

2020

## SUCCESS!

Vaccines tested, approved, and distributed

# THE HISTORY OF mRNA Vaccines

Today's success with mRNA vaccines against COVID-19 comes from the decades of research that came before it.



2010s

## Smarts and spikes

After outbreaks of other coronaviruses in 2003 (SARS) and 2012 (MERS), scientists study how the “spike protein” works and how it could be used in vaccines.



2000

## And we're off!

In 2005, scientists figure out how to make synthetic mRNA safe for injection into cells. Research in the field accelerates.



1990s

## Failing forward

Could synthetic forms of mRNA be used in medicine? The potential seems endless, but so do the challenges. Failed experiments still build knowledge.



1980s

## Love those lipids

Researchers study the nature of lipids, which lays the groundwork for using lipid nanoparticles in mRNA vaccines many decades later.

For more information about this history, visit: [cihr-irsc.gc.ca/e/52424.html](https://cihr-irsc.gc.ca/e/52424.html)



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