

Active and passive immunization

Passive immunization

- Substitution of missing specific antibodies protecting against infectious disease or treating the infectious disease.
- Used mainly in infectious diseases or diseases caused by toxins.
- Prompt but short-term effect.
- No immunological memory is induced.

Active immunization

- Induction of immune memory by harmless antigen.
- In the case of infection by a pathogen prompt secondary immune response protects the immunized person from the disease.
- Has protective, but no therapeutic effect.

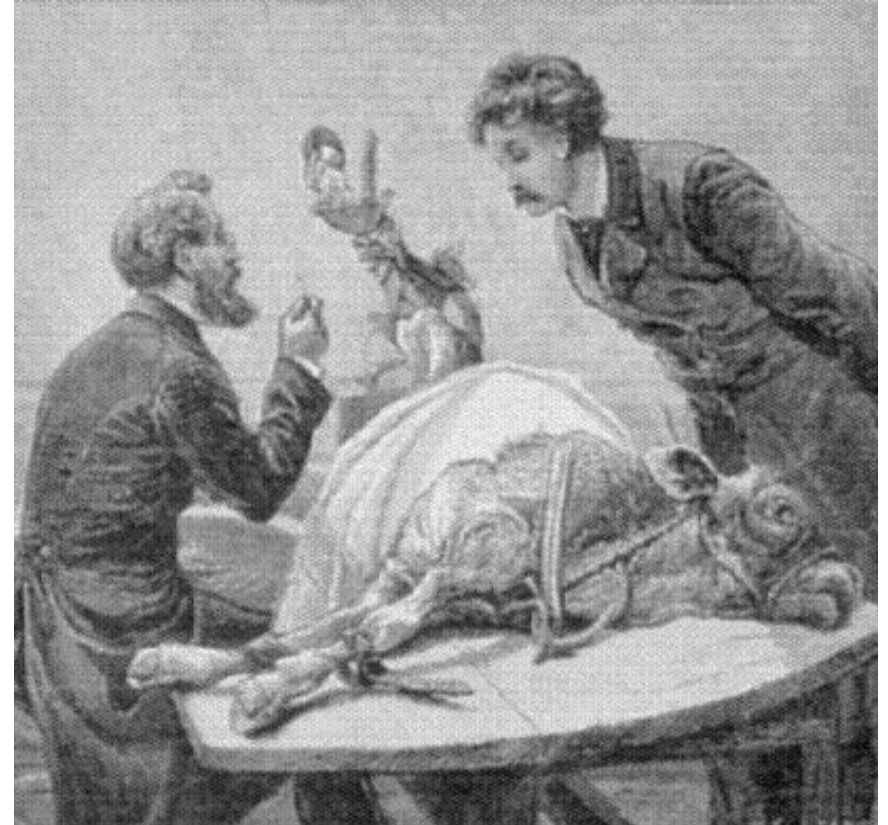
Active and passive immunisation

	<u>Active immunisation</u>	<u>Passive immunisation</u>
Speed of response	Delayed	Prompt
Length of response	Long-term	Short-term
Clinical use	Long-term prophylaxis	Treatment, short-term prophylaxis

Antisera used in human medicine

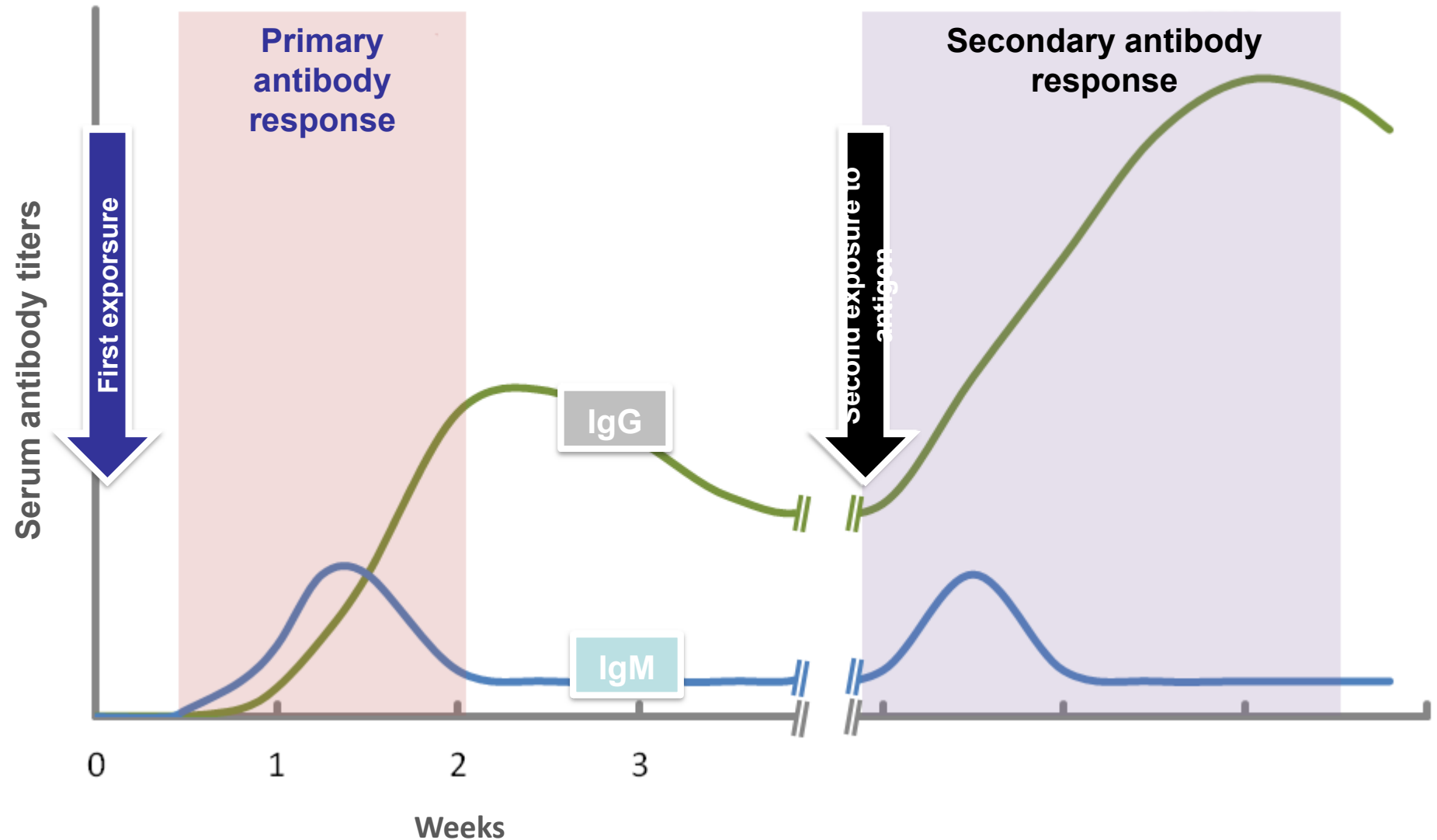
- Against bacterial infections: Tetanus (human), Diphtheria (equine), Botulism (equine)
- Against viral infections: Hepatitis B (human), Rabies (equine), Varicella-zoster (human), CMV (human), tick-born encephalitis (human), hepatitis A, measles and other viral infections (pooled human immunoglobulin)
- Against snake or black widow spider toxins
- Anti Rh

Edward Jenner

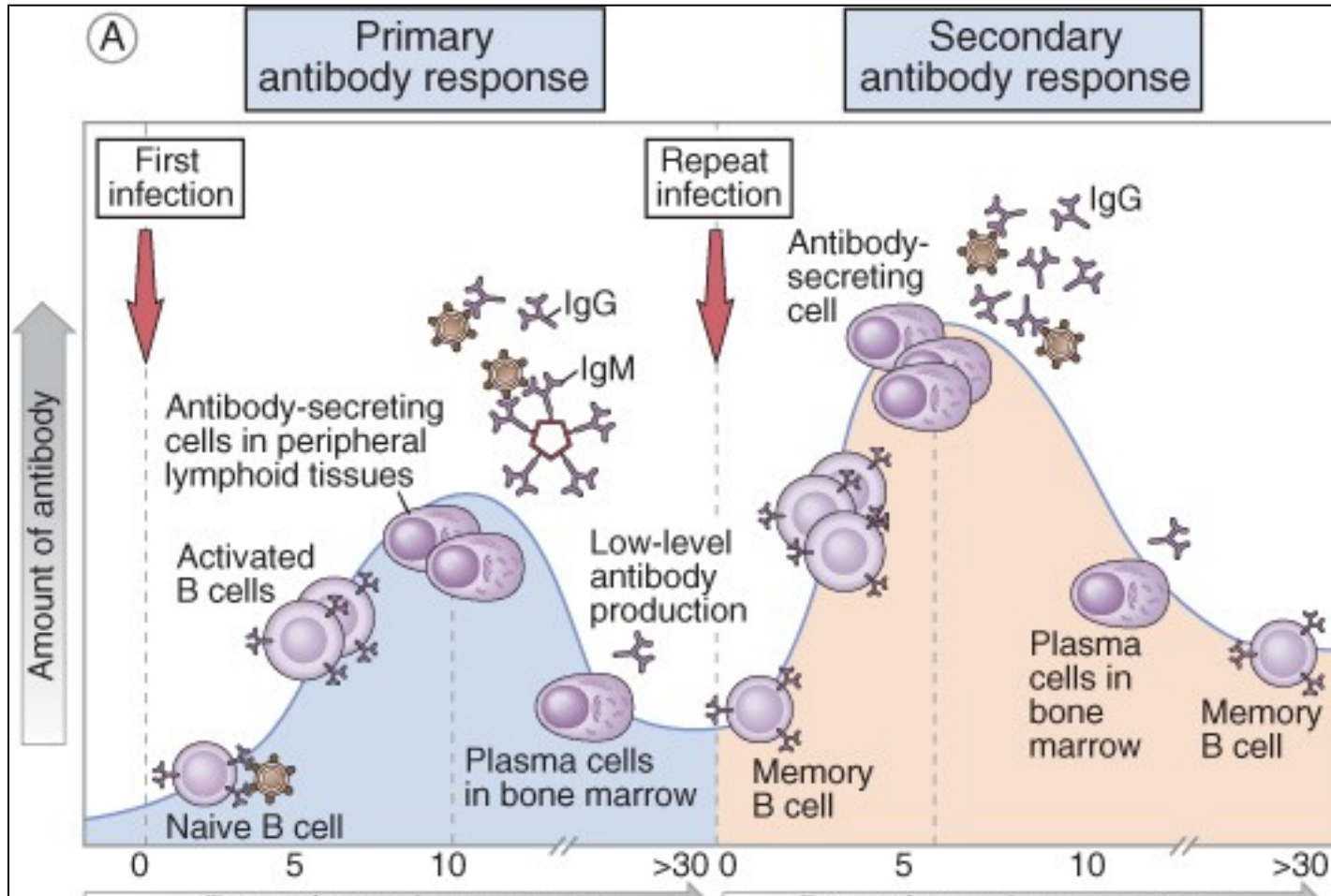


Discovery of small pox vaccine

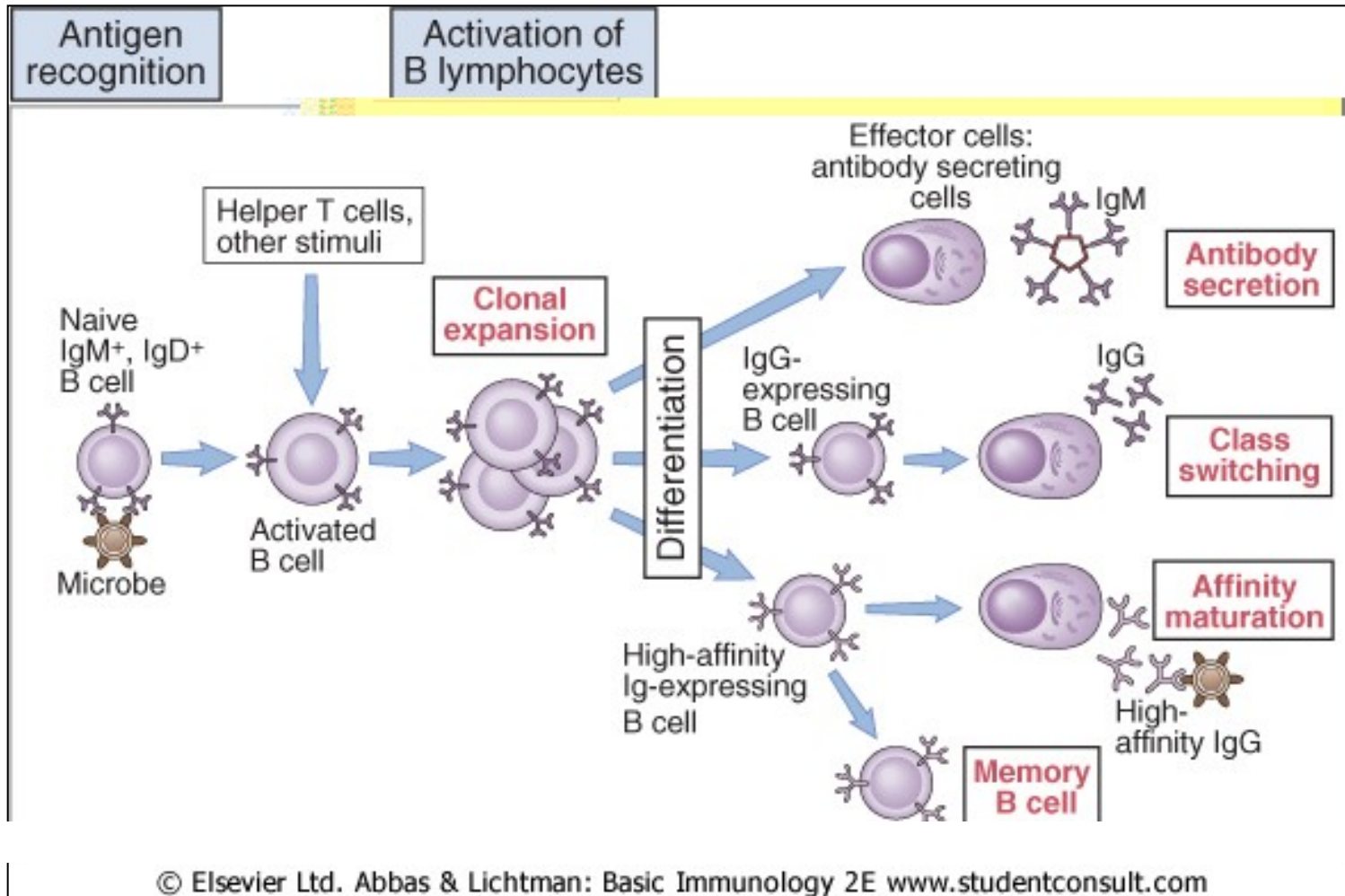
Primary and secondary immune response



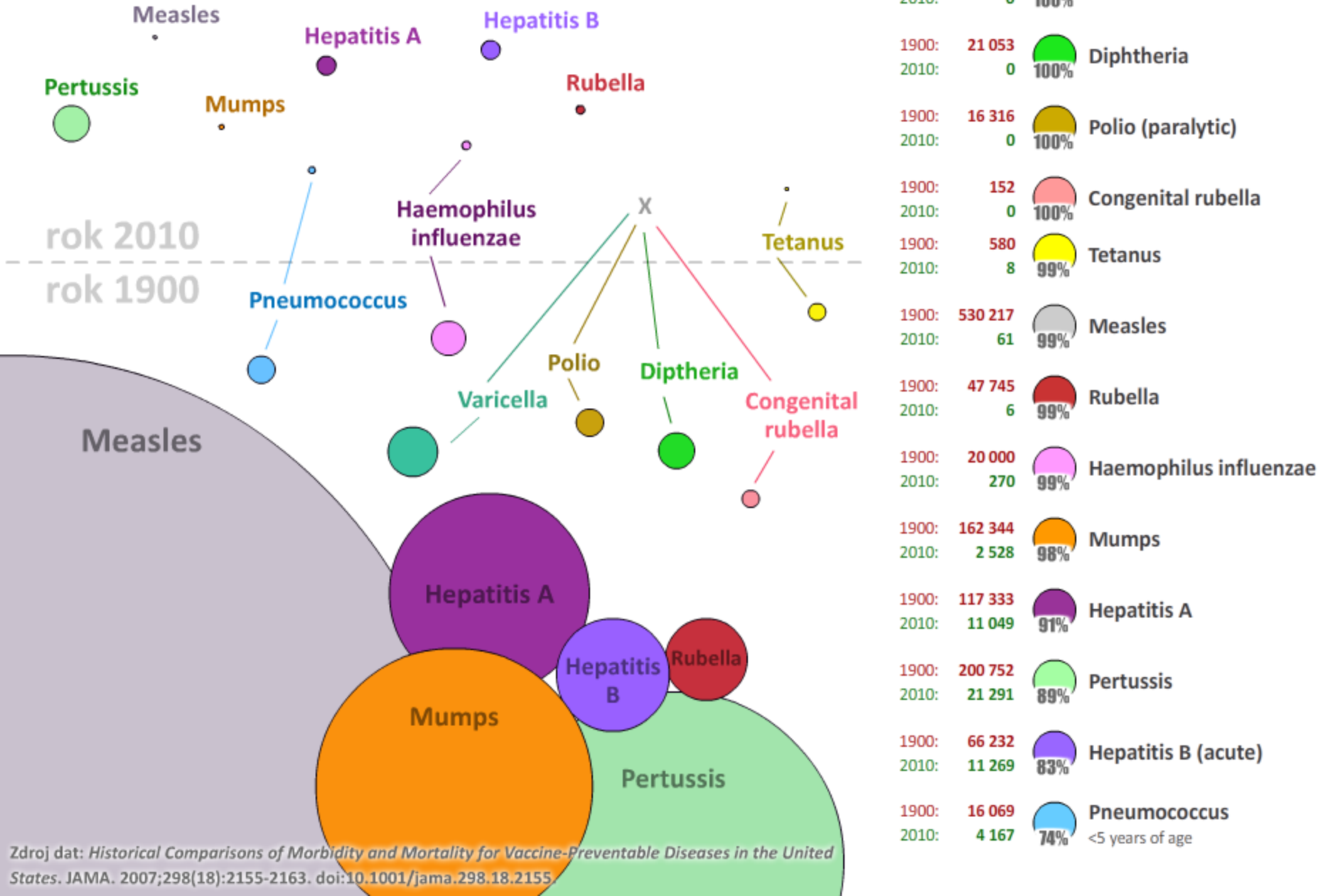
Primary and secondary immune response



Formation of memory cells after antigenic challenge



The effect of vaccination on infectious diseases occurrence in USA



„Classical“ vaccines

- **Attenuated microbes:** mumps, measles rubella, rotavirus varicella, BCG (against TBC), cholera, yellow fever, poliomyelitis,
- **Inactivated microorganisms:** rabies, hepatitis A, tick-born encephalitis, poliomyelitis, cholera, plague. Formerly pertussis.
- **Toxoids:** tetanus, diphtheria

„Modern“ vaccines

- **Subunit:** influenza, pertussis
- **Polysaccharide:** Haemophilus influenzae B (conjugated), Meningococcus (group A a C, conjugated on non-conjugated), Pneumococcus (conjugated and non-conjugated)
- **Recombinant:** hepatitis B
- **Virus-like particles** : papillomavirus

„Future (?)“ vaccines

- Synthetic polypeptides
- Antiidiotype antibodies
- DNA vaccines
- Vector vaccines
- Antigens inserted into food
(bananas, potatoes)

Interaction idiotype-antiidiotype

