Antigens

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Specific structures in microbes/foreign materials that the body responds to by adaptive responses

*3 receptors for antigens:

1-On B cells...or secreted from B cells
   * Antibody (soluble receptor for antigen)

2-On T cells

3-Major histocompatibility complex (MHC)...= human leukocyte antigen (HLA)...encoded by a cluster of genes
   Function: presentation of antigenic peptides to T cells
More about receptors for antigens...

• B cell: binds the antigen directly without the need of a MHC molecule

...but T cell bind both: antigen + MHC bound to the antigen

*in this case the Ag is cell-associated (virus...etc)
“Epitope” is the recognized part of “antigen”

- Epitope is the real small part that is identified by the receptor

- For example, a protein is an antigen but a small amino acid sequence of the protein is the real part that is specific for the receptor.
  ...single molecule may have multiple epitopes

- The two terms are usually used interchangeably
2 types of epitope

T cells recognize only linear type (bound to MHC)

Antibodies can recognize both types

Linear epitope: Amino acid residues are adjacent in the polypeptide chain

Discontinuous epitope: Created from amino acid residues located in different parts of the polypeptide chain
Antigen VS immunogen

- Antigen may bind to the receptor but may not induce antibody production (ineffective binding)

- Immunogen is the effective antigen that elicit antibody production

- To be effective, the molecule needs to be larger and more complex and fit more to the receptor

- Proteins are more immunogenic than carbohydrates and lipids

- Enzymatically-cleavable proteins are more immunogenic than non-cleavable ones
Haptens

• They are simple molecules that are non-immunogenic...but if they are coupled to a larger molecule (an immunogen) which is called “carrier”, they bind effectively to the receptor, and now the response is directed toward both the hapten and the carrier epitope

• They are usually non-biological
End of appetizers...
Relax & recharge for the next week