

T cell-mediated immunity

B & T CELL RECEPTORS

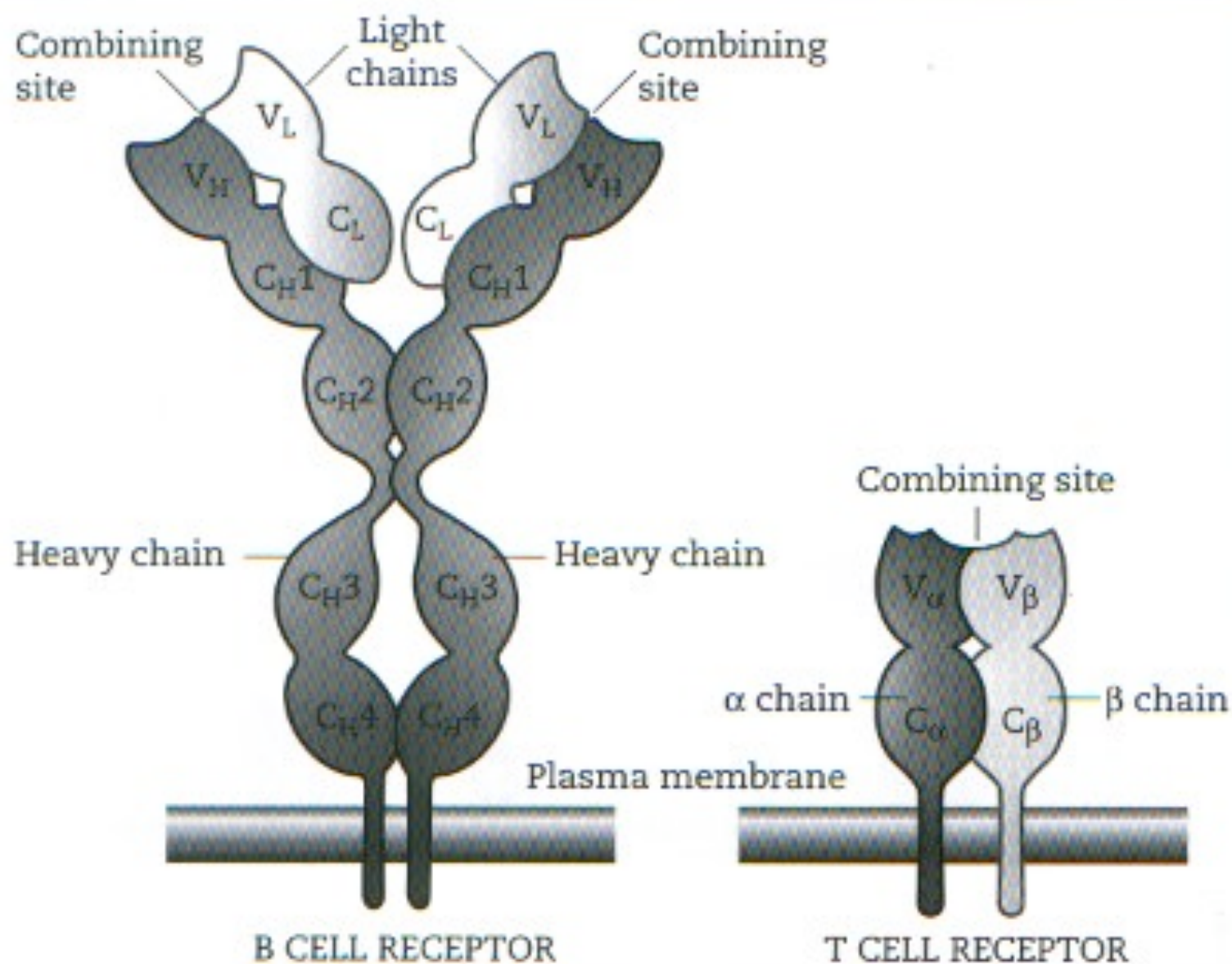
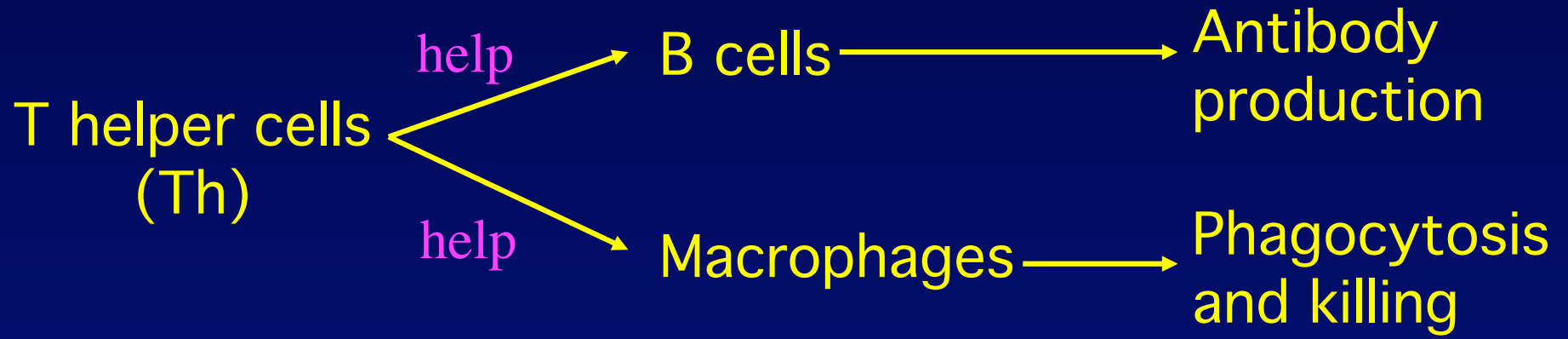
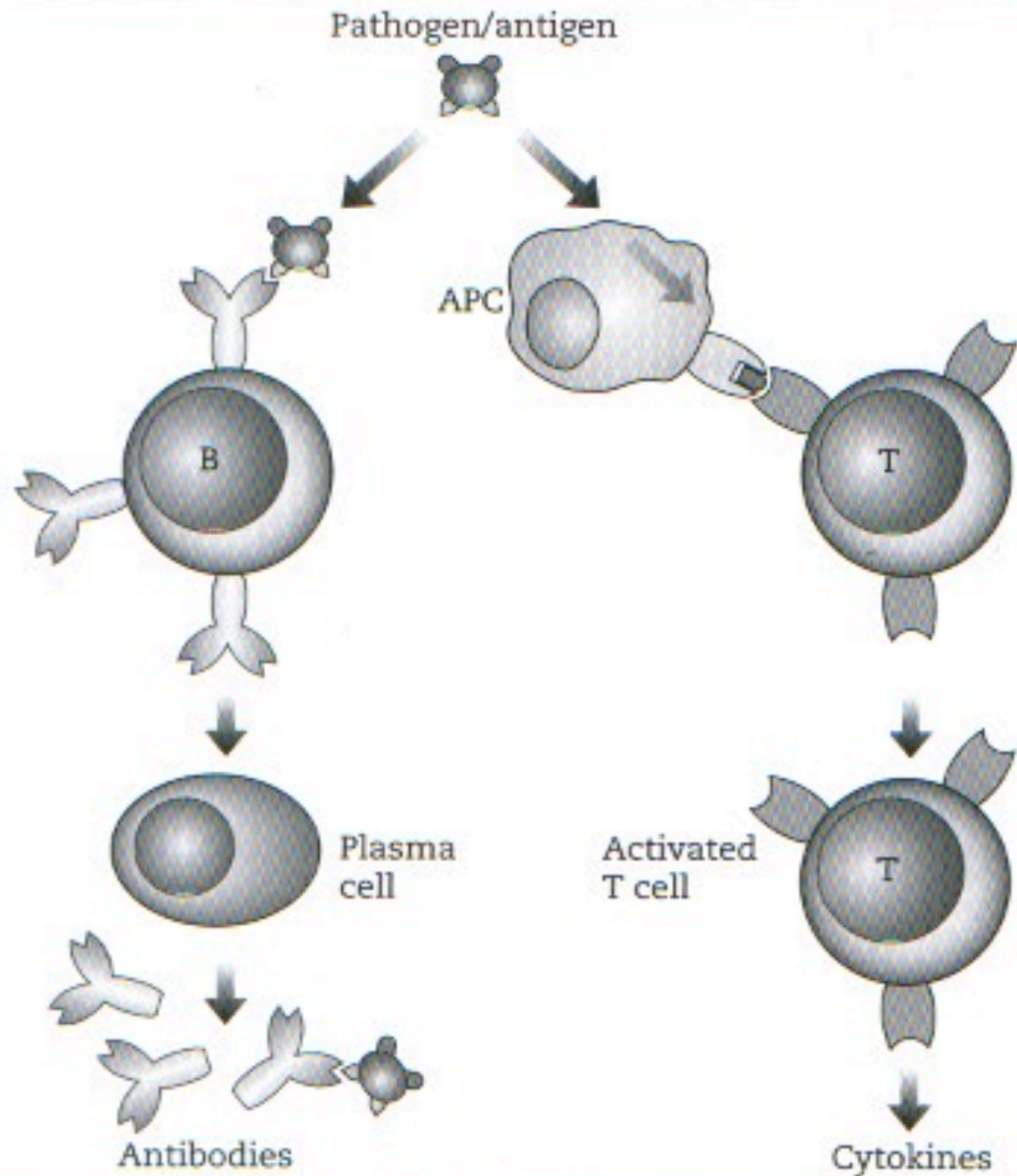


Fig. 2.4 The structure of B and T cell receptors for antigen (the former exemplified by monomeric IgM).



B & T CELL RECOGNITION OF ANTIGEN



HLA CLASS I & II GLYCOPROTEINS

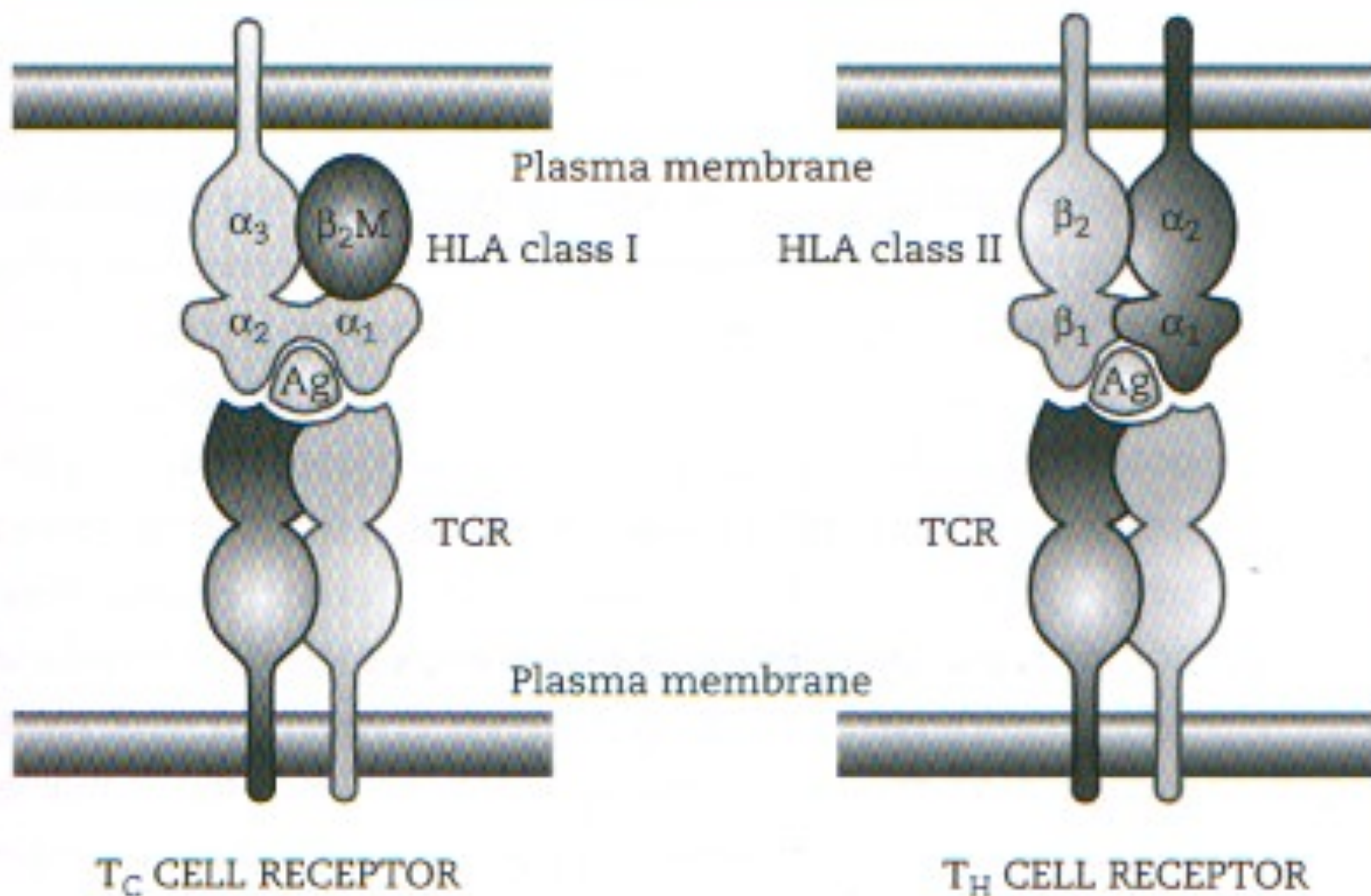


Fig. 2.8 The structure of HLA class I and II glycoproteins, and their interactions with antigenic determinants (Ag) and T cell receptors (TCR). β_2M , β_2 -microglobulin.

INTERACTION OF CD8 & CD4 WITH HLA

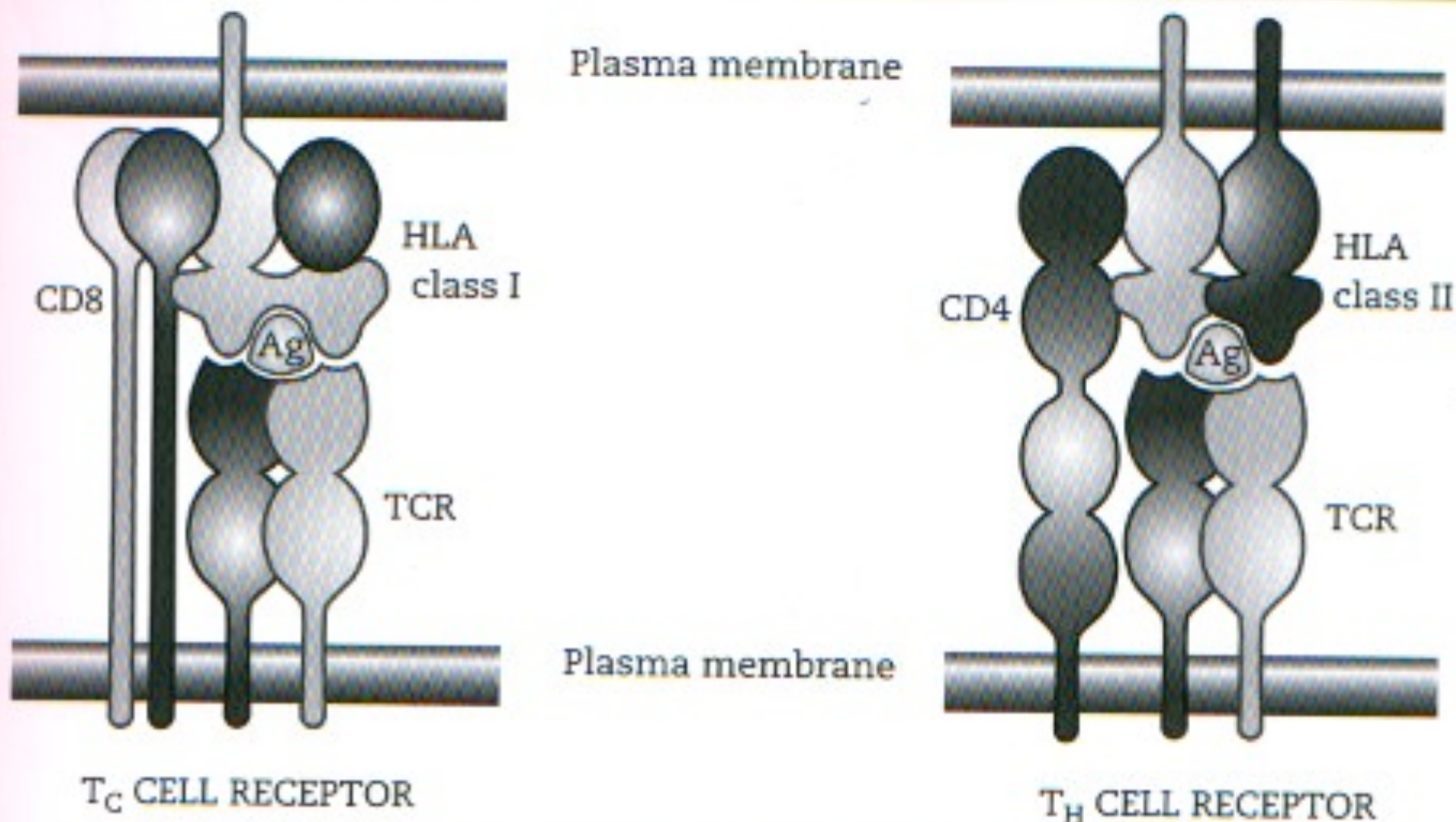


Fig. 3.3 A schematic representation of the interaction between a CD8⁺ T cell and antigenic determinant (Ag) bound to HLA class I, and a CD4⁺ T cell and antigenic determinant bound to HLA class II. TCR, T cell receptor.

PROCESSING OF ANTIGEN FOR HLA CLASS I

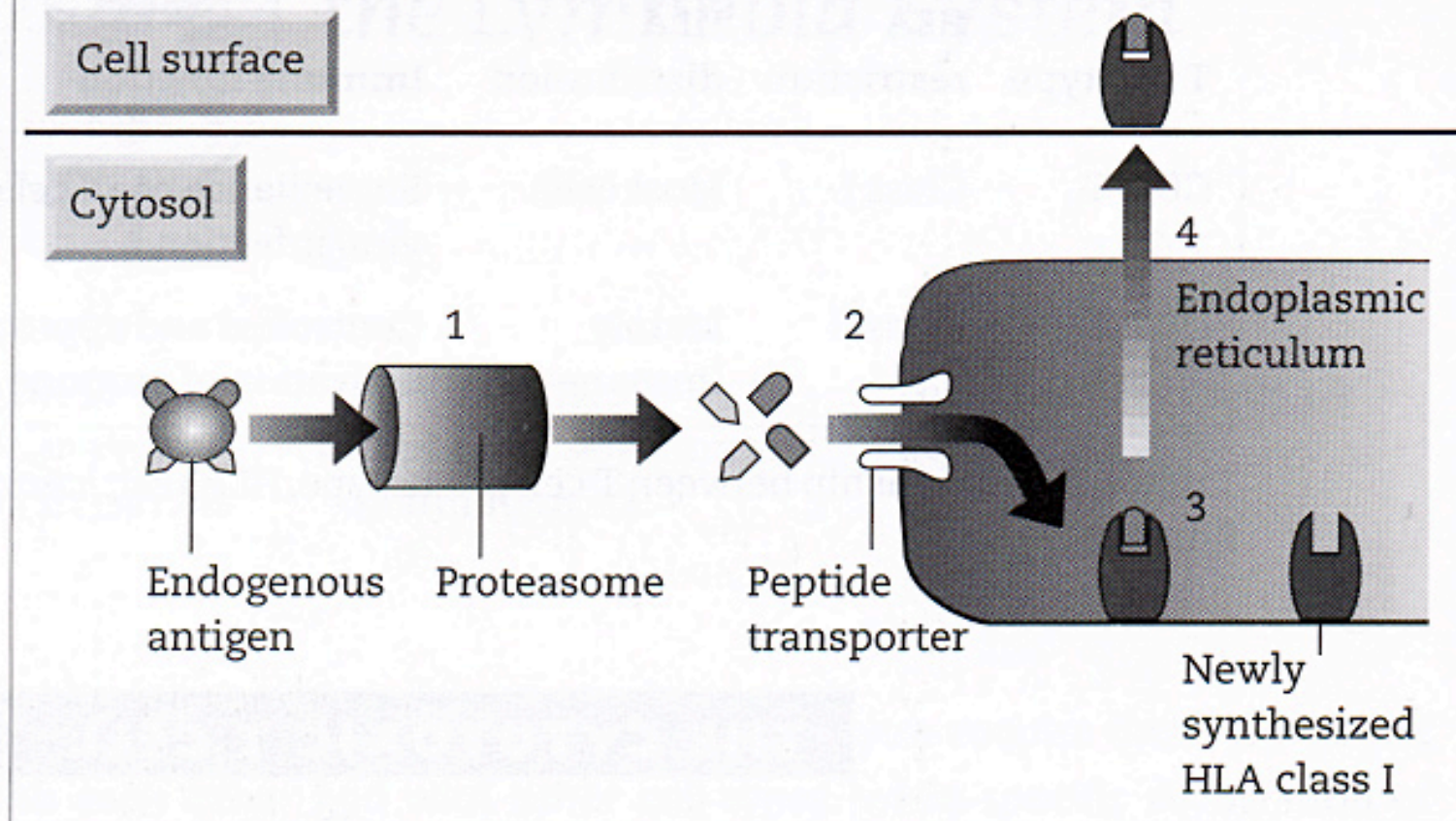


Fig. 4.2 Processing of antigen for presentation by HLA class I. (1) Protein antigens present in the cytoplasm are degraded in an enzyme complex called a proteasome; (2) some of the peptides generated are transferred to the endoplasmic reticulum via peptide transporter proteins; (3) peptides of appropriate length (eight or nine amino acids) and amino acid sequence associate with newly synthesized HLA class I molecules; (4) the peptide-HLA complexes are transported to the cell surface where they are available for recognition by T cells.

PROCESSING OF ANTIGEN FOR HLA CLASS II

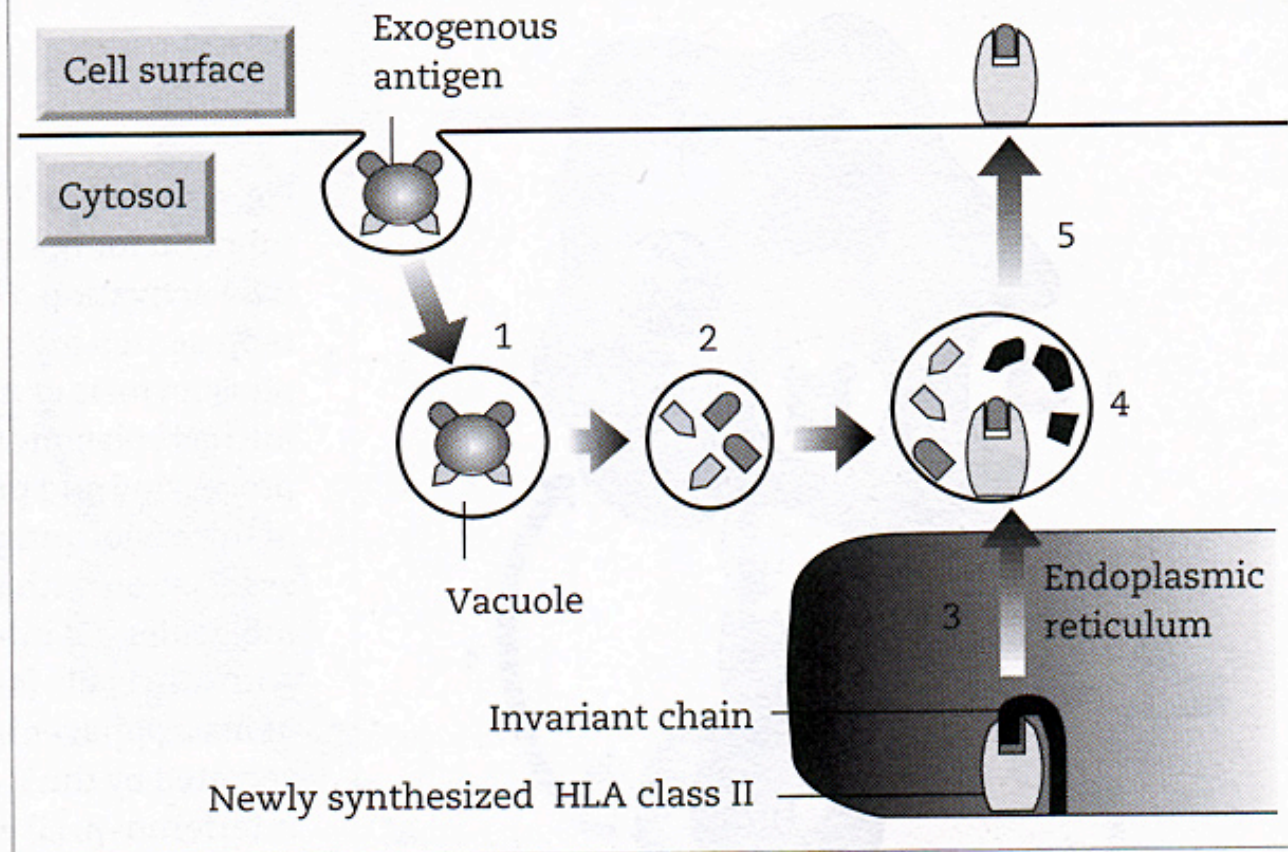
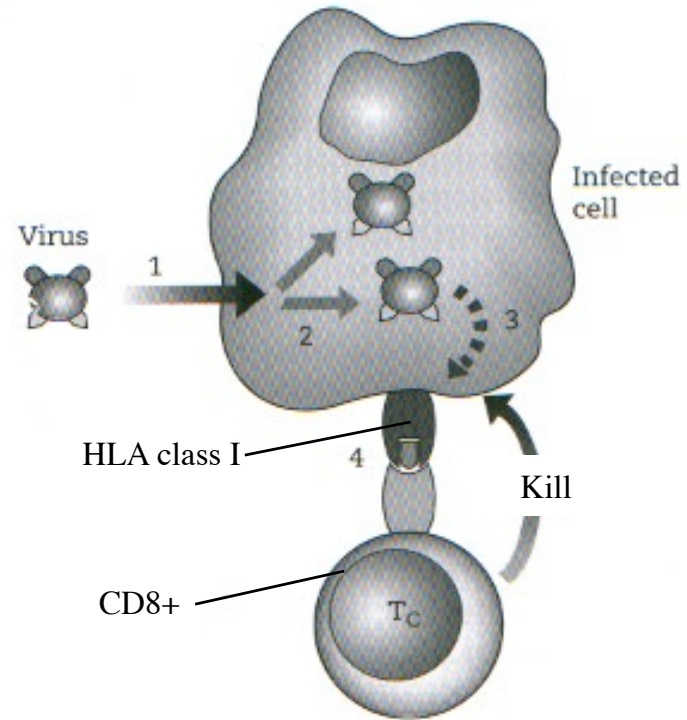
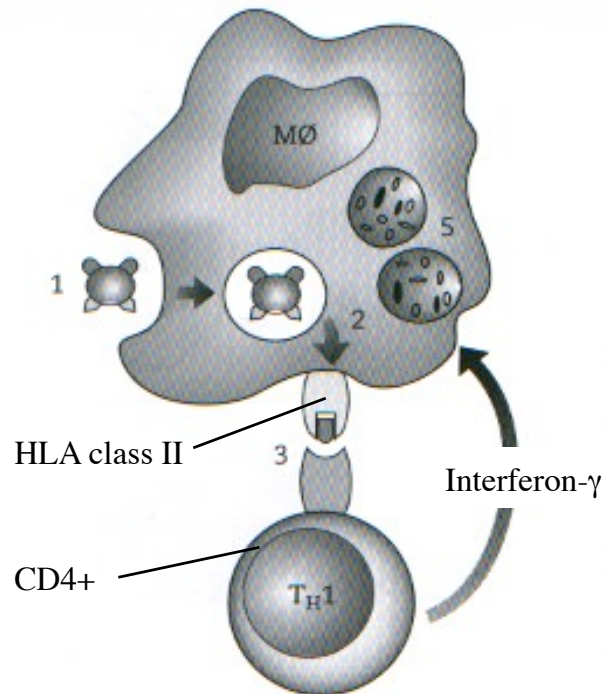


Fig. 4.3 Processing of antigen for presentation by HLA class II. (1) Endocytosis of exogenous protein antigen leads to its internalization into a vacuole; (2) enzymes entering the vacuole degrade the antigen; (3) newly synthesized HLA class II molecules in the endoplasmic reticulum associate with the invariant chain and are transported to the vacuole; (4) the invariant chain is degraded and antigen peptides of the appropriate length and amino acid sequence associate with the class II molecules; (5) the peptide-HLA complexes are transported to the cell surface where they are available for recognition by T cells.

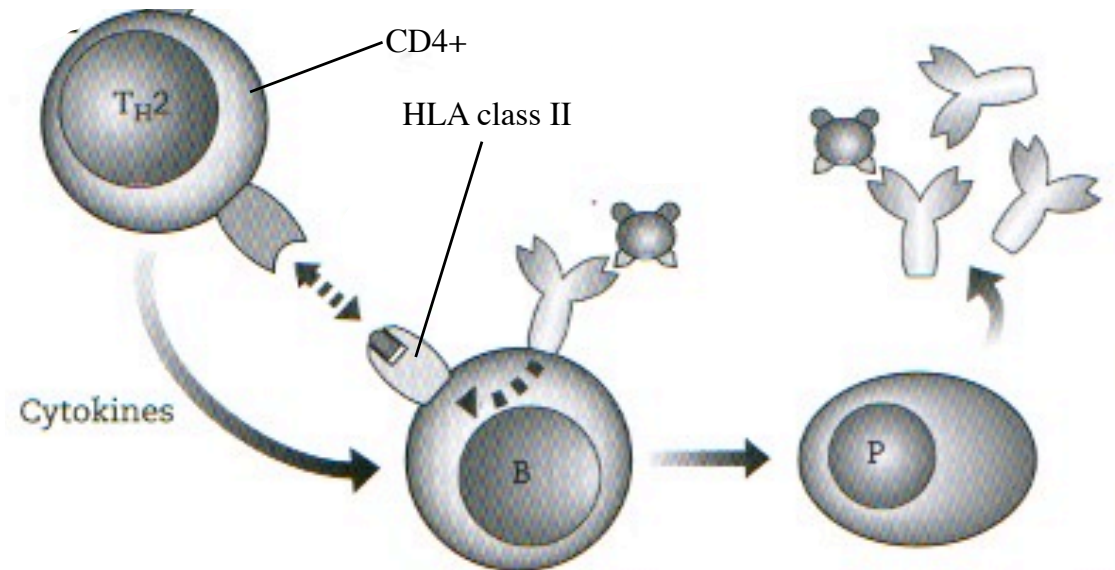
THE CYTOTOXIC T CELL



T_H & MACROPHAGE ACTIVATION



B CELL ACTIVATION & ANTIBODY PRODUCTION



<u>T cell type</u>	<u>HLA restriction</u>	<u>HLA distribution</u>	<u>Immune function</u>
CD8+ T _C	Class I	Most cells	Surveillance of all cells, eg. to kill virally infected cells
CD4+ T _H	Class II	Mainly immune cells	Controlled and appropriate activation of immune cells, eg. for bacterial digestion by macrophages

