



Humoral Immune Response

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2 year students



Objectives :

1

Define immune response

2

Discuss primary and secondary humoral response

3

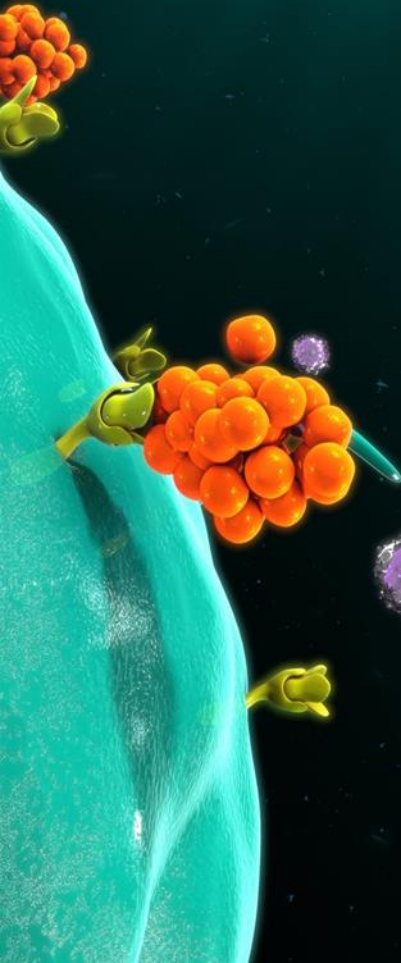
Discuss stimulation and inhibition of humoral response

4

Differences between primary and secondary humoral response

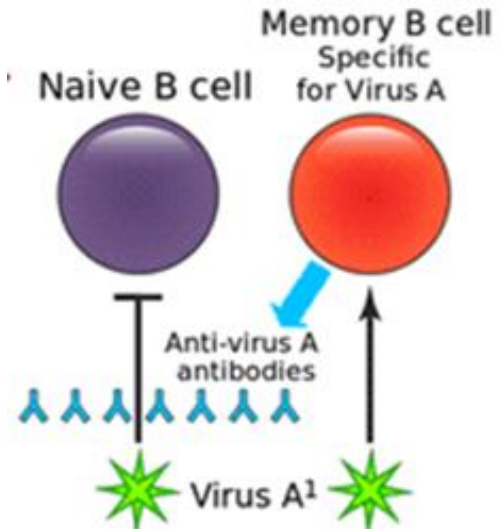
What's the humoral immune response ?

Is the specific reactivity induced in a host by an antigenic stimulus. For the generation of immune response, antigen must interact with and activate a number of different cells. In addition, these cells must interact with each other.

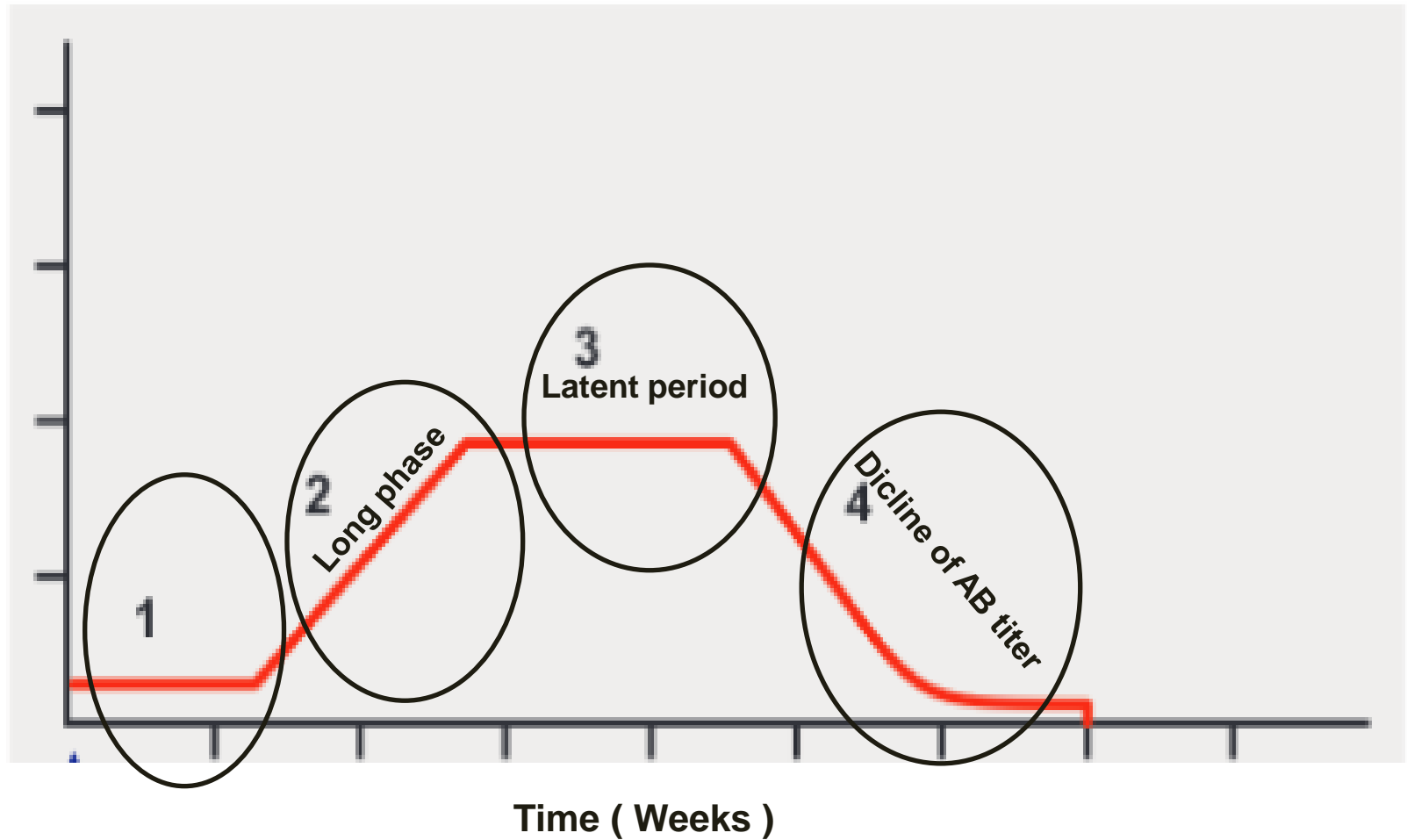


Primary Immune Response :

- ✓ Characterized by the production of antibody.
- ✓ Plasma cells and memory B cells.
- ✓ Characterized by a lag phase.
- ✓ IgM is secreted initially.
- ✓ A primary response can last for various periods, from only a few days to several weeks.



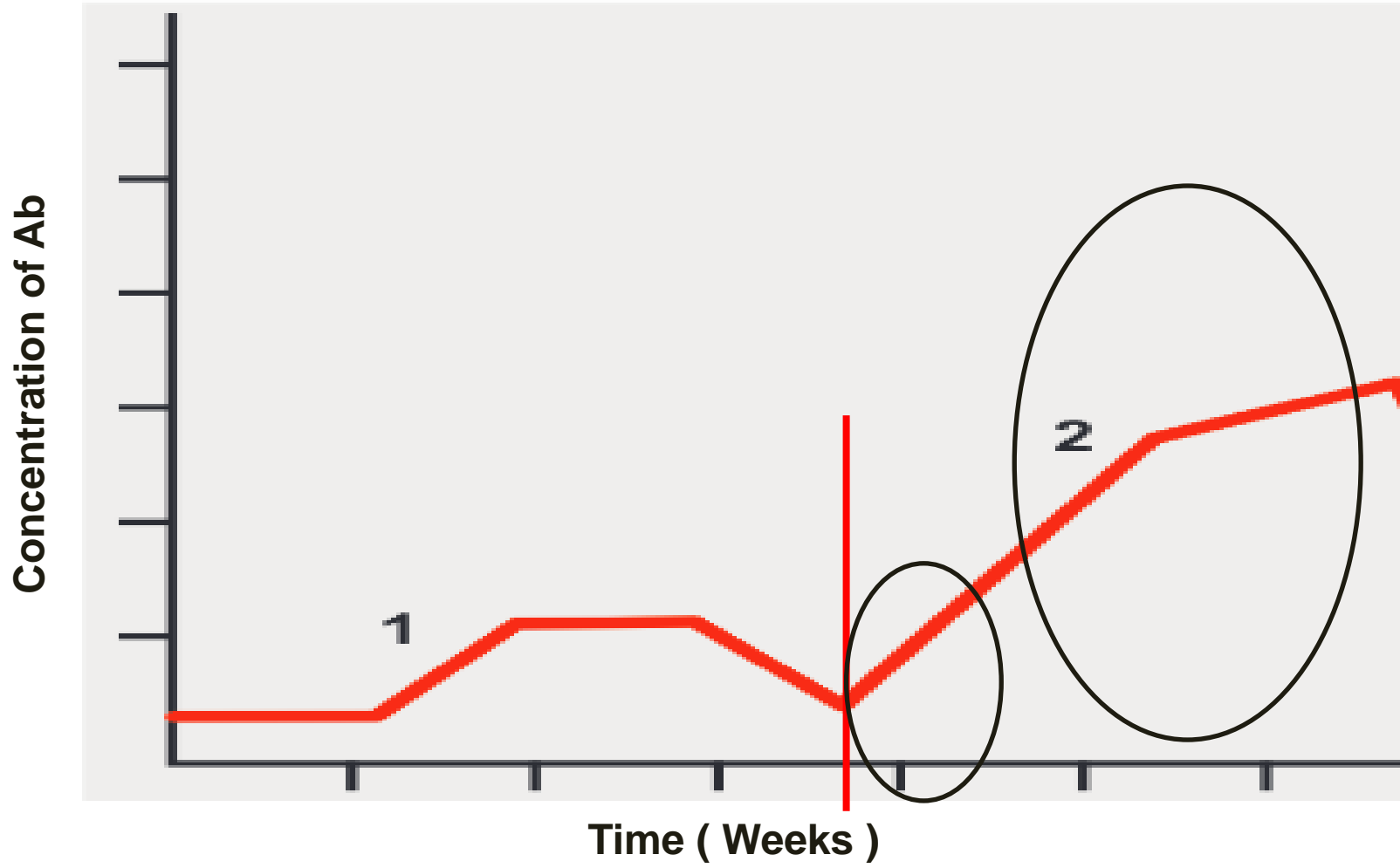
Concentration of Ab





Secondary Immune Response :

- ✓ Activation of memory cells by antigen results in a secondary antibody response.
- ✓ The main isotype is IgG.
- ✓ Activation of memory cells by antigen results in a secondary antibody response.
- ✓ Shorter lag period.
- ✓ Characterized by secretion of antibody with a higher affinity for the antigen.
- ✓ Level of antibody produced is 10 or more times than 1st response .

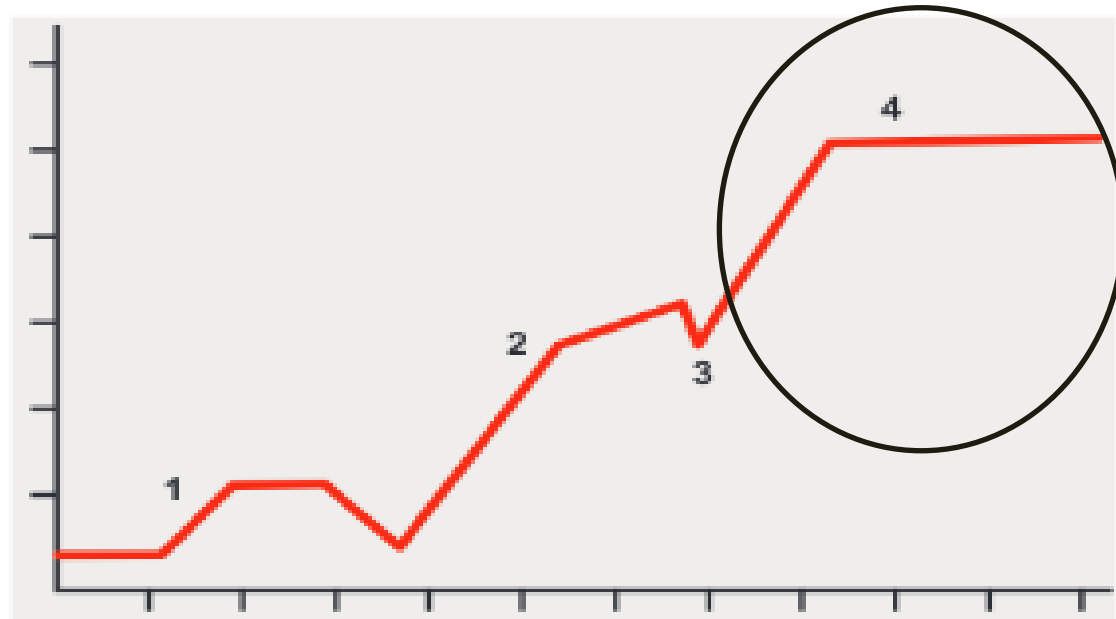




Stimulation and inhibition of humoral response

Priming dose and booster doses :

The first injection is known as the “priming” dose and subsequent injections as “booster” doses.

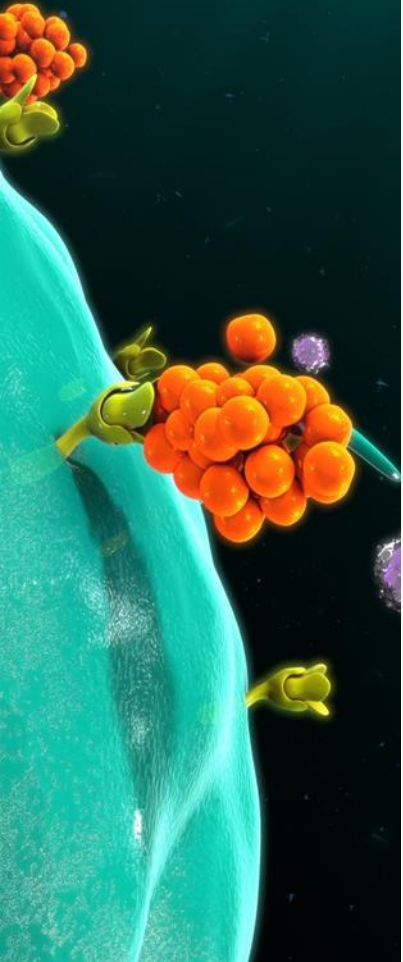




Negative phase :

The same animal is subsequently exposed to the same antigen already carrying the specific antibody in circulation, a temporary fall in the level of circulating antibody occurs due to the combination of the antigen with the preexisting antibody. This is known as the 'negative phase.' It is followed by an increase in the titre of the antibody exceeding the initial level.

Differences between 1st & 2nd Humoral response



Primary

Relatively long latent period.

Amount of antibodies produced is low.

During decline phase, the antibody level drops to a very low value.

Secondary

Relatively short latent period (quick).

Antibody produced is much Produced.

During decline phase, the antibody level persist at a higher value for longer.

Differences between 1st & 2nd Humoral response

Immune globulin M.

Responding cell is naive B-cell and T-cell.

Level of antibody reaches peak in 7 to 10 days.

It takes longer time to establish immunity.

Immune globulin G.

Responding cell is memory cell.

Level of antibody reaches peak in 3 to 5 days.

Takes shorter time to establish immunity.



Summary:

- ✓ The humoral response is the specific reactivity induced in a host by an antigenic stimulus.
- ✓ In the primary immune response IgM is secreted initially .
- ✓ In the secondary humoral response, the main Ig is IgG.
- ✓ The first injection is known as the “priming” dose and subsequent injections as “booster” doses.
- ✓ Negative phase when the same antigen already carryin the specific antibody in circulation.

A vertical strip on the left side of the slide features a microscopic illustration. It shows a light blue, textured surface, possibly a cell membrane or a biological structure, with several clusters of bright orange, spherical granules. Some of these granules are attached to small, green, hook-like structures. The background is dark, making the blue and orange elements stand out.

References :

- ✓ ***Essentials of Medical Microbiology, S.Kumar. P-125-126.(Chapter18) .***
- ✓ **<http://www.microbiologynotes.com>**



Thank you