

Significance of viruses

Viruses in vaccine production – vaccine is the substances that helps to protect against certain diseases by simulating the production of antibodies and provide immunity against a disease.

Types of vaccines –

- 1) live attenuated vaccines
- 2) Inactivated vaccine
- 3) recombinant vaccines
- 4) toxoid viruses.

1) **Live attenuated vaccines**; -live vaccine virus in attenuated state that create a strong and long lasting immune response. It protect against viral diseases like MMR, Rota viral disease, Small pox, chicken pox etc.

2) **Inactivated vaccines** -it contain killed version of virus. These vaccines are mainly used against viral disease like hepatitis-a ,flu, polio, rabies etc.

3) **Recombinant vaccines** - it contains sub units of pathogenic virus. These vaccine is used to protect against 1) Hepatitis-A, 2) HPV 3) Whooping cough 4) shingles.

4) **Toxoid vaccines** - in these vaccine toxin is made from the germ that cause a disease. These vaccines are used against Diphtheria , Tetanus diseases.

Importance of viral vaccines; it is the one of the most striking success stories in the history of medicine; having reduced the threat of many common disabling and even fatal viral infections.

Viruses as biopesticides

These are natural substances that control pests. These are prepared by employing living organisms(fungi, bacteria, viruses etc)

Biopesticides are classified in to three categories-

- 1) microbial pesticides
- 2) plant incorporated protectants
- 3) biochemical pesticides

BACULOVIRUSES is playing a major role presently important biopesticides.

U.S.M.



Baculovirus

- Baculovirus are present in invertebrates primarily insect species
- They are not infectious for vertebrates & plants
- Genome is covalently closed circular double stranded of 134 kbp, due to its small it can accommodate large fragments of foreign DNA
- They are divided into two groups on the basis of their structure as:-

Nucleopolyhedroviruses (NPV)

Granuloviruses

These NPV are mainly used as expression vectors i.e. *Autographa californica* NPV (AcMNPV) isolated from the larva of the alfalfa looper

Baculo viruses are limited to tackle lepidopteran pests of vegetables, rice, cotton.

pest	Common name	crop
<i>Heliothis</i> sp	Cotton bollworm	Cotton
<i>Anti carsia gemmatilis</i>	Velvet bean caterpillar	Soya bean
<i>Mamestra brassicae</i>	Cabbage moth	Vegetables
<i>Trichoplusiani</i>	Cabbage looper	Brassica
<i>Spodotera exigua</i>	Beet army worm	Vegetables, flowers

Advantages of baculovirus based biopesticides;

- 1.these viruses do not affect non targeted organisms.
- 2.they act as powerful tools to control disease causing germs.
- 3.they are eco friendly
- 4 play vital role in crop improvement.

Virus as cloning vectors

In gene cloning the vector is a dna molecule that serves as the carrier for transfer or insertion of foreign genes in to another cell, where it is replicated and expressed.

Viruses are among the essential tools for gene cloning. Generally cloning vector is dna taken from viruses, plasmids or cells to be inserted with foreign dna fragments for gene cloning purposes.

Viruses which infect bacteria are called bacteriophages.

Along with bacteriophages , plasmids, cosmids, phagemids, bac, yac etc also acts as cloning vectors.

Cosmids are plasmids that contain lambda phage.

Phagemids are artificially prepared vectors like cosmids by combining the features of phages and plasmids.

Cloning vectors derived from bacteriophages are mainly filamentous type (m13 and f1), lambda,

Bacteriophages as vectors are more advantageous and are widely used vectors

Importance of viral vectors;

- 1)they act as important elements in gene cloning technology.
- 2)this method is useful for producing transgenic plants with desirable characters
- 3)they play important role in agriculture and medicine..

1)The term vaccine was derived by

(1)

1 edward jenner

2 alexander flemming

3 louis Pasteur

4 none of the above

2)Example for live attenuated vaccine

(1)

1 MMR vaccine

2 rabies vaccine

3 hepatitis vaccine

4 polio vaccine

3)Viral biopesticides comes under this category

(3)

1 plant incorporated protectants

2 biochemical pesticides

3 microbial pesticides

4 none of the above

4)Baculo virus is effective against the

(4)

1 arthropods

2 annelids

3 lepidopteran

4 all the above

5) This is true about baculo virus (4)

1 eco friendly

2 species specific

3 play important role in agriculture

4 all the above

6) Virus which attack bacteria are called (3)

1 zoophages

2 phytophages

3 bacteriophages

4 phagemids

7) This is not true about plasmids (3)

1 extra genetic material

2 circular dna

3 present in virus

4 self replicating

8) Examples for cloning vectors (3)

1 bacteriophages

2 Plasmids (A)

3 cosmids

4 all of the above

True or false questions on significance of virus

1) A virus that attack bacteria is called bacteriophages

True/false

1A) True

2) extra chromosomal genetic material found in bacteria is called plasmid

True/false

2A) True

3) plasmid with cos site is called plasmid

True/false

3A) False

4) Baculo virus is best example for biopesticide

True/false

4A) True

5) MMR vaccine is example for attenuated vaccine

True/false

5A) True

6) plasmid combined with phage is called plasmids

True/false

6A) False

7) plants produced with desired genetical characters are called transgenic plants

True/false

7A) True

8) the vaccine for hepatitis is example for attenuated vaccine

True/false

8A) False

9) viral biopesticides comes under microbial pesticides

True/false

9A) True

10) YAC is called as yeast artificial chromosome

True/false

10A) True

MATCH THE FOLLOWING

1) Bacteriophages		diphtheria
2) plasmids		insertion of foreign gene
3) rabies vaccine		lepidopterons
4) viral biopesticides		microbial pesticides
5) baculovirus		yeast artificial chromosome
6) cosmids		bt cotton
7) gene cloning		inactivated vaccine
8) yac		plasmid with cos site
9) transgenic plant		bacteria
10) toxoid vaccine		virus which attack bacteria

ANSWERS

1) 10 2) 9 3) 7 4) 4 5) 3 6) 8 7) 2 8) 5 9) 6 10) 1

MS: Videos Prepared on significance of viruses total number of Videos:1

Media Player



GOVERNMENT OF ANDHRA PRADESH
COMMISSIONERATE OF COLLEGIATE EDUCATION



SIGNIFICANCE OF VIRUSES BOTANY

A.Hanuman prasad M.Sc

Govt. Degree College, Veeraghattam
Email. Id : prasad.hdp123@gmail.com



Play (Ctrl+P)

Learn more at <http://ccelms.ap.gov.in>