



Immunization

Ziyad Fawzi Omar

3454

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Objectives

1. Define Immunization.
2. Describe the mechanism of vaccines.
3. Describe types of vaccines.

Immunization

- It is a process to increase host resistance to specific microorganism or a disease agent to prevent them from causing disease and provides protection from the most infections diseases This is indicated by the presence of an antibody to that organism.⁽¹⁾



The mechanism of vaccines

- When a person takes a vaccine, their immunity recognizes the antigen (virus or bacterium) as a foreign body,
- This activates the immune cells (T-cells and B-cells) so that they kill the disease-causing virus or bacterium and make antibodies against it.
- Later, if the person had been infected with the actual virus or bacterium, their immune system remembers it and produces the right antibody and activates the right immune cell quickly, to kill the microbe and protect the person from the disease.⁽²⁾

Types of Vaccines

Live-attenuated vaccines

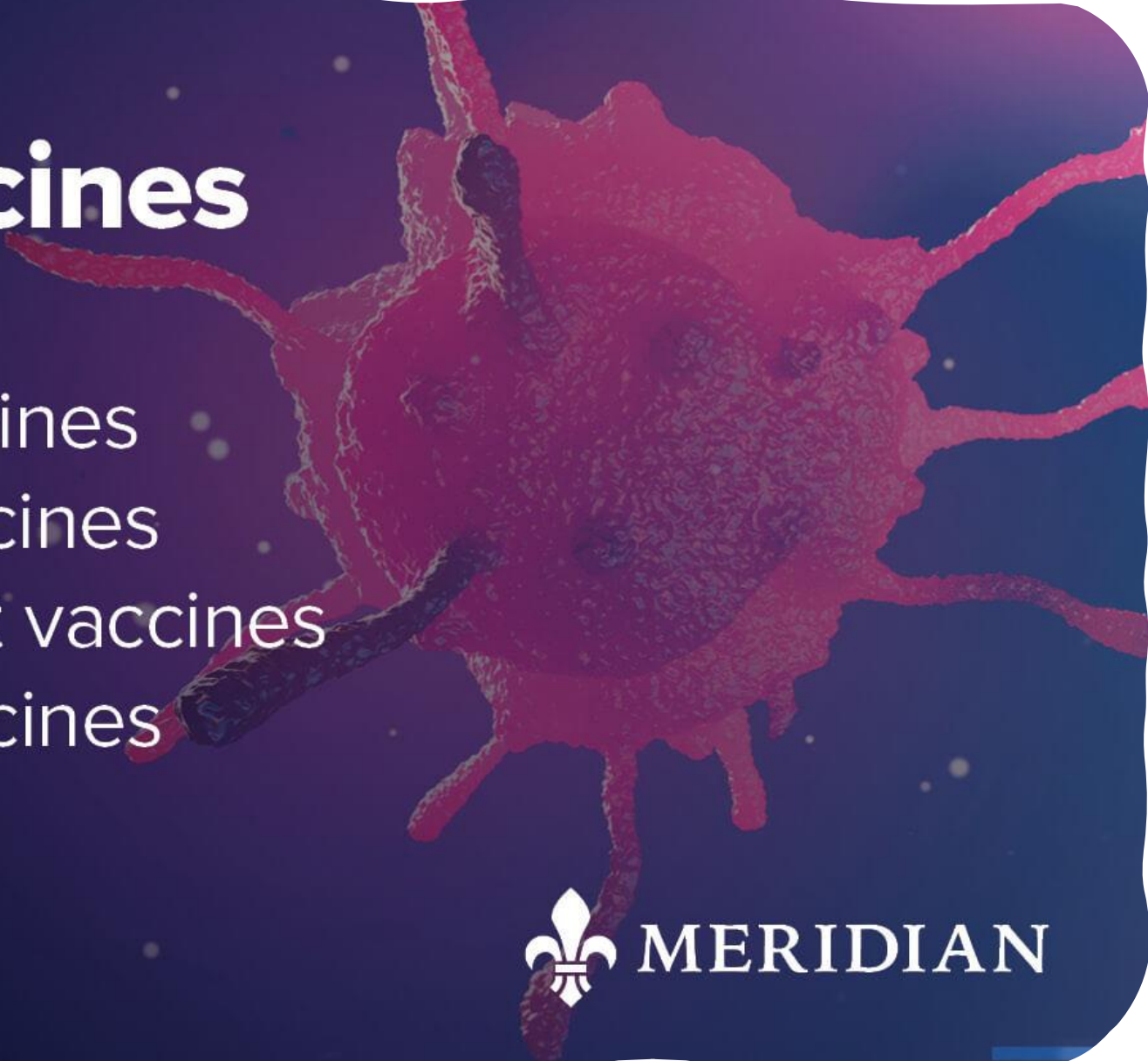
Inactive or dead vaccines

Conjugate or subunit vaccines

DNA and mRNA vaccines

Viral vector vaccines

Toxoids



1-Inactivated vaccines:

- Inactivated vaccines use the killed version of the germ that causes a disease.
- Inactivated vaccines usually don't provide immunity (protection) that's as strong as live vaccines.⁽³⁾
- Inactivated vaccines are used to protect against:
 - Hepatitis A
 - Flu (shot only)
 - Polio (shot only)
 - Rabies



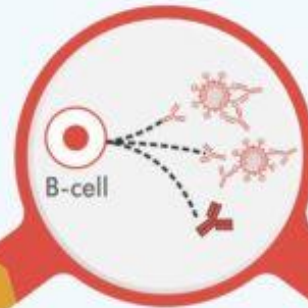
Bacterial or
viral strain
is selected

Selected strain
is inactivated
using heat
or chemicals



Vaccine is
produced

Inactivated
(killed)
vaccine is
injected



Immune
response
is evoked

Neutralizing
Antibodies



2- Live-attenuated vaccines:

- Live vaccines use a weakened (or attenuated) form of the germ that causes a disease.
- They create a strong and long-lasting immune response.⁽³⁾
- Live vaccines are used to protect against:
 - Rotavirus
 - Smallpox
 - Chickenpox
 - Yellow fever

3-Messenger RNA (mRNA)vaccines

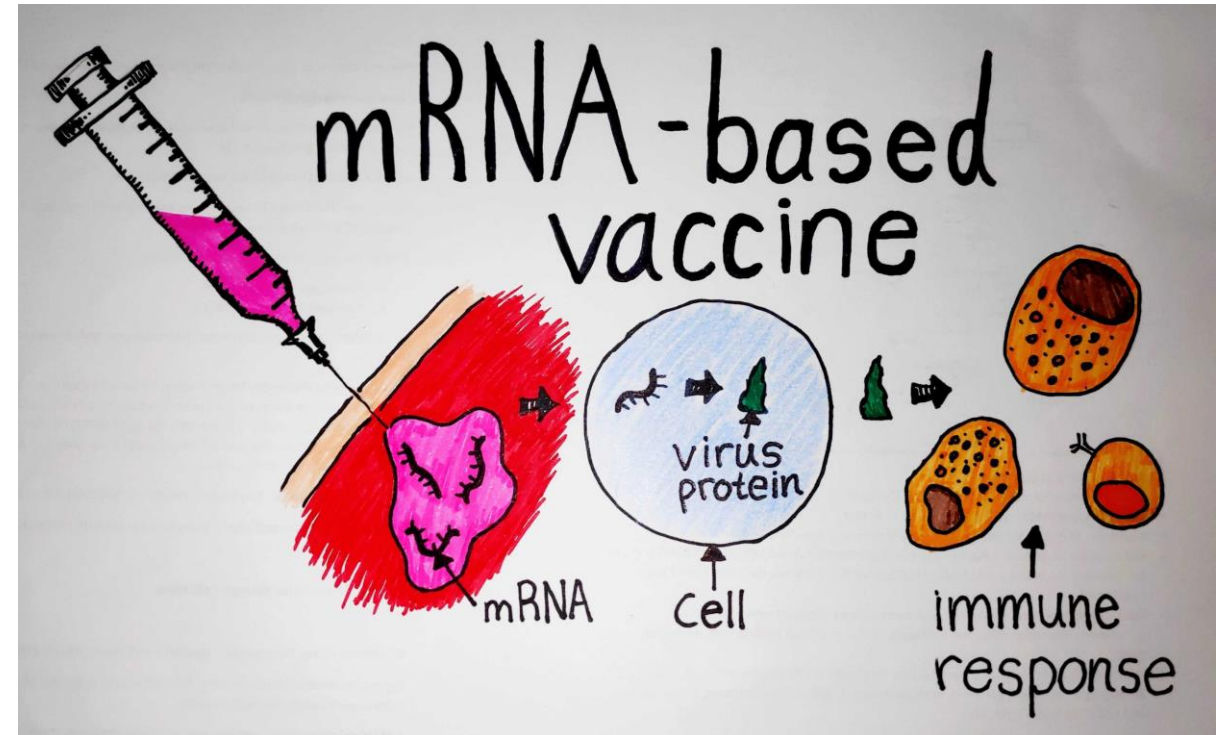
mRNA vaccines make proteins in order to trigger an immune response.

Because they do not contain a live virus, there's no risk of causing a disease in the person getting vaccinated.(3)

mRNA vaccines are used to protect against:

COVID-19

Zika Virus



4- Conjugate or Subunit vaccines

These vaccines use specific pieces of the germ—like its protein, sugar, or capsid (a casing around the germ).

- They give a very strong immune response that's targeted to key parts of the germ.⁽³⁾ These vaccines are used to protect against:
- Hepatitis B
- Pneumococcal disease
- Meningococcal disease
- Shingles

5-Toxoid vaccines

- Toxoid vaccines use a toxin made by the germ that causes a disease. They create immunity to the parts of the germ that cause a disease instead of the germ itself.⁽³⁾
- Toxoid vaccines are used to protect against:
 - a) Diphtheria
 - b) Tetanus





6-Viral vector vaccines

- Viral vector vaccines use a modified version of a different virus as a vector to deliver protection. Several different viruses have been used as vectors
- These include viruses such as influenza, vesicular stomatitis virus (VSV), measles virus, and adenovirus, which causes the common cold. Adenovirus is one of the viral vectors used in some COVID-19 vaccines being studied in clinical trials.⁽³⁾

References

- 1. Slideplayer.com. 2022. *Immunization programme - ppt download*. [online] Available at: <https://slideplayer.com/slide/5381735/>>
- 2. [Internet]. 2022 [cited 3 June 2022]. Available from: <https://vaccination-info.eu/en/vaccine-facts/how-vaccines-work#:~:text=Vaccines%20work%20by%20stimulating%20a,prevent%20disease%20that%20it%20causes>
- 3.- [Internet]. 2022 [cited 3 June 2022]. Available from: <https://www.hhs.gov/immunization/basics/types/index.html>

THANK YOU

