NOT ALL FLU VACCINES ARE CREATED ALIKE

Various flu vaccine technologies follow the same general steps, but there are differences.

MANUFACTURING PROCESS

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- **STRAIN IDENTIFICATION**
- In the United States, the CDC and other collaborating centers of the WHO predict the influenza strains likely to be the most prevalent in the upcoming flu season^{1*}

REPLICATION

- The selected strain(s) is/are replicated or created synthetically to provide sufficient quantities²
- Risk of mismatch with the selected strain(s) varies depending on the technology used^{1,3}

Að !

HARVESTING & PURIFICATION

- Resultant antigens are harvested and purified to remove contaminants²
- With technologies that use live virus, the live virus must generally be inactivated²

TOTAL PRODUCTION TIME

EGG-BASED & CELL-BASED FLU VACCINES



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INFECT EGG/CELL

GROW



- Virus is inoculated into chicken eggs (egg-propagated production) or mammalian cells (cell-propagated production)²
- Eggs/cells are incubated to allow viral replication²

INACTIVATE & PURIFY
• Virus is harvested, inactivated, and purified^{1,4}

INACTIVATED INFLUENZA VACCINE

6-8 months⁵

HARVEST & PURIFY

REPLICATE HA GENE

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RECOMBINE

TRANSLATE rHA

ANTIGEN

- The HA is harvested and purified
- Because there's no live virus, there's no need for virus inactivation^{1,2}

The gene for hemagglutinin (HA) is cloned

The HA gene is inserted into a baculovirus

them to express the HA protein^{1,2}

vector which then infects insect cells, causing

from a reference virus published in the

GISAID database¹

• 2-3 months¹

RECOMBINANT FLU VACCINES

Why does type of flu vaccine technology matter? \rightarrow

*CVVs may be provided by either the CDC or another laboratory partner in the WHO Global Influenza Surveillance and Response System.² CDC=Centers for Disease Control and Prevention; GISAID=Global Initiative on Sharing All Influenza Data; WHO=World Health Organization.

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For US healthcare professionals only

VACCINE TECHNOLOGY CAN INFLUENCE VACCINE ATTRIBUTES

Consider the characteristics.



- Vast infrastructure with 70+ years of manufacturing experience⁶
- Able to meet annual US demand for new seasonal vaccines and support pandemic preparedness^{5*}
- Susceptible to antigenic changes in viral proteins during production¹



- Production does not rely on the egg supply, and cells can be frozen and stored to ensure an adequate supply for vaccine manufacturing⁷
- Reduced susceptibility to viral antigen changes during production, resulting in antigen that more closely matches target influenza strains⁶
- Some cell lines may be susceptible to viral antigen changes during production¹



• Antigen is genetically cloned from a reference virus, so no live virus is required¹

- Produces antigens that are an exact match to candidate strains from a reference virus published in the GISAID database¹
- Production may be more complex and costly than for conventional vaccines⁸

Take technology into account when you consider a flu vaccine for your appropriate patients.

*Egg-based propagation is capable of producing an estimated 1.5 billion doses annually.⁵

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