

December 11, 2020

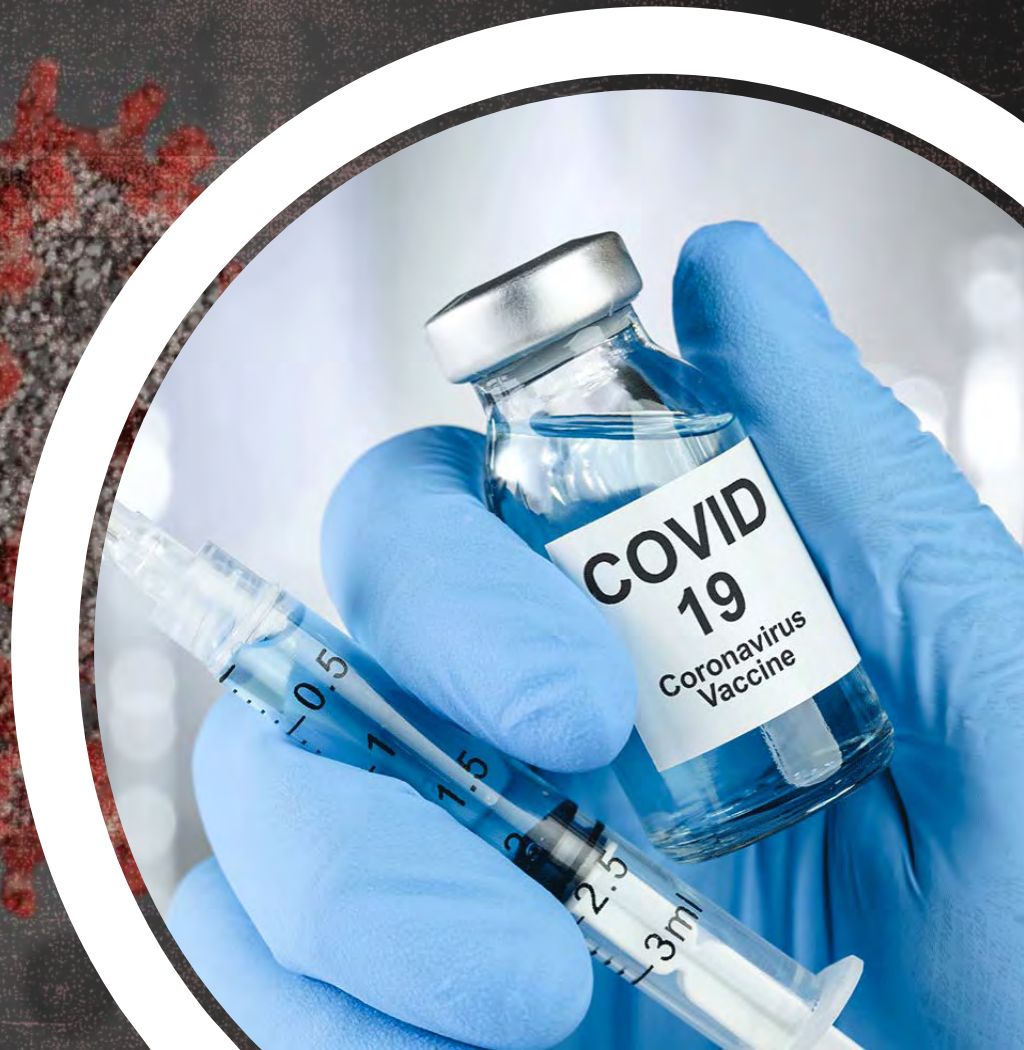
# COVID-19 VACCINATION

Will Smith, MD, Paramedic, FAEMS

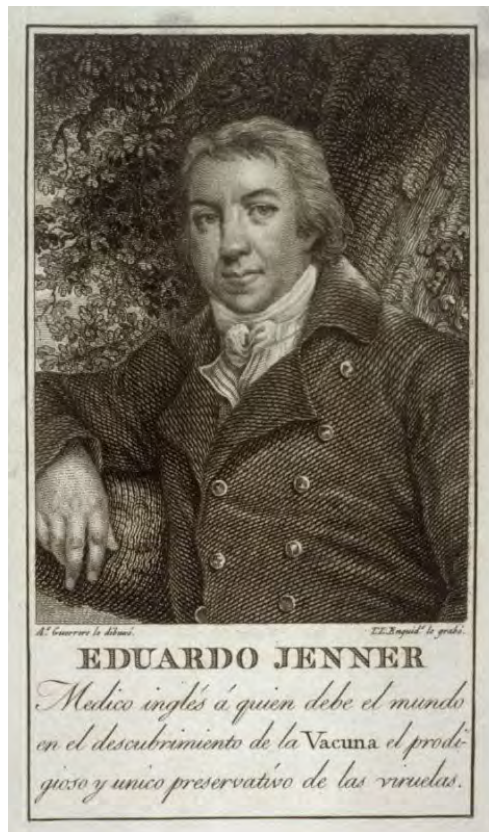
AJ Wheeler, MD

Medical Directors

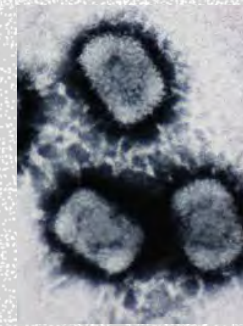
JHFEMS / TCSAR-TCSO / GRTE NP / BTNF - USFS







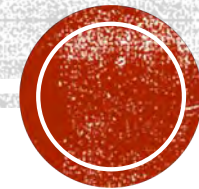
# EDWARD JENNER 1796



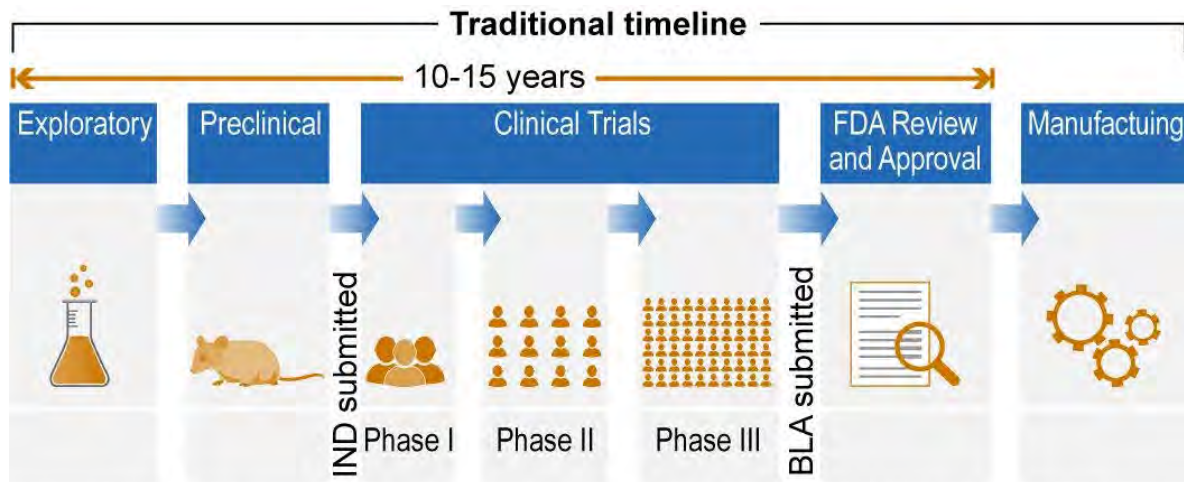
Small Pox vaccination from Cow Pox

Latin for cow – vacca

Called vaccination



<https://www.cdc.gov/smallpox/index.html>



BLA = Biologics License Application

EUA = Emergency Use Authorization

IND = Investigational New Drug

Source: GAO analysis of GAO-20-215SP, FDA, HHS, and Pharmaceutical Research and Manufacturers of America (PhRMA) documentation. | GAO-20-583SP

<https://www.hhs.gov/coronavirus/explaining-operation-warp-speed/index.html>



## VACCINE DEVELOPMENT

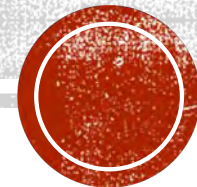
Smallpox – thousand years

Measles – 10 years

Ebola – 5 years

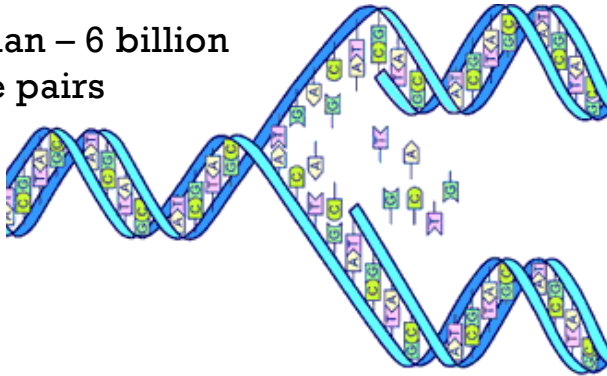
COVID-19 – 63 days

Human Genome Project (sequencing)





Human – 6 billion  
base pairs



# HUMAN GENOME PROJECT

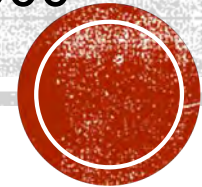
13 years (1990-2003)

\$3 billion

200 US Labs + 18 other countries

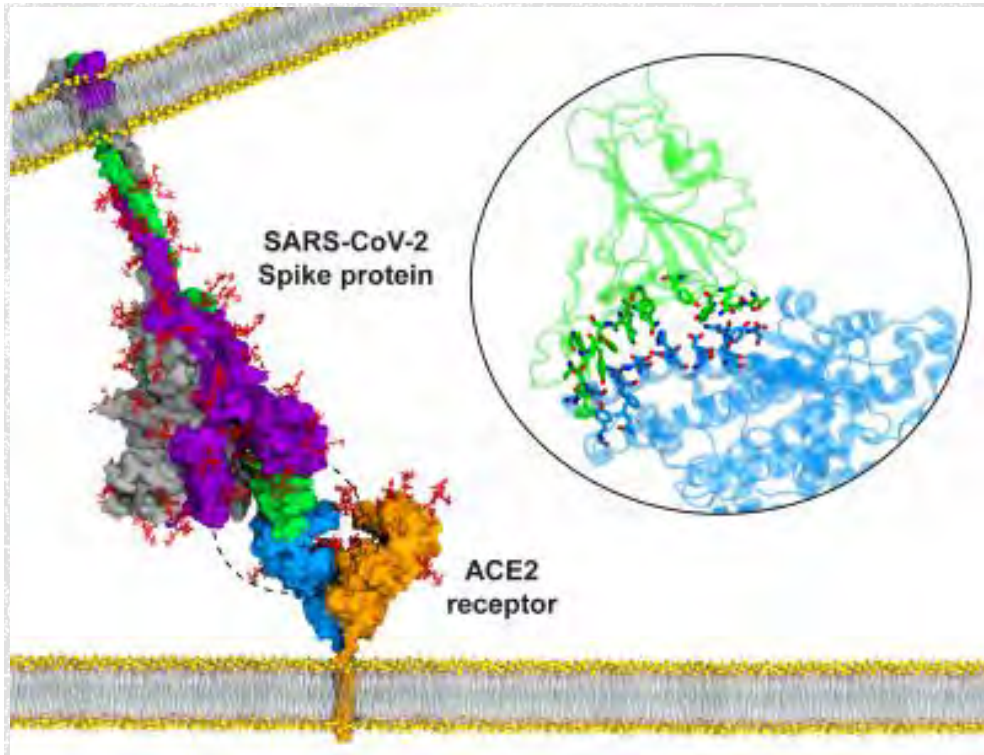
Today's Technology:

24-48 hours / less than \$1,000



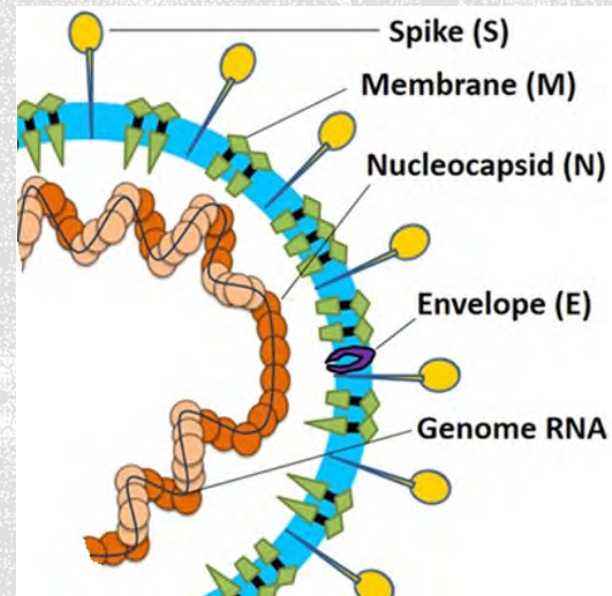
# SARS COV2 GENETIC CODE

30 thousand base pairs

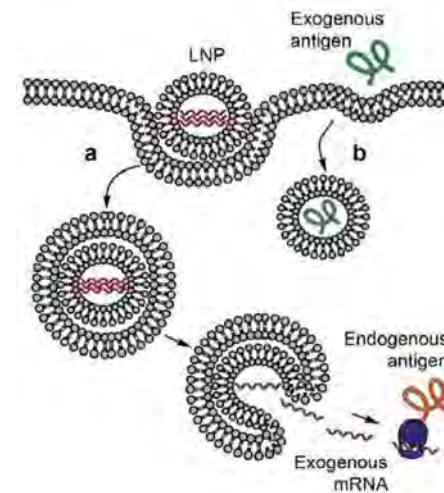
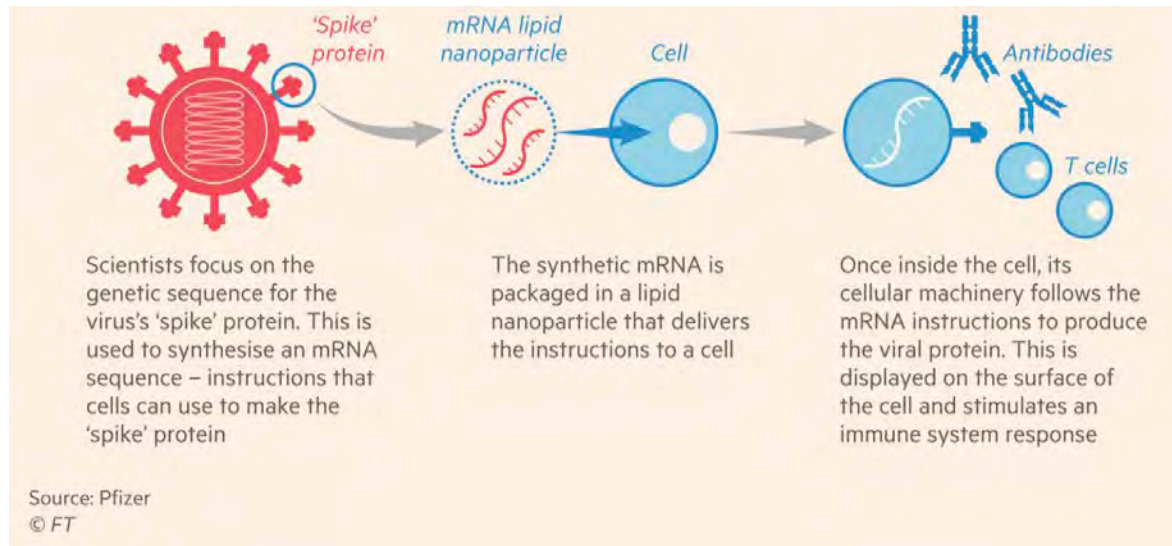


Human – 6 billion base pairs

E. coli – 5 million base pairs







# MRNA VACCINES

- NOT A VIRUS!!!
- mRNA codes for a target protein (Spike)
- Lab made virus like Lipid NanoParticle (LNP)





# PFIZER - BIONTECH VACCINE

- mRNA Vaccine
- Ultracold storage  $-80^{\circ}\text{C}$  ( $-112^{\circ}\text{F}$ ) = 6 months
- Refrigerator = 5 days
- Room Temperature = 6 hours
- No significant safety concerns
- 95% effective to decrease illness severity
- Both Antibody and T-cell Immunity
- 2 vaccinations – 21 days apart
- Projecting 50 million doses by end of 2020 / 1.3 billion 2021

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





# MODERNA VACCINE



- mRNA Vaccine
- Normal Freezer = 6 months
- Refrigerator = 30 days
- Room Temperature = 6-12 hours
- No significant safety concerns
- >94% effective to decrease illness severity
- Both Antibody and T-cell Immunity
- 2 vaccinations – 28 days apart
- Projecting 20 million doses by end of 2020

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



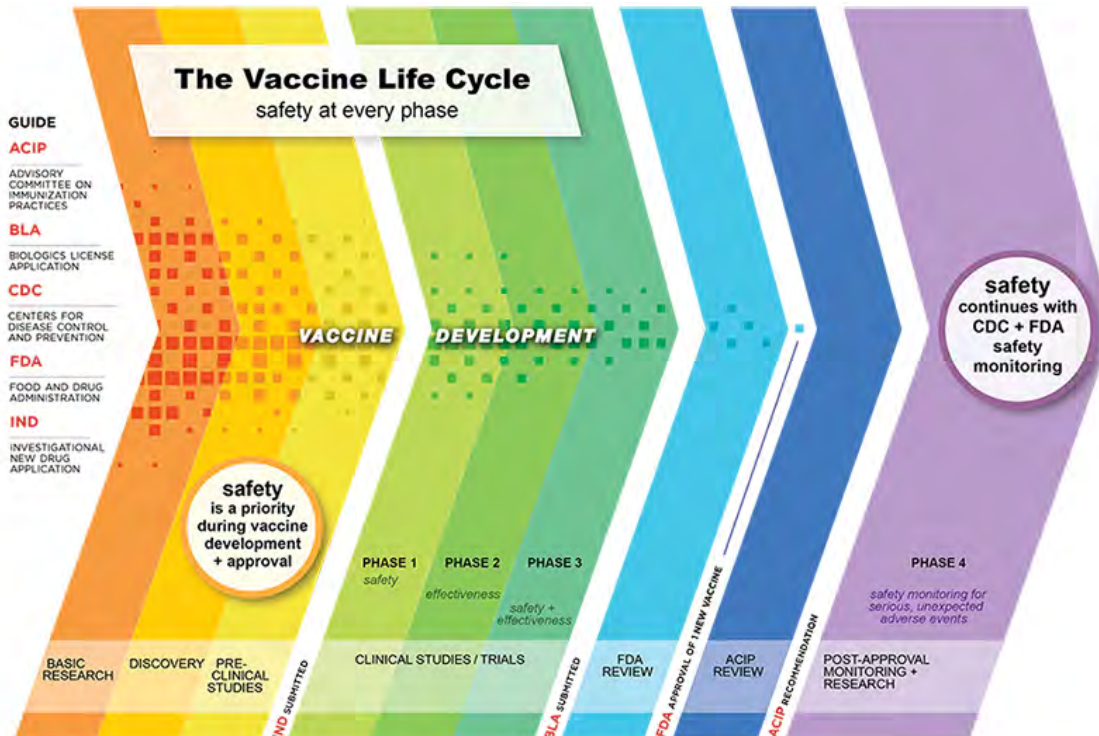


# OTHER COVID-19 VACCINES

- Astra Zeneca
- Johnson & Johnson
  - Single Shot
- Novavax



# BENEFIT >>>>> RISK



**VAERS**  
Vaccine Adverse Event Reporting System

Co-managed by  
CDC and FDA  
<http://vaers.hhs.gov>



- Continued Monitoring for Safety
  - >44,000 in initial studies
- UK has already began immunization
- Symptoms after immunization







# TETON COUNTY PLAN

- St. John's Health
- Teton County Public Health
- Final plans still pending...



# QUESTIONS & ANSWERS

- Will Smith, MD, Paramedic, FAEMS
  - [wsmith@tetoncountywy.gov](mailto:wsmith@tetoncountywy.gov)
- AJ Wheeler, MD
  - [ajwheeler@tcsosar.org](mailto:ajwheeler@tcsosar.org)

