SUPPLEMENTAL INFORMATION

Unit 2: Lesson 3 – Types of Vaccines and Immunity

GLOSSARY

Adjuvant
A substance used as an ingredient in vaccines, particularly types of vaccine that use an antigen unlikely to cause a strong immune response by itself, to enhance the immune response and decrease the amount of vaccine or number of doses needed to gain protective immunity.

Antibody
Y-shaped proteins produced by B cells that are specific to a particular pathogen and can neutralize it. Five different classes of antibodies occur which have distinct functions.

Antigen
Part of a pathogen that generates an immune system response because it is recognized by cells of the immune system.

Attenuation
The process of weakening a live pathogen for use in vaccines so it produces a strong immune response with less risk than catching the disease itself. Typically achieved by growing a pathogen in non-human cells, such as chicken eggs, or in a different environment, such as a colder temperature, so they are less prepared to survive when introduced to the immune system in a vaccine.

Byproduct
Trace, nonactive chemicals and cell materials leftover from the production of a vaccine. Byproducts may be a result of how the cell culture was grown, including egg proteins, fetal tissues, human proteins, or yeast, or how the vaccine was sterilized and purified, including antibiotics, formaldehyde, or broken strands of DNA.

Cell culture adaptation
The process by which viruses are weakened in a laboratory, so that they can be used in a vaccine. In this process, viruses are grown in cell types that are not those in which the virus is used to growing, so that as it gets better at growing in the new cell type, it gets worse at growing in the type of cell it typically infects.

Combination vaccine
A vaccine made by combining the antigens from two or more different pathogens, providing immunity to multiple diseases at the same time.

Conjugate vaccine
A type of subunit vaccine made by attaching a helper protein to a disease-causing protein so that an immune response will be made against the disease-causing protein.

Contraindication
A condition that indicates a vaccine or other medical procedure should not be used because it is likely to cause the patient harm. Examples of vaccine-related contraindications include a known or severe allergic reaction to an ingredient of a vaccine and the use of live vaccines in immunocompromised people.

SUPPLEMENTAL INFORMATION

DNA vaccine
A vaccine made of genetic information from a target pathogen inserted into a plasmid and injected into the body, where the DNA is transcribed into mRNA that teaches the body to recognize proteins from the target pathogen without risk of infection.

Herd immunity
When most members of a community are immune to a particular pathogen even those who are not immune are less likely to be infected. The pathogen has less opportunity to find susceptible hosts, such as individuals who may not be immune because they are too young to be immunized or because their immune systems are weakened by illness or treatments to illness. Studies have shown that it is better to be a susceptible person in a highly immune population than to be an immune person in a highly susceptible population.

Immunity
The ability to resist infection.

Immunocompromised
Having a weakened immune system.

Inactivated vaccine
A vaccine made using a killed virus.

Live, weakened viral vaccine
A vaccine made using a live virus that has been weakened, so that it does not cause disease.

mRNA vaccine
A vaccine made from mRNA and a lipid nanoparticle envelope that encourages cells to produce proteins that mimic those on the target pathogen, which teaches the body how to identify and destroy the pathogen when encountered in the wild.

Multivalent vaccine
A vaccine that combines antigens from different strains of the same pathogen, providing broad immunity against that type of pathogen.

Passive immunity
Immunity generated by one person's immune system but used to protect another person. An example is the antibodies found in a baby from the mother's blood or breast milk.

Peptide subunit vaccine
A type of subunit vaccine that uses lab-engineered chains of amino acids, called peptides, to imitate the regions of an antigen that are recognized by the immune system.

Plasmid
A small, circular piece of DNA into which a gene for a protein of interest can be inserted. When the plasmid is translated to produce proteins, the protein of interest is also produced.

Polysaccharide subunit vaccine
A type of subunit vaccine that uses sugar molecules isolated from the surface of cultured bacteria to teach the immune system to recognize that bacteria in the future.

SUPPLEMENTAL INFORMATION

Preservative
A substance used in vaccines to prevent bacterial or fungal contamination, especially in multi-dose vaccines from the same vial.

Protein subunit vaccine
A type of subunit vaccine that uses harmless fragments of surface proteins from a bacteria or virus to teach the immune system to recognize those proteins without the risks associated with using the whole pathogen.

Recombinant vaccine
A vaccine made using genetic engineering technology. Technically considered a type of subunit vaccine.

Stabilizer
A substance used in vaccines to prevent the active ingredients from breaking down during manufacture, storage, and transport.

Subunit vaccine
A broad category of vaccines that use only the purified parts of a pathogen rather than a whole killed or weakened pathogen to more safely stimulate the immune system. This category includes conjugate vaccines, protein subunit vaccines, polysaccharide subunit vaccines and peptide subunit vaccines.

Toxin
A harmful chemical produced by some bacteria that can cause disease.

Toxoid
An inactivated toxin.

Toxoid vaccine
A vaccine made using an inactivated toxin (or toxoid) produced by bacteria. Technically can also be classified as a type of subunit vaccine.

Vaccine
A tool that introduces the immune system to potential pathogens in a controlled manner, so that it does not cause disease, but it does allow for the development of protective immunity.

Viral vector vaccine
A vaccine that places the gene for the surface proteins of a target virus into another, harmless virus, called the vector virus, to deliver the genetic data without risk of severe infection.