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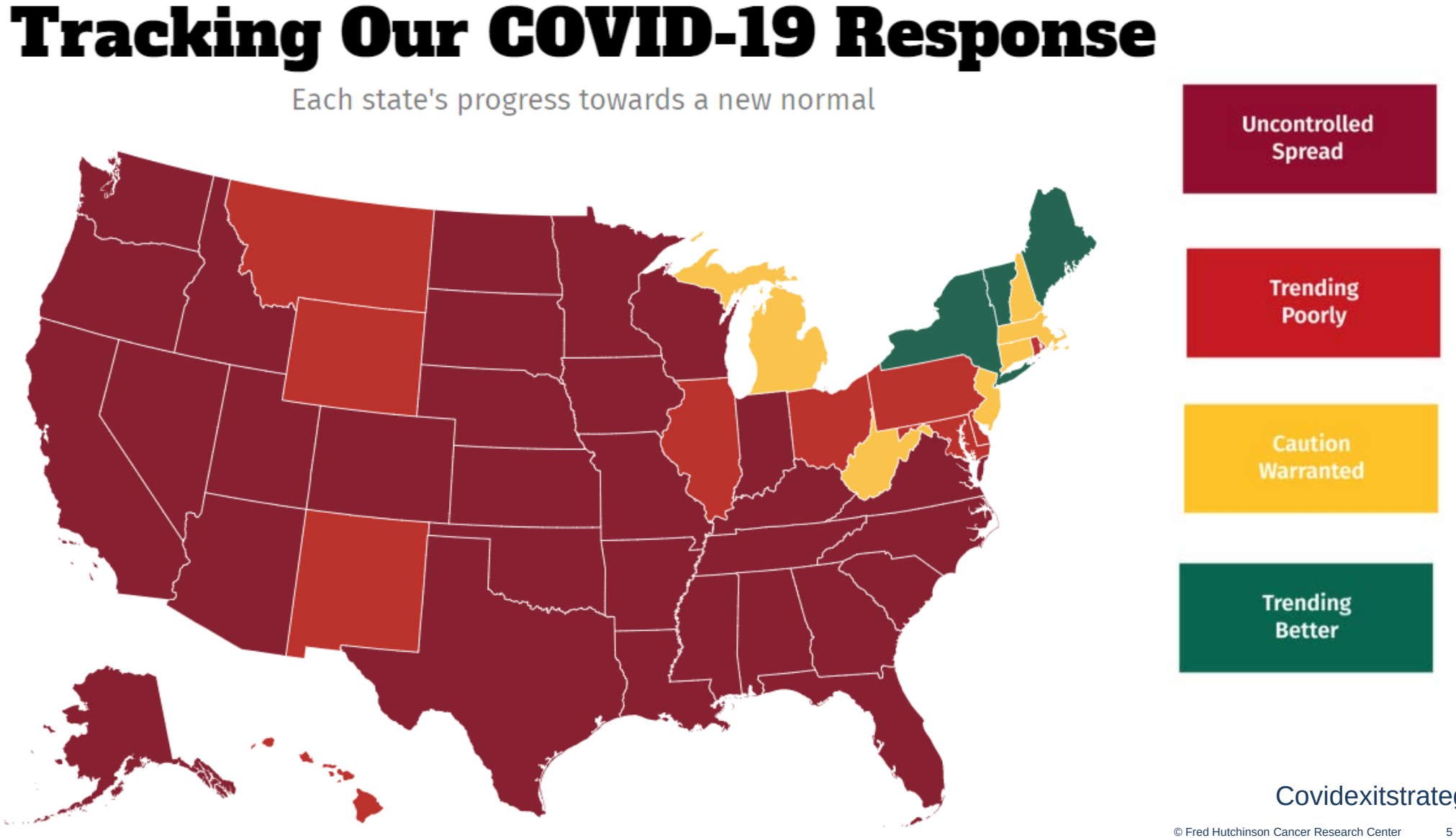
FORMATION OF THE COVID-19 PREVENTION NETWORK (COVPN) AND OFFICIAL WEBSITE LAUNCH

COVID-19
Prevention Network

- The COVID-19 Prevention Network (CoVPN) was formed by the National Institute of Allergy and Infectious Diseases (NIAID) at the US National Institutes of Health to respond to the global pandemic. Using the infectious disease expertise of their existing research networks and global partners, NIAID has directed the networks to address the pressing need for vaccines and monoclonal antibodies (mAbs) against SARS-CoV-2. The HVTN is one of four NIAID-funded networks that constitute the CoVPN.
- **Access the official website:** https://coronaviruspreventionnetwork.org

Spread in the US



Covidexitstrategy.org

What could a SARS-CoV-2 vaccine do?

Benefit the individual

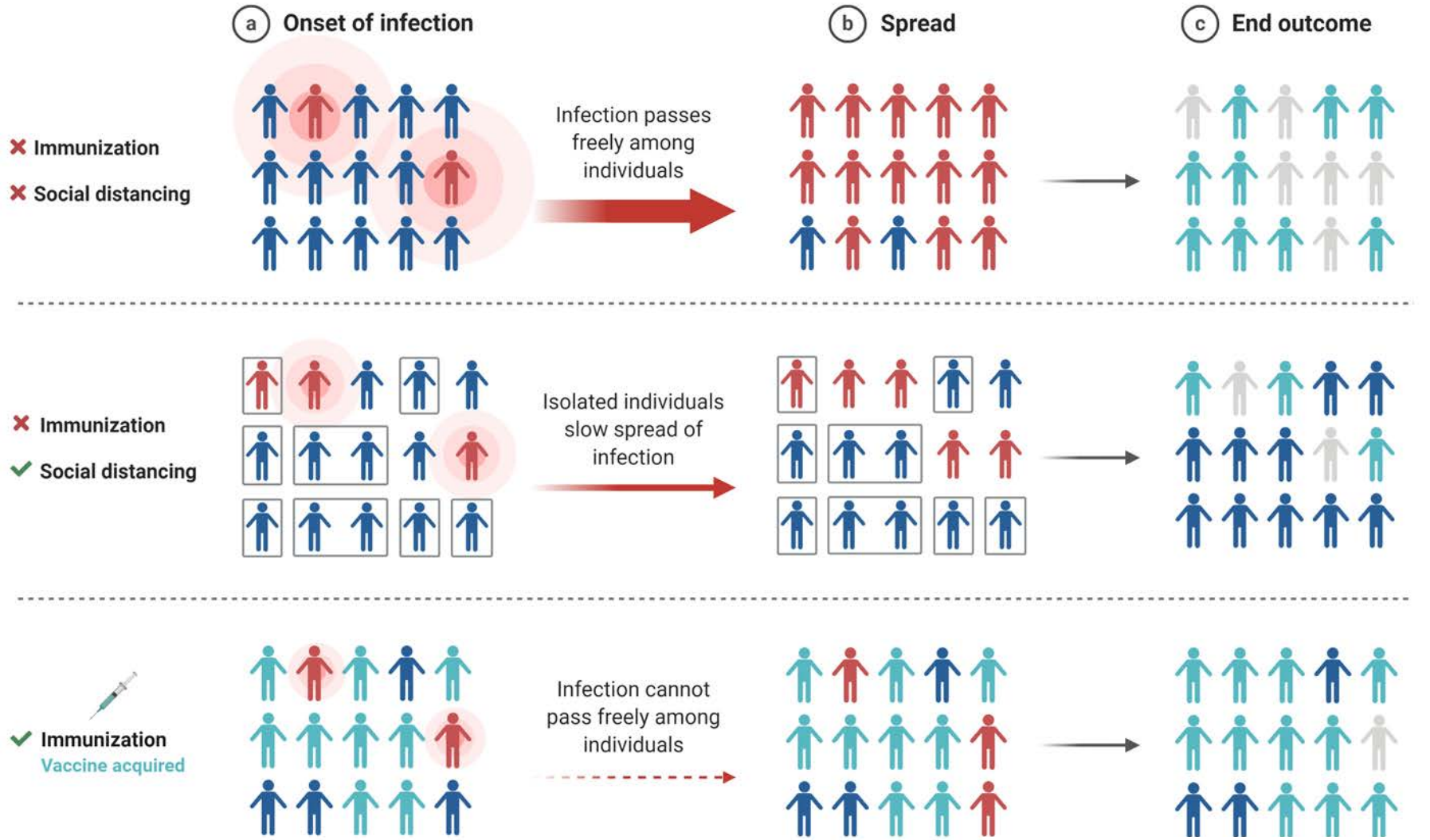
- Reducing the severity of illness
- Prevent infection

Benefit the community

- Reduce transmission
- Healthier communities

COVID-19
Prevention Network

Principles of
HERD IMMUNITY & SOCIAL DISTANCING



Images made with BioRender

How does a vaccine work?

- By teaching the body to recognize and fight invaders

Body recognizes SARS-CoV-2

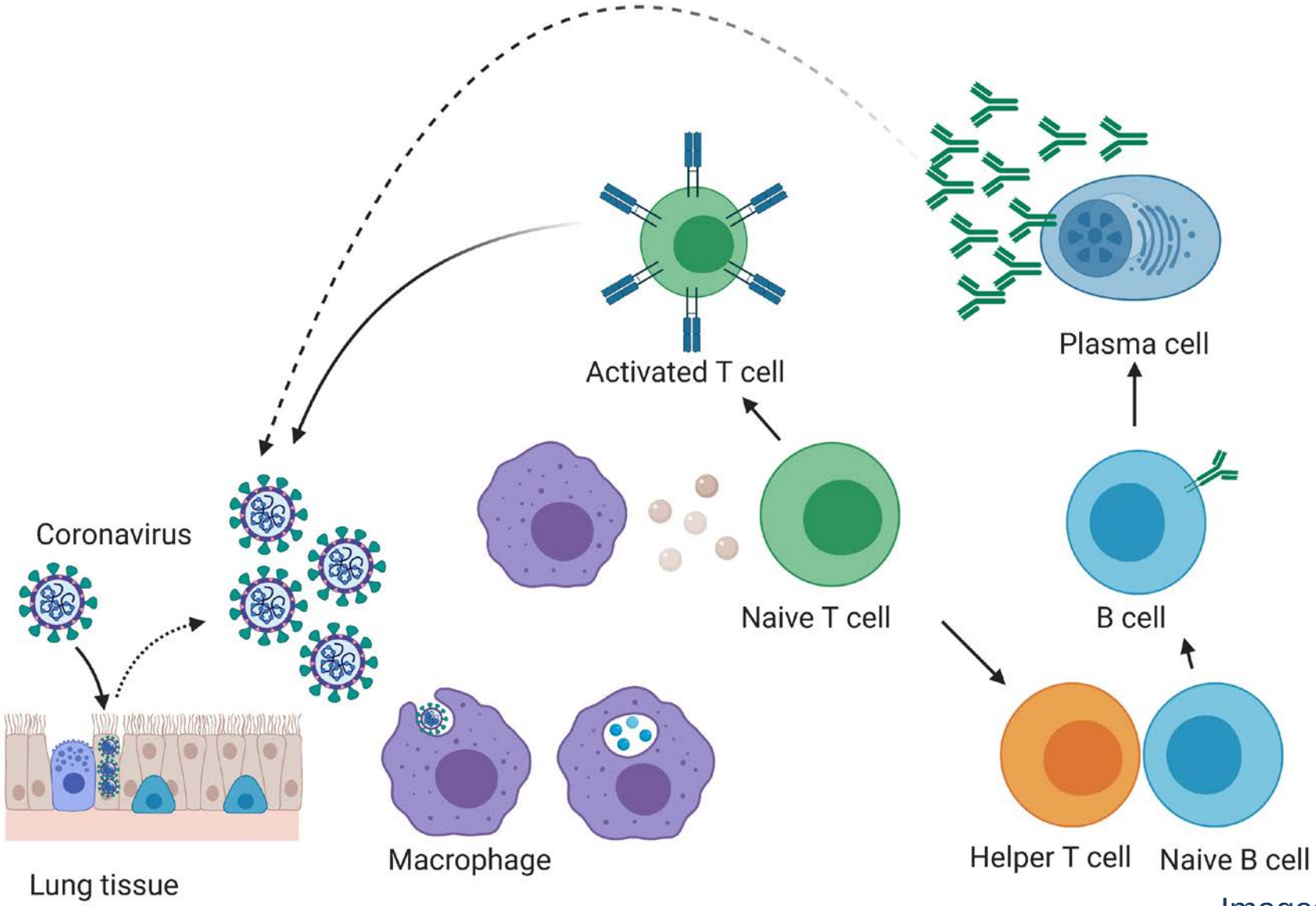
Body – sounds alarm

Fighter cells & proteins go into action

GOAL: SARS-CoV-2 is blocked or controlled

COVID-19
Prevention Network

Immune response to infection



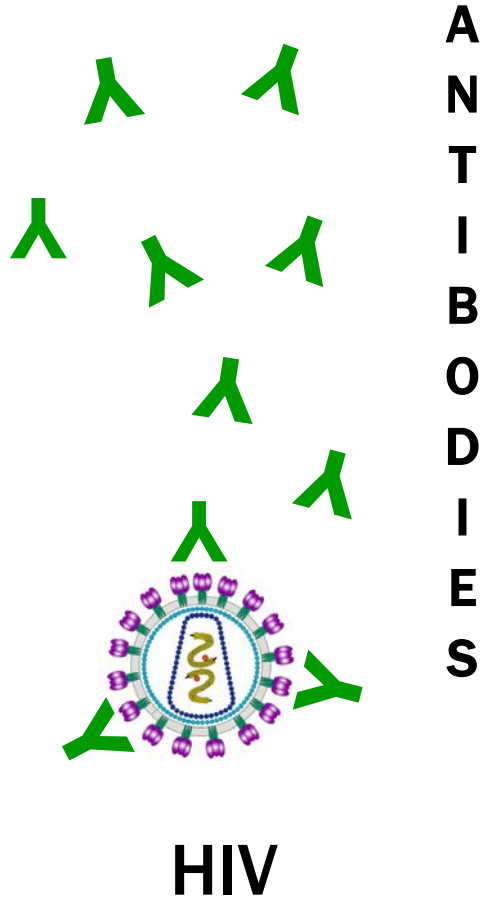
Images made with BioRender

How do Antibodies Work ?

- Three distinctive ways

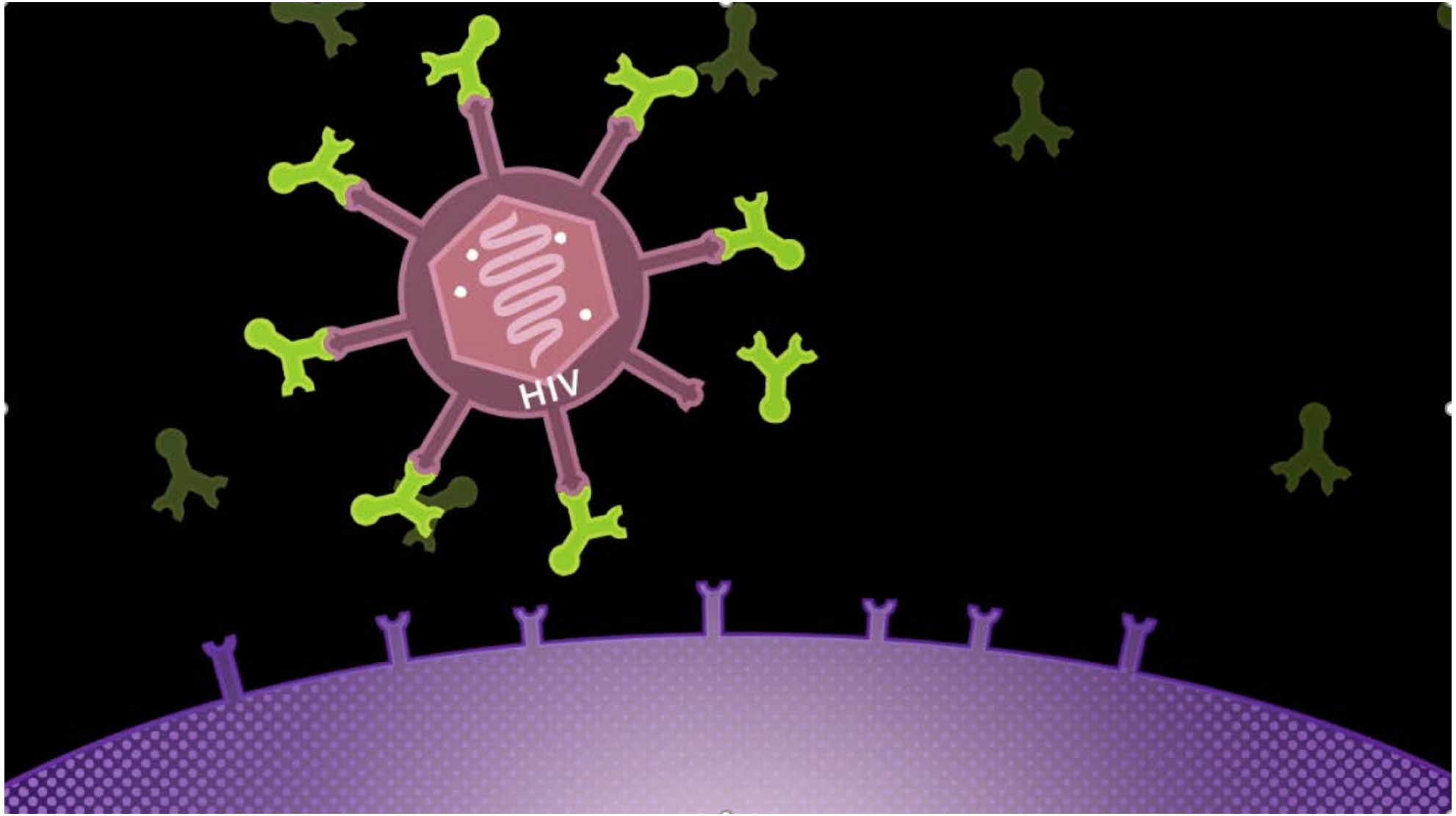
Reduce Severity

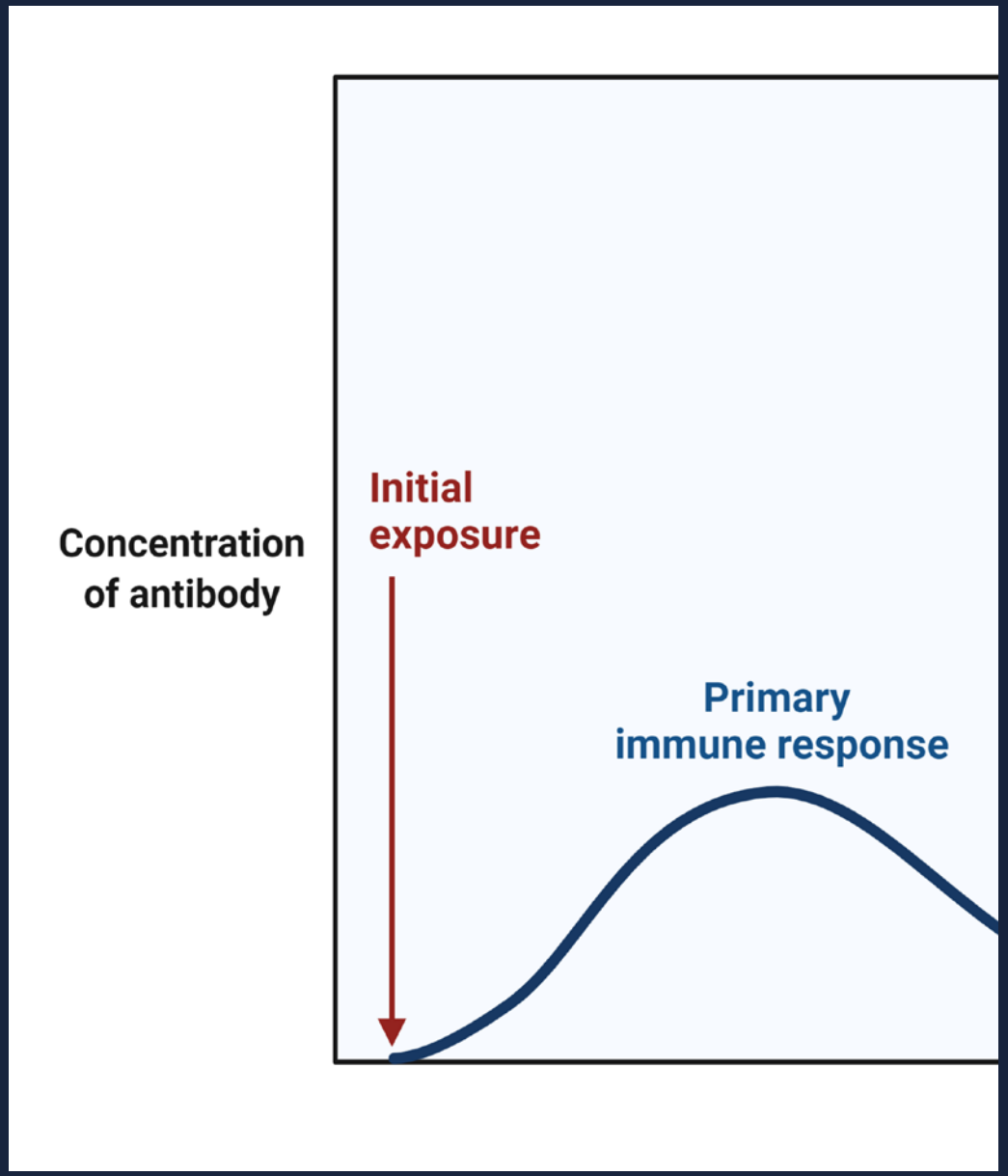
- Neutralization
- Opsonization
- Sensitization/Complement Activation

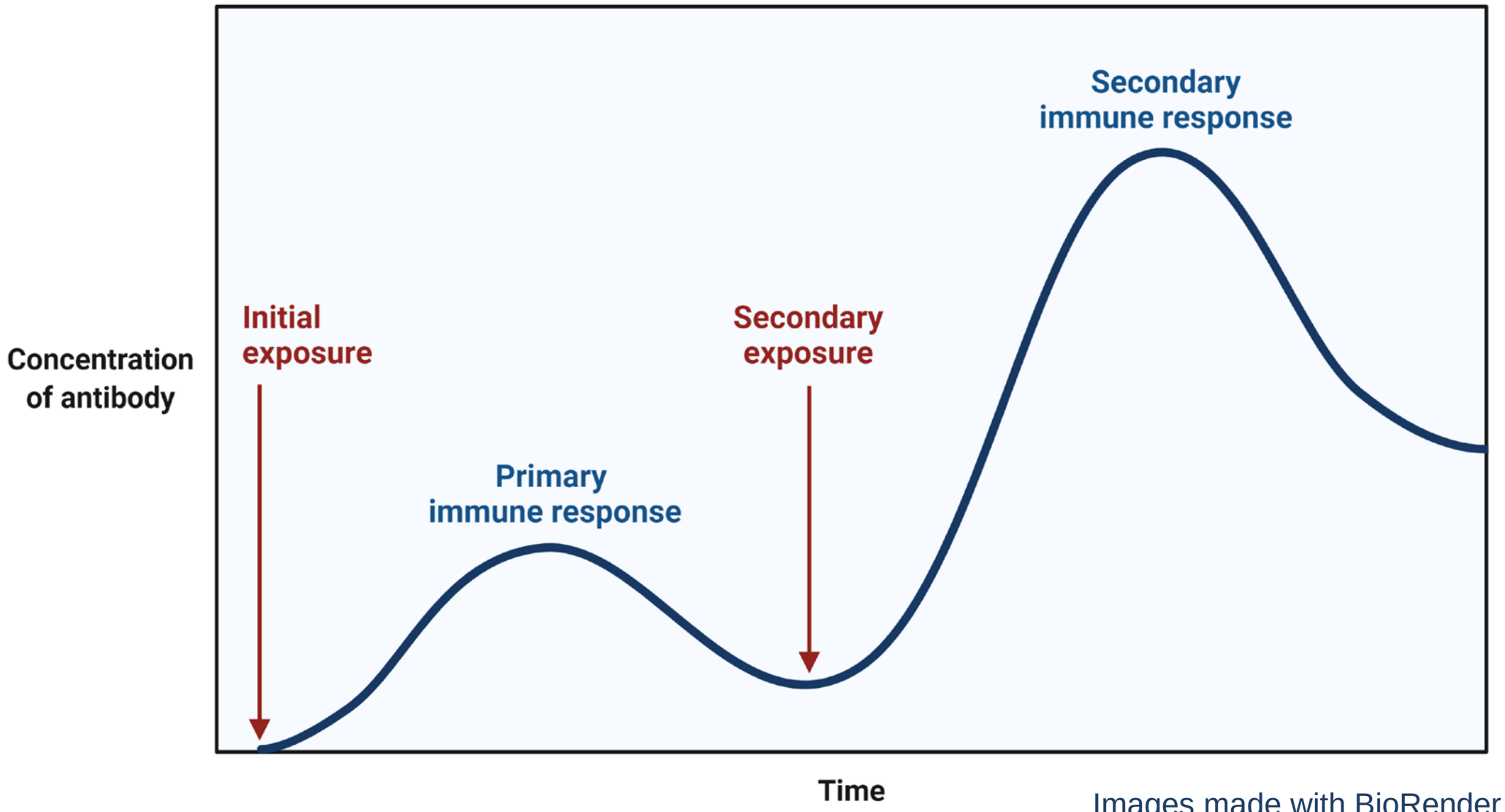


How Do Antibodies Prevent Infection?

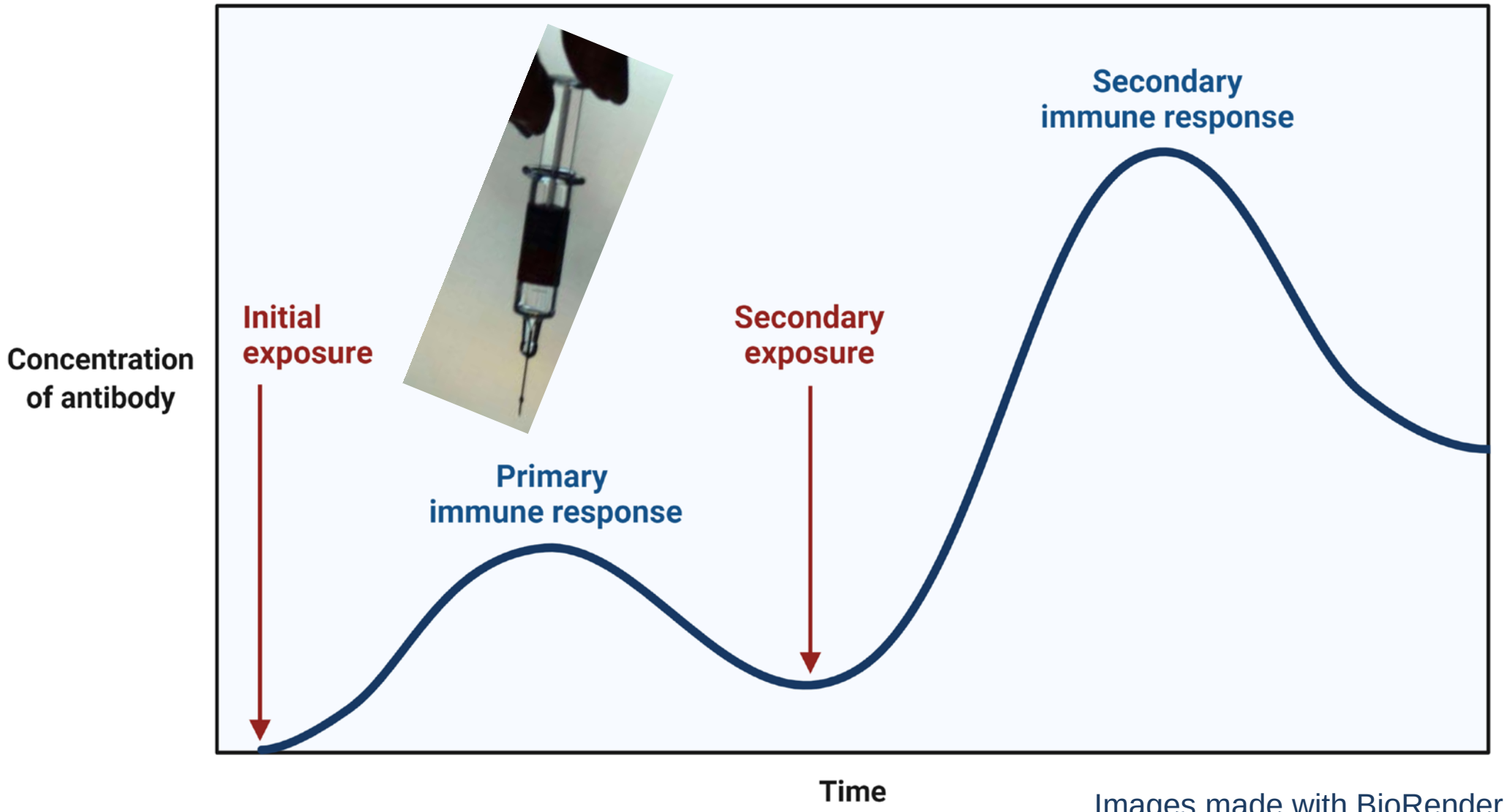
Neutralization







Images made with BioRender



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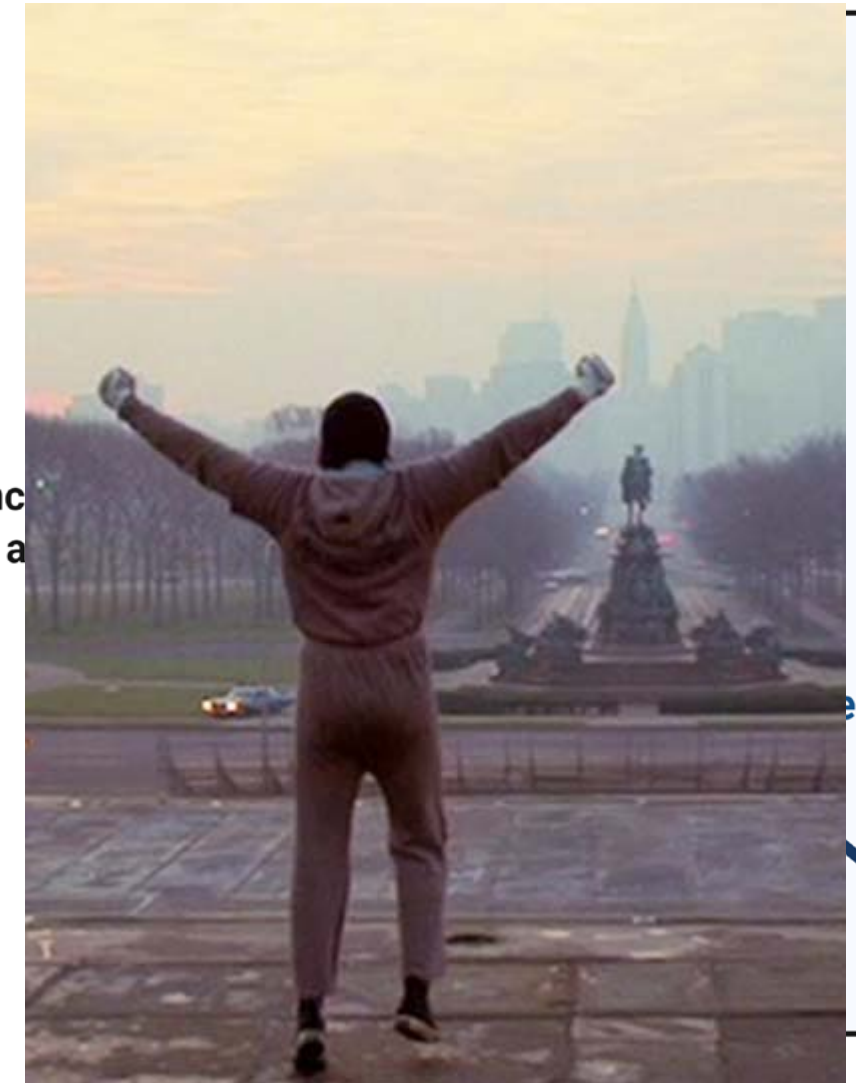
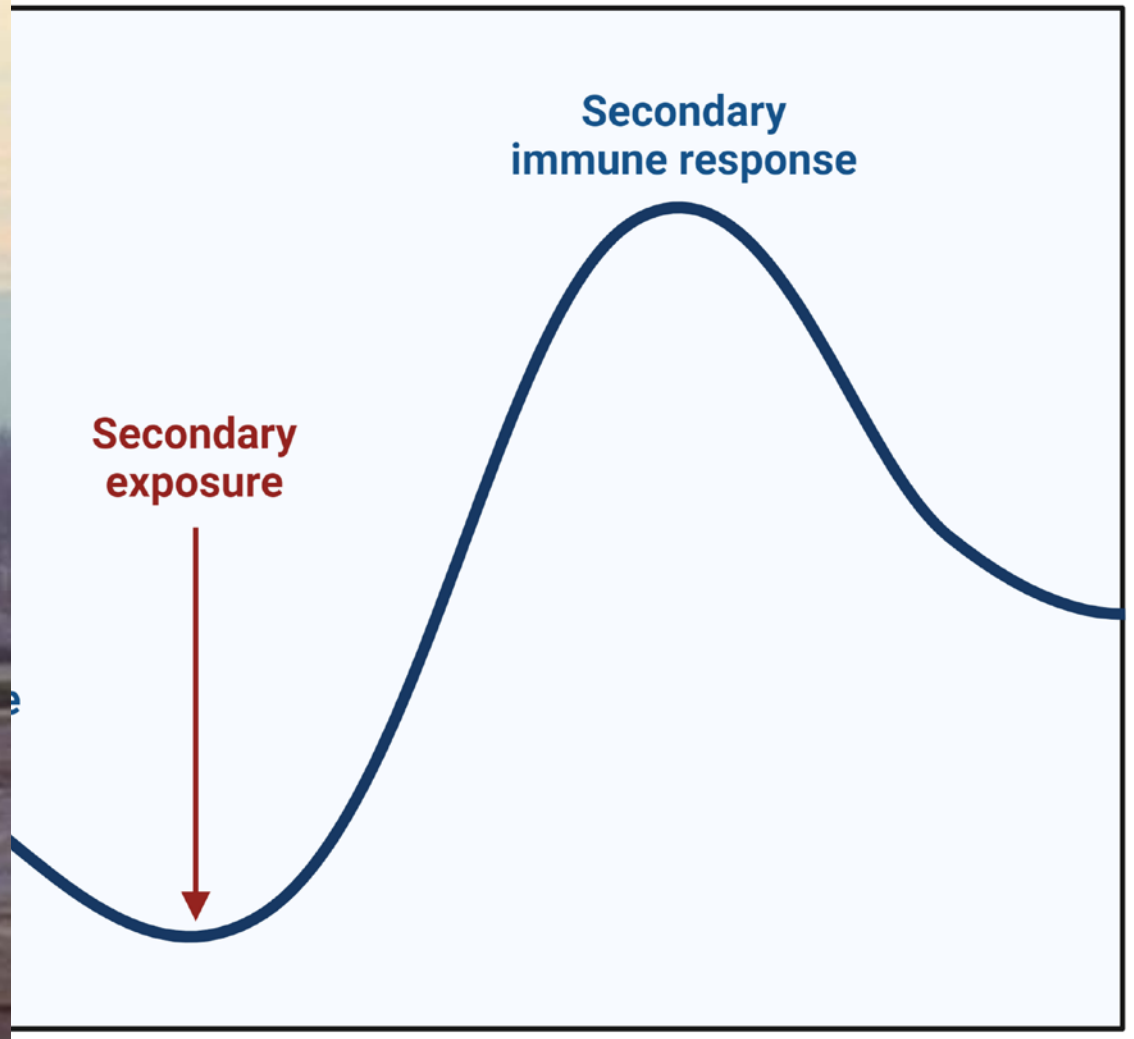




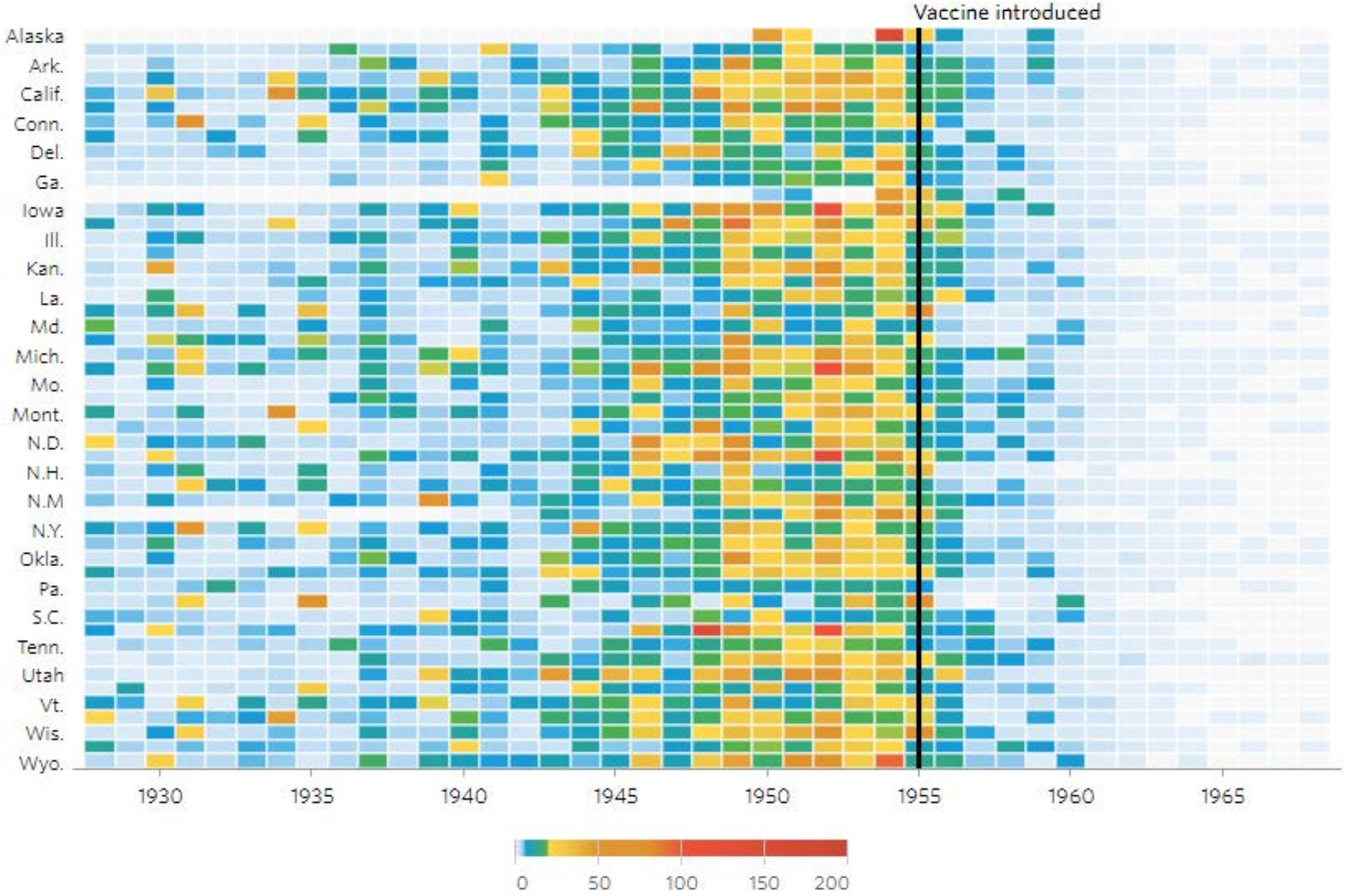
Images made with BioRender

Smallpox: The first vaccine

- Virus killed over 20 million in the 20th century
- Edward Jenner discovered vaccine in 1796
- Full eradication of the virus took until 1980

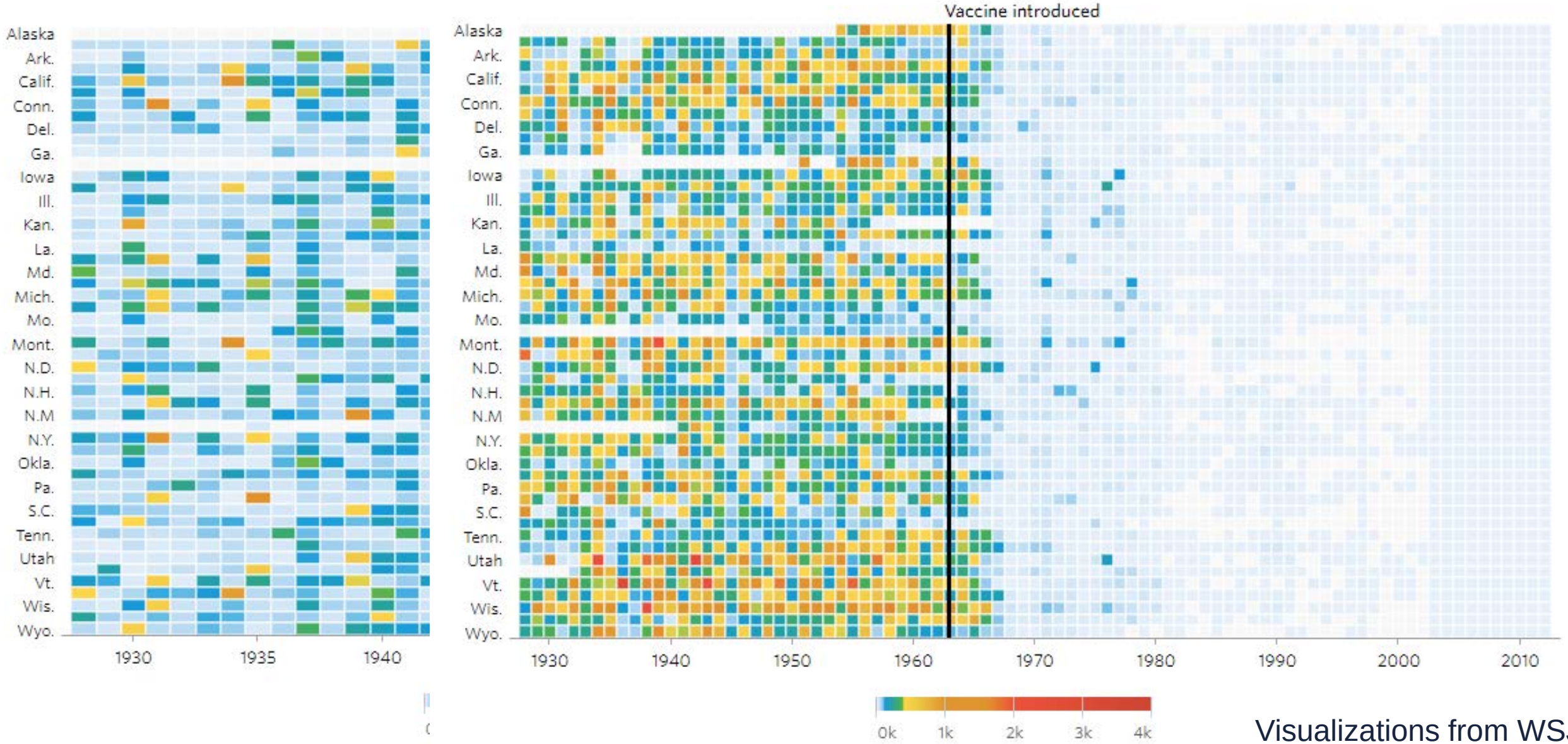
Smallpox: The first vaccine

Polio



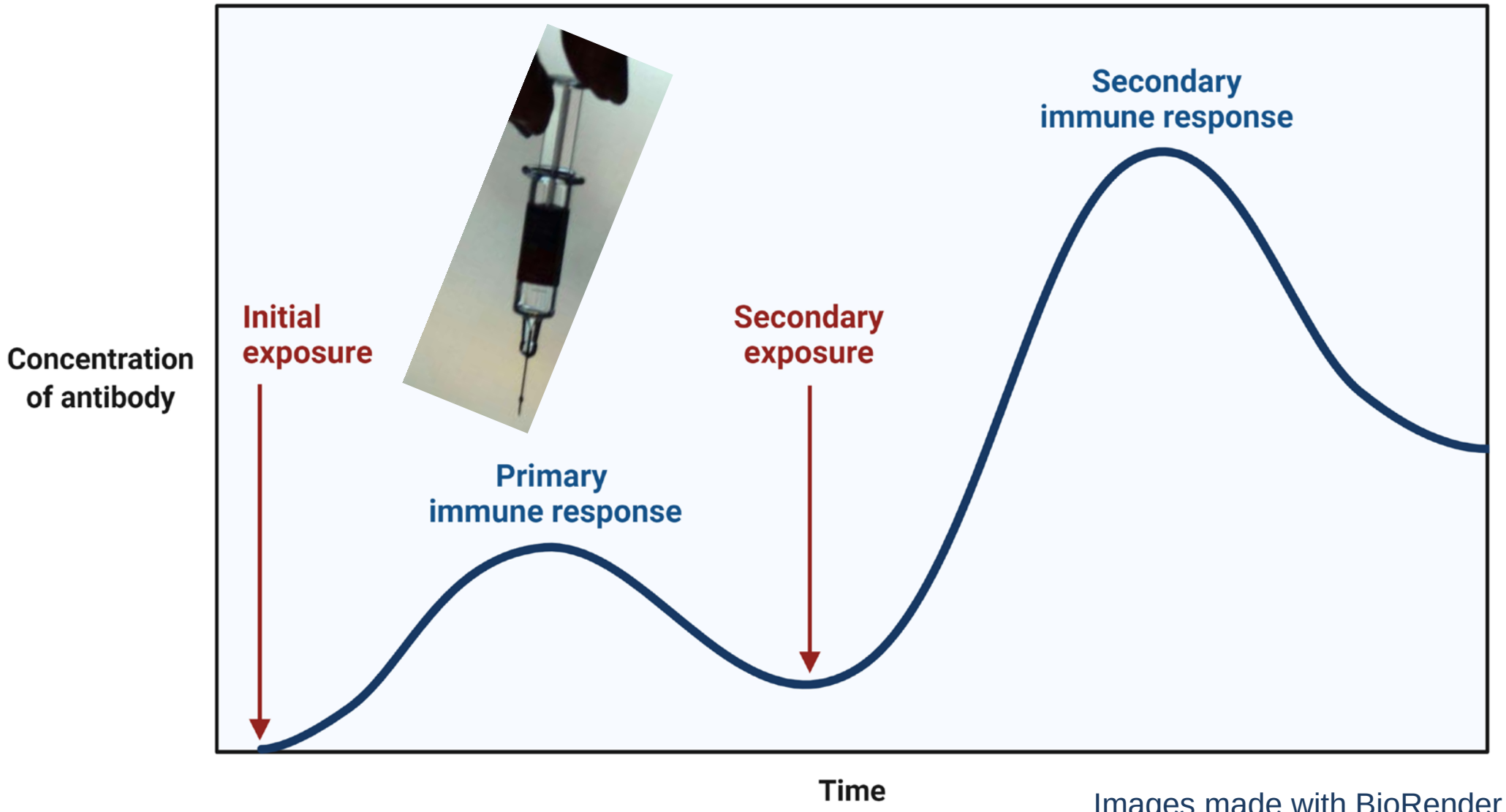
Polio

Measles



Visualizations from WSJ

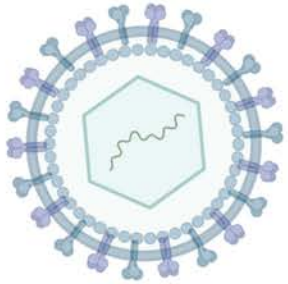
Questions?



Images made with BioRender

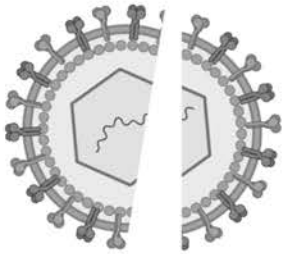
Approaches to **Viral Vaccine Development**

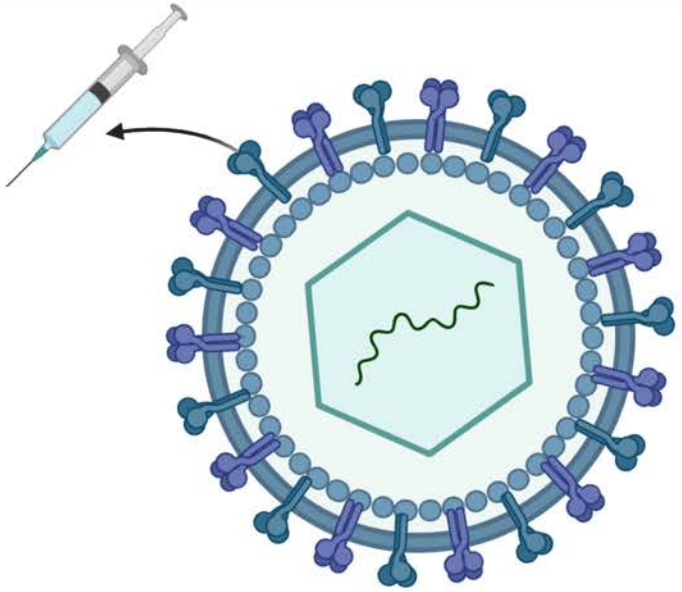
a. Live attenuated



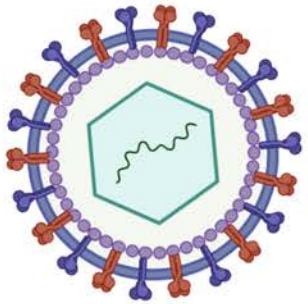
b. Whole inactivated

c. Split inactivated

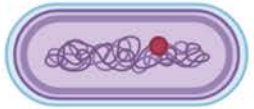




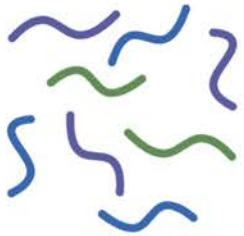
i. Recombinant viral vectors



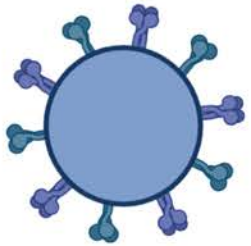
h. Recombinant bacterial vectors



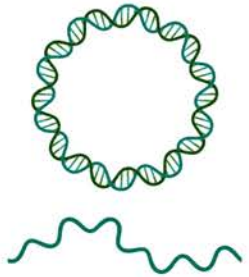
d. Synthetic peptides



e. Virus-like particles



f. DNA or RNA

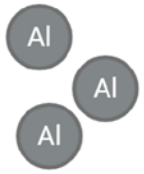


g. Recombinant subunits

Images made with BioRender

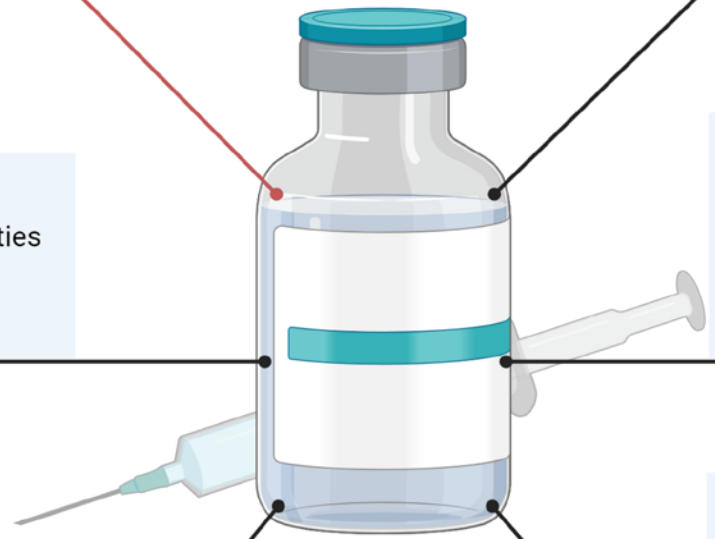
Common components of vaccines

Active ingredients
Viral or bacterial antigens that directly stimulate the immune system but cannot cause disease.

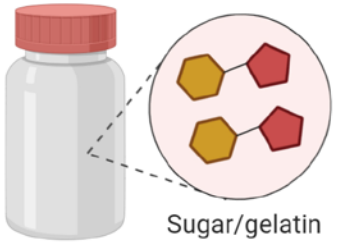


Adjuvants
Aluminum salts in small quantities that help to boost the immune response to the vaccine.

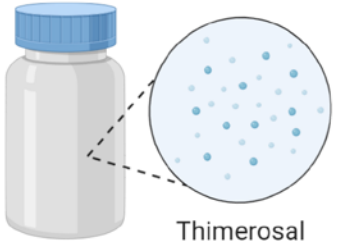
Antibiotics
Prevent contamination by bacteria during the vaccine manufacturing process.



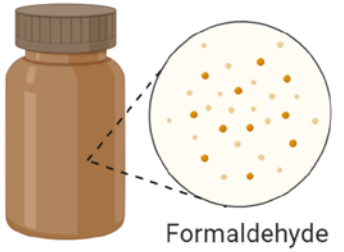
Stabilisers
Sugar/gelatin keep the vaccine effective until it is administered to a patient.



Preservatives
Thimerosal prevents dangerous bacterial or fungal contamination (only used for influenza vaccines).



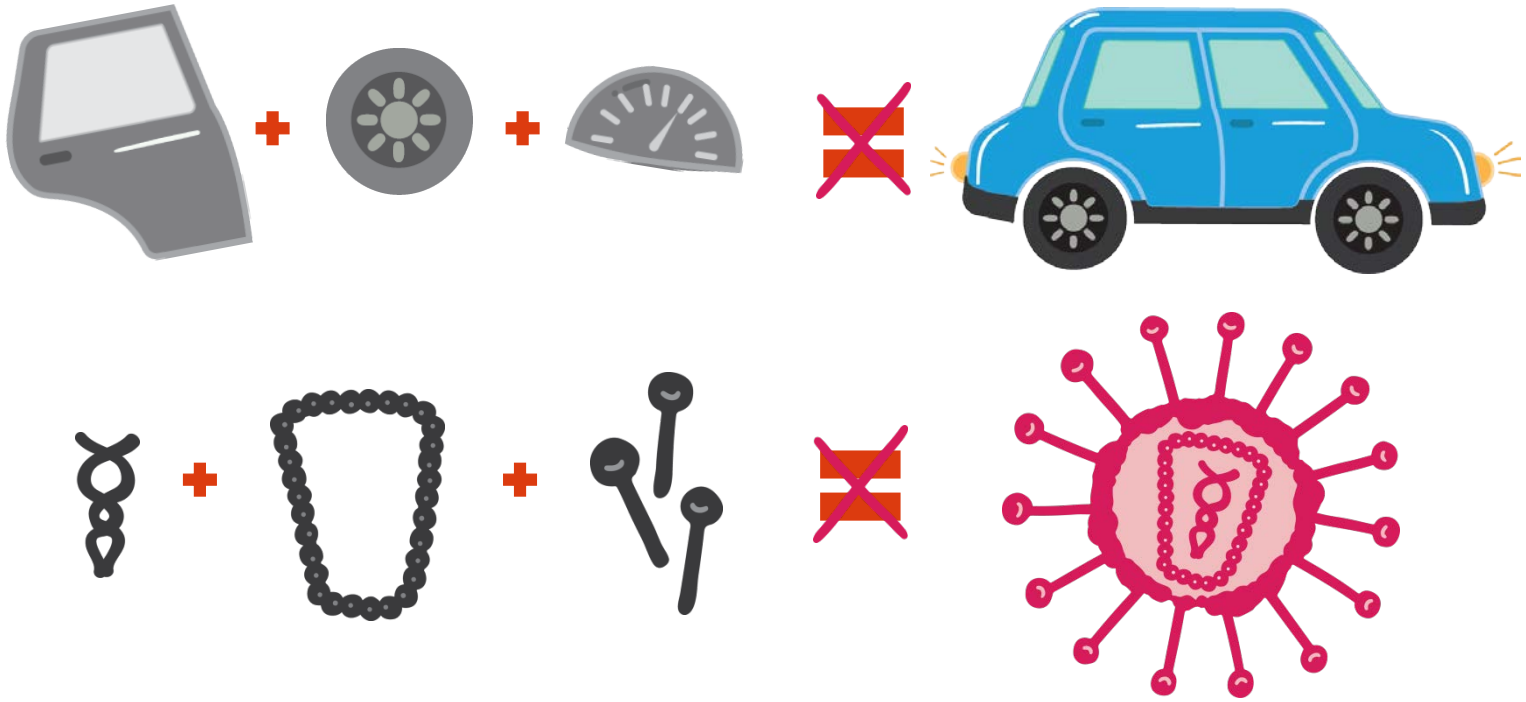
Trace components
Residual inactivating ingredients such as formaldehyde, and residual cell culture materials (present in small quantities that does not pose a safety concern).



Images made with BioRender

Can HIV Vaccines Give Someone HIV?

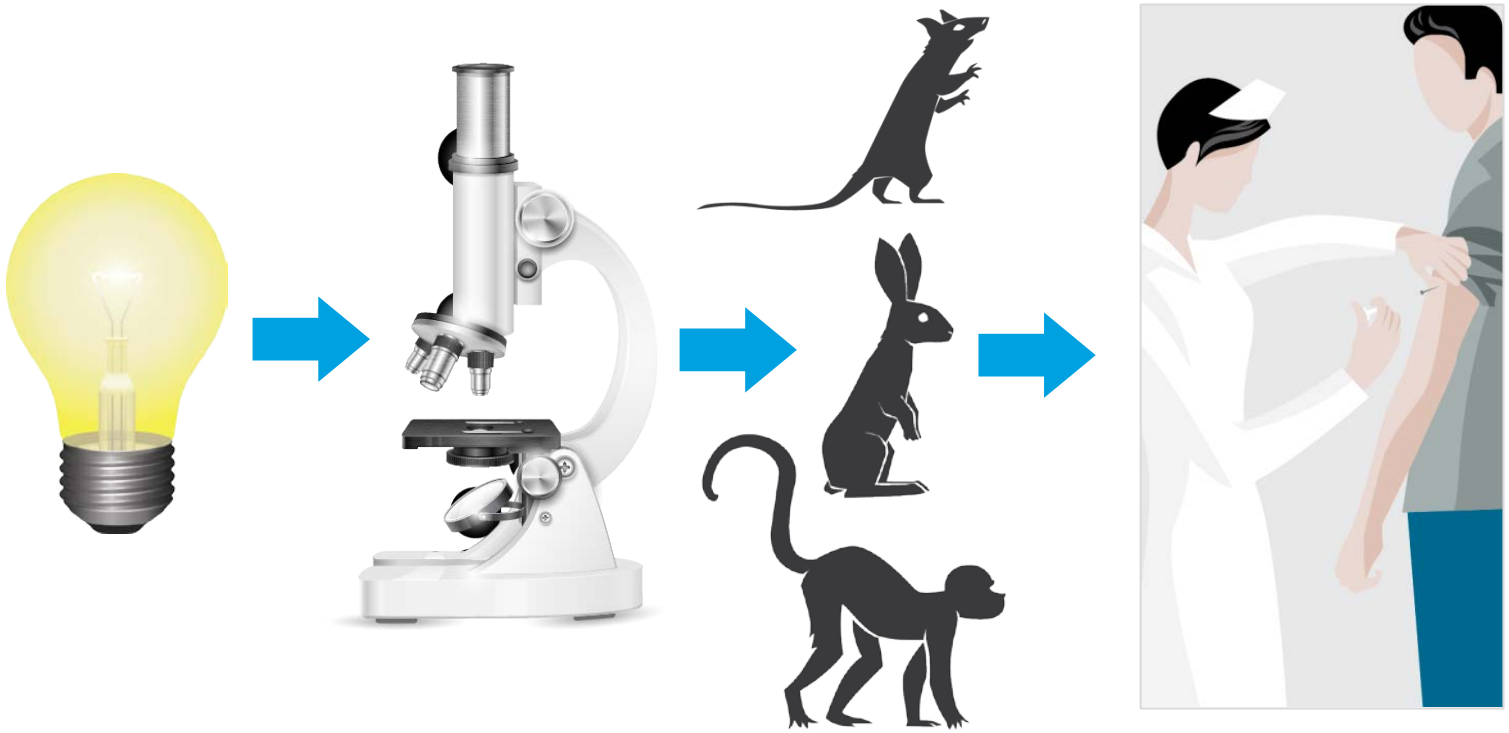
NO! **The HIV vaccines being tested are made from synthetic, or man-made pieces of HIV. Therefore, the vaccines CANNOT cause HIV infection.**



Acknowledgments: Bridge HIV/SFDPH

How Vaccine Research and Development is Conducted

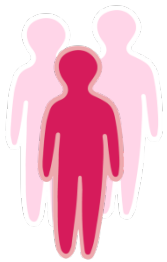
How Do We Conduct HIV Research?

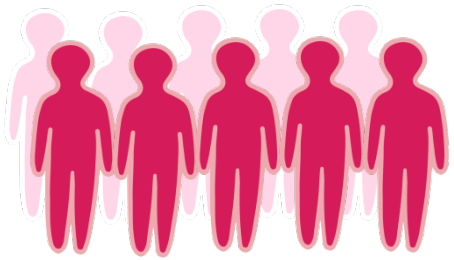


IDEAS → RESEARCH → ANIMAL TESTING → HUMAN TRIALS (STUDIES)

Clinical Trials of Preventive HIV Vaccines Will Require More People!

PHASE I	PHASE II	PHASE III
12 TO 18 MONTHS	**UP TO 2 YEARS**	**3 TO 4 YEARS**
Small group of healthy, HIV-negative participants to test safety	Hundreds of HIV-negative participants to test safety and immune responses	Thousands of participants at higher risk, to test safety and efficacy





Questions?

New addition counters are reset every Monday by 11:59 PM ET. Last updated July 29, 2020 at 9:05 PM ET

Vaccines

157 +1
TOTAL

35 +1
IN HUMAN TRIALS

Therapeutic Drugs

337 +7
TOTAL

259 +7
IN HUMAN TRIALS

Biorender vaccine tracker

Clinical Trials of Preventive HIV Vaccines Will Require More People!

PHASE I	PHASE II	PHASE III
12 TO 18 MONTHS	**UP TO 2 YEARS**	**3 TO 4 YEARS**
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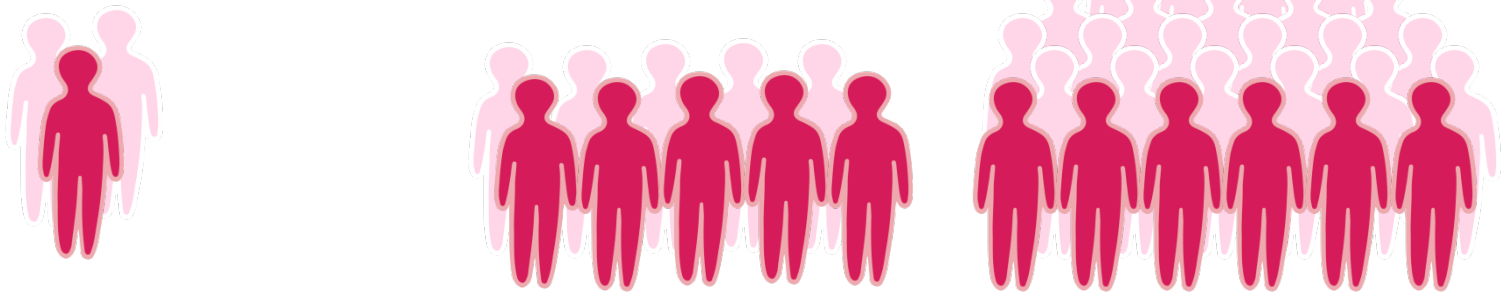


About the COVID-19 Prevention Network (CoVPN)

The **COVID-19 Prevention Network (CoVPN)** was formed by the National Institute of Allergy and Infectious Diseases (NIAID) at the US National Institutes of Health to respond to the global pandemic. Using the infectious disease expertise of their existing research networks and global partners, NIAID has directed the networks to address the pressing need for vaccines and monoclonal antibodies (mAbs) against SARS-CoV-2. The CoVPN is comprised of the partners listed below.

Our Mission

To conduct Phase 3 efficacy trials for COVID-19 vaccines and monoclonal antibodies. The CoVPN will work to develop and conduct studies to ensure rapid and thorough evaluation of US government-sponsored COVID-19 vaccines and monoclonal antibodies for the prevention of COVID-19 disease.

Can the vaccine:

1) Reduce risk of infection?
2) Reduce severity of illness?
3) Reduce transmission of the virus?

Coronavirus Structure and Protein Visualization

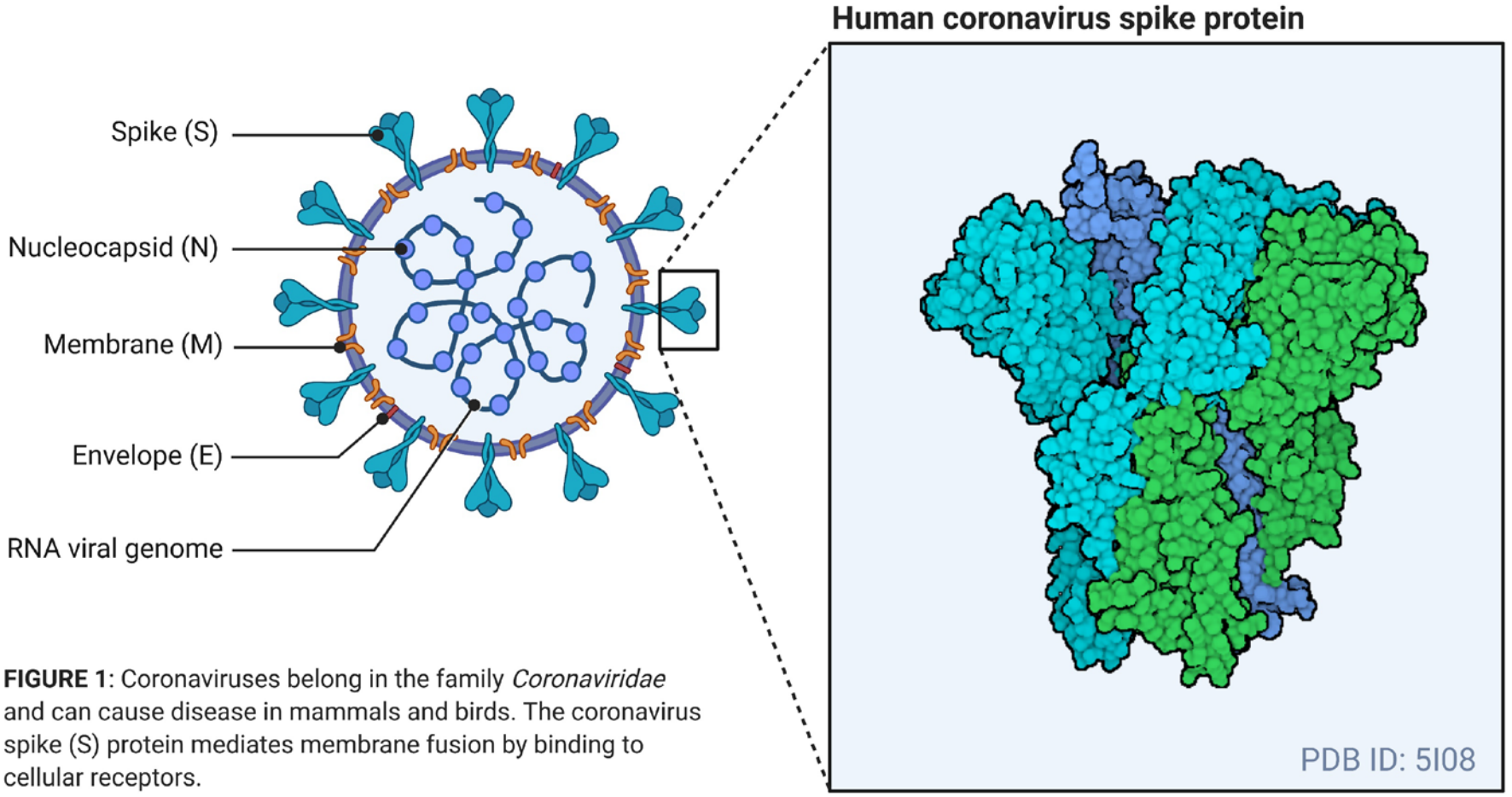
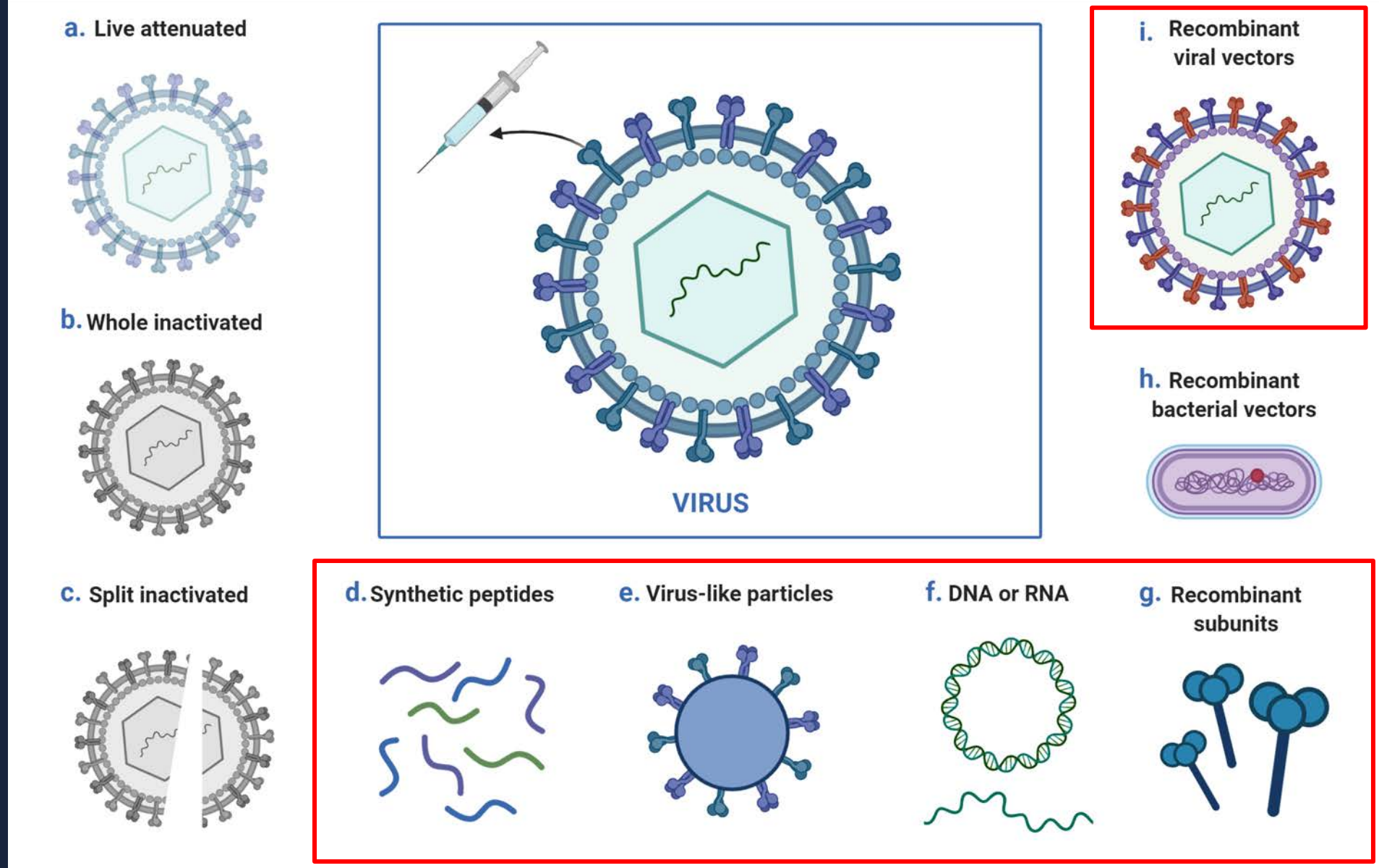


FIGURE 1: Coronaviruses belong in the family *Coronaviridae* and can cause disease in mammals and birds. The coronavirus spike (S) protein mediates membrane fusion by binding to cellular receptors.

Images made with BioRender

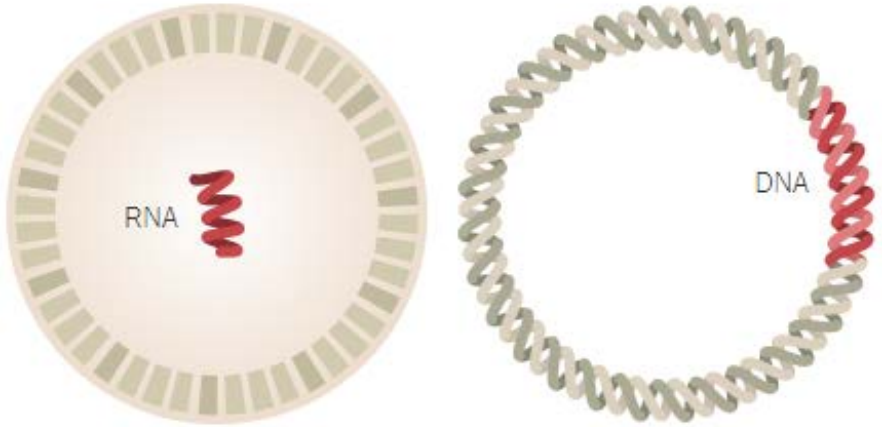
Approaches to **Viral Vaccine Development**



Images made with BioRender

Genetic Vaccines

Vaccines that use one or more of the coronavirus's own genes to provoke an immune response.



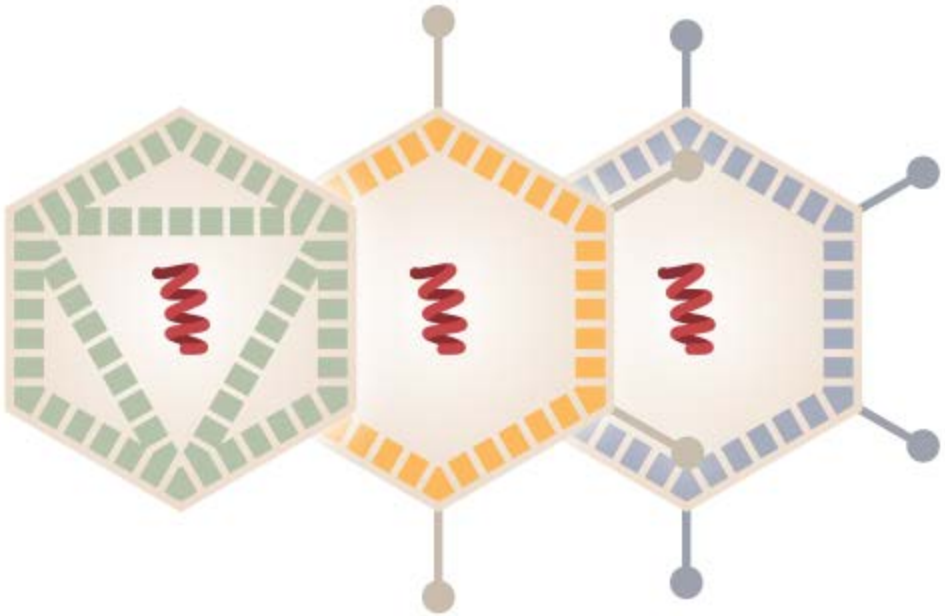
PHASE III

moderna

NIH National Institutes of Health
Turning Discovery Into Health

Viral Vector Vaccines

Vaccines that use a virus to deliver coronavirus genes into cells and provoke an immune response.



PHASE II PHASE III COMBINED PHASES

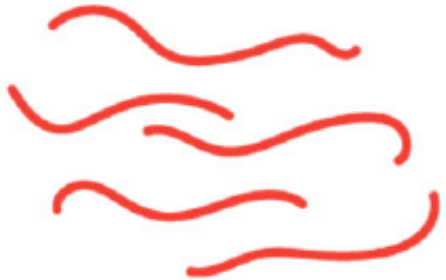
AstraZeneca

UNIVERSITY OF OXFORD

Images from NYTimes vaccine tracker

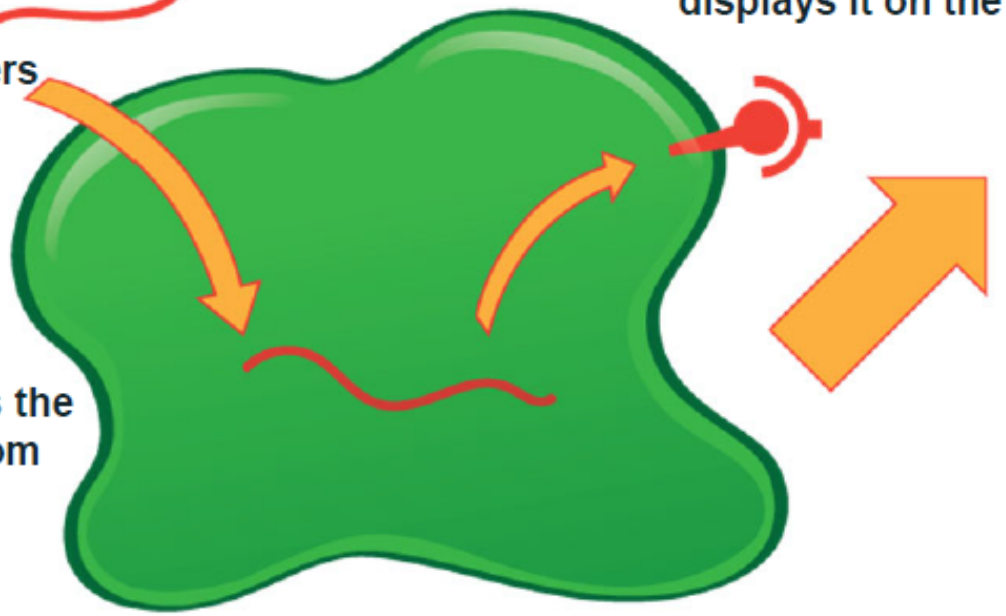
mRNA Vaccines

1) mRNA that has the instructions for making the spike protein from SARS-CoV-2



2) mRNA enters a human cell

4) Cell makes protein and displays it on the surface



5) Immune System sees the protein, recognizes it as foreign, and creates an immune response to block infection and prevent disease

3) mRNA in the cell delivers the message: "Make protein from SARS-CoV-2"

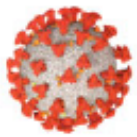
Human Cell

COVID-19
Prevention Network

Study groups

Number of people	Group	First Injection (Day 1)	Second Injection (one month later)
15,000 people	1	mRNA Vaccine	mRNA Vaccine
15,000 people	2	Placebo (sterile salt water)	Placebo (sterile salt water)

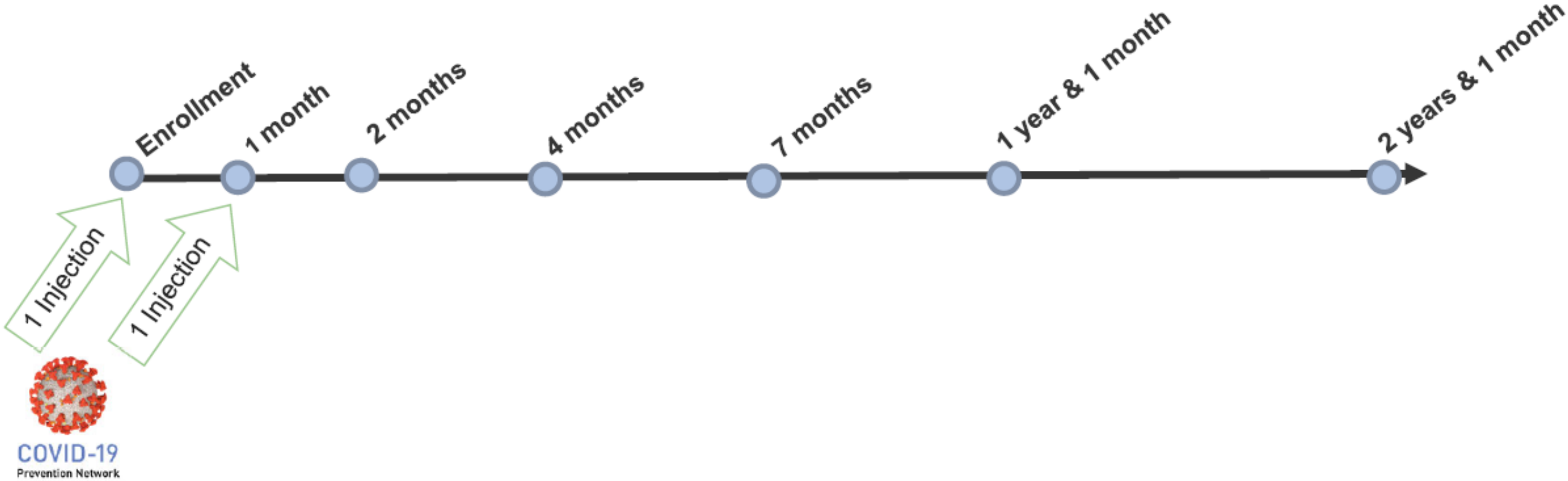
The clinic visits and safety follow-up will take place over about 2 years.



COVID-19
Prevention Network

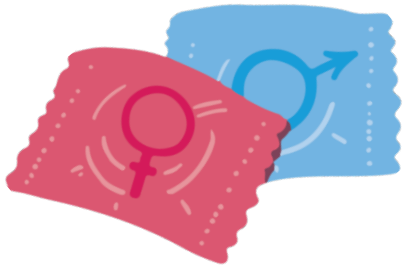
Study visits

- You will come to the clinic for visits about 7 times over about 2 years.
- At the first 2 of visits you will get study injections in the muscle of your upper arm (Day 1 and 1 month later).
- Other visits for safety follow-up are scheduled at 4 months, 7 months, 13 months, and 25 months. In between visits there will be phone calls to check on your health.



Can a Study Vaccine Protect One from HIV?

All participants are counseled on how to best protect themselves against HIV



Use condoms

Reduce number of partners

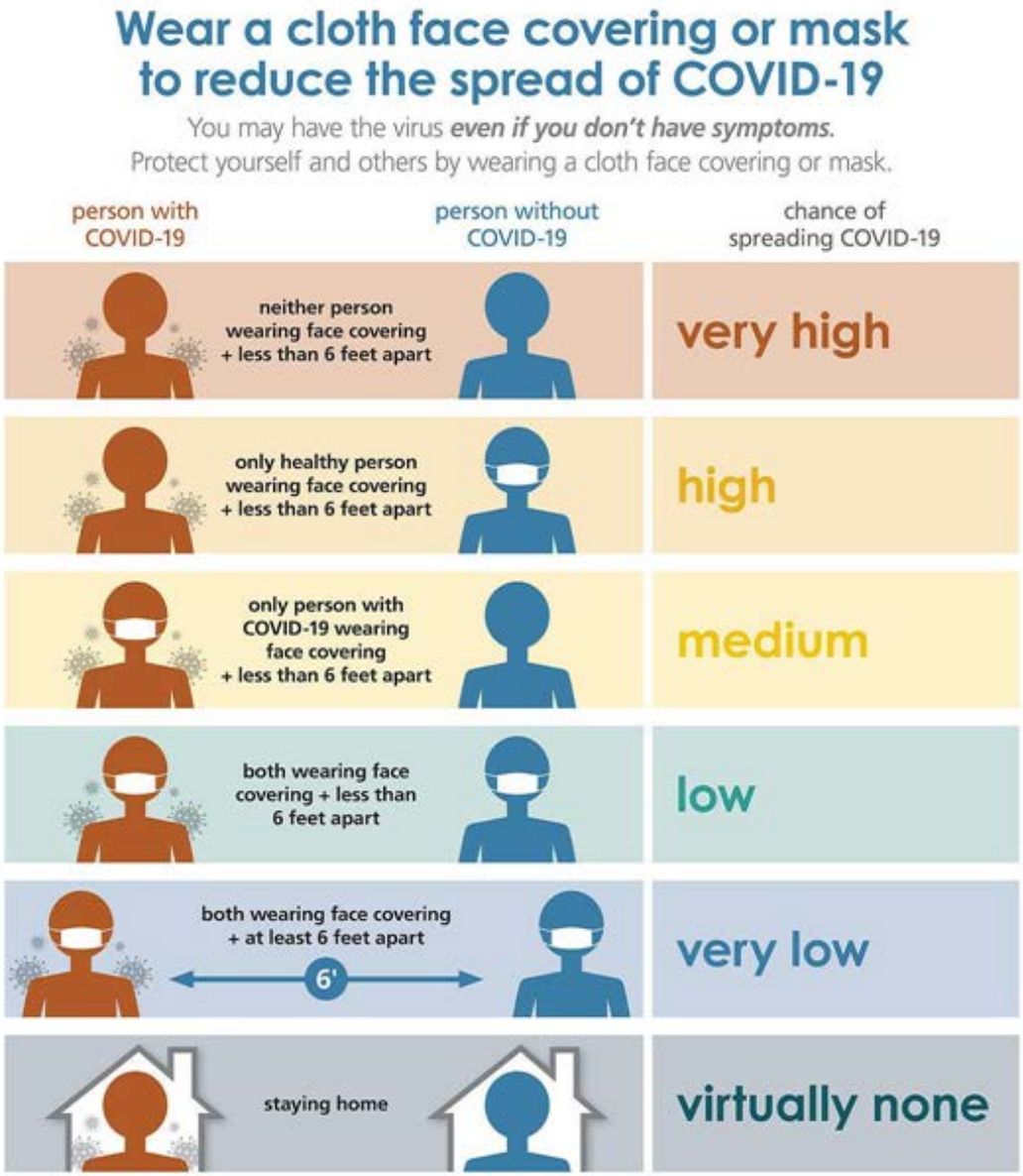
Reduce alcohol consumption

??

Other new methods?

Acknowledgments: Bridge HIV/SFDPH

The importance of masks



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SCAN

Questions?

To learn more, go to: fredhutch.org/coronavirus

To participate in the vaccine trial go to: coronavirusprevention network.org

To donate to Fred Hutch go to: fredhutch.org/give

To ask Guppy more questions email: agupta@fredhutch.org

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