TYPES OF VACCINES

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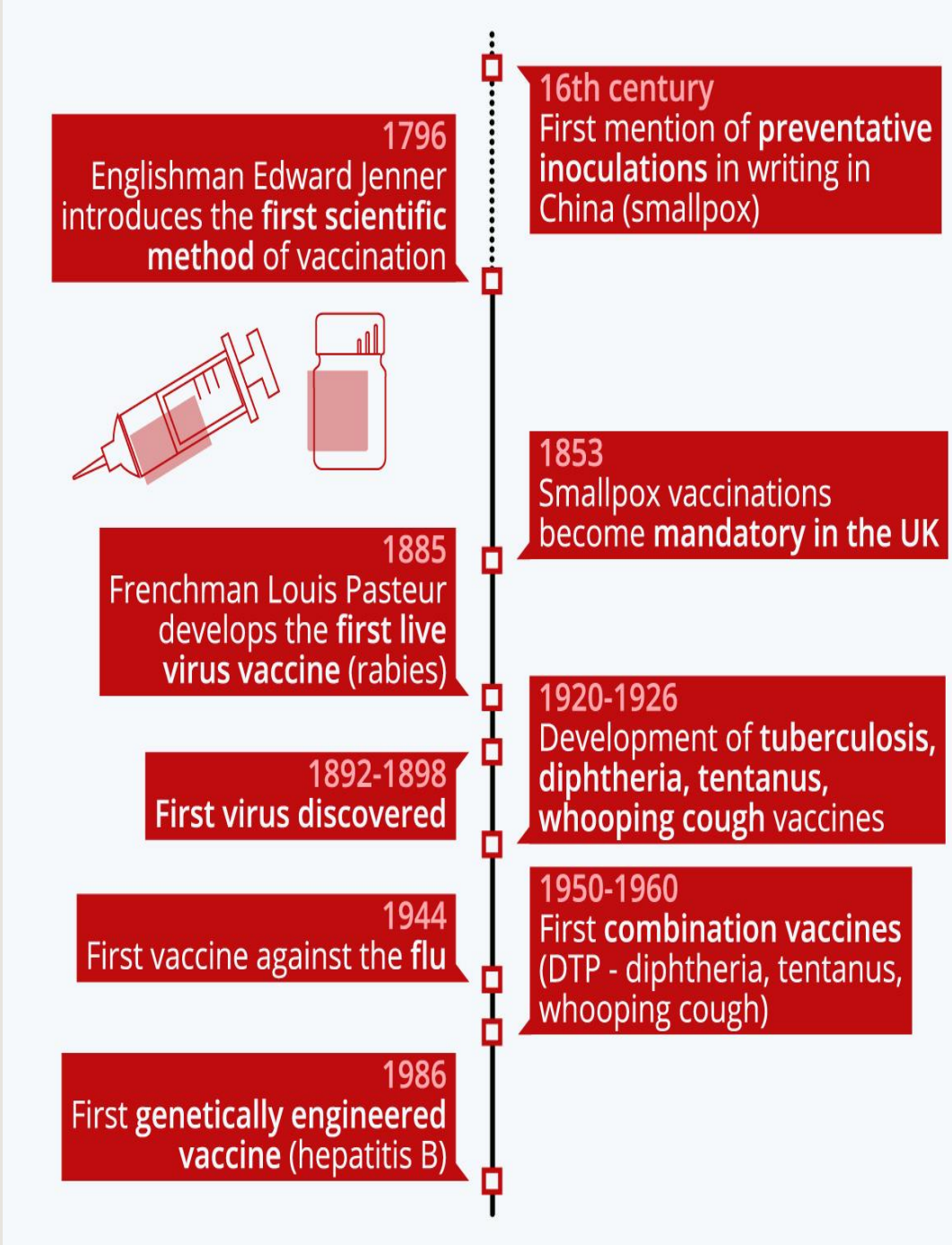
GROUP: 308

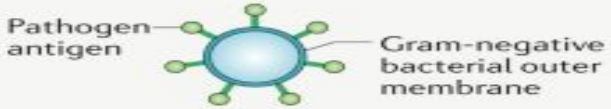
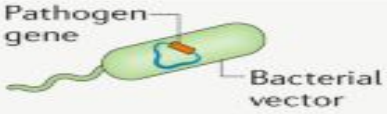
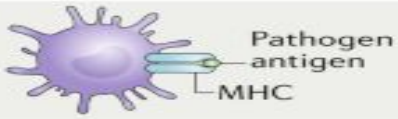
VACCINE {ACTIVE IMMUNOPROPHYLAXIS}

- Vaccine is an immunobiological preparation that provides specific protection against a given disease.
- Following vaccine administration, the immunogen (active ingredient of the vaccine) stimulates the immune system of the body to produce active immunity in the form of protective antibody/immunocompetent T cell response.

HISTORY

- The terms **vaccine** and **vaccination** are derived from '' Variolae vaccinae'' (smallpox of the cow) the term devised by Edward Jenner in 1796 to denote cowpox.



Type of vaccine		Licensed vaccines using this technology	First introduced
Live attenuated (weakened or inactivated)		Measles, mumps, rubella, yellow fever, influenza, oral polio, typhoid, Japanese encephalitis, rotavirus, BCG, varicella zoster	1798 (smallpox)
Killed whole organism		Whole-cell pertussis, polio, influenza, Japanese encephalitis, hepatitis A, rabies	1896 (typhoid)
Toxoid		Diphtheria, tetanus	1923 (diphtheria)
Subunit (purified protein, recombinant protein, polysaccharide, peptide)		Pertussis, influenza, hepatitis B, meningococcal, pneumococcal, typhoid, hepatitis A	1970 (anthrax)
Virus-like particle		Human papillomavirus	1986 (hepatitis B)
Outer membrane vesicle		Group B meningococcal	1987 (group B meningococcal)
Protein–polysaccharide conjugate		*Haemophilus influenzae* type B, pneumococcal, meningococcal, typhoid	1987 (*H. influenzae* type b)
Viral vectored		Ebola	2019 (Ebola)
Nucleic acid vaccine		SARS-CoV-2	2020 (SARS-CoV-2)
Bacterial vectored		Experimental	–
Antigen-presenting cell		Experimental	–

TYPES OF VACCINES

1. ***LIVE ATTENUATED VACCINE***: They are prepared from live (usually attenuated) organism that lose the bility to induce full blown disease, but retain their immunogenicity.

e.g. BCG vaccine, measles.

2.***INACTIVATED/KILLED VACCINE***: It consist of organisms which are grown in culture under controlled conditions, and the killed by using methods like heat or formaldehyde.

e.g. Typhoid vaccine, Salk vaccine (IPV)

LIVE ATTENUATED BACTERIAL VACCINE	**LIVE ATTENUATED VIRAL VACCINE**
BCG Vaccine Typhoral vaccine	Measles vaccine Mumps vaccine Rubella vaccine Rotavirus vaccine Oral Polio Vaccine (Sabin Vaccine) Influenza Vaccine, Hepatitis A vaccine
KILLED/INACTIVATED BACTERIAL VACCINE	**KILLED/ATTENUATED VIRAL VACCINE**
Typhoid, Cholera, Pertussis, Plague vaccine	IPV or Salk vaccine, Killed infleuenza vaccine, Rabies vaccine, Hepatitis A vaccine
TOXOID VACCINE	
DT (Diphtheria toxoid), TT (Tetanus toxoid)	

3. ***TOXOID VACCINE***: The exotoxins produced by certain bacteria can be detoxicated to form toxoid by treating with acidic pH, formalin or by prolonged storage.
e.g. Diphtheria toxoid, Tetanus toxoid.

4.***SUBUNIT VACCINE***: For certain viruses only a particular subunit of the virus is necessary to initiate the infection, e.g. Hepatitis B surface antigen (HBsAg) is the immunogenic component of hepatitis B virus.

e.g. Human Papillomavirus vaccine (HPV)

5.***COMBINED VACCINE***: If more than one immunizing agents are included in vaccine preparation, it is called combined vaccine.

e.g. in DPT vaccine, the pertussis component acts as an adjuvant, which increases the immunogenicity of both diphtheria toxoid and tetanus toxoid.

SUBUNIT VACCINE **BACTERIAL**	**VIRAL**
	Hepatitis B vaccine HPV (Human Papilloma Virus) Vaccine
COMBINED VACCINE **BACTERIAL**	**VIRAL**
DPT vaccine (Diphtheria, Pertussis and Tetanus) Pentavalent vaccine (DPT+Hib+ Hepatitis B)	Mumps, Measles, Rubella (MMR) vaccine