin kills bacterial cells by modifying structured non-coding RNAs](#), by Nathan Bullen, John Whitney and co-workers at McMaster University, Hamilton, Ontario

RNA Canada ARN recently spoke with Nathan Bullen about his recent research article discussing a bacteria killing, RNA-modifying toxin, recently published in the journal **Molecular Cell**:



Could you summarize your paper for us?

ADP-ribosyltransferases (ARTs) are enzymes that catalyze the transfer of ADP-ribose from NAD⁺ onto a target molecule. Much is known about the biochemistry of these enzymes as many of the first identified bacterial virulence factors are ARTs. These ‘canonical’ ART toxins are delivered into host cells where they modify essential proteins, thereby inactivating cellular processes and promoting pathogenesis. However, since this early work, our understanding of the function ARTs has since expanded beyond protein-targeting toxins to include activities such as antibiotic inactivation and DNA damage repair, suggesting that more novel functions remain to be discovered. With that in mind, in this study we report the discovery of RhsP2 as an ART toxin delivered between competing bacteria by a type VI secretion system of *Pseudomonas aeruginosa*. We solved the structure of RhsP2, finding that it resembles protein-targeting ARTs such as diphtheria toxin. However, in characterizing its activity, we found that it does not target proteins, but instead ADP-ribosylates 2′-hydroxyl groups of double-stranded RNA. We show that this unique activity grants RhsP2 a high degree of substrate promiscuity, with identified cellular targets including the tRNA pool and the RNA-processing ribozyme, ribonuclease P. Consequently, cell death arises from the inhibition of translation and disruption of tRNA processing. Overall, our study demonstrates a previously undescribed mechanism of bacterial antagonism and uncovers an unprecedented activity catalyzed by ART enzymes.



Why is your paper so cool? What are the important implications?

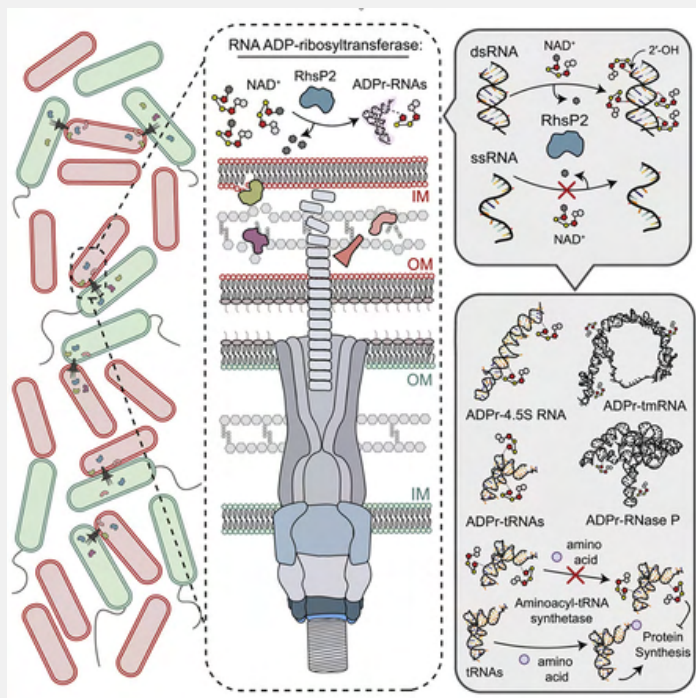
What are the important implications? I think most excitingly, we discovered a protein with enzymatic activity never before seen in nature. This is remarkable because ADP-ribosyl transferases are among the oldest and well-studied families of proteins. With respect to the potential implications of this work, I think we provide evidence to suggest that the substrate range for ARTS could be much greater than previously appreciated. In fact, I just read a pre-print that discovered an ADP-ribosyltransferase that modifies viral mRNA as a mechanism to protect against bacteriophage phage infection. I suspect no molecule, RNA or otherwise, is free from ADP-ribosylation!

Nathan's paper has also been highlighted by [ASBMB](#) and [Genetic Engineering and Biotechnology News](#).

Thank you Nathan!

Nathan and Dr. Whitney's manuscript can be accessed [here](#). [Nathan Bullen](#) is currently a Ph.D candidate in the lab of [Dr. John Whitney](#) at the Michael DeGroot Institute for infectious Disease Research at McMaster University.

[@johnwhitneyidr](#) [@NathanBullen4](#) [@McMasterIIDR](#) [@MacBiochemGrad](#)



This is the graphical abstract for the team's paper,

[“An ADP-ribosyltransferase toxin kills bacterial cells by modifying structured non-coding RNAs”](#)



adMare BioInnovations is a private, non-profit company whose mission is to translate leading academic research into new companies of scale; to train the next generation of highly-qualified personnel to drive the growth of Canadian companies into strong anchors; and to help existing life sciences companies scale up.



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It re-invests its returns into Canadian industry to ensure its long-term sustainability. adMare currently has 29 portfolio companies that have attracted \$2.3 billion of risk capital, have a combined value of more than \$4 billion, and have created over 1,000 jobs in Canada.

RNA Canada ARN recently spoke with their Senior Director of Partnerships, Amie Phinney, to learn more about what they do.

Thank you for meeting with us Amie! Could you tell us more about your role?

I am lead adMare's Partnerships team. Our team is responsible for outreach to academics and bioentrepreneurs with the aim of identifying innovative research projects with the potential to be translated into impactful medical therapies and will form foundational products for Canada's life science industry.

Why do YOU think what you study is so cool?

I engage with Canada's top scientists. I spend my days talking to our country's top biomedical researchers, learning about their cutting-edge research. Then, I have the privilege of discussing how we might work together to translate their discoveries into biomedical innovations. It's the best job in the country!

How would you explain your work to a non-scientist?

I facilitate business partnerships between researchers and drug developers to enable the translation of discoveries into medicines. I find the people/research that are ready for partnerships, then help set up them up for success. We provide a plan, a team and funding for that partnership to become a new Canadian biotech company.



How did you come to realize that RNA is the best macromolecule?

The RNA field has been gradually gaining increased attention in the drug discovery world, as both a drug target and as a therapeutic. The power of RNA-based therapeutics has been earning industry attention for some time now, stimulating drug hunters like me to explore how to harness this power beyond ASOs and mRNA vaccines.

Do you have any words of wisdom to share with your RNA colleagues across Canada?

All the research projects can be translated into new life-saving treatments for the patients and to grow the Canadian life science industry. When designing a project, thinking about how the research could eventually be turned into a company is strategic to increase the chances of developing a new medicine for the patients.

For more information about how AdMare contributes to the Canadian Biotechnology Landscape, please visit:

<https://www.admarebio.com/en/news-details/admare-s-company-co-creation-model---a-pioneering-approach-in-canadian-life-sciences-industry>

Thank you Amie!

RNA Canada ARN members can follow Amie on LinkedIn:
<https://www.linkedin.com/in/amiéphinney/>



AWARDS AND GRANTS

Dr. Ute Kothe, U. of Manitoba
2024 RNA Society's Lifetime Achievement Award



RNA Canada ARN congratulates Dr. Ute Kothe for being named the RNA Society's recipient of the 2024 Lifetime Achievement Award. Ute has taken a major leadership role in the international development of the RNA Salons, and has been an EDI champion on behalf of the RNA Society. Ute has also been elected into the College of the Royal Society in Canada, received a RiboClub Blue Jacket award, and was awarded the Canadian Society for Molecular Biosciences (CSMB) Jeanne Manery Fisher Memorial Lecture.

More information about the RNA Society's Lifetime Achievement Award can be found [here](#) and [here](#). Congratulations Ute!

RNA CANADA ARN 2024 INDUSTRY PANEL: OCTOBER 1ST, 2024

RNA Canada ARN is excited to announce a panel discussion on the “**Promises and Challenges of RNA-based Medicines**” at the upcoming RNA Canada ARN 2024: The Future of RNA Technology conference (October 1, 2024).

Following short presentations by Drs. Adrian Krainer and Pieter Cullis (inventors of early RNA drugs and vaccine technologies), panelists will discuss diverse topics on the future of RNA-based medicines.

Panelists include:

- Adrian Krainer (St. Giles Foundation Professor, Cold Spring Harbor)
- Pieter Cullis (Professor, University of British Columbia, Gairdner International Awardee)
- Phil Sharp (Professor, Koch Institute, MIT, Nobel Laureate)
- Jared Davis (President and CTO of Northern RNA)
- Sarit Assouline (Clinician Scientist, McGill Centre for Translational Research in Cancer)

Be sure to [register for RNA Canada ARN 2024!](#) Hope to see you there!



QUEBEC GOVERNMENT INVESTMENT IN ARN-BASED THERAPIES: A BLUEPRINT FOR FUNDING RNA RESEARCH IN CANADA

The government of Quebec, through the Ministry for Economy, Innovation and Energy, Genome Québec, Fonds de Recherche du Québec, and Médicament Québec will be investing a combined **\$37.9M** into RNA research over three years, **\$20.3M** coming directly from the Quebec government. The Quebec Consortium on Drug Discovery (CQDM) will coordinate this initiative and ensure that it takes advantage of existing expertise by creating front-line networks and developing collaborations between companies, universities, research centers as well as establishments in the health and social services. One of the several partners in this project is **ARN Québec**, **RNA Canada ARN's** regional affiliate.

In an announcement by M. Pierre Fitzgibbon, minister of Economy, Innovation and Energy, and M. Christian Dubé, Minister of Health, the government has committed to catalyze the development of new RNA-based therapies within Quebec, making the province a central innovation hub in RNA research. *“Quebec is lucky to rely on high-caliber researchers on RNA-based therapies. With this ambitious project, we will bring together key stakeholders within this field to make it a true sector of the future. It is with these kinds of initiatives that we may raise Quebec to the level of a world-class innovation hub in this critical sector”* state M. Fitzgibbon.

Quebec wants its investment to stimulate innovation by deploying new services, improving current industrial capacities and attracting innovative companies from the RNA sector. It also aims to establish an RNA training program to attract young people and to accelerate the valorization of RNA innovations from Quebec public research through transfer to industry and entrepreneurship. *“We want to create start-ups and momentum,”* says Mr. Fitzgibbon.

Quebec and Canada host an extraordinary concentration of world-class RNA researchers and represent an ideal location for the development of a center of excellence in RNA science. While the COVID-19 pandemic has highlighted the tremendous potential of RNA research for the development of life-saving vaccines, the potential of RNA-research further extends to a broad range of medical and technological advances, including the treatment of infectious and neurodegenerative diseases, cancer, as well as new biotechnological tools used in medical devices and the agricultural industry. Provincial investment in RNA research, in part through **ARN Québec** will catalyze the growth of this section, training of a new generation of RNA scientists and the development of industry. This initiative showcases the need for governmental stakeholders such as the federal and other provincial governments to invest in RNA research across the country, through organizations such as **RNA Canada ARN**.

- <https://www.quebec.ca/nouvelles/actualites/details/projet-mobilisateur-dans-lindustrie-des-sciences-de-la-vie-plus-de-20-m-au-cqdm-pour-faire-du-quebec-un-pole-dinnovation-des-therapies-basees-sur-larn-55480>
- <https://www.lapresse.ca/actualites/sante/2024-04-30/quebec-investira-20-millions-dans-l-arn.php>

**RiboClub**

<https://home.riboclub.org/schedule/>
4:30pm first or second Monday of each month.

Montreal RNA Salon

<https://www.mtlrna.org/>
4pm, first Thursday of each month

Toronto RNA Club

<https://torontornaclub.com/>
4pm, first Wednesday of each month

ARRTI at ULeithbridge (Alberta RNA Research and Training Institute)

<https://www.ulethbridge.ca/research/centres-institutes/alberta-rna-research-and-training-institute>

Vancouver RNA Club

<https://www.vanrnaclub.com/>

RNA Collaborative Seminars Series (RNA society)

<https://www.rnasociety.org/rna-collaborative-seminar-series>

[Youtube channel](#)

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