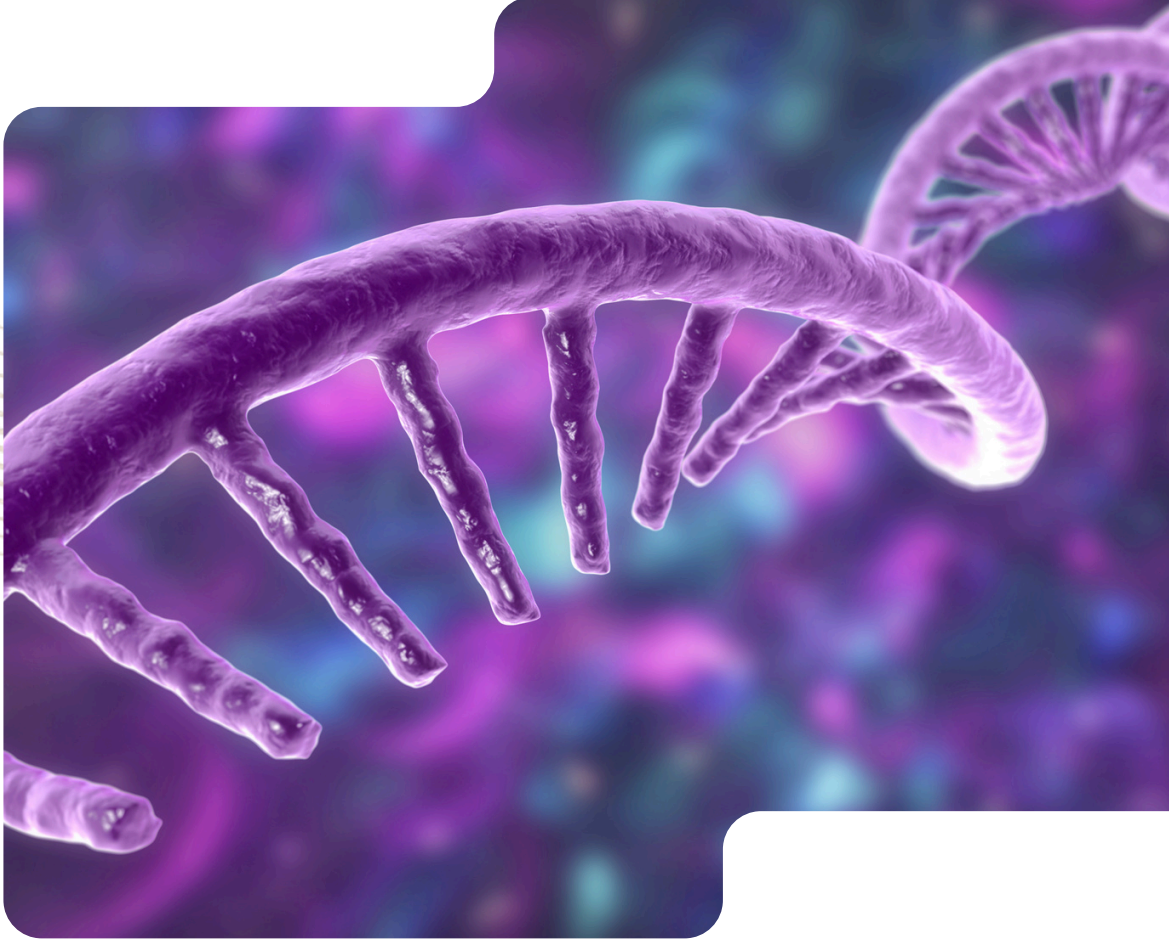
BRIDGE RESEARCH CONSORTIUM



A toolkit for building confidence in RNA-based medical technologies

NOVEMBER 2026

The BRC has developed a toolkit to support health-care practitioners and public health professionals in conversations about RNA-based medical technologies, including mRNA vaccines. This toolkit aims to help build confidence in addressing concerns and responding to questions from patients and the public.

This toolkit emerged as a response to practitioners who attended **RNA and Health Care Futures**, an event featuring a screening of *The Messenger: A Story of mRNA* followed by a panel discussion. It provides resources to support stand-alone screenings and locally facilitated discussions.

Key milestones in RNA-based medical innovation

1961: Discovery of messenger RNA.

August 26, 1998: FDA approves first RNA-based medication (Fomivirsen) to treat Cytomegalovirus retinitis.

March 11, 2020: WHO declared COVID-19 pandemic

December 2020: mRNA Pfizer and Moderna COVID-19 vaccines authorized in Canada (regulatory approval).

September 22, 2021: Initial EUA (emergency use authorization) approved for single-booster dose of high-risk groups (Pfizer-BioNTech).

October 21, 2021: Initial EUA approved for half-dose booster approved for adults 65+ and high-risk groups (Moderna).

November 2021: EUA approved for all adults for both Pfizer-BioNTech and Moderna vaccines
31 August 2022: Bivalent COVID-19 boosters from Pfizer-BioNTech and Moderna authorized by FDA under EUA.

October 2, 2023: Nobel Prize awarded to Katalin Karikó and Drew Weismann for their discoveries concerning nucleoside base modifications that enabled the development of effective mRNA vaccines against COVID-19.

November 8, 2024: Canada approves Moderna's RSV vaccine for those age 60 or older.

January 18, 2025: Alberta publishes "Alberta's COVID-19 pandemic response: Alberta COVID-19 Pandemic Data Review Task Force: final report" which claimed that mRNA vaccines insufficiently tested and therefore unsafe.

August 5, 2025: U.S. Department of Health and Human Services announce wind-down of mRNA vaccine development activities and cease mRNA-based equity investments (projects worth $500 million).

September 17, 2025: Quebec announces COVID-19 vaccines will no longer be free to general public in Quebec.

September 19, 2025: Moderna announces shipment of first mRNA fully manufactured in Canada being shipped to provinces and territories.

December 2025: U.S. CDC vaccine panel votes to stop recommending birth dose of hepatitis B vaccine for all newborns and major CDC recommendations call mRNA vaccines unsafe.

January 5, 2026: U.S. CDC announces new childhood vaccine recommendations, suggesting fewer shots.

February 10, 2026: U.S. FDA refuses Moderna's application to review new mRNA vaccine.

February 18, 2026: U.S. FDA agrees to review Moderna's mRNA vaccine application.

July 18, 2026: Publication of *Safety and efficacy of mRNA vaccines: a mechanistic and public health perspective* report in *The Lancet*.

August 11, 2026: BMJ Group retracts paper on COVID-19 vaccines and mortality featured in U.S. Senate hearing. BMJ Public Health retracted the paper for "misinformation in the discussion regarding the possible causes of excess mortality, and because the limited nature of the original work by the authors was not sufficiently described."

August 2026: Moderna began first in-human testing of mRNA vaccine against Bundibugyo ebolavirus.

August 17, 2026: Pfizer and BioNTech receive US FDA approval for XFG-adapted COVID-19 vaccine.

September 8, 2026: Launch of Allison Inquiry by Conservative MP Dean Allison.

September 17, 2026: Subsequent opinion published in Toronto Sun: “Biggest health policy mistake in Canadian history at best, or crime against humanity at worst”.

September 17, 2026: Health Canada authorized Pfizer–BioNTech’s XFG-adapted Comirnaty for individuals aged 6 months and older.

September 18, 2026: Government of Canada announces major contribution to strengthen Canada’s dual-use life sciences sector ($67 million investment, includes Northern RNA based in Alberta, to establish good manufacturing practice capacity for oligonucleotides and self-amplifying RNA).

September 22, 2026: B.C. offering time-limited RSV immunization program, using mRESVIA mRNA vaccine approved for adults >60 yrs and adults 18-59 at increased risk from LRTD (lower respiratory tract disease) caused by RSV. It will be free of charge for adults 75 and older, First Nations, Inuit, and Métis individuals of 60 and older.

October 22, 2026: Results of Merck-Moderna clinical mRNA cancer vaccine trial released showing prevention of melanoma recurrence and death.

November 2026: A WHO advisory group recommends advancing Moderna mRNA vaccine against Bundibugyo ebolavirus to a Phase 2/3 efficacy study in the Democratic Republic of the Congo.

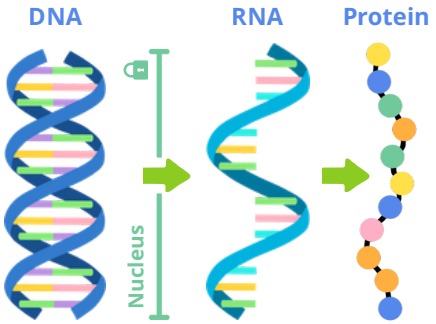
November 5, 2026: Health Canada approves the use of mFLUSIVA, Moderna's mRNA seasonal influenza vaccine for adults 50 years and older.



RNA Unwrapped

What is RNA?

DNA holds all our genetic information and stays **safely locked inside the cell's nucleus**. It contains the blueprint for making proteins that keep our body working (e.g. hemoglobin, insulin). Since proteins are built outside the nucleus, the cell makes a **temporary copy** of just the needed instructions. The copy, called messenger RNA (**mRNA**), carries the information to the cytoplasm so the protein can be made. Once its job is done, the **mRNA is quickly broken down** and disappears. Beyond mRNA, scientists are discovering **new types of RNA that could help treat diseases** by regulating protein and gene expression.



Different RNA Therapeutics

RNA-based vaccines and therapies use RNA's natural properties, making their effects **temporary** and **controllable**. Their synthesis and production is **straightforward**, **scalable** and **easy to adapt** to different diseases, offering hope for **treating many illnesses, even those resistant to traditional treatments**.

RNA therapies can **help the body make the proteins it needs** when they are missing, too low, or made incorrectly **because of DNA errors**. mRNA vaccines give the body temporary instructions to make a harmless piece of a pathogen, which **safely trains the immune system** to recognize and fight infections.

Amplify

Gene Expression

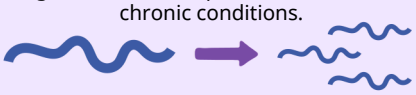
Suppress

mRNA
(messengerRNA) delivers short-term instructions for cells to make a specific protein. While mRNA disappears quickly, limiting its use for chronic conditions, the immunity from vaccines lasts long after the mRNA is gone.



Ex.: Classic COVID-19 vaccine (tozinameran), respiratory syncytial virus vaccine (mRESVIA).

saRNA
(self-amplifying RNA)can copy itself inside cells, resulting in a higher and longer-lasting protein production from less RNA. This can strengthen vaccine responses and is useful for chronic conditions.



Ex.: Novel COVID-19 vaccine (ARCT-154)*.
**Currently only approved in Japan and EU.*

siRNA
(small interfering RNA), along with other proteins, acts like a pair of molecular scissors. By attaching itself to a matching RNA, it triggers the cell to chop it up.



Ex.: hypercholesterolemia (inclisiran), hereditary transthyretin amyloidosis (patisiran).

ASO
(antisense oligonucleotide), which can be made up of RNA, binds directly to a complementary mRNA strand, blocking it from being read into an unwanted or harmful protein.



Ex.: spinal muscular atrophy (nusinersen), amyotrophic lateral sclerosis (tofersen).

RNA therapies can also **turn down harmful or overactive genes** by binding to matching mRNA inside the cell and forming a double strand. Double-stranded RNA prevents the message from being read and is naturally flagged as a sign of infection, leading cells to **destroy it before harmful proteins can be made**.

RNA does not alter your DNA

RNA therapies use or target RNA, not DNA itself (which is safely locked inside your nucleus). **RNA can't directly cause changes to DNA**.

RNA technology has been studied for decades

RNA technology research has been in progress **since the 70s**. Today, **more than 35 RNA therapies** are approved worldwide, including 13 in Canada, and **over 1,200 more are in development**. Many of these **target rare diseases**, where treatment options are limited.

RNA does not remain in your body for long

RNA doesn't stick around in your body for long. mRNA breaks down **within hours to days**, which is why repeated doses are needed. Self-amplifying RNA **lasts longer (several weeks)** due to self-regeneration and may work with fewer/smaller doses.

BRIDGE RESEARCH CONSORTIUM · AVENGER · ScienceUpFirst — AN INITIATIVE OF THE CANADIAN ASSOCIATION OF SCIENCE CENTRES

Prepared by ScienceUpFirst for Bridge Research Consortium with support from AVENGER: Suiyang Liao, Petya Popova and Lisa Opsomer.

Social media posts

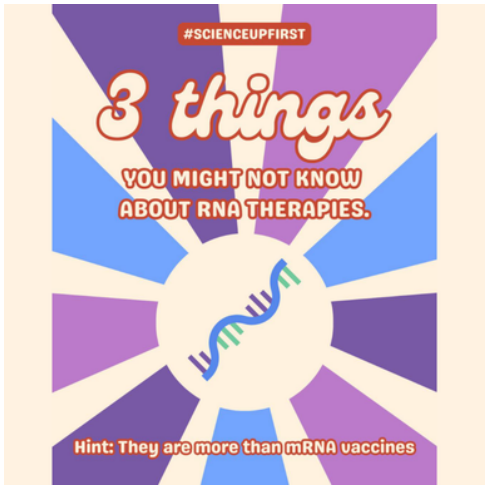
Together with ScienceUpFirst, we developed the following social media posts that can help people in Canada understand the science behind immune-based innovations (e.g. vaccines and other RNA therapies).



CANADA IS STEPPING INTO THE SPOTLIGHT BY ADVANCING RNA MEDICINE

mRNA is a temporary copy of the information contained in our DNA, used by cells to build proteins. Scientists are also testing new types of RNA that could help treat diseases.

Read more



3 THINGS YOU MIGHT NOT KNOW ABOUT RNA THERAPIES

RNA therapies build on the body's natural system to treat disease. Today, they are being explored for rare diseases, cancer, infectious diseases, and more.

Read more



RNA IS EVERYWHERE AND PART OF EVERY LIVING THING

Remember that what might seem "new" or "risky" in medicine often comes straight from the biology that's already inside us.

Read more

RNA and Health Care Futures

In November 2025, the BRC partnered with the University of British Columbia's RNA and Formulation Core to convene an educational event for health-care practitioners and public health professionals who regularly discuss vaccines and emerging therapeutics with patients. The goal was to strengthen their understanding of mRNA technology and its potential future impact on health care in Canada.

The event featured a screening of *The Messenger*, a documentary chronicling the 30-year evolution of mRNA science, followed by a panel discussion with leaders in mRNA science, public health, clinical practice, medical anthropology and regulatory affairs.

Moderator: Adriana Barton
Panelists: Dr. Pieter Cullis, Dr. Ève Dubé, Heather Deehan, Dr. Jia Hu, Dr. Steve Pascolo

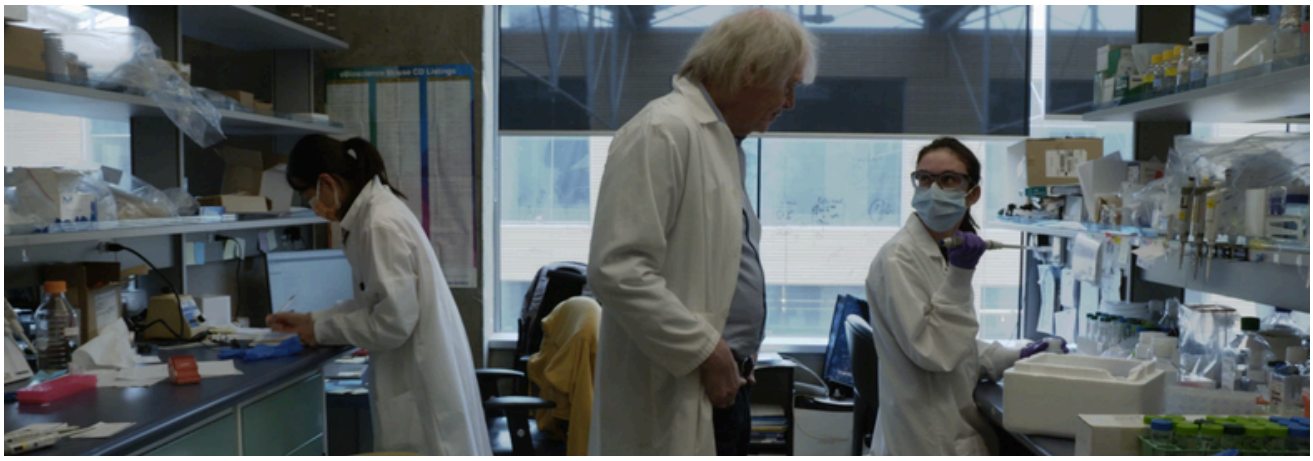


Listen to the recording and read the transcript:
https://youtu.be/cdjRLQAPBnA?si=1i58OyklYIK-1-zX

120+ attendees
including health-care providers and health systems leaders

>80% of post-survey respondents
learnt something new about mRNA technologies and their role in Canadian health care, and feel more comfortable explaining mRNA technologies and sharing what they learned.

Host a screening of *The Messenger*



We have made *The Messenger* available as an educational resource, enabling organizations and teams to host their own screenings and learning activities that support informed discussions about mRNA technologies and their role in health care.
Screening information

Discussion questions

1. How does mRNA vaccine technology compare to traditional vaccine technology? What is unique about mRNA vaccine technology?
2. Many advances in mRNA technology and its application have occurred since the documentary. Name a few of these advances. Why are they poised to potentially transform how we treat and prevent diseases and where are areas where this technology can be improved? Discuss Canada's contribution to advancing the mRNA landscape.
3. Common misunderstandings about mRNA vaccine technology include that it alters DNA, it is novel and thus its development was rushed, and the vaccine remains in the body permanently. How could you approach these concerns in conversations based on what information was shared in the documentary?
4. The documentary highlights several relationships between academic scientists and industry, including scientists establishing their own biotechnology companies. How do these relationships contribute to public perceptions of mRNA technologies and vaccines generally? Would transparency of scientist-industry relationships improve the public's understanding of and trust in novel biomedical technologies? Why or why not?
5. The metaphor of a recipe is used to explain how mRNA and mRNA vaccines work. Was this metaphor helpful? Why or why not? What other communication techniques could be used to help explain how mRNA or mRNA vaccines work?
6. How is trust portrayed throughout the documentary? What factors might contribute to improving public trust in mRNA vaccines (and vaccines in general)? What elements might harm public trust in mRNA vaccines (and vaccines in general)?

Case studies

CASE STUDY 1

You are the nurse practitioner in a primary care clinic. A patient in their mid-60s with no major chronic illness is coming in for their regular flu shot but has learned that the shot is now an mRNA-based flu/COVID-19 combination shot. They are not opposed to vaccination in principle, but they are hesitant because they believe mRNA vaccine technology was developed too quickly to be trustworthy and this combination shot is new and they don't want to be a guinea pig. They trust clinicians in general but have seen conflicting information on mRNA vaccine technology online and distrust in big pharmaceutical companies, so they want to make an informed decision without being judged.

You have three (3) minutes to: Discuss the patient's concerns with empathy, using clear, non-technical language. Explain some of the mRNA vaccine development process while supporting shared decision-making without pressuring the patient.

CASE STUDY 2

You are the pharmacist at a busy local community pharmacy. A patient in the second trimester of their pregnancy is asking about how to best protect themselves and their unborn baby during a new COVID-19 wave. They did take the COVID-19 vaccine when it was first launched during the pandemic (but not a booster), but now that more time has passed and being a first-time mother, they are slightly more skeptical of the technology. They are concerned that mRNA vaccine will alter their baby's DNA and remain in their body permanently and affect their baby. They want to learn how mRNA vaccines work and how safe they are before deciding whether to receive the COVID-19 vaccine.

You have three (3) minutes to: Explain the technology in clear, non-technical language, and explore concerns by addressing some common myths. Aim to correct misconceptions without sounding dismissive and highlight the benefits to both patients involved.