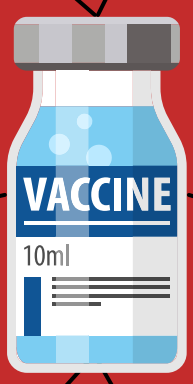
Anatomy of a VACCINE

Vaccine ingredients serve the following purpose:

- Provide Immunity [1-5]
- Keep Vaccines Safe [1-5]
- Increase Vaccine Effectiveness [1-5]
- Increase Shelf Life [1-5]

Main Vaccine Ingredients



1 ANTIGENS [1,2,3]

Antigens are the active component of vaccines. Antigens will either be a killed, attenuated (weakened) or synthesized version of the disease-causing pathogen/pathogen component.

2 ADJUVANTS [1,2,3]

These are added to encourage a stronger immune response to the vaccine antigen. Adjuvants allow for a reduction in the amount of antigen needed to achieve immunity
e.g., Aluminum salts

3 PRESERVATIVES [1,2,3]

Preservatives may be added to stop unwanted contamination of vaccines.
e.g., *Phenol, 2-phenoxyethanol*

4 STABILIZERS [1,2,3]

These substances are added to keep the vaccines effective under heat or cold after manufacturing for the duration of their shelf life
e.g., Sugar, gelatin

5 INACTIVATING AGENTS [1,2,3]

Inactivating agents are used in the manufacturing stage to kill viruses or inactivate toxins. Vaccines are purified to remove almost all inactivating agents, with trace residual amounts remaining.
e.g., *Formaldehyde*

6 ANTIBIOTICS [1,2,3]

Some vaccines may contain minute amounts of antibiotics that prevent contamination during the viral cell culture (during manufacturing). The antibiotics are usually reduced during purification steps.
e.g., Neomycin, Kanamycin, Streptomycin

Other Vaccine Components

Thimerosal: [6]

Thimerosal is a mercury-based preservative used in multi-dose vials. Thimerosal is broken down into non-toxic products and excreted rapidly from the body. Thimerosal is not used routinely in vaccines except for some influenza vaccines.

Eggs and Chicken Protein: [1,2]

Some vaccines may contain trace amounts of eggs and chicken protein because the viruses used to make them are grown in eggs or cells isolated from chicken embryos.

Yeast: [1,2,3]

Some vaccines are produced using yeast cells. These vaccines are purified to remove them. However, trace amounts can remain in the final product.

Human Blood Products: [1,2,3]

Vaccines do not contain human blood products except the rabies vaccine (albumin derived from human blood).

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6. Centers for Disease Control and Prevention. Thimerosal and vaccines [Internet]. Centers for Disease Control and Prevention. Centers for Disease Control and Prevention; 2020 [cited 2023Feb24]. Available from: https://www.cdc.gov/vaccinesafety/concerns/thimerosal/index.html

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