BRINGING mRNA CANCER VACCINE TO CHILDREN IN ALBERTA & CANADA

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DISCLOSURE

- No conflict of Interest
- Happy Chair Holder 2025-2030

kids cancer care

UNIVERSITY OF CALGARY

Vision & Mission

VISION **Smarter cures, Better lives, Inspire**

MISSION

Transform treatment through innovation, leadership and collaboration for every child with brain tumors

1. Deliver innovative research trials (mRNA vaccine, CART, targeted agents)
2. Build a Western Canadian center of excellence
3. Inspire and train the next generation globally

OBJECTIVES

- How it all started
- General principals of mRNA vaccine in Oncology
- Clinical development at ACH
- Where we are going

HOW IT ALL STARTED

- 2013 Adam, 13 yrs old boy with High Grade Glioma
  - No curative option
  - Palliative surgery and focal radiotherapy
  - His father launched a biotech company developing mRNA cancer vaccine (Providence Therapeutics)

- 2023 Despite the grim prognosis of his tumor, he was still alive
  - Should we revisit his diagnosis in the molecular era?
  - Connection in the background with Dr Jennifer Chan for sequencing of his tumor



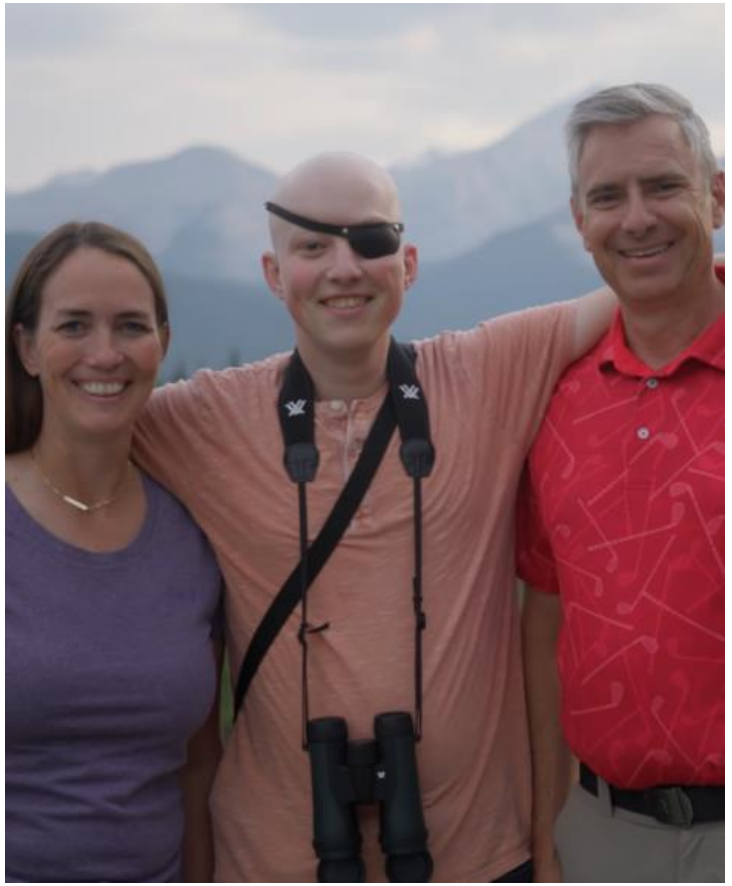


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ADAM' STORY

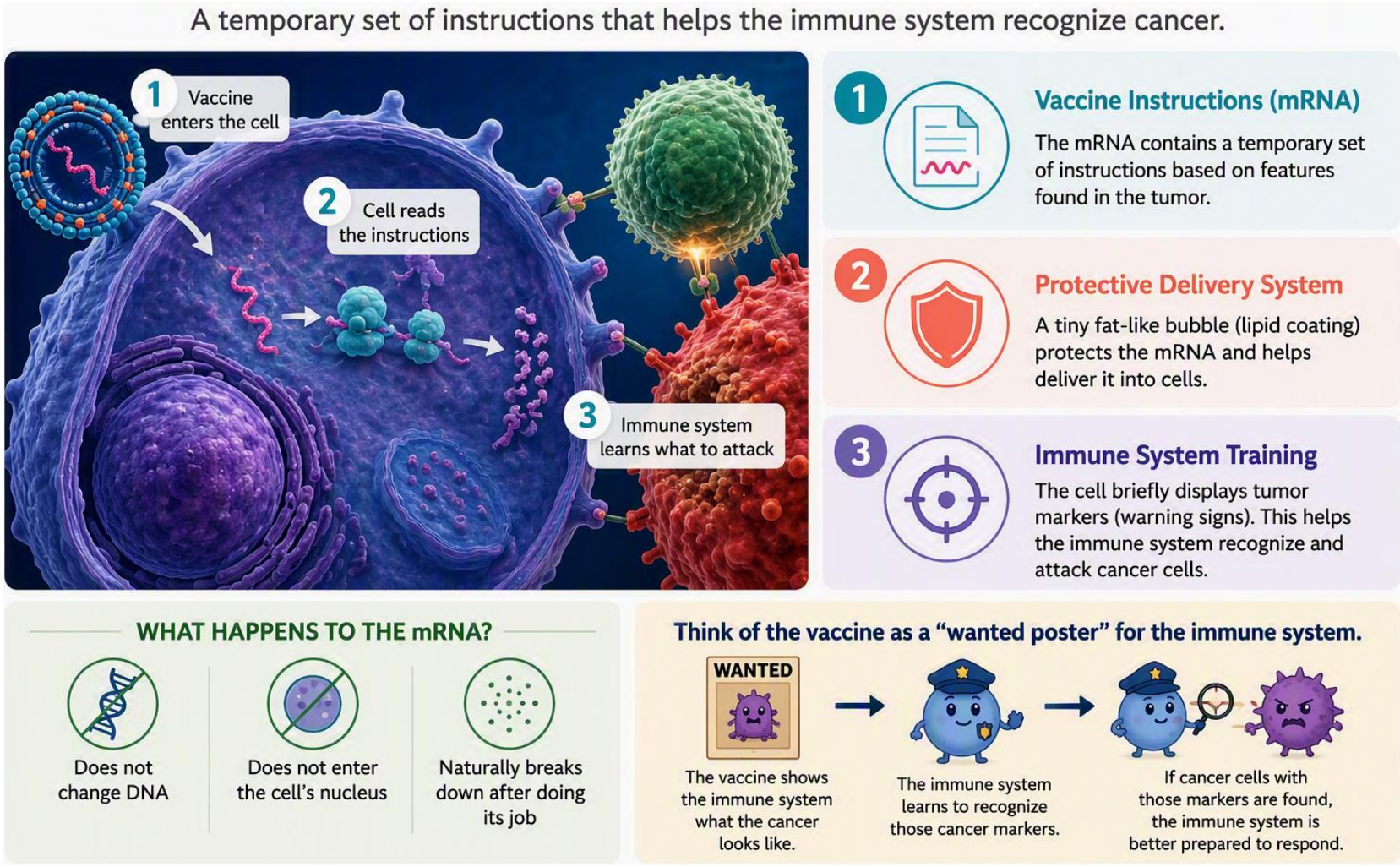
- 2024 He presented with relapse
  - Managed in the adult side with surgery and repeated RT
  - Not ready to give up, but his personalized cancer vaccine was "almost ready" (Adam's Story – YouTube)

- Regulations issues in Canada to administer investigational new drug
  - Out of country options….
  - Self administration at home of his personalized mRNA vaccine over 8 months (several boosts)
  - Evidence of tumor response (at 10 months)



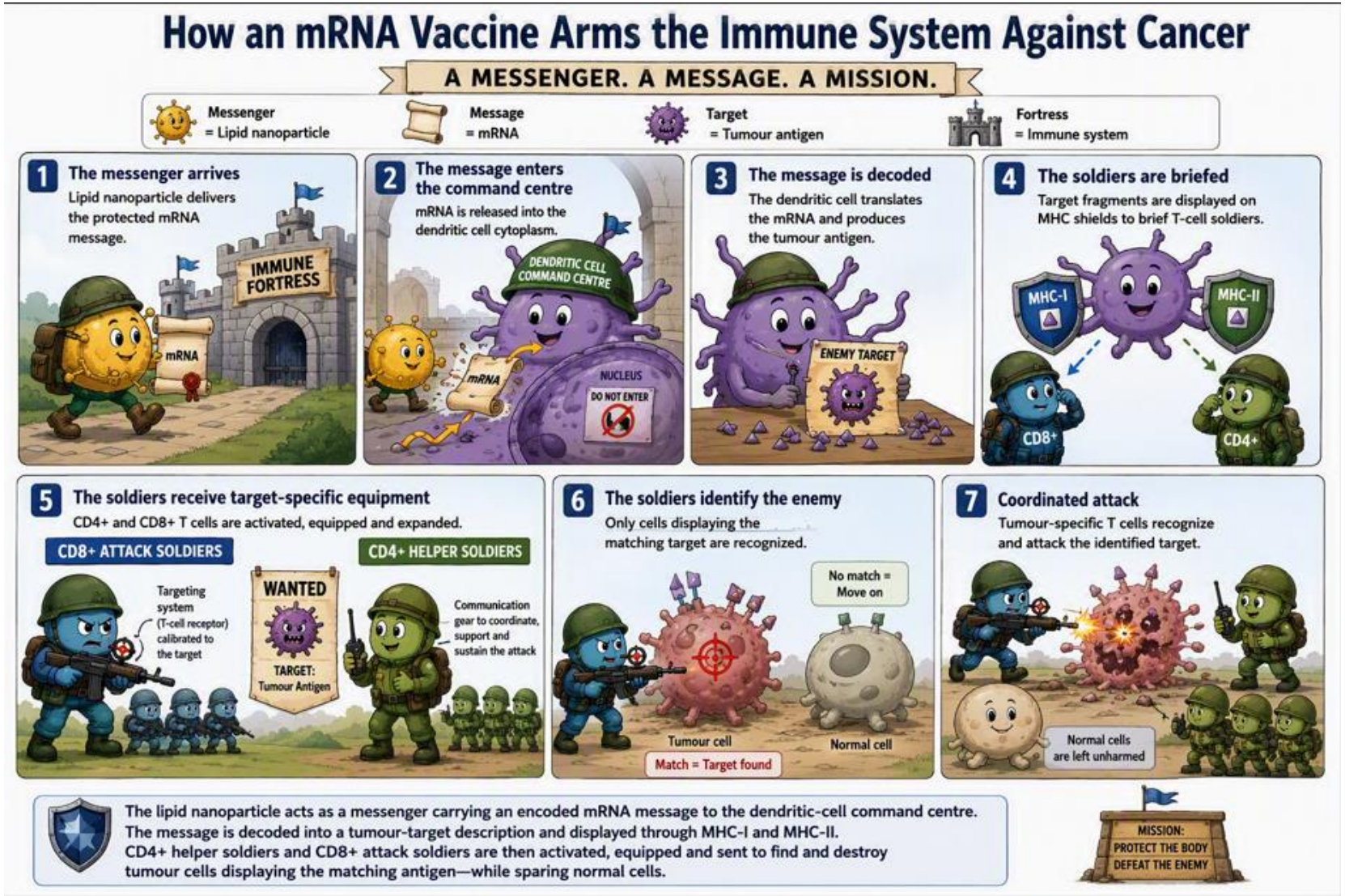
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WHAT IS AN mRNA VACCINE FOR CANCER



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HOW DOES IT WORK?



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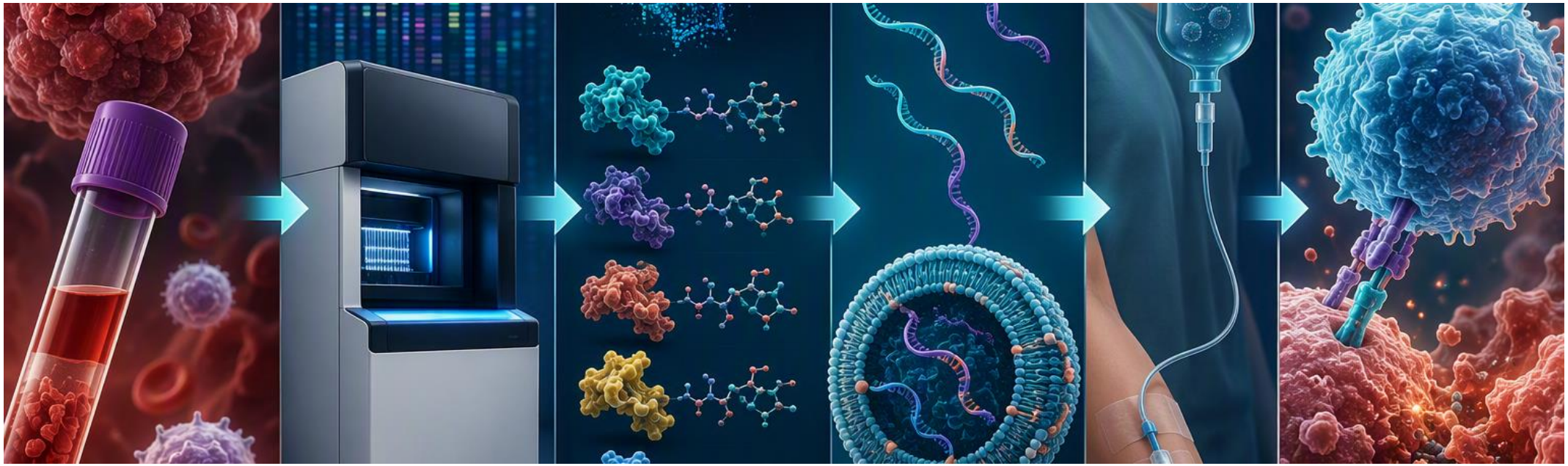
MEANWHILE IN AUSTRALIA



- PaedNEOVAX clinical trial
  - Easier regulation in Australia
- Phase I/II clinical trial of personalized mRNA cancer vaccine for Pediatric Brain tumors
  - Newly diagnosed DMG
  - Relapse HGG, MB, EP
  - Phase II target of 65 patients (45 DMG)
  - Fully personalized vaccine (~ 9 weeks)

MECHANISM: FROM MESSAGE TO TUMOR KILLING

Each patient's tumour provides the blueprint.

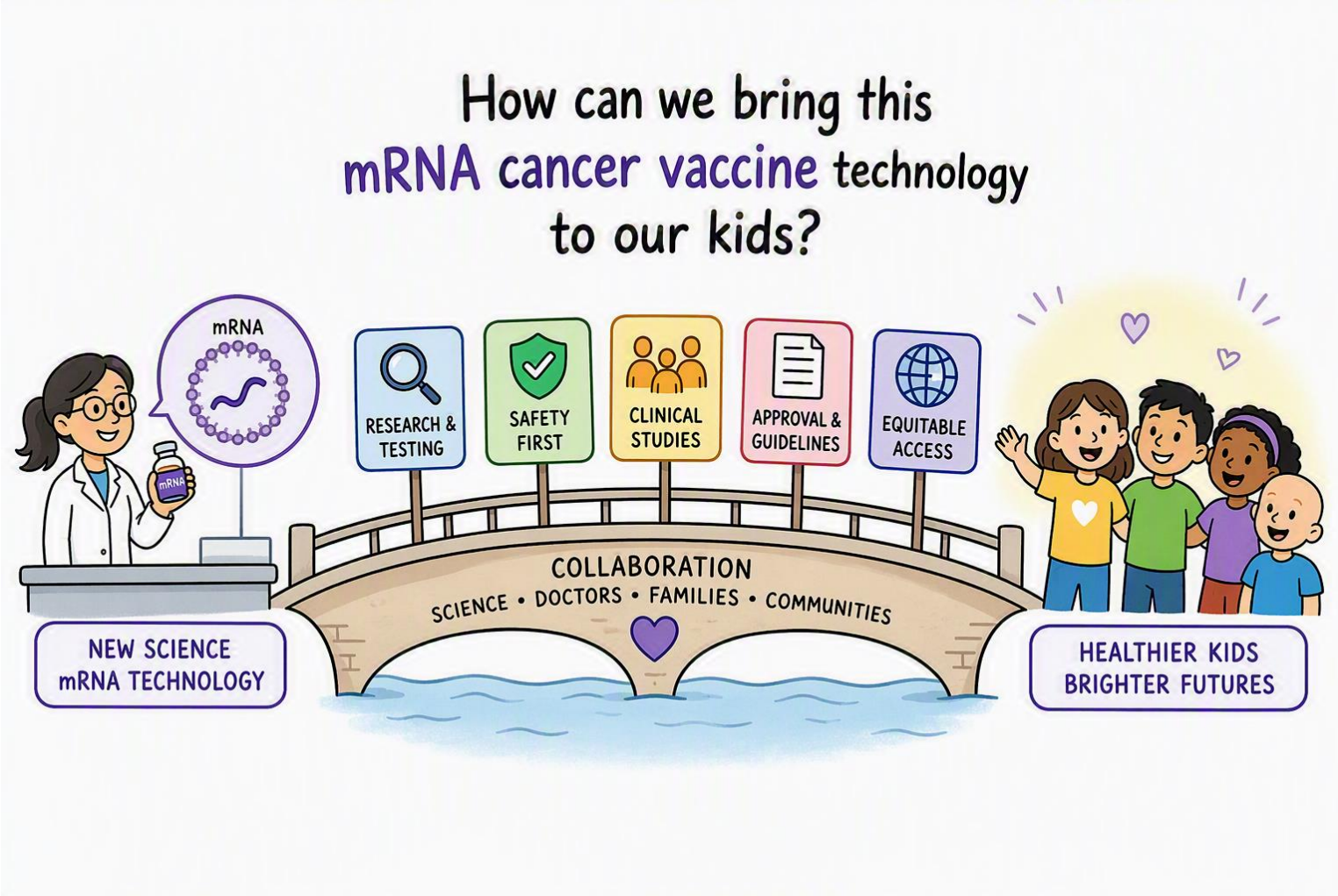


Tumour + normal sample → Sequence mutations → Predict Tumor Specific Antigens and Tumor Associated Antigen → Manufacture mRNA-LNP → Vaccinate + monitor

Personalization increases specificity but adds time, logistics, cost and manufacturing complexity.

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WHY NOT IN ALBERTA AND CANADA?



FROM A CALGARY BASED BIOTECH TO ALBERTA CHILDREN'S HOSPITAL…….



- 2025 Relapse MB patient connected with Providence Therapeutics
  - We met with Providence team
    - Compassionate Access of mRNA vaccine through single patient study (OLIP) **Let's do it!**
  - Everybody got on board (CRU, University, Pharmacy, nurses)

    This is a lot of work for one patient
  - Received Health Canada approval within 1 month
  - June 2025 Launch of first Open Label Individual Patient (OLIP) with personalized PTX 102 mRNA vaccine trial

    First in Canada for pediatric patient
- 2026 Launch of 2nd OLIP for a patient with progressive DMG (PTX106-R)

WHERE DO WE GO NOW?

- Partnership between Providence Therapeutics and the University of Calgary Nov 2025
- Can we bring this new cancer treatment platform to more children through a **clinical trial in Canada** ?
- How do we position ourselves/ongoing trials like PedNeovax
  - Can we optimize the time, logistics, cost and manufacturing complexity attached to personalization of the mRNA vaccine



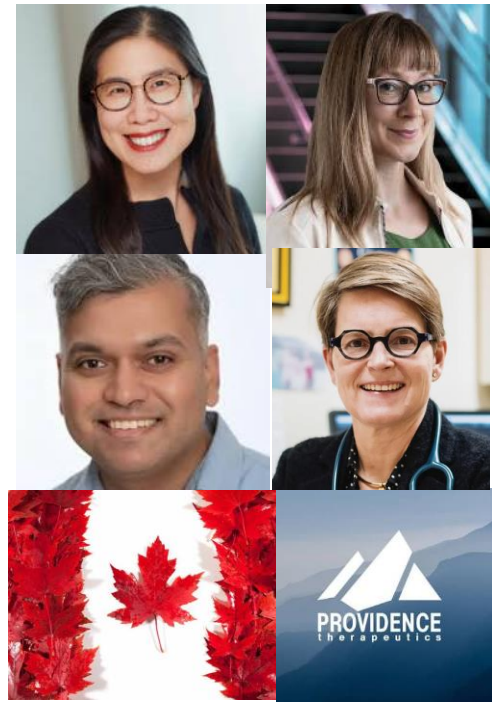


OUR NEXT STEP

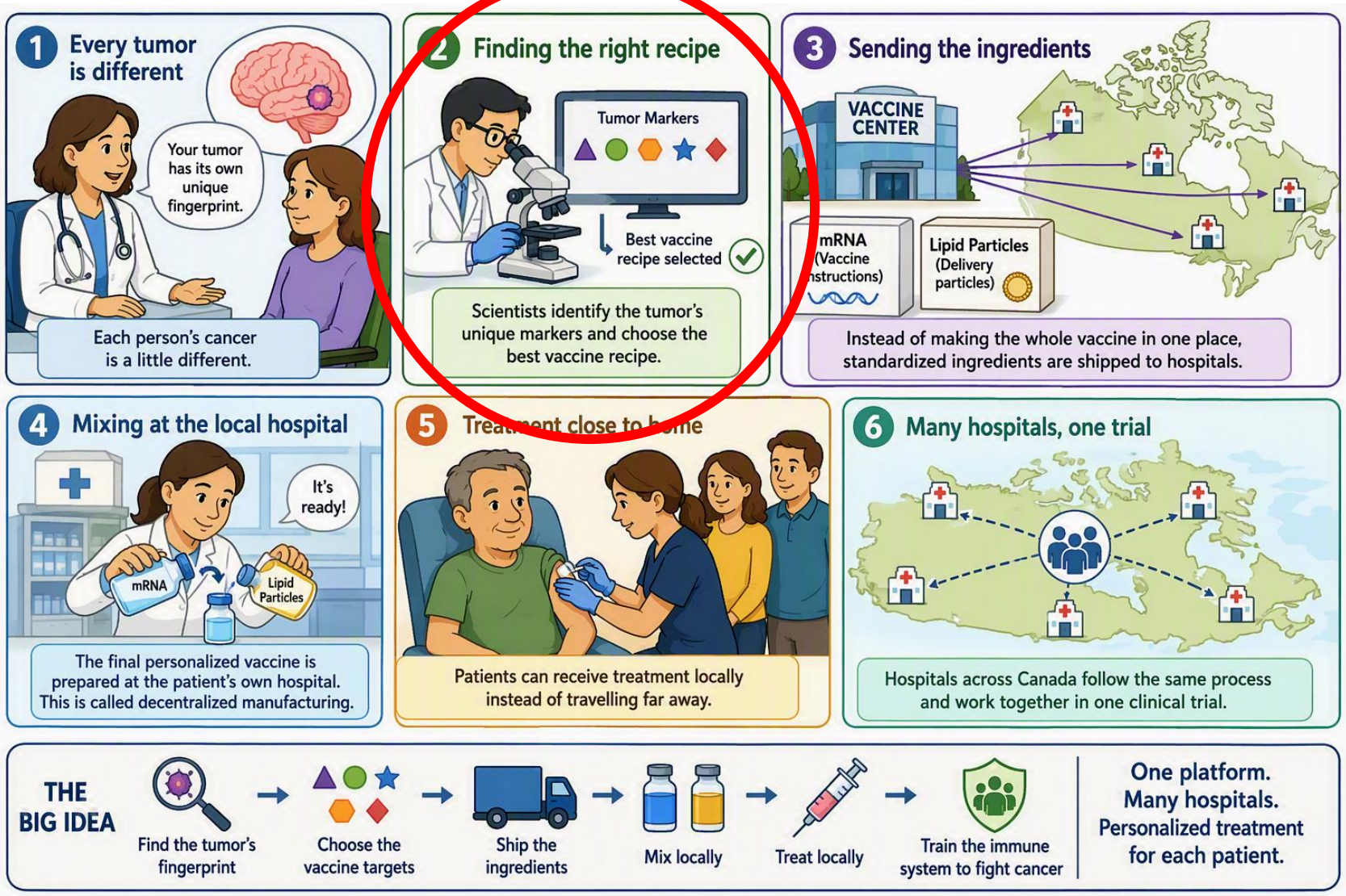
- Successful LOI application to the Canadian Research Society (CRS)

  "A feasibility study of a **modular precision mRNA-LNP cancer vaccine** platform targeting neoantigens and tumour-associated antigens in children with high-risk brain tumors

- Full Grant application submitted Sept 16th (500 K)
  - To treat 15 patients in Canada with DMG and recurrent high-risk brain tumors (HGG, MB, EP, ATRT)
  - "Semi personalized vaccine"
    - Several preset combinations of mRNAs for antigens most commonly found in specific brain tumor type
    - Characterization of tumor associated antigens of each patient tumor (by staining IHC)
    - To be mixed at the bedside



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PRECISION mRNA VACCINE

Semi personalized

Goal of 3 weeks from receipt of tumor sample to matching of mRNAs combination ready for the patient

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OUR NEXT STEP

- Primary objectives
  - Feasibility of molecular to treatment workflow with delivery target timeline of 3 weeks
  - Feasibility and reproducibility of decentralized point of care vaccine manufacturing
  - Safety and tolerability

- Secondary objectives :
  - Characterization of antigen specific immune response (blood test)
  - Description of tumor response by imaging (MRI)

VISON



We aim at

- Putting Calgary on the map as national lead to develop mRNA vaccine platform for pediatric cancers
- Allowing access of this promising approach to more Canadian children
- Larger Phase II clinical trial

MERCI !

- Clinical Research Unit in the section of Pediatric Oncology, Alberta Children Hospital

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Kids Cancer Care Chair in Pediatric Neuro Oncology