Serology and vaccinology

مصول ولقاحات

Lec2

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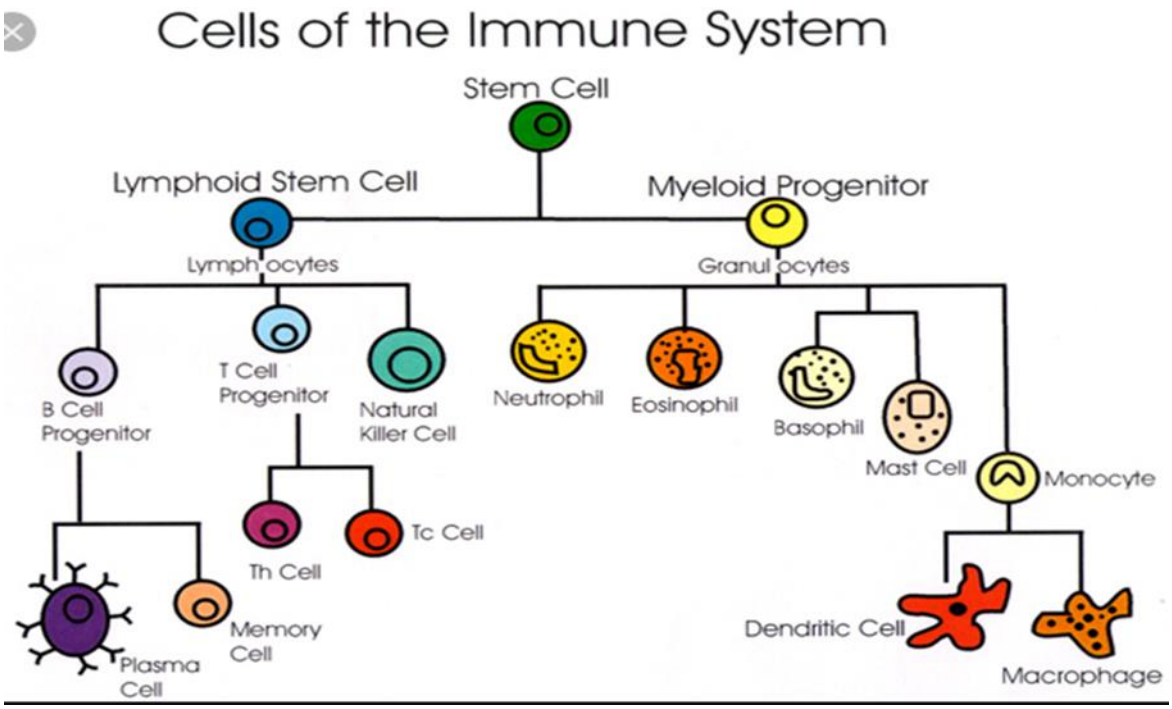

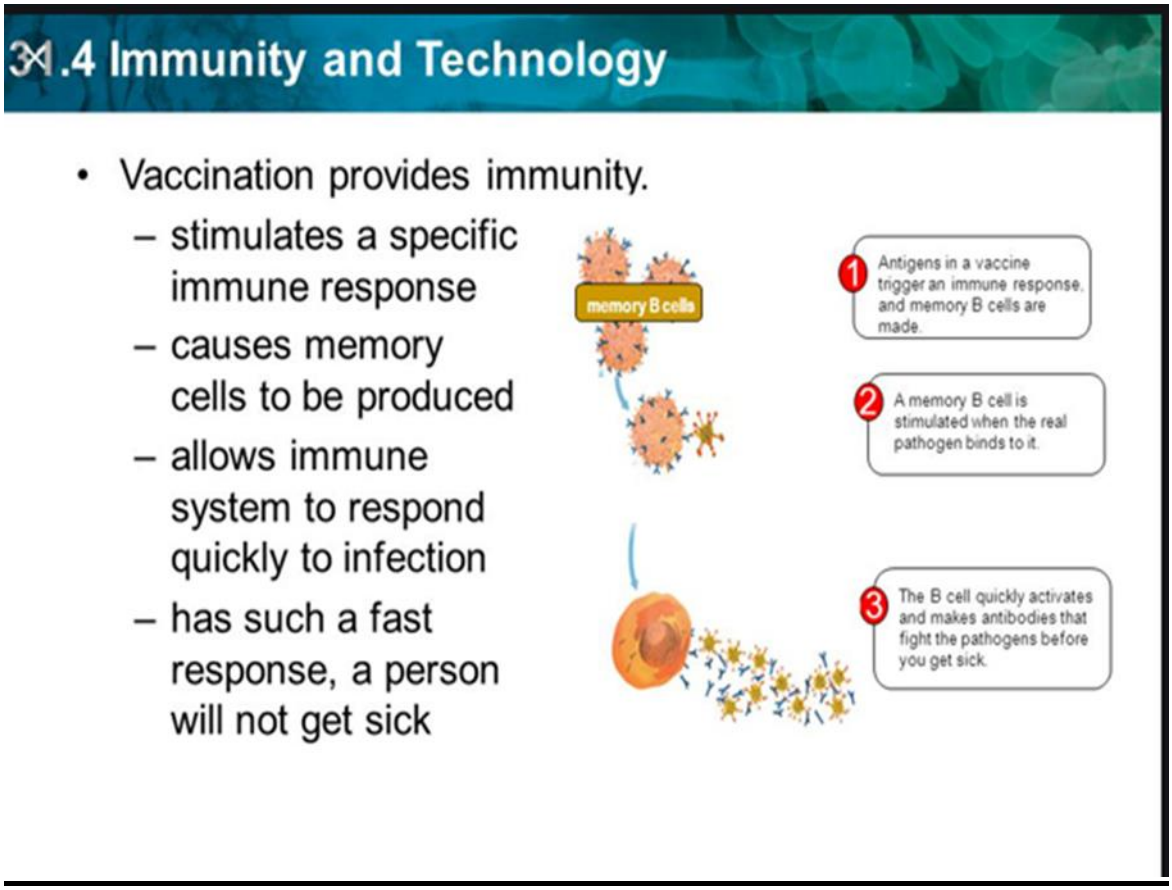

Herd immunity مناعة القطيع

Even though no vaccine is entirely safe or completely effective, their use is strongly supported by their benefit-to-risk ratio. Vaccination can provide excellent protection to a population, even if not every individuals in a population is vaccinated, because of a phenomenon known as herd immunity.

Requirments of herd immunity: متطلبات مناعة القطيع

1- Disease agents restricted to a single –host species within which transmission occurs(e.g small pox)
2- Direct transmission(direct contact)
3- Infection must induce solid immunity(from vaccination or previous infection)

Properties of ideal vaccine (characteristics): صفات اللقاح المثالى

Vaccine must fulfil several criteria to be effective in protecting large numbers of individuals:

1- It is highly immunogenic so that a single vaccine does provide a complete immunization regimen
2- It has long duration of immunity so that frequent booster doses are not needed
3- It limits spread of infection, because it prevents vaccine recipients from spreading infection to other people
4- It is heat stable, so that refrigeration (cold chain) is not required during shipping and storage.
5- Injection is not required for administration eg. Nasal spray of vaccine can be used.
6- It can safely be administrated simultaneously with other vaccine either as a part of a specific combination vaccine e.g measles-mumps –rubella)or as separate individual vaccine.
7- Adverse effects in vaccine recipients are few.
8- The microbe used to prepare the vaccine does not cause disease in recipients who have immune system weakened by HIV infection. Severe malnutrition, malignancies or congenital immunodeficiency.
9- The microbe used to prepare the vaccine never revert to wild type or otherwise mutants to cause disease in vaccinated people or in their close contacts.
10- It is in expensive to manufacture, distributes and administer so that it is affordable by the maximum number of people.
11- It is technically simple to manufacture , so that it can be produced in less sophisticated setting.

Route of administration of vaccine: طرق اعطاء اللقاح

a- Subcutaneous or intramuscular route(most vaccines)
b- Oral route (poliovirus)
c- Intradermal(BCG)
d- Scarification (smallpox)
e- Intranasal(live attenuated influenza vaccine)

Characteristics of disease suitable for control by vaccine and immunization: صفات المرض المناسب ان نسيطر عليه بواسطة اللقاح

1- Disease is well known by public and commonly occurs , so that many people are aware of its existence and importance.

2- Disease is recognizable by health workers (eg. Causes rash), so that the consequences of the disease can be linked to a specific type of microbe and disease outbreaks can be recognized.

3- Disease short term or long term effects on individuals can sometimes be severe or permanent, so that the public(e.g . parents, health workers and policy makers)support preventing its future occurrence.

4- Disease is difficult to control at a population level without the use of immunization programs

5- Disease incubation period is not too short, so that vaccine still provide at least partial protection if given after exposure (e.g measles vaccine give early in the 10-14 day incubation period or rabies vaccine given soon after animal bite exposure.

6- Microbe has no non human reservoir from it which can be reintroduced into the human population after a adequate control has been achieved.

7- Genetic mutations that results in biochemical changes to the microbe outer coat occur very slowly, if it at all, so that that vaccine ability to prevent infection and disease is well maintained over time.

8- Infection with the microbe does not result in mild disease or in a prolonged (carrier state), so that there are no infected people who could easily spread the disease to susceptible contacts because they themselves do not feel ill or appear ill.

Scheme of immunization: جدولة اعطاء اللقاح

A: primary vaccination: one dose vaccines (BCG, Variola, measles ,Mumps, rubella ,Yellow fever)

B: multiple dose vaccines (polio, DPT, Hepatitis B) : booster vaccine to maintain immunity level after its declines after some time has elapsed.

Herd immunity: مناعة القطيع

It is phenomenon that arises when a high percentage of the population is protected through vaccination against a virus or bacteria, making it difficult for disease to spread because there are so few susceptible people left to infect. This can effectively stop the spread of disease in the community , these include children who are too young to be vaccinated , people with immune system problems , and those who are too ill to receive vaccines(such as some cancer patients).