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Dr. Ankita Garg Jaiswal
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Biography:

Dr Ankita Garg is in School of Medicine at University of California San Diego and investigating the role of myeloid derived suppressor cells mediated immune suppression in HIV-1 infection. She earned Ph.D. from SGPGIMS, India for her work on understanding molecular mechanism of Ethambutol resistance in Mycobacterium tuberculosis and immune pathogenesis of ethambutol resistant M tuberculosis strain. During postdoctoral research at UTHCT Texas, Dr. Garg studied the role of natural killer and regulatory T cells in M tuberculosis infection. She has served as Senior Research Scientist in R&D Division of Panacea Biotec and Lupin Ltd, two well-established drug discovery and development organizations. She was responsible for rationalized selection of targets and enriching the discovery pipeline including drug discovery, in-vitro and in-vivo assays, cross-functions such as DMPK, toxicology for diverse therapeutic areas. Dr Garg has over nine years of experience in translational research pertaining to infectious disease and immune disorders.

Research Interests:

- ✓ Mycobacterium tuberculosis
- ✓ Immune dysfunction in HIV-AIDS and associated co infections
- ✓ Cellular and clinical immunology
- ✓ Translational immunology
- ✓ Biomarkers
- ✓ vaccine research

IMMUNOPROPHYLAXIX

Immunoprophylaxix

Protection against infectious diseases by (immunization) acquired by the individual either passively or actively:

I- Passive acquired immunity

II- Active acquired immunity

I- Passive acquired immunity

Ready made Ab transferred to individual giving rapid protection and short lasting immunity:

a-Naturally acquired passive immunity

Occurs when antibody are transferred from mother to fetus (IgG) or in colostrum (Ig A).

b- Artificially acquired passive immunity

Short-term immunization by injection of antibodies, For examples:

- injection of antitoxic serum for treatment of diphtheria or tetanus.
- injection of gamma globulin that are not produced by recipient's cells, to hypogammaglobulin children.

II- Active acquired immunity

Individual actively produces his own Ab.

Immunity develop slowly and long lasting due to development of immunological memory:

a-Natural active acquired immunity

The person becomes immune as a result of previous exposure to a live pathogen

b-Artificially active acquired immunity

A vaccine stimulates a primary response against the antigen without causing symptoms of the disease.

-immunity against pathogens (viruses and bacteria) by using:

live attenuated

killed

altered antigens

that stimulate the body to produce antibodies

-Vaccines work with the immune system's ability to recognize and destroy foreign proteins (antigens)

Vaccination

- Vaccination prevents and control such diseases as cholera, rabies, poliomyelitis, diphtheria, tetanus, measles, and typhoid fever

- Vaccines can be:

a- prophylactic (e.g. to prevent or ameliorate the effects of a future infection by any natural or "wild" pathogen

b- Therapeutic (e.g. vaccines against cancer are also being investigated

Types of vaccines:

Killed vaccines:

Virulent bacteria or virus used to prepare these vaccines may be killed by heat (60 °C) or by chemicals.

examples:

- **a-TAB vaccine against enteric fever (heat)**
- **b-Salk vaccine against poliomylitis (formalin)**
- **c-Samples vaccine against rabies (phenol)**
- **d-pertussis vaccine against whooping cough (merthiolate)**

Types of vaccines:

- Killed vaccine are:
- Do not stimulate local immunity
- Short lasting
- Do not stimulate cytotoxic T cell response in contrast to live attenuated vaccines
- safe can be given to pregnant woman and immunocompromised host
- It is heat stable

Types of vaccines:

2-live attenuated vaccines:

living m.o lost its virulence so do not produce disease but produce immunity.

stimulate both humoral and cell mediated immunity, local and systemic.

Not given to pregnant women and immunocompromised hosts (may cause diseases)

heat unstable

Types of vaccines:

- It is prepared by:

a-repeated subculture in unsuitable condition chemical or media

ex: BCG vaccine against T.B and 17 D vaccine against yellow fever.

b-Growing at high temp i,e above optimum temperatures

ex: Pasteur anthrax vaccine

c-Selection of mutant strains of low virulence

ex: Sabin vaccine against poliomylitis.

Types of vaccines:

3- Toxoids

- ✓ It is prepared by detoxifying bacterial toxins.
- ✓ bacterial exotoxins treated by formalin to destroy toxicity and retain antigenicity
- ✓ e.g.diphtheria and tetanus toxoid.

4- Microbial products

vaccines are prepared from bacterial products or viral components

ex: a-Capsular polysaccharide vaccines are:

Poor immunogen in children below 2 years age
ex: *H. influenza*

-do not respond to T cell independent antigens
in spite of its generation of Ig M
-produce ant capsular opsonizing antibodies
-examples *meningococcal, pneumococci and H. influenza*

b-cellular purified proteins of *pertussis*

c- purified surface Ag of hepatitis B virus

d-influenza viruses

prepared by recombinant DNA technology for improvement vaccines

ex:

a- subunit vaccines

In which microbial polypeptides are isolated from the infective material hepatitis B and influenza viruses

B- Recombinant DNA-derived antigen vaccines:

In which Ag are synthesizing by inserting the coding genes into E. coli or yeast cell as HBV vaccines

C- Recombinant DNA a virulent vector vaccines:

In which the genes coding for the Ag is inserted into genome of an a virulent vector such as BCG vaccine

D-Synthetic peptide vaccines:

synthesis of short peptides that correspond to antigenic determinants on a viral or bacterial proteins

Ex: cholera toxins and poliovirus to produce Ab response.

Combined immunization (Vaccination)

-Immunization against diseases is recommended in combination (for young children) as :

- ✓ Diphtheria, tetanus (lockjaw), and pertussis (whooping cough), given together (DTP).
- ✓ Measles, mumps, and rubella, give together as MMR
- ✓ Haemophilus influenzae b (Hib) with DTP
- ✓ Influenzae b (Hib) with inactivated poliomyelitis vaccine (IPV)

Influenza; and Neisseria meningitides (meningococcal meningitis).

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