



# VACCINE PRODUCTION

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## Abstract :

Vaccine is biological preparation that provide acquired immunity against a particular infectious disease The vaccine production has several stages from choosing the right microbe and collecting it, then making copies of the same. The lot produced is then inactivated. In this presentation I've covered the most basic steps needed to produce the vaccine for use in infectious diseases caused by viruses and bacteria.

## Keywords :

Vaccine, seed selection, solvent detergent inactivation,

## Introduction :

Vaccines are immunostimulants. These may be either bacterial vaccine or viral vaccine. These contain killed or attenuated microorganism and sometimes live microbes too. Antibodies are formed in body against that specific microbe. Production of vaccine takes place with attenuated microbes which can be obtained by heat or passing through foreign host and antigen is collected.

## Method

### Strain selection

Small amount of seed taken from seed lot system. Seed should be free from impurities and record should be maintained.



### Growing Microbe

#### GROWING BACTERIA

##### Batch culture

Microbe is grown in closed vessel either in test tube or flask. All the nutrients are poured and bacteria is added left for sometime.

##### Continuous culture

Microbe is grown in vessel medium is constantly added and recovered simultaneously. It's done in chemostat.

#### GROWING VIRUSES

##### Tissue culture

Cultured cell grown in sheets that support viral replication and permit observation for cytopathic effect.

##### Bird-embryos

Incubating eggs in ideal system virus is injected through shell.

### Isolation & Purification

#### Isolation

Product isolation is removal of those components whose properties vary markedly from desired product.

#### Purification

Selectively separate & retains the desired product at highest purity specification.



### Inactivation

#### Virus

Viruses can be either lipid coated or non lipid coated. \* by attacking capsid & destroying ability to infect. \* by disrupting the viral DNA or RNA & preventing replication. \* solvent detergent inactivation. \* pasteurisation. \* UV inactivation. \* azide pH inactivation.

#### Bacteria

\* Inclusion bodies. \* membrane extraction. \* Capsule extraction.



### Vaccine formulation

#### Suspending agent

Egg proteins, yeast proteins are used in vaccines as suspending agents.

#### Preservatives

Albumin, phenol, glycerol, sodium azide, thimerosal used as preservatives.

#### Inactivating agents

Formaldehyde, beta-propiolactone, glutaraldehyde are used as inactivating agents for various vaccines.

## QC & Release

Identity tests, potency tests, purity tests, biological activity tests, analytical, microbiological, endotoxins, pH content, uniformity etc are performed.



## Conclusion:

Vaccines are vital for the patients and saves them from many infectious diseases caused by viruses and bacteria. The production of vaccines involves several steps and when ready undergoes many tests to ensure safety. During production of vaccines strict guidelines and safety measures are taken.

## References:

1. Jayaraman S, ohri R, "pharmaceutical biotechnology", thakur publication pvt ltd, lucknow, 2019, 116-131
2. Plotkin S, "vaccine, vaccination and vaccinology", journal of infectious disease" vol 187(9) 2003 may



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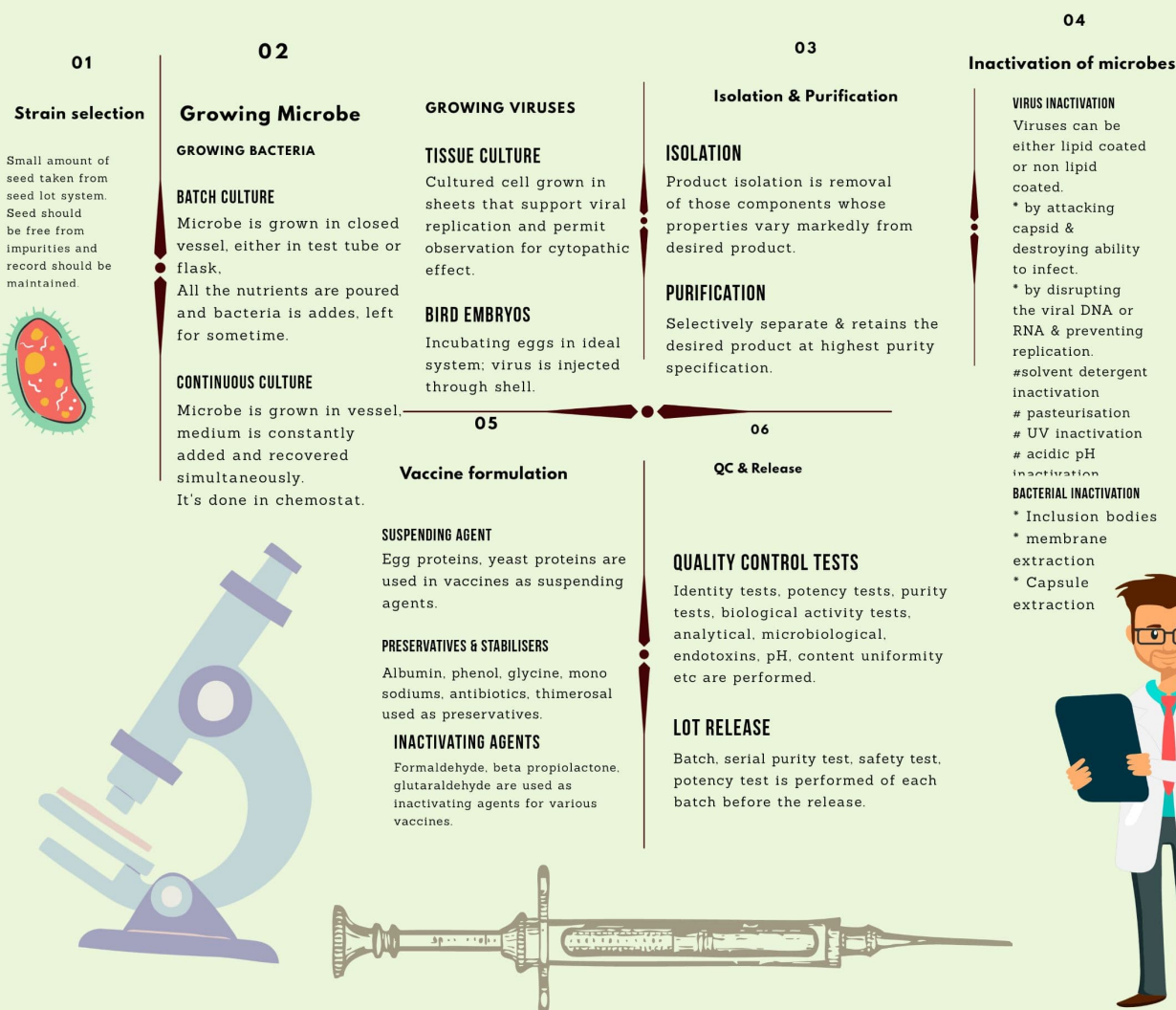
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## METHOD OF PREPARATION



## Result & discussion

Vaccines are vital for the patients and saves them from many infectious diseases caused by viruses and bacteria. The production of vaccines involves several steps and when ready undergoes many tests to ensure safety. During production of vaccines strict guidelines and safety measures are taken.

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