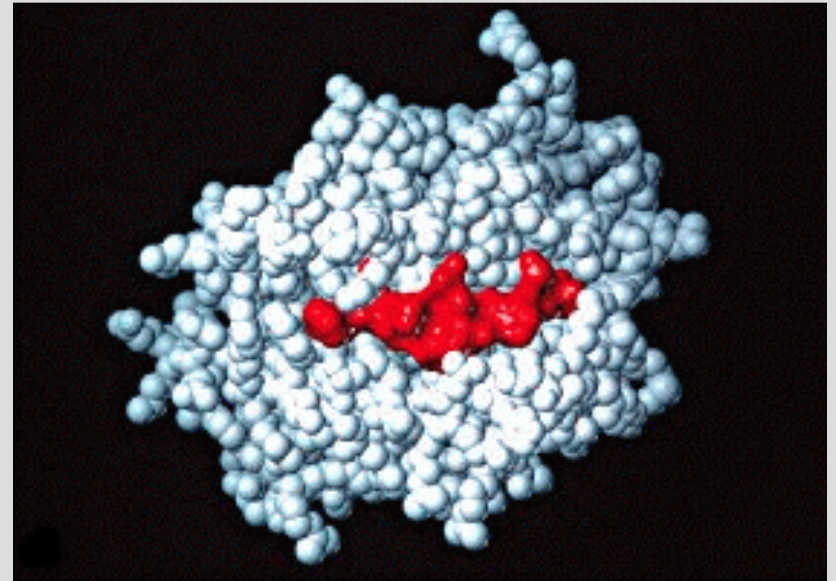
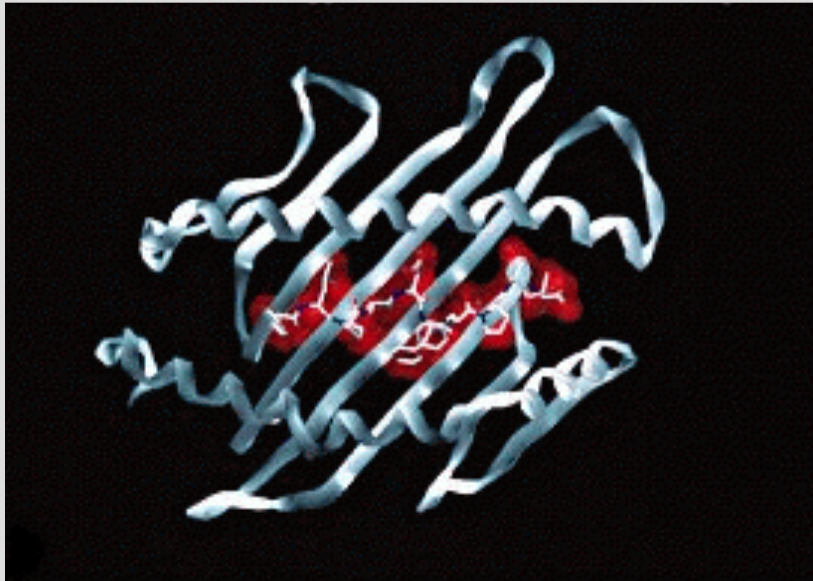


Figure 4.15 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

MHC classe I



H_2N^+	T	Y	Q	R	T	R	A	L	V	COO^-
H_2N^+	S	Y	F	P	E	I	T	H	I	COO^-
H_2N^+	K	Y	Q	A	V	T	T	T	L	COO^-
H_2N^+	S	Y	I	P	S	A	E	K	I	COO^-

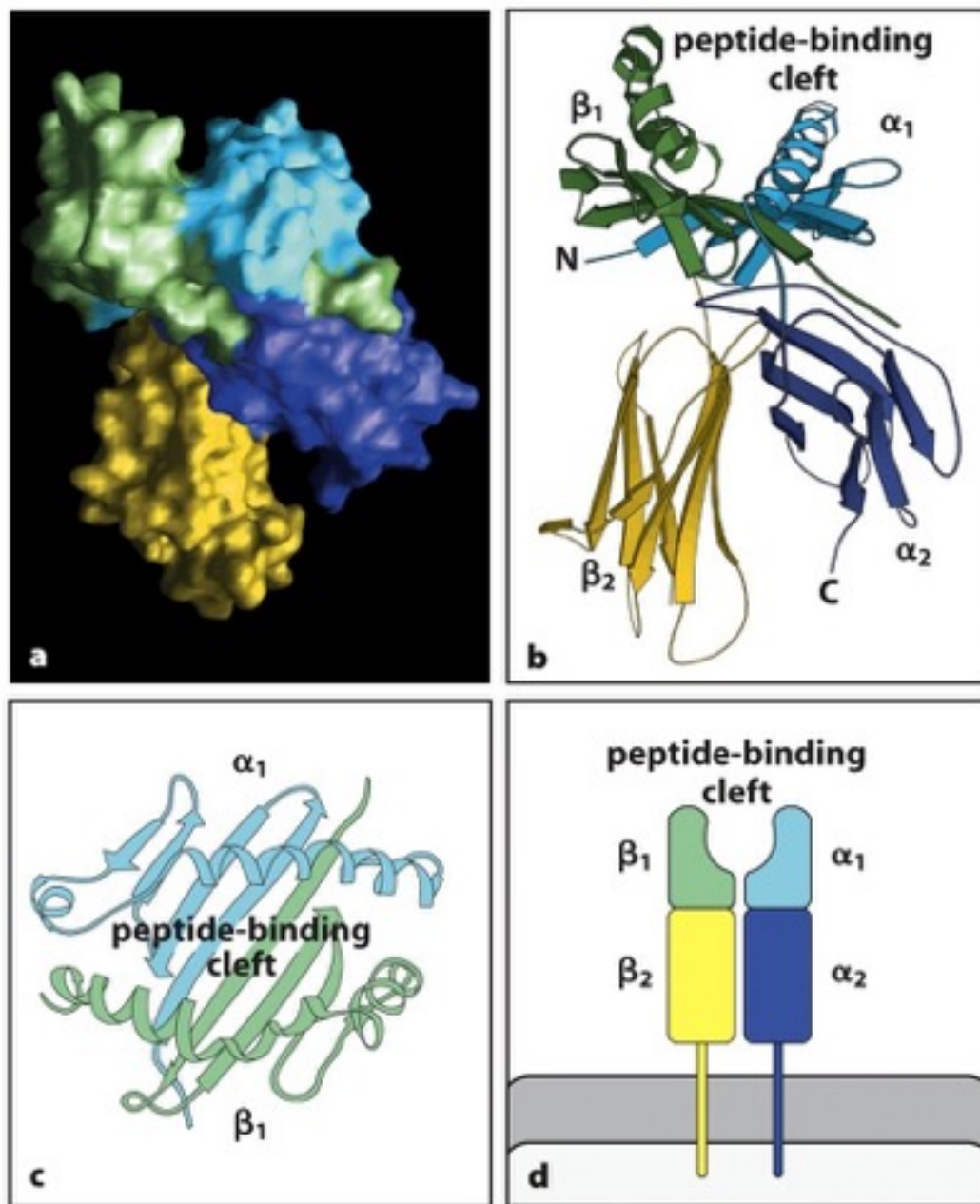
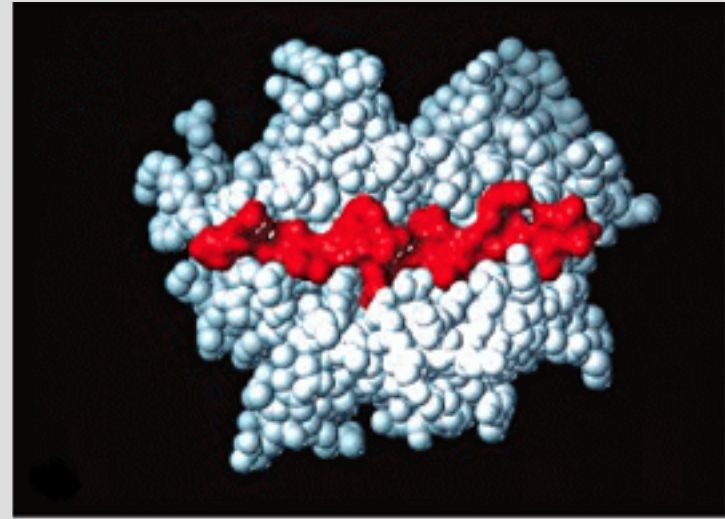
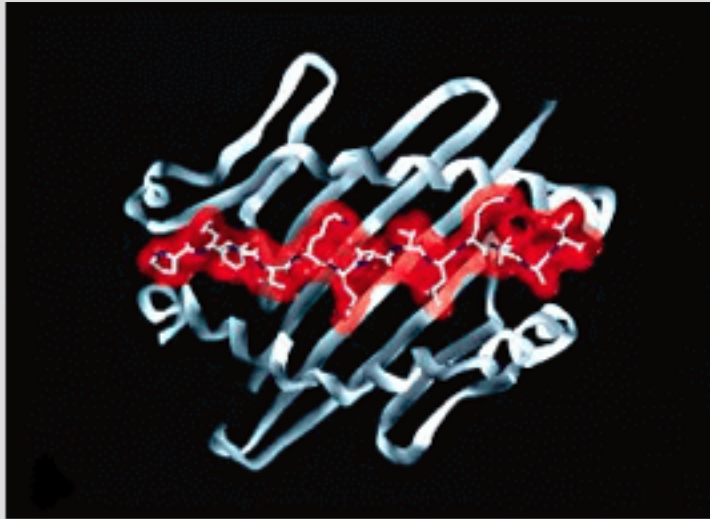
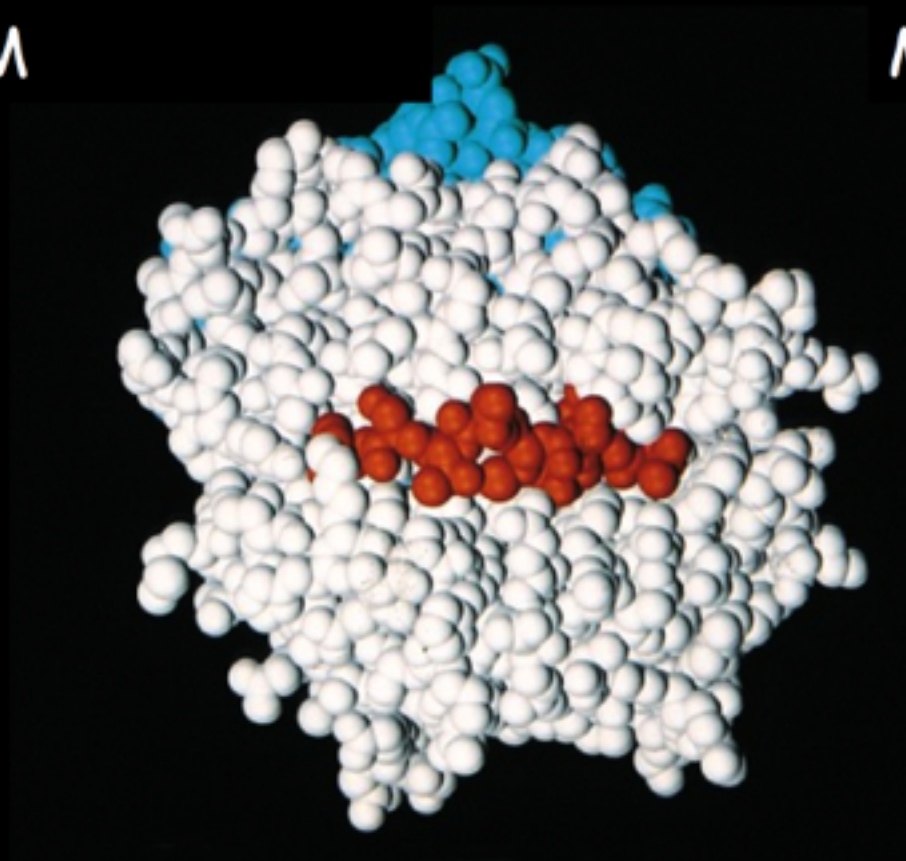


Figure 4.16 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

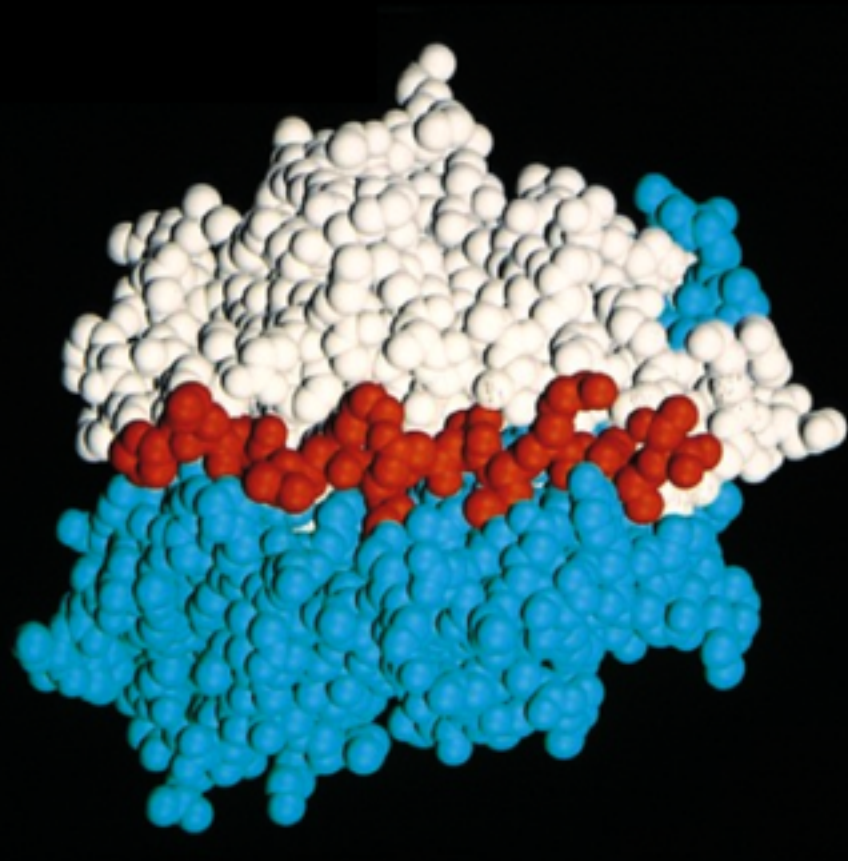
MHC classe II



M



M



O MHC é polimórfico e poligênico

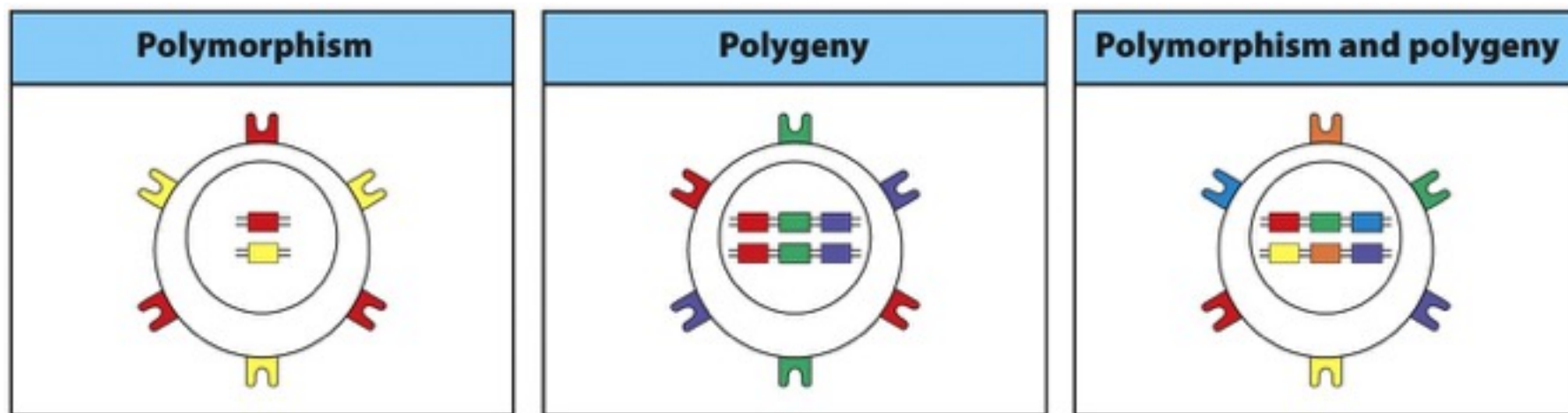
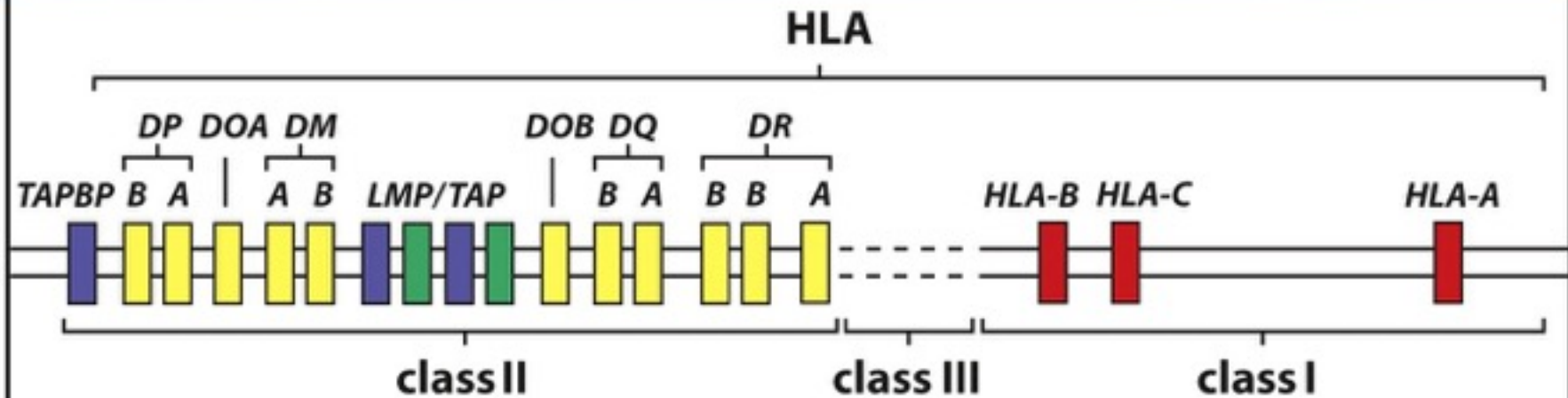


Figure 6.17 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

Gene structure of the human MHC



Gene structure of the mouse MHC

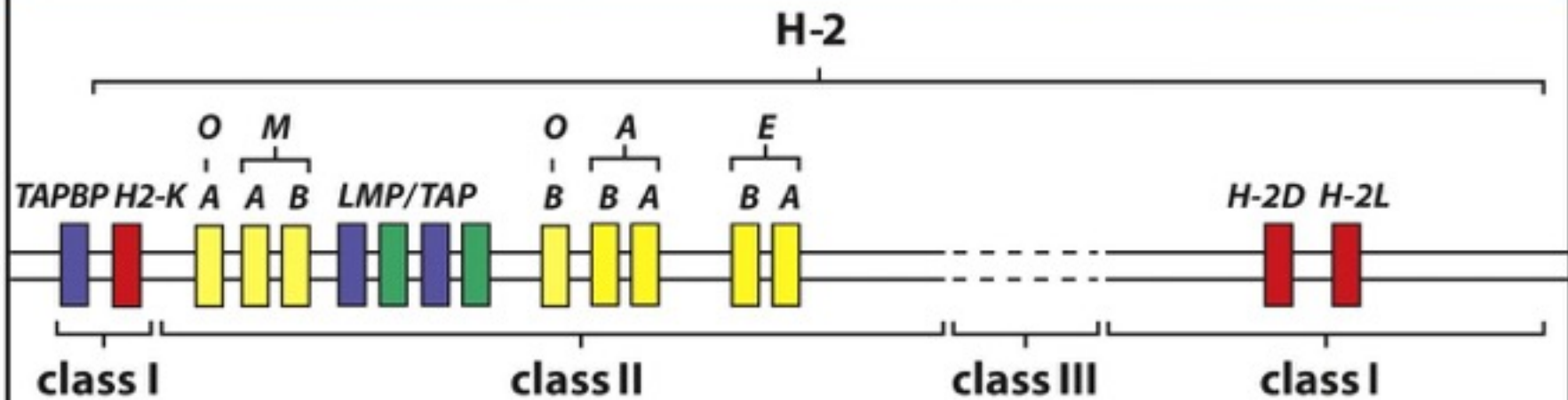


Figure 6.14 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

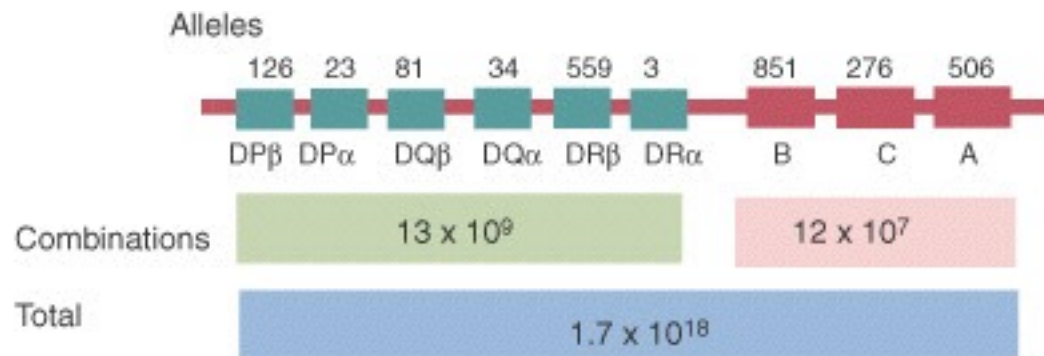


FIGURE 9-15 An example of how major histocompatibility complex (MHC) polymorphism can generate an enormous number of different MHC haplotypes. The numbers above each locus are the number of identified alleles in the human MHC as of January 2007. The number of different combinations can be determined by multiplying all of them together. Thus there are 13×10^9 class II combinations, 12×10^7 class I combinations, and 1.7×10^{18} total possible combinations, more than sufficient to give every human a unique haplotype.

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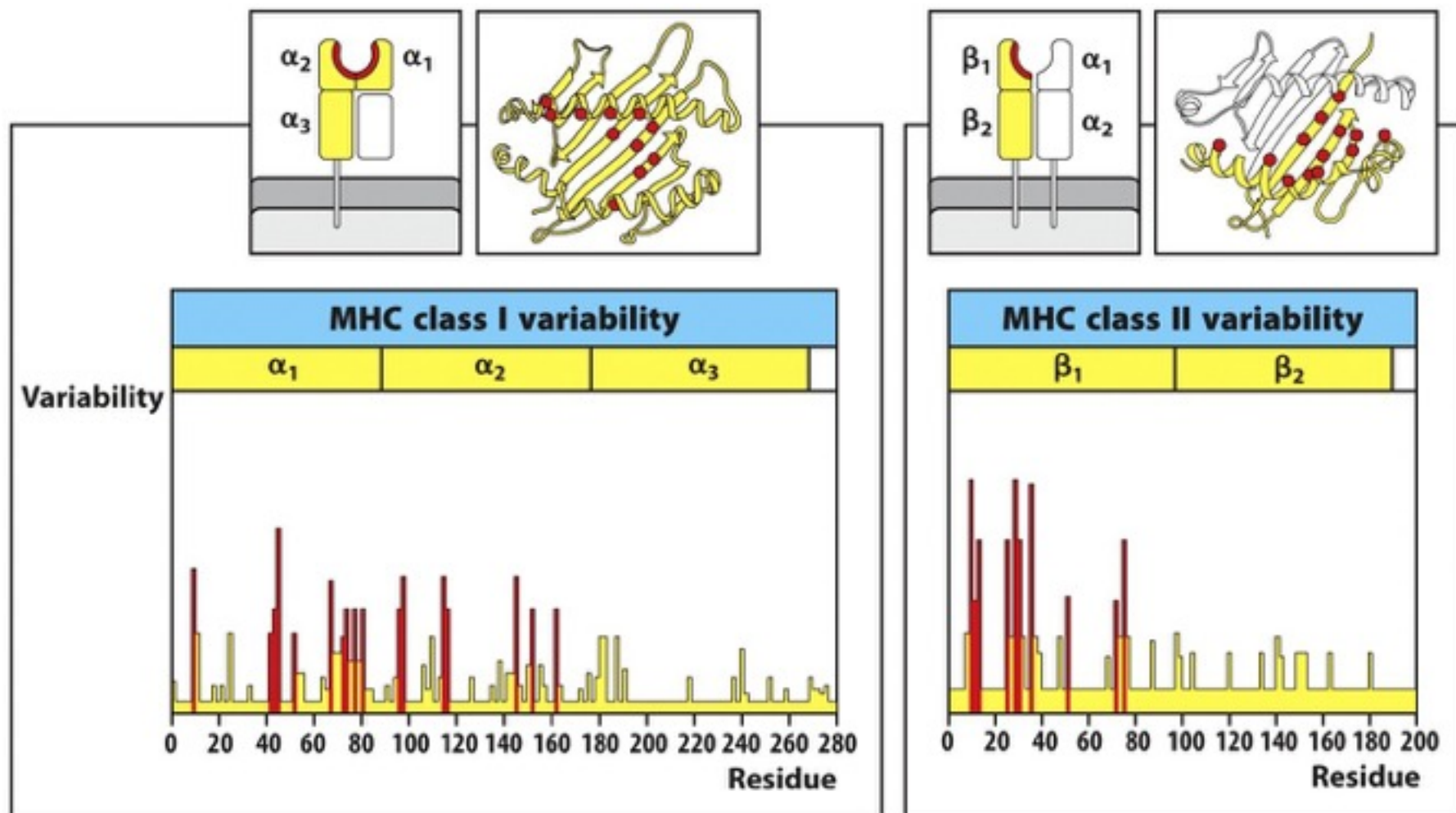
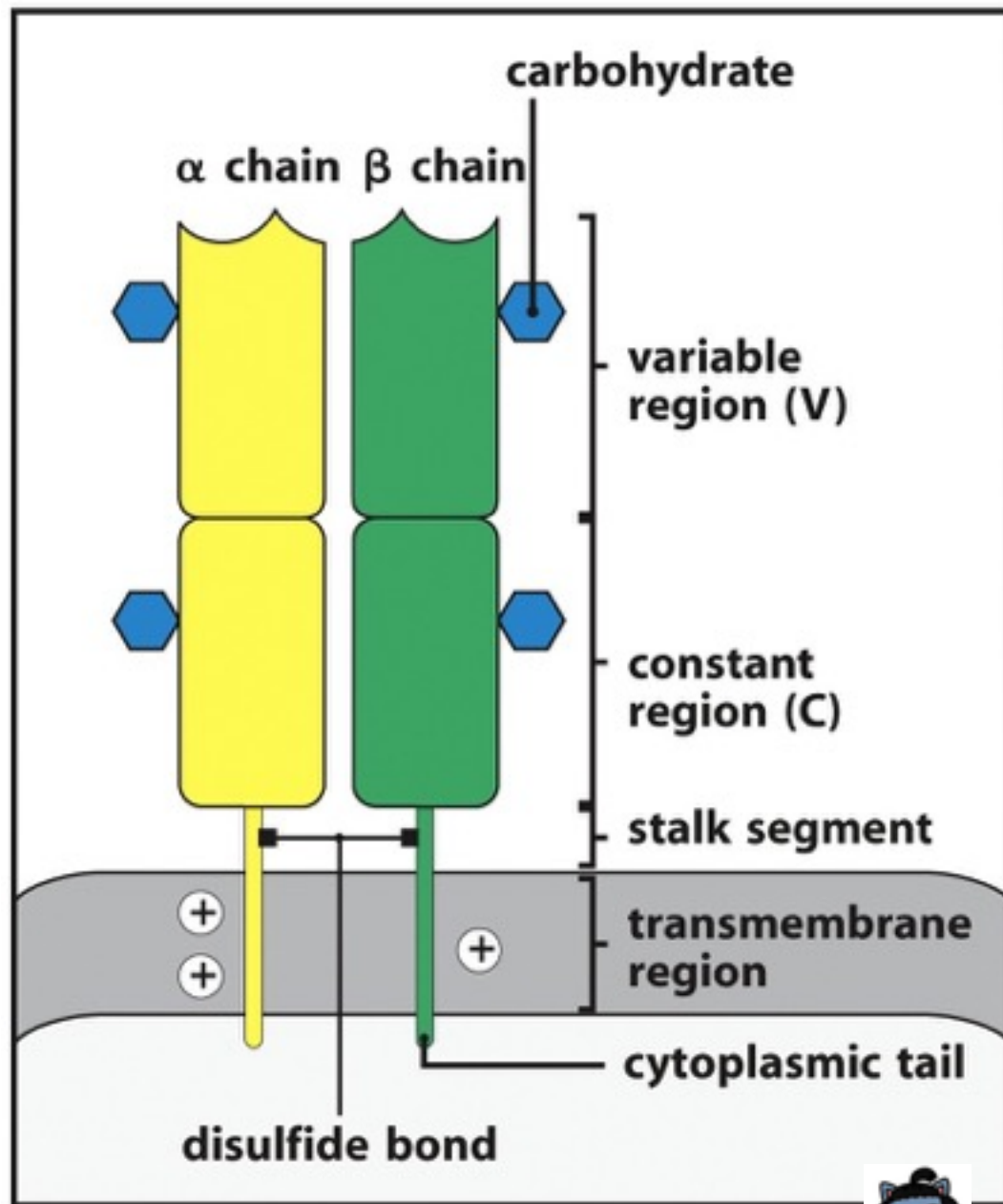


Figure 6.19 Janeway's Immunobiology, 8ed. (© Garland Science 2012)



T
Cell
Receptor

Figure 4.12 Janeway's Immunobiology, 8ed. (© Garland Science 2012)



conceito importante!

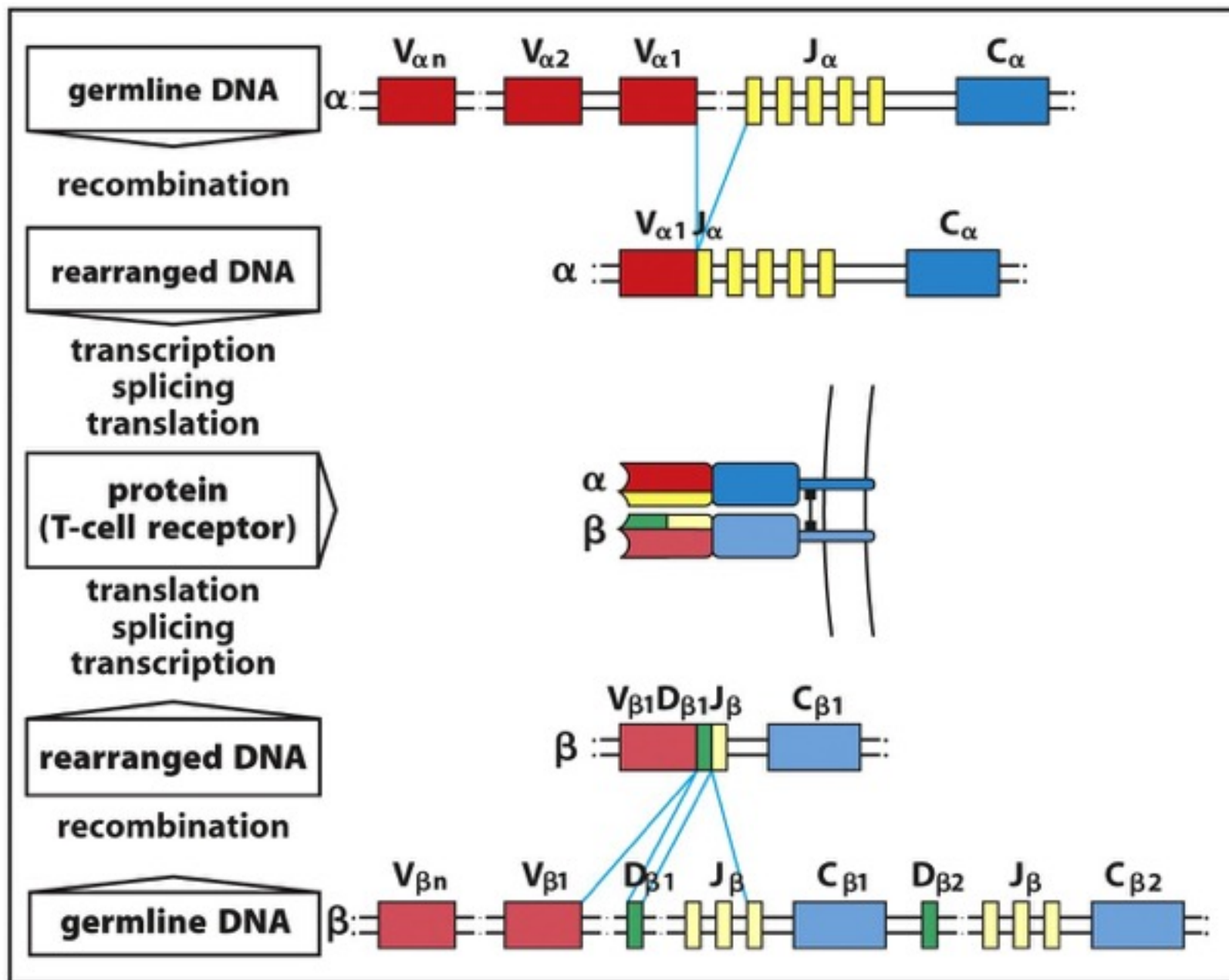
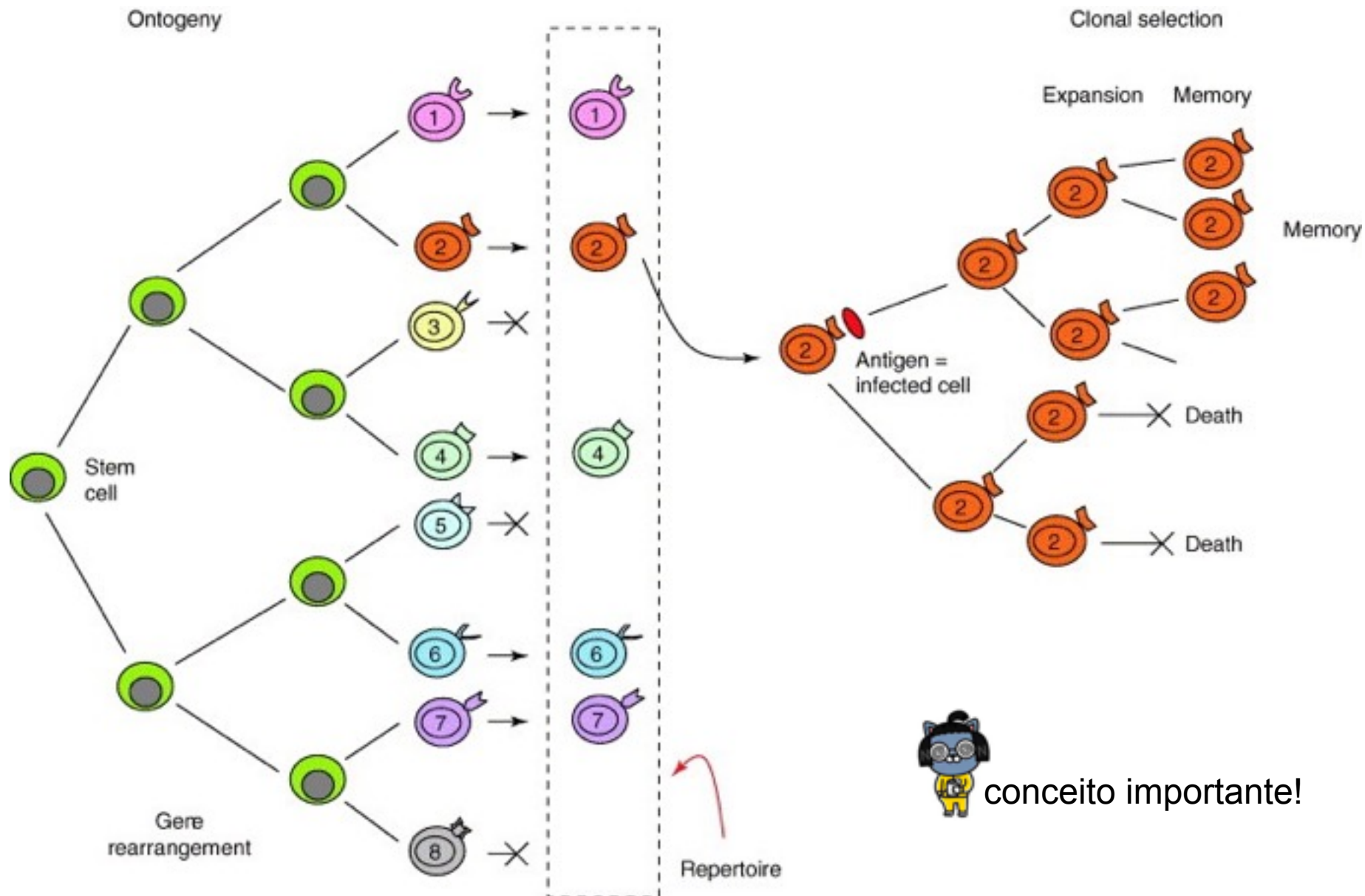


Figure 5.9 Janeway's Immunobiology, 8ed. (© Garland Science 2012)



conceito importante!

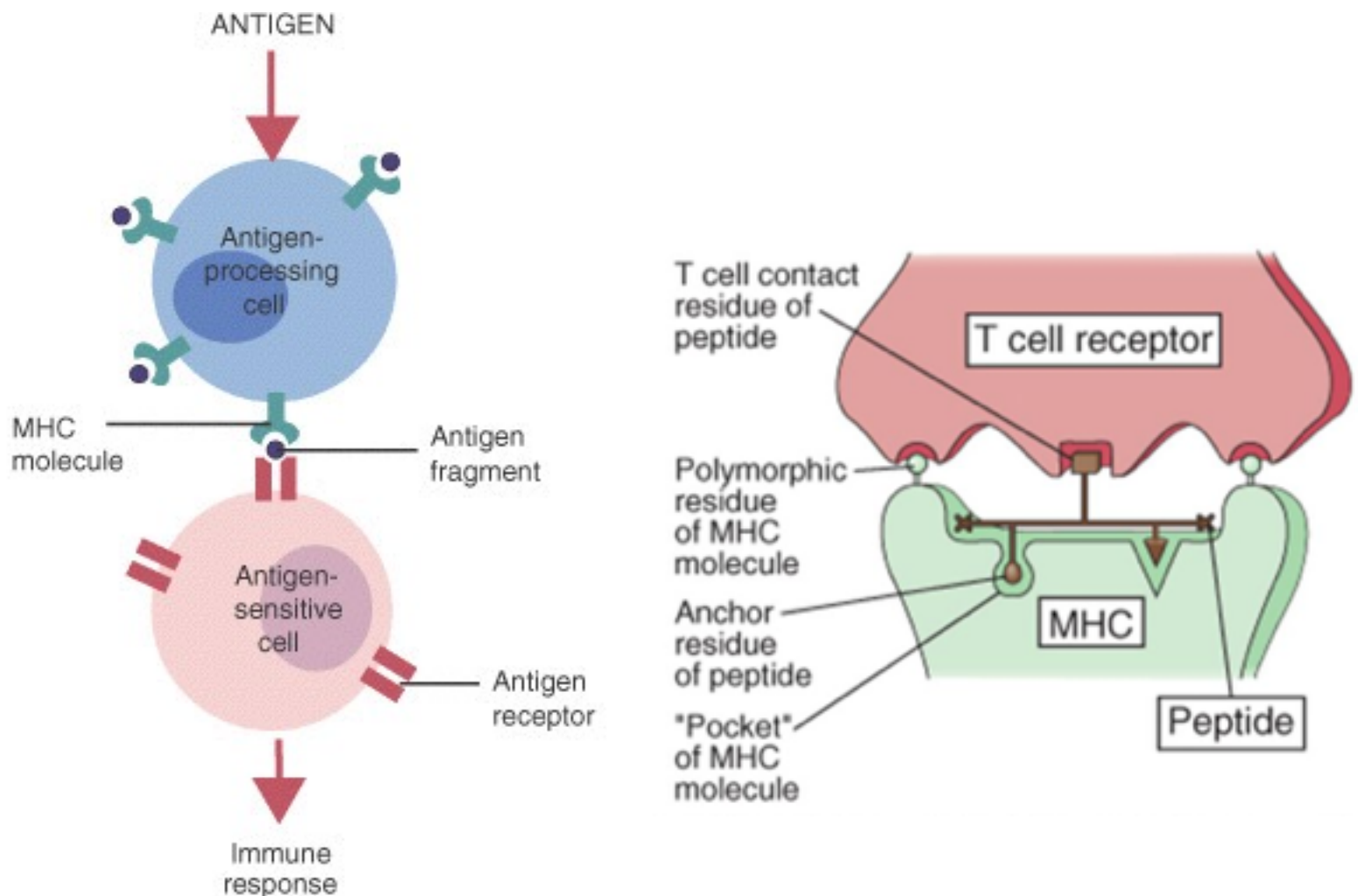


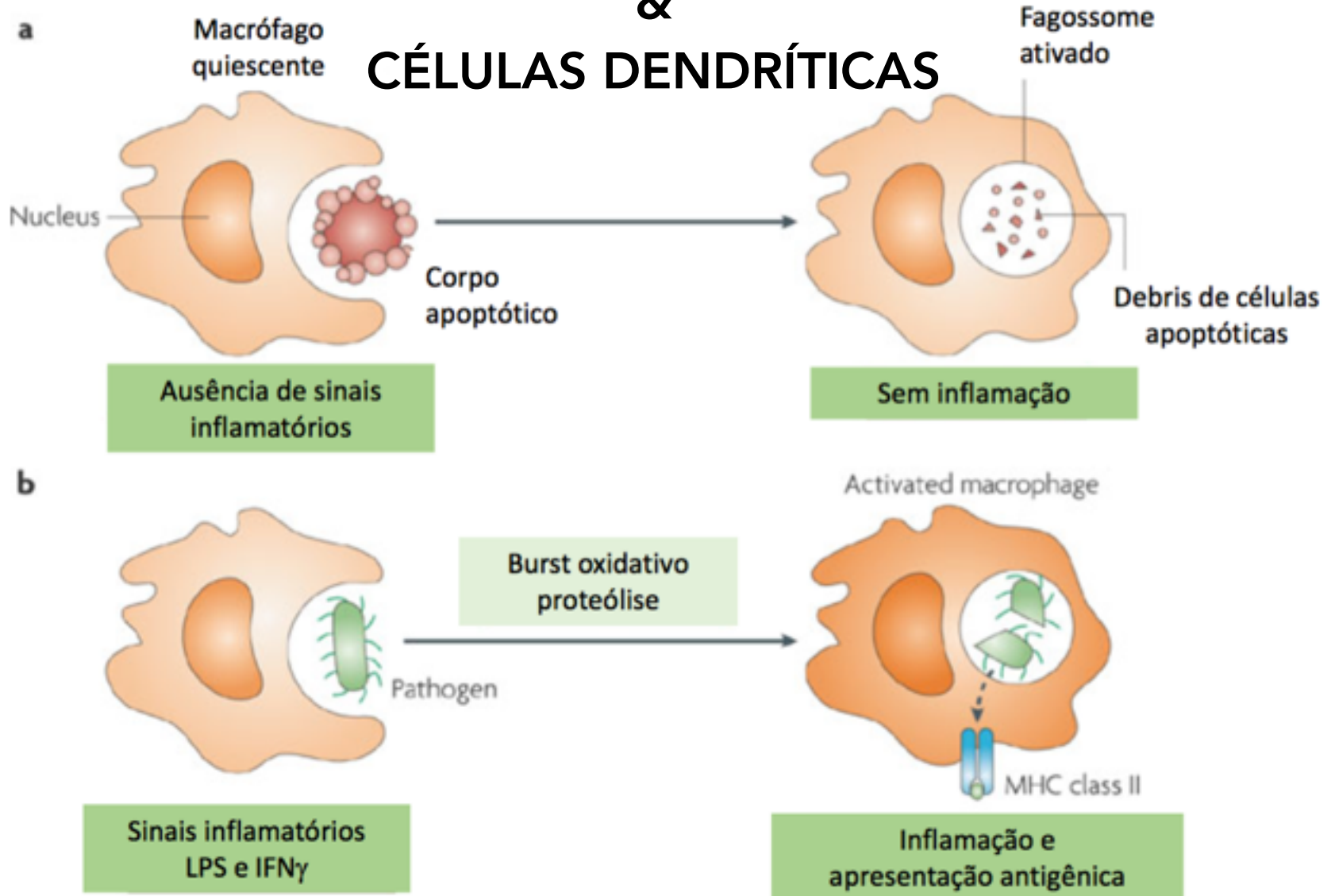
FIGURE 9-1 The key initial step in any immune response is the presentation of antigens by antigen-processing cells to antigen-sensitive cells. This step is performed by major histocompatibility complex (*MHC*) molecules located on the surface of antigen-processing cells.



MACRÓFAGOS

&

CÉLULAS DENDRÍTICAS



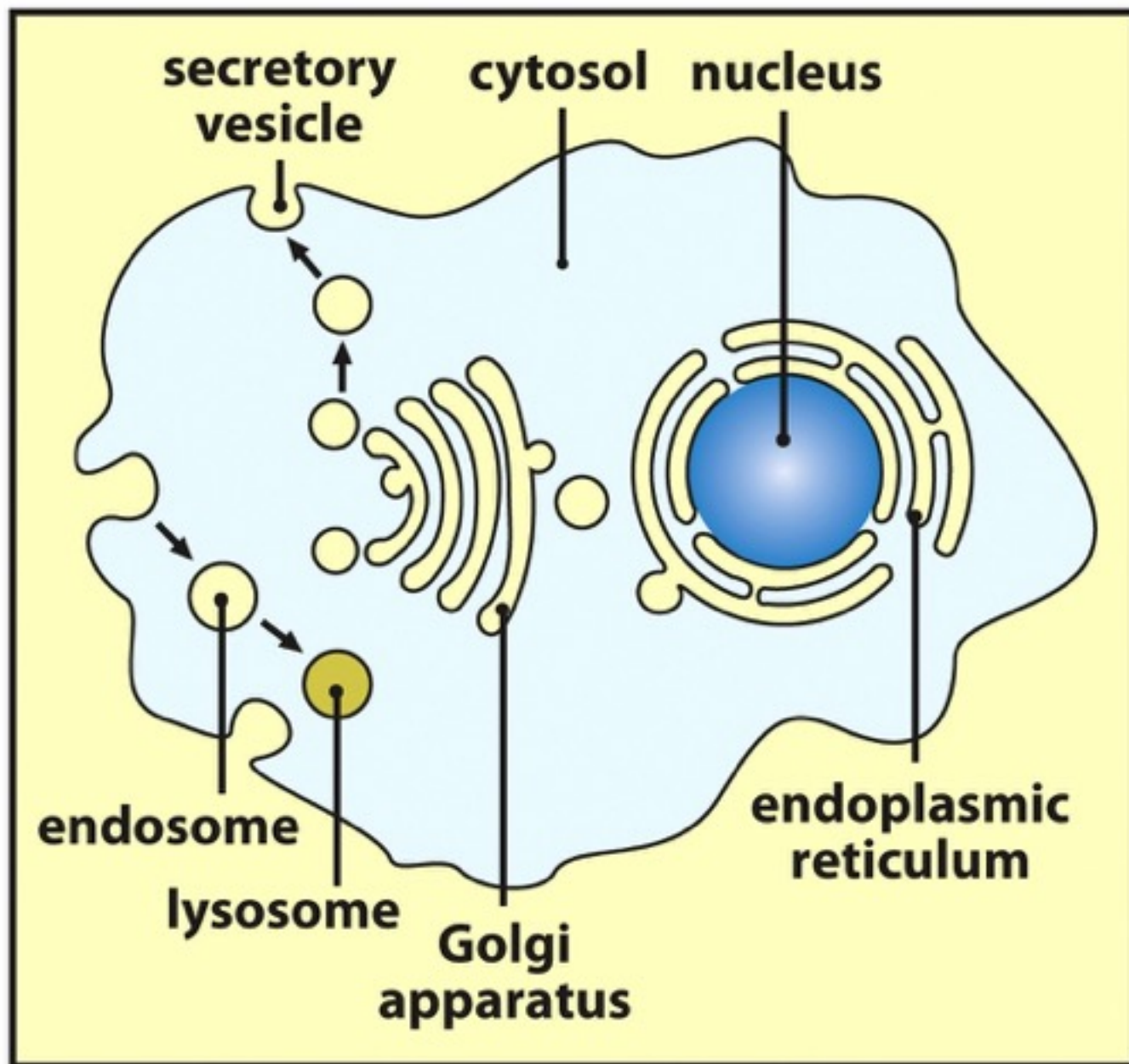


Figure 6.1 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

Apresentação de Antígeno via MHC classe I

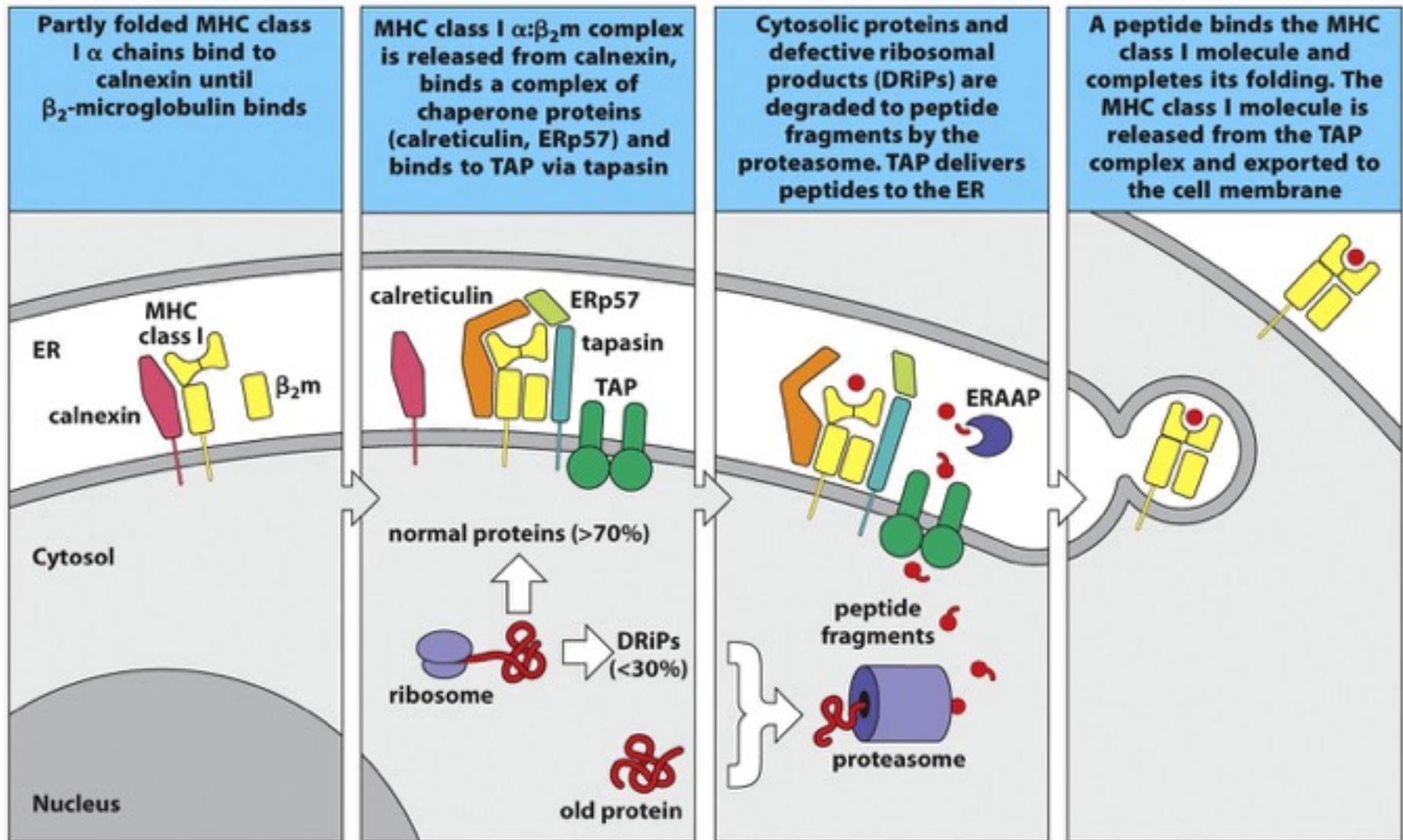


Figure 6.5 Janeway's Immunobiology, Bed. (© Garland Science 2012)

Apresentação de Antígeno via MHC classe II

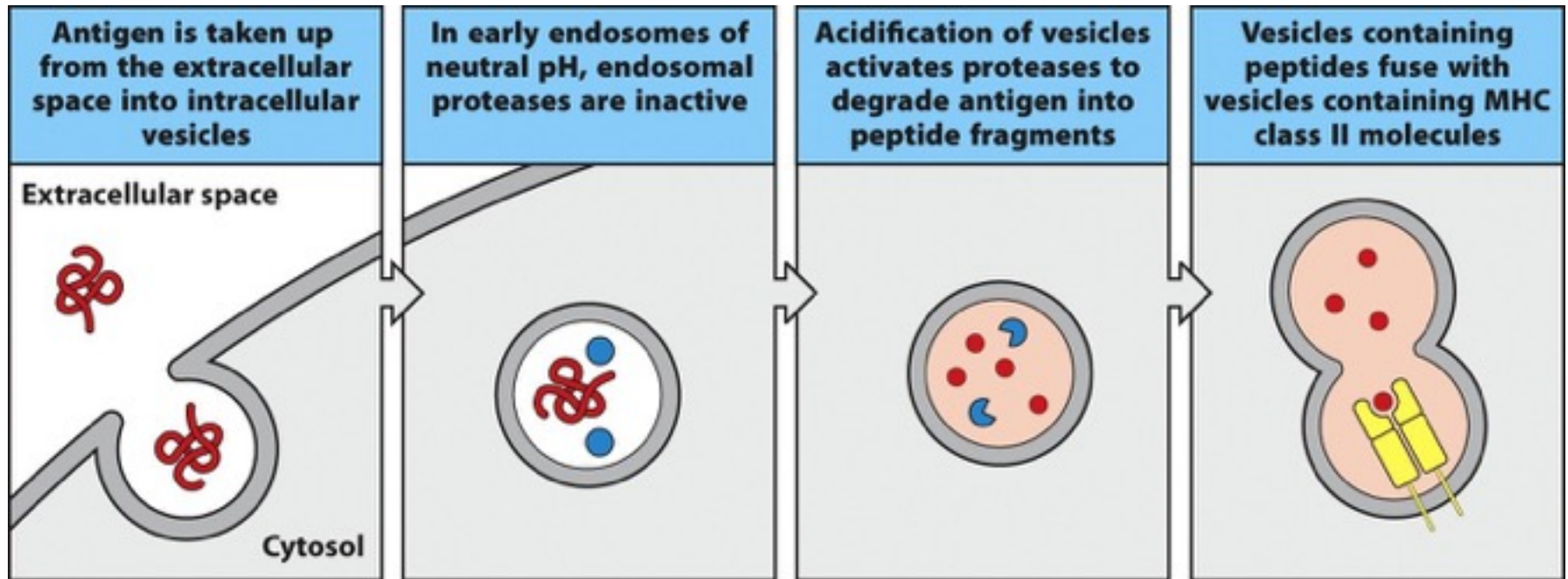


Figure 6.9 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

Apresentação de Antígeno via MHC classe II

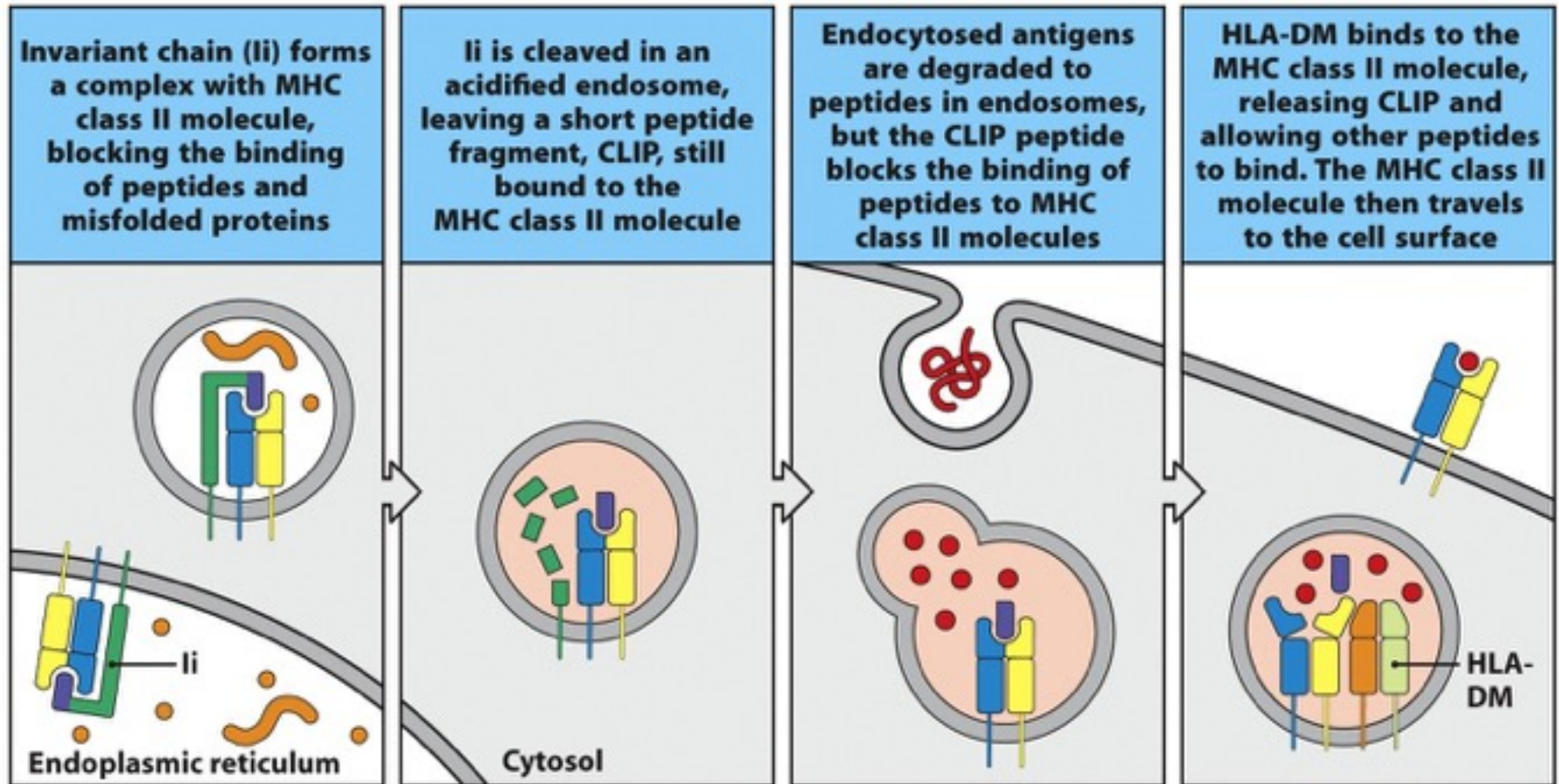


Figure 6.12 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

nurse

[nɜːrs] *noun*

the first person you see after saying, “hold my beer and watch this!”

Apresentação Cruzada

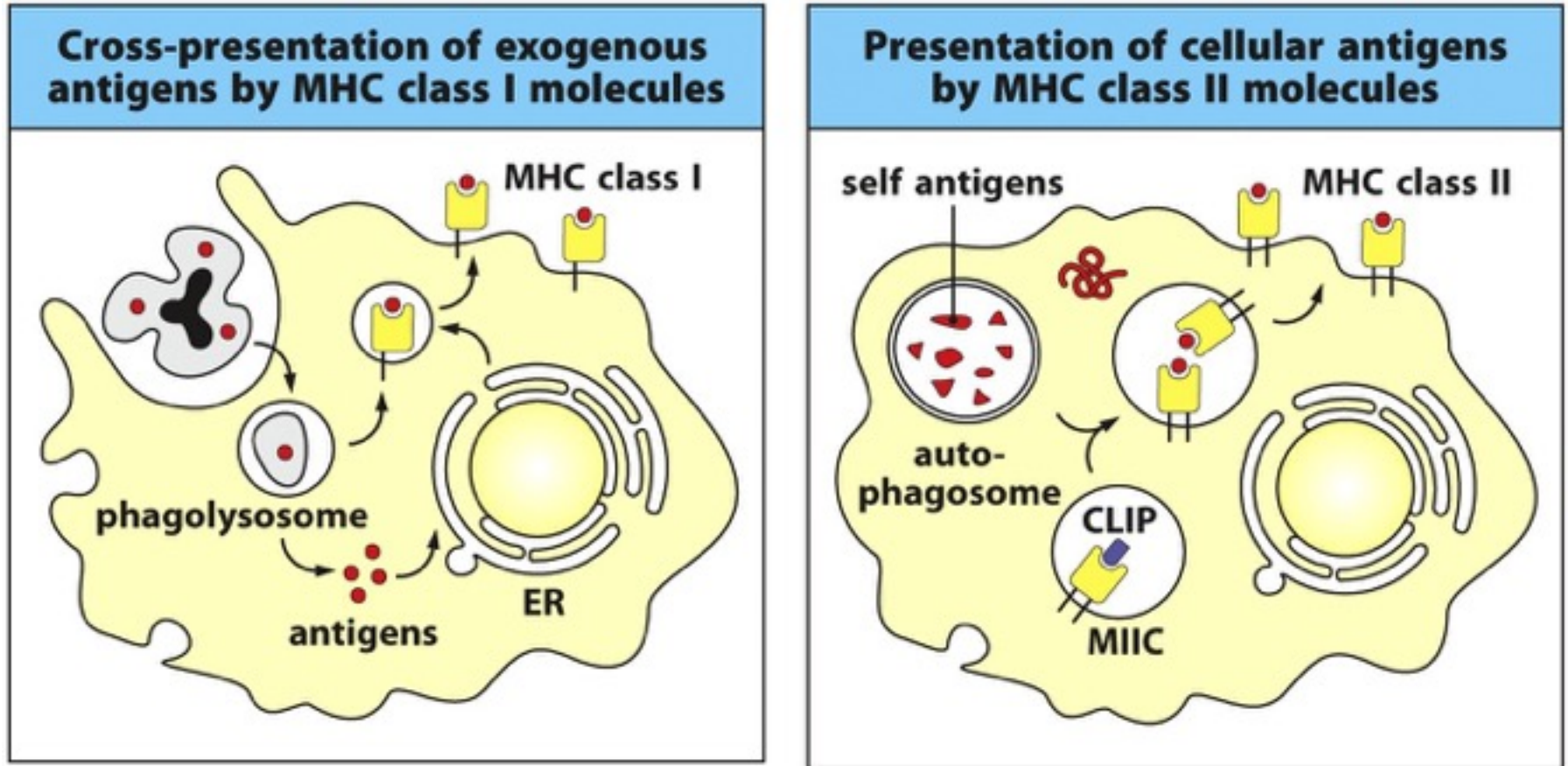


Figure 6.13 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

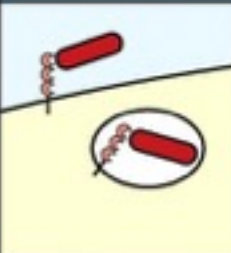
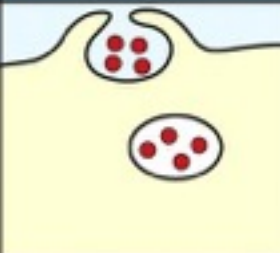


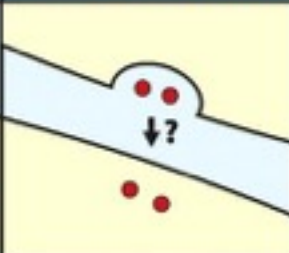
Routes of antigen processing and presentation by dendritic cells					
	Receptor-mediated phagocytosis	Macro-pinocytosis	Viral infection	Cross-presentation after phagocytic or macropinocytic uptake	Transfer from incoming dendritic cell to resident dendritic cell
					
Type of pathogen presented	Extracellular bacteria	Extracellular bacteria, soluble antigens, virus particles	Viruses	Viruses	Viruses
MHC molecules loaded	MHC class II	MHC class II	MHC class I	MHC class I	MHC class I
Type of naive T cell activated	CD4 T cells	CD4 T cells	CD8 T cells	CD8 T cells	CD8 T cells

Figure 9.12 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

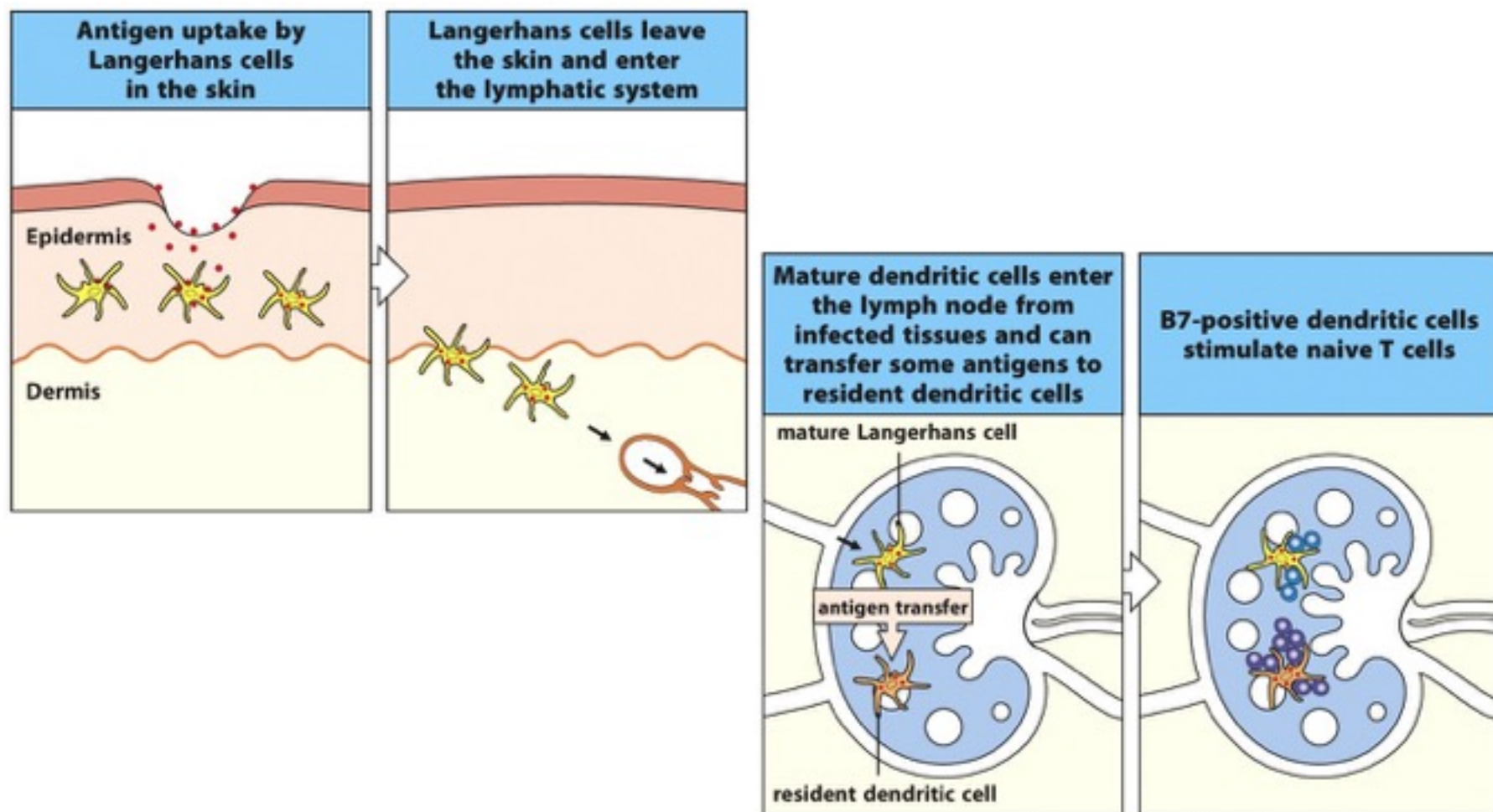


Figure 9.13 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

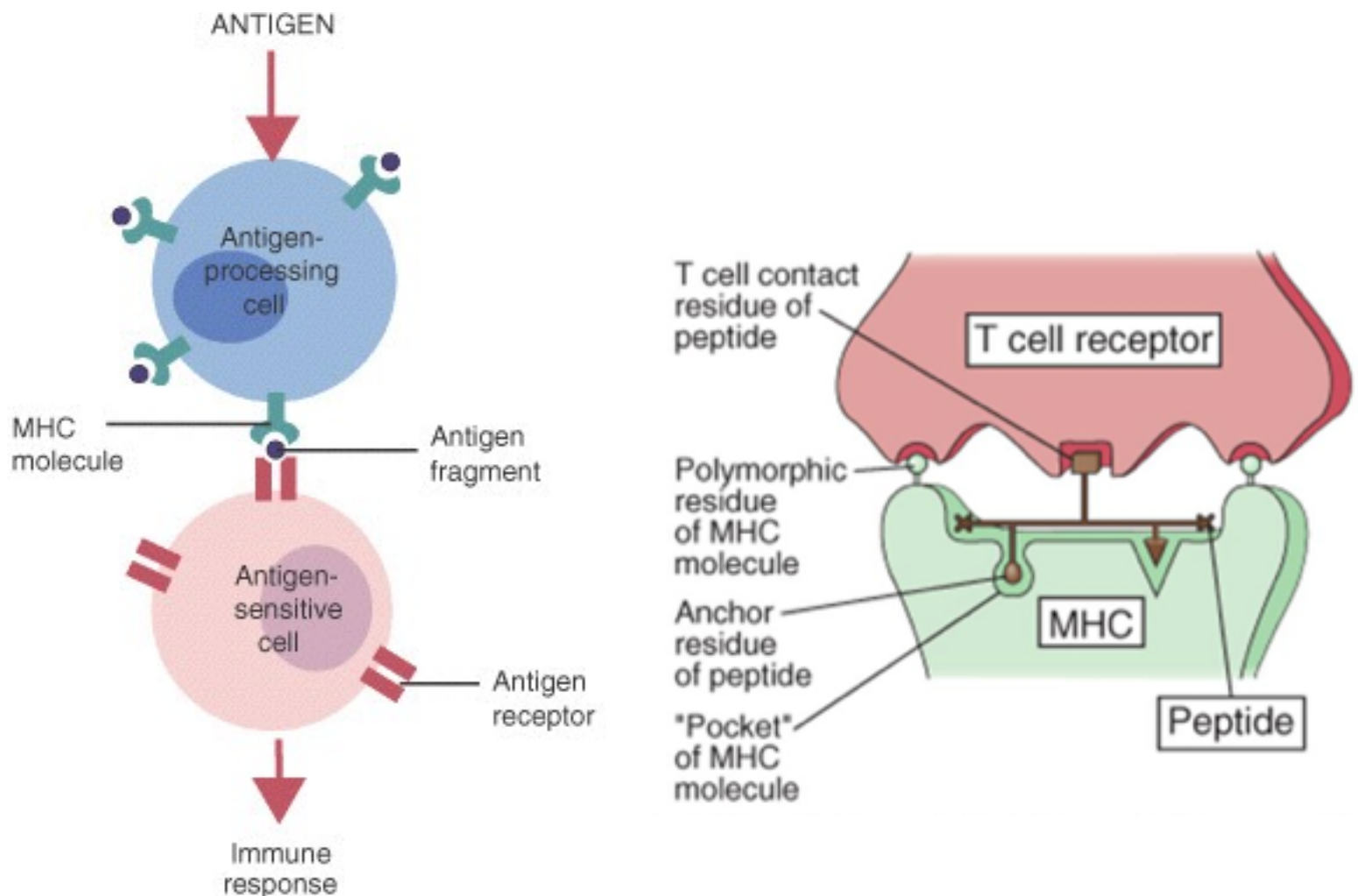


FIGURE 9-1 The key initial step in any immune response is the presentation of antigens by antigen-processing cells to antigen-sensitive cells. This step is performed by major histocompatibility complex (*MHC*) molecules located on the surface of antigen-processing cells.

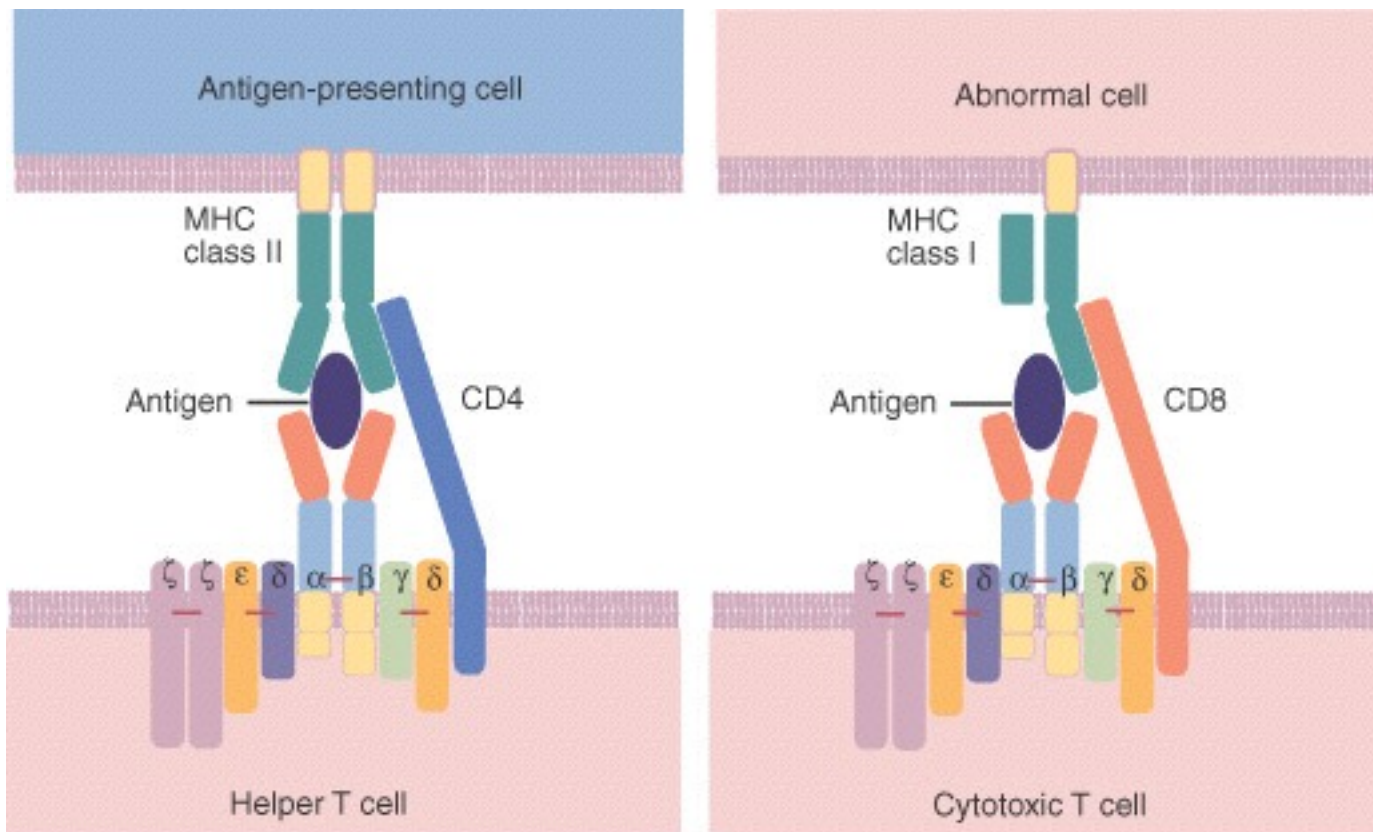


FIGURE 12-5 Role of CD4 and CD8 in promoting T cell responses. These molecules link the T cell to the antigen-presenting cell, binding the two cells together and ensuring that an effective signal is transmitted between them. CD4 binds to major histocompatibility complex (MHC) class II molecules. This interaction is seen in Chapter 8, Figure 8-6, A.

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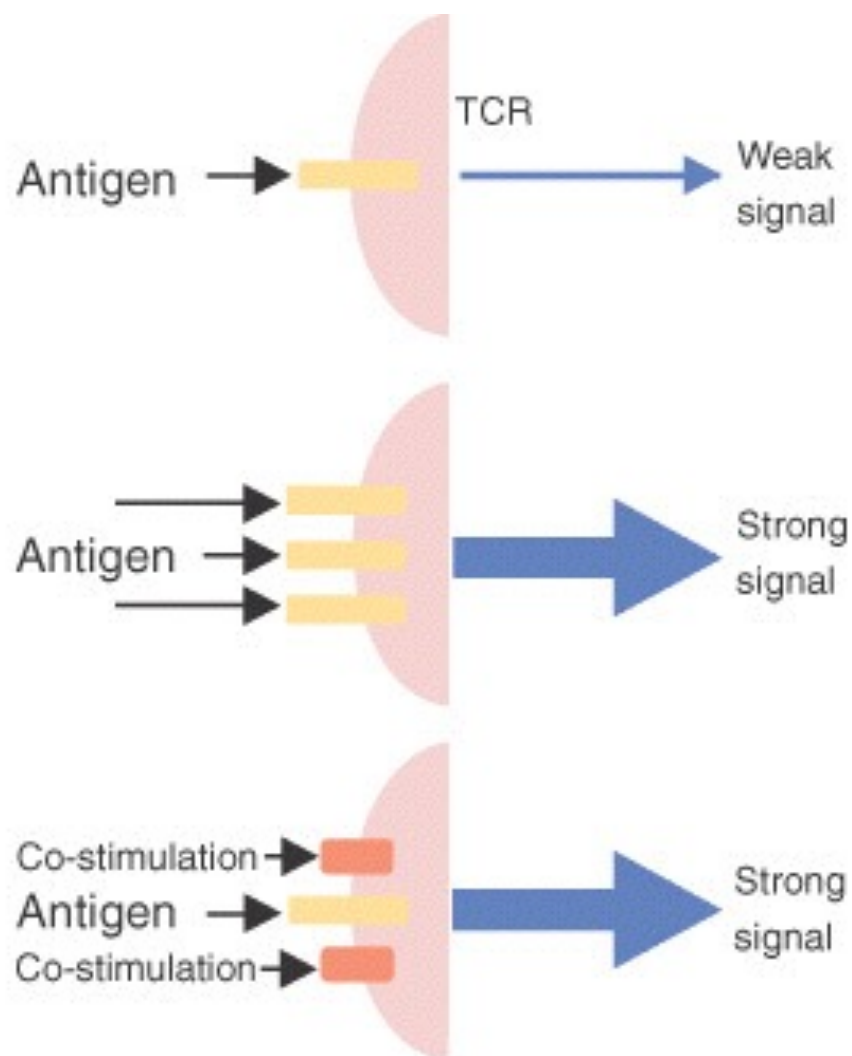


FIGURE 12-10 Successful stimulation of a T cell requires multiple signals. Depending on the antigen, the T cell may be activated by signals from multiple T cell antigen receptors (*TCR*) or by appropriate co-stimulation.

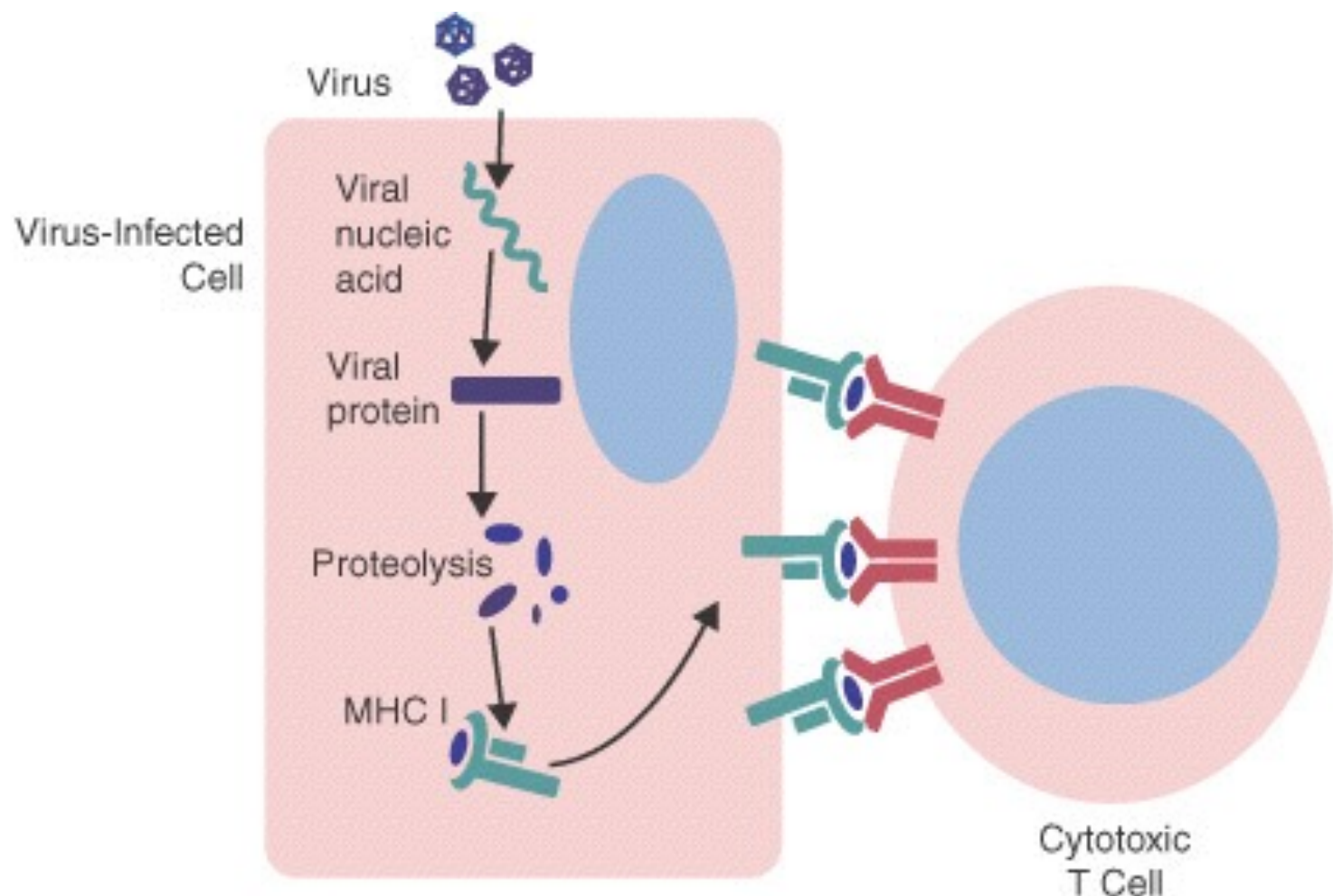


FIGURE 16-1 Processing of endogenous antigen. Endogenous antigen is first broken down into small peptides and inserted into the antigen-binding groove of major histocompatibility complex (*MHC*) class I molecules. When presented on a cell surface, antigen bound to *MHC* class I molecules triggers a cytotoxic T cell response.

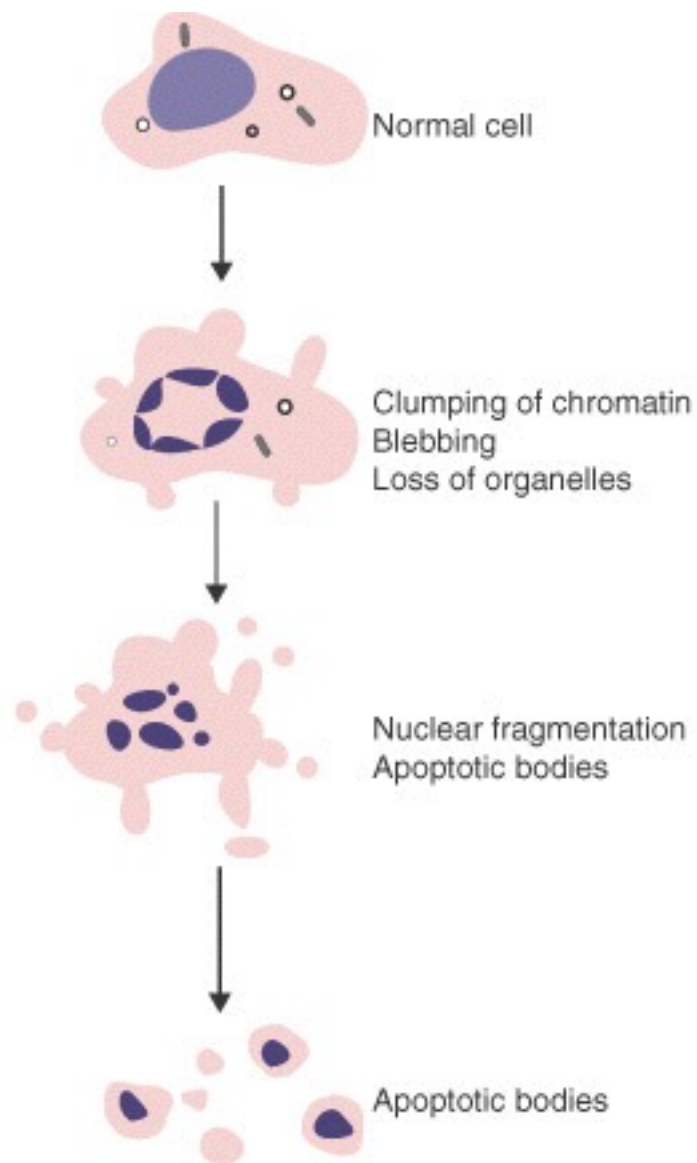


FIGURE 16-3 Major morphological features of cell death by apoptosis.

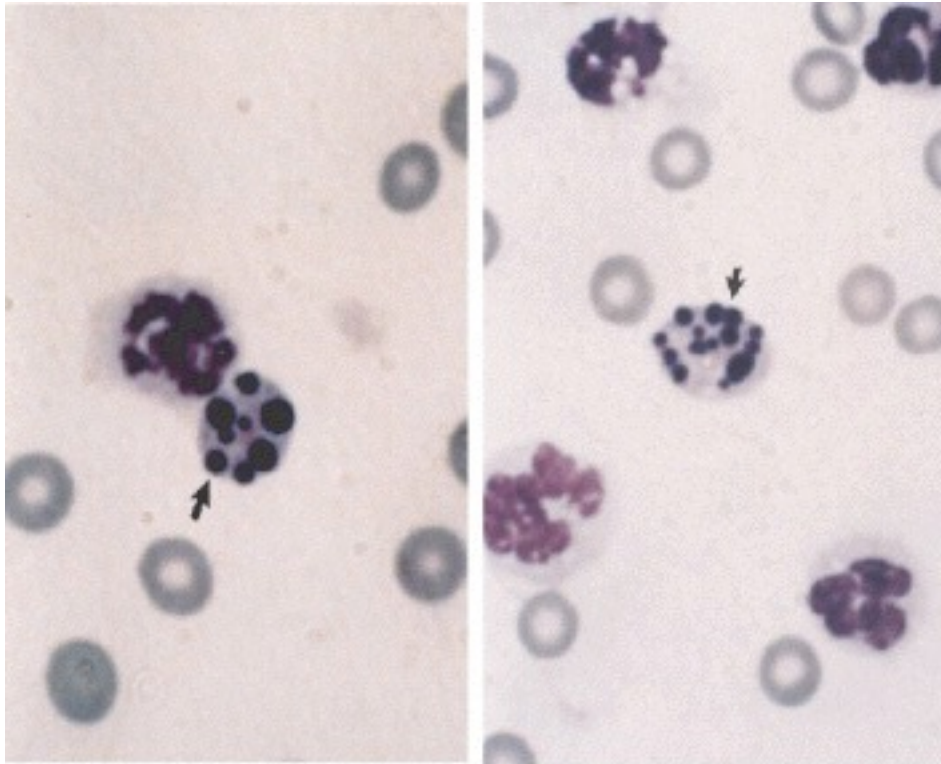


FIGURE 16-4 Two rat neutrophils showing nuclear condensation and fragmentation characteristic of apoptosis.
(Courtesy Ms. K. Kennon.)

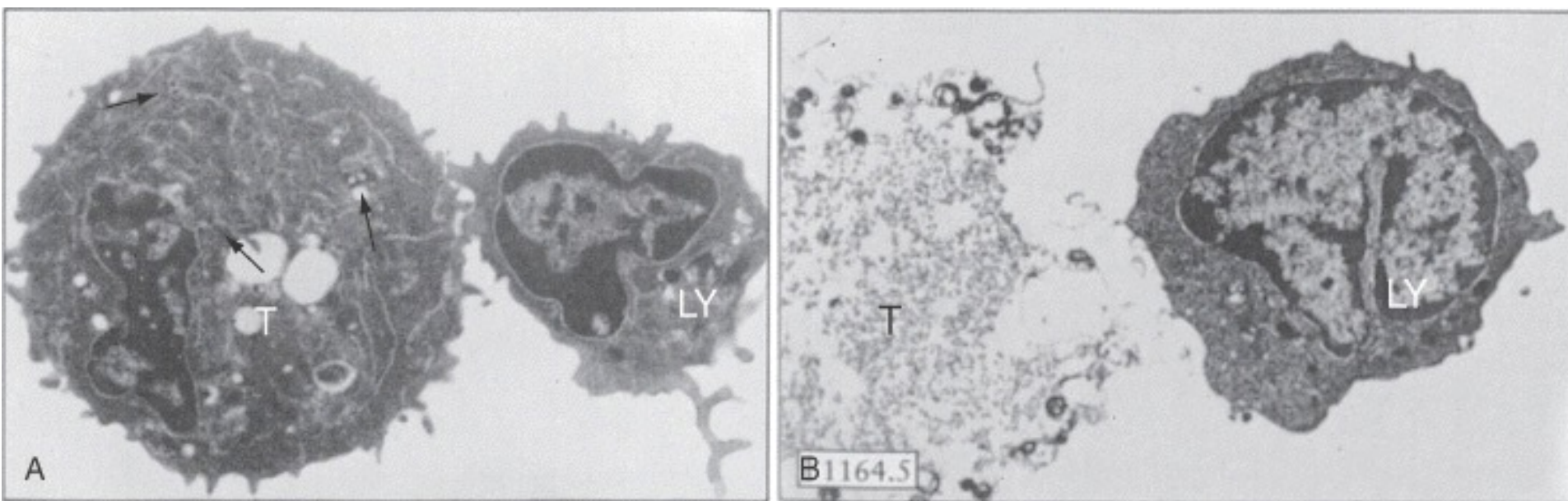


FIGURE 16-5A Destruction of target cells by cytotoxic T cells. **A**, Conjugation between a peritoneal exudate lymphocyte (the small cell on the right) and a target cell. Note the lysosome-like bodies (*LY*) and the nuclear fragmentation of the target cell (*T*). **B**, A lymphocyte with the remains of a lysed target cell.

(From Zagury D et al: *Eur J Immunol* 5:881, 1975.)

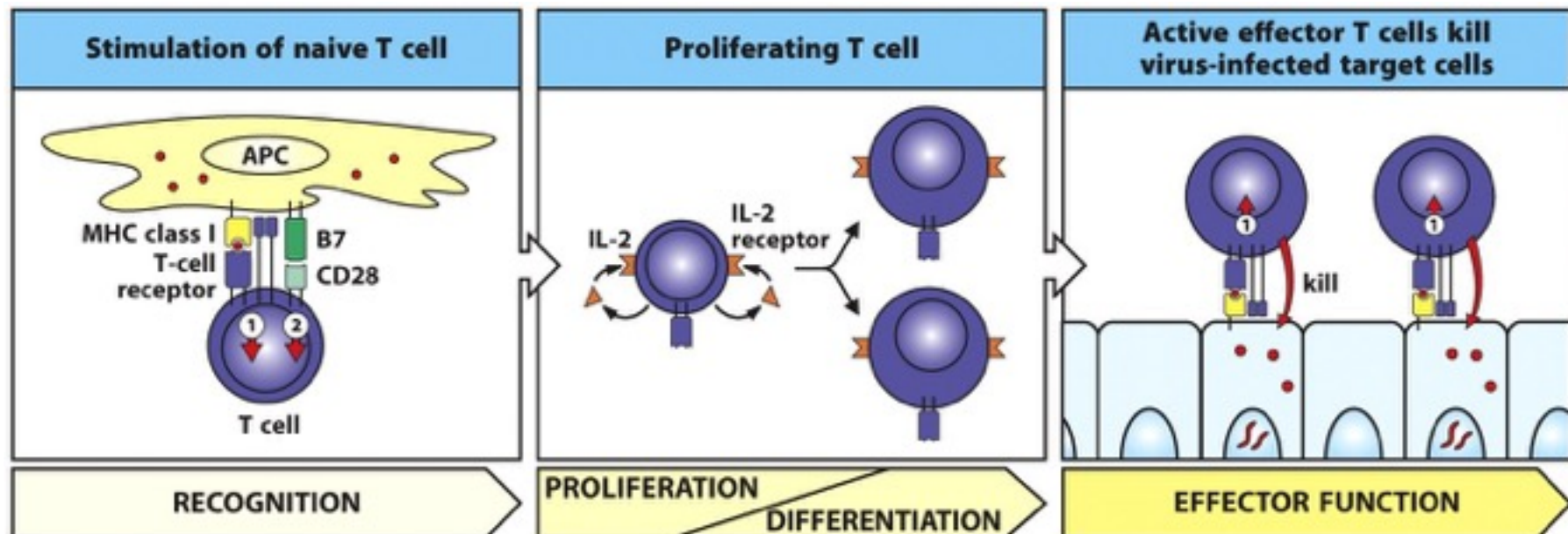


Figure 9.24 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

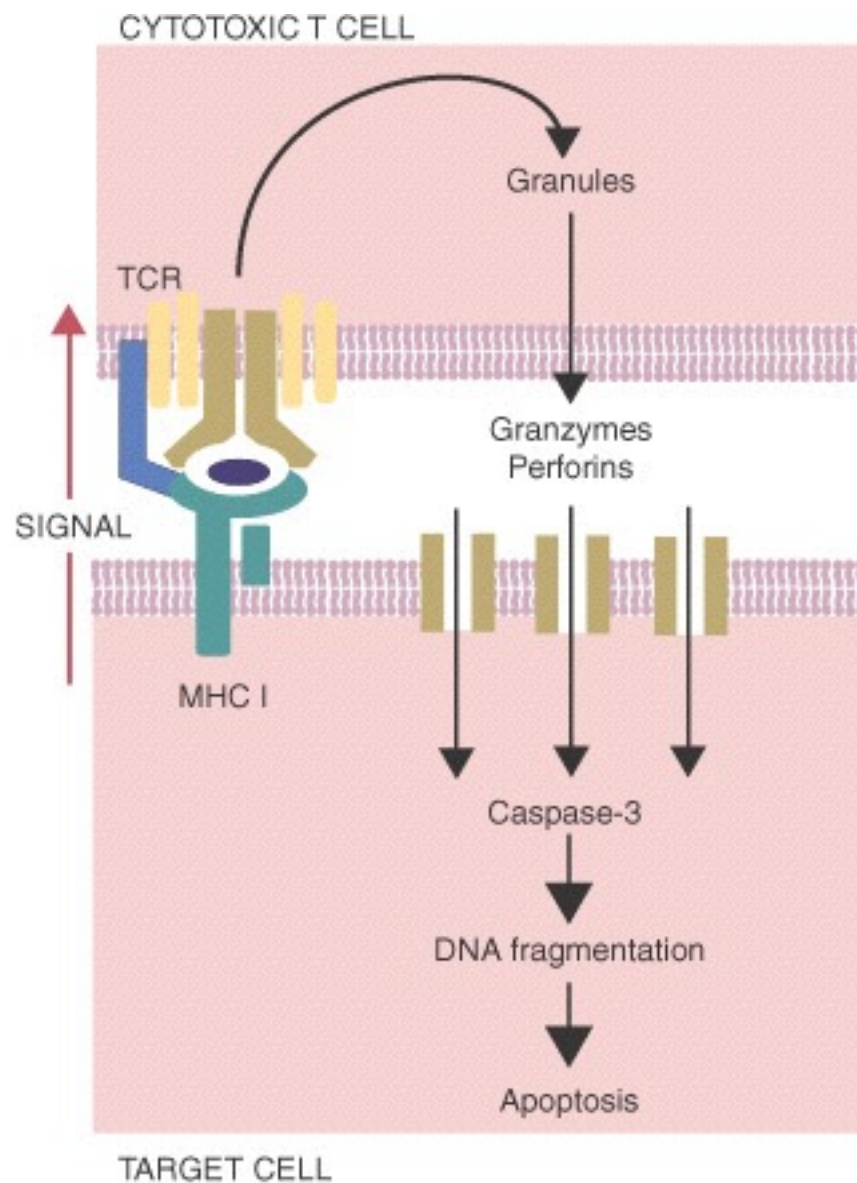


FIGURE 16-7 The perforin pathway by which T cells kill targets.

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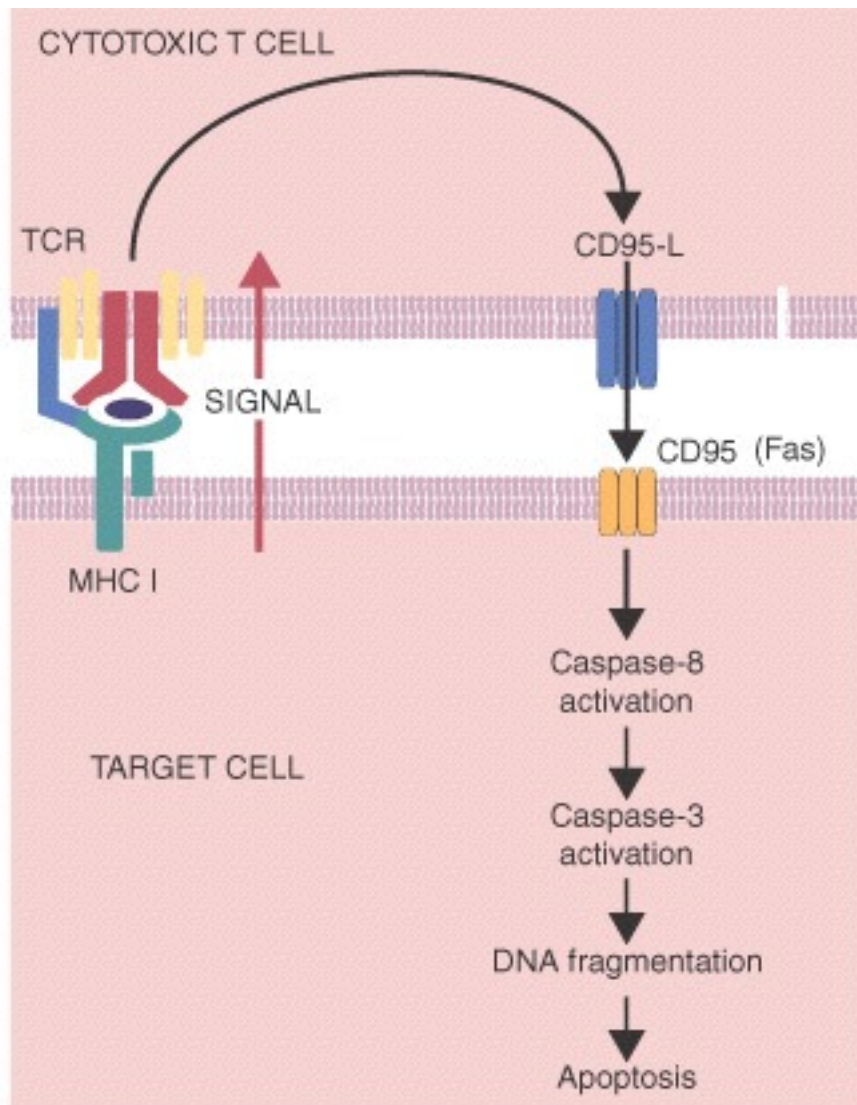


FIGURE 16-8 The CD95 pathway of T cell-mediated cytotoxicity.

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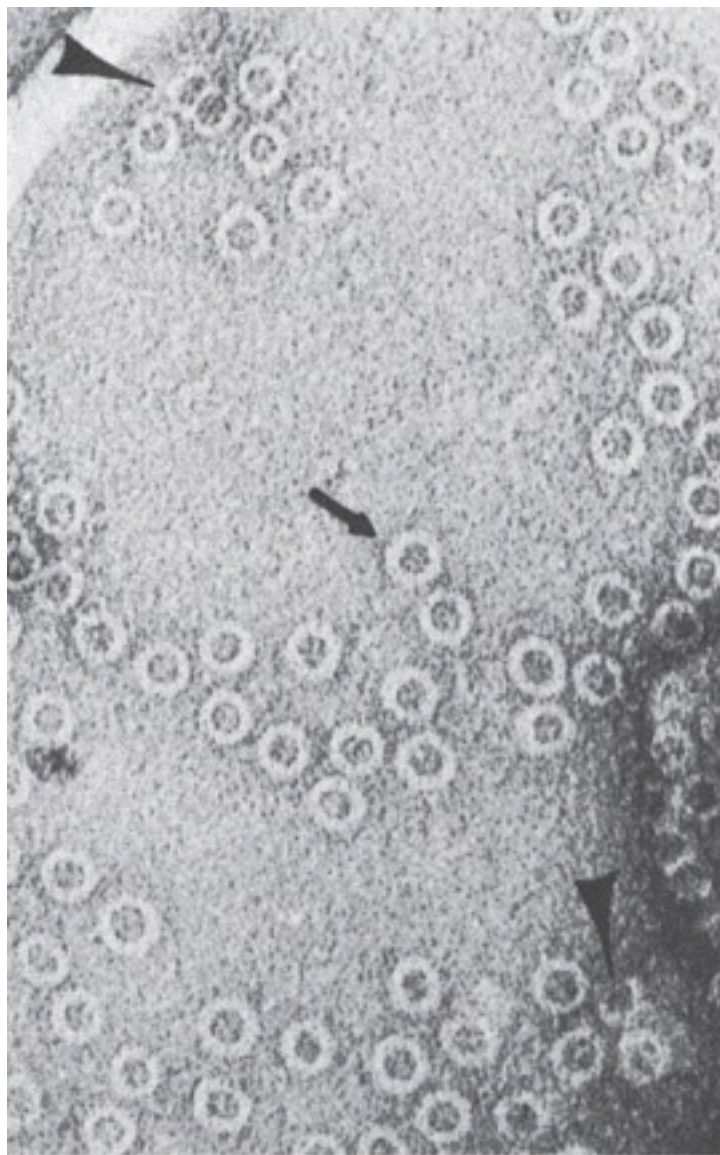


FIGURE 16-9 Perforins from human natural killer cells on the surface of a rabbit erythrocyte target. The arrowheads point to incomplete rings and double rings.

(From Podack ER, Dennert G: *Nature* 301:44, 1983.)

Protein in granules of cytotoxic T cells	Actions on target cells
Perforin	Aids in delivering contents of granules into the cytoplasm of target cell
Granzymes	Serine proteases, which activate apoptosis once in the cytoplasm of the target cell
Granulysin	Has antimicrobial actions and can induce apoptosis

Figure 9.36 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

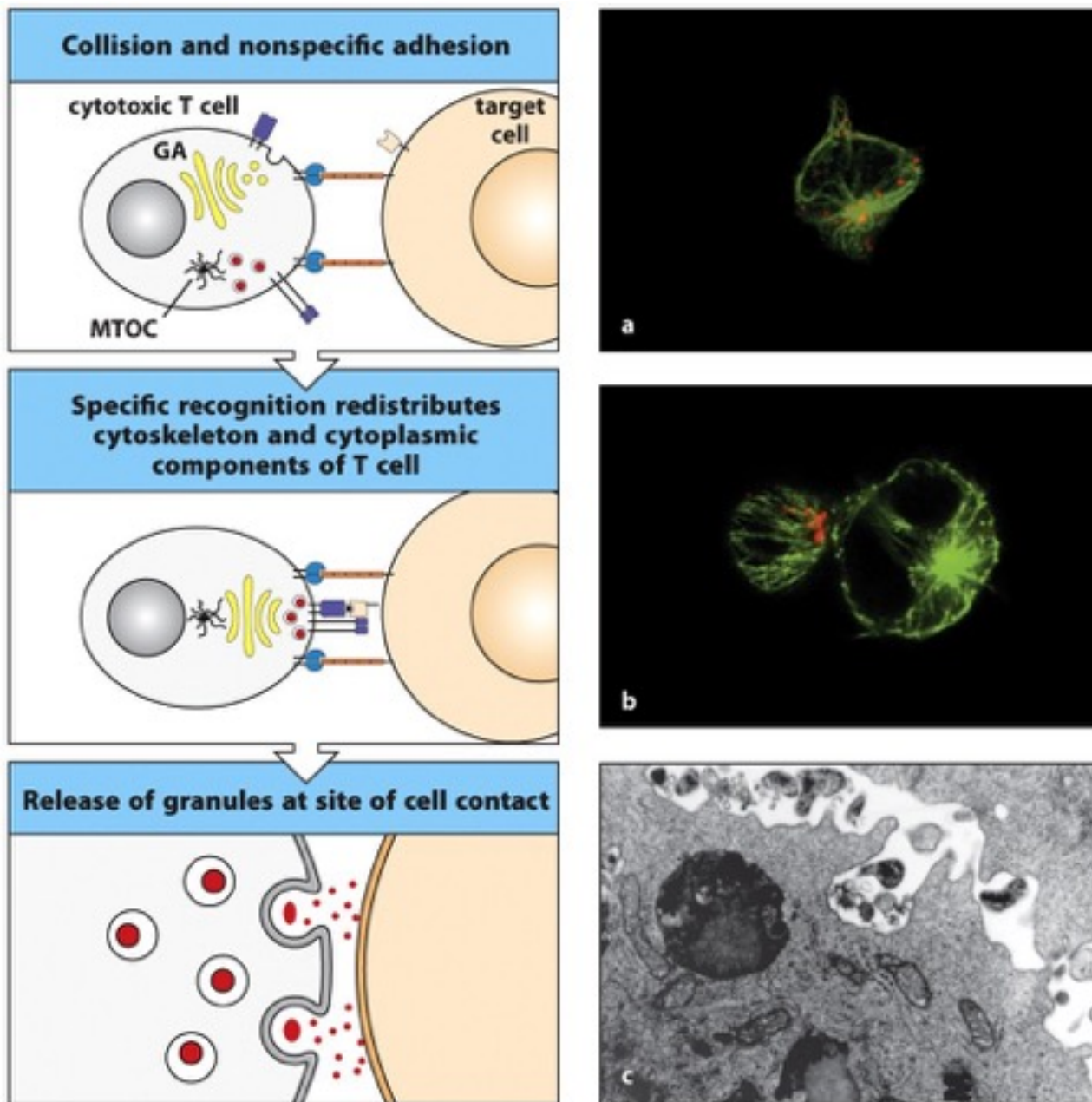


Figure 9.32 Janeway's Immunobiology, Bed. (© Garland Science 2012)

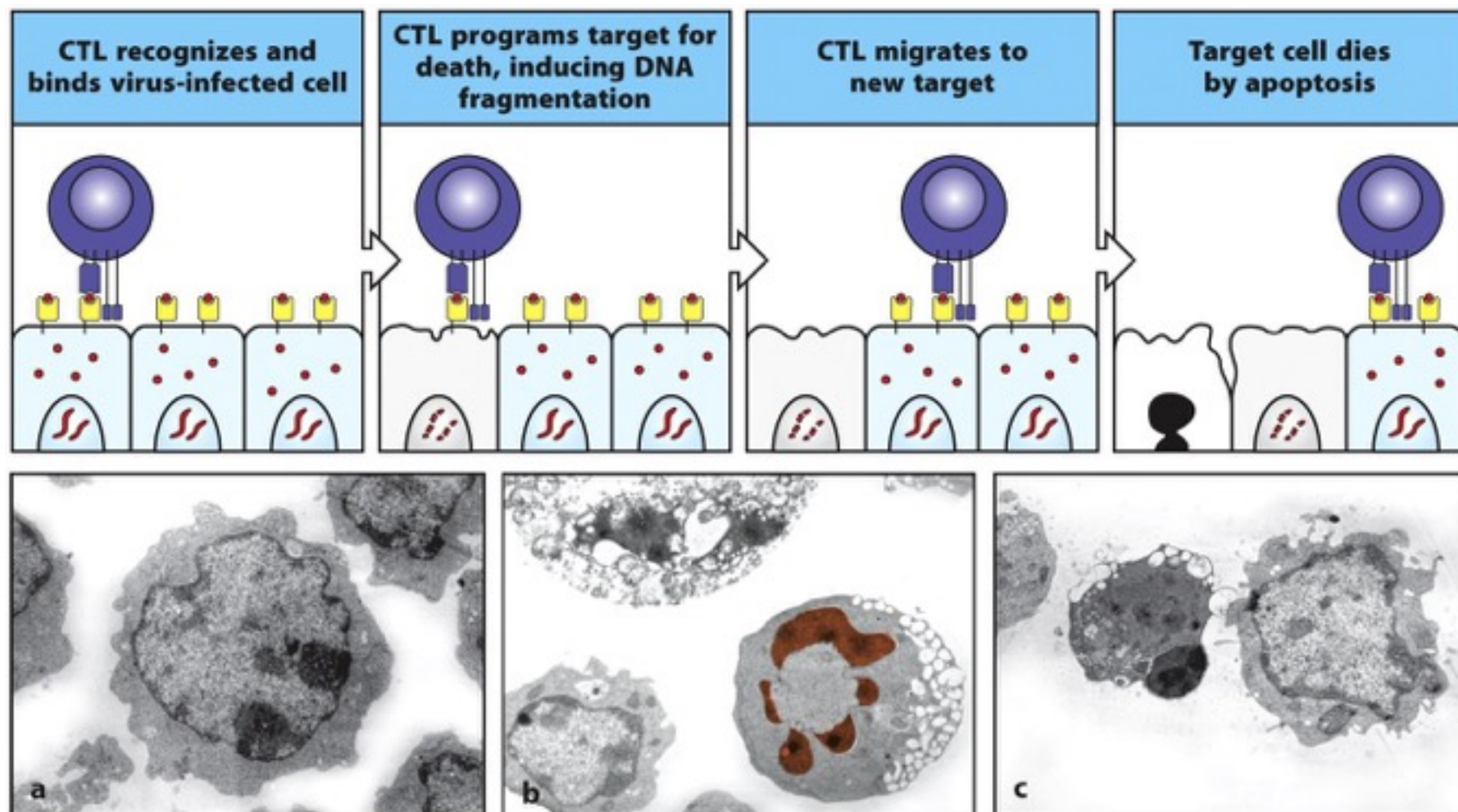


Figure 9.35 Janeway's Immunobiology, 8ed. (© Garland Science 2012)

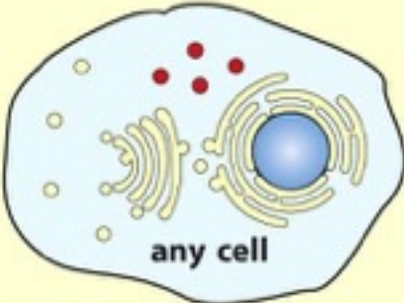
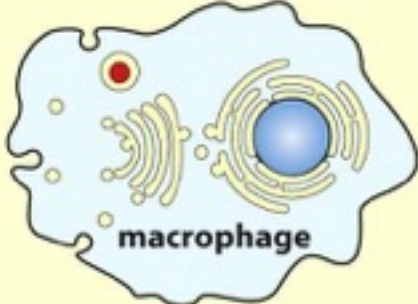
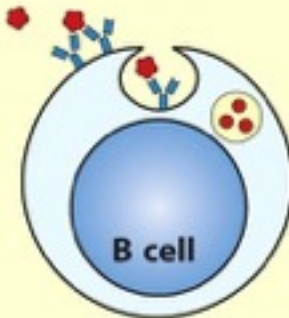
	Cytosolic pathogens	Intravesicular pathogens	Extracellular pathogens and toxins
			
Degraded in	Cytosol	Endocytic vesicles (low pH)	Endocytic vesicles (low pH)
Peptides bind to	MHC class I	MHC class II	MHC class II
Presented to	Effector CD8 T cells	Effector CD4 T cells	Effector CD4 T cells
Effect on presenting cell	Cell death	Activation to kill intravesicular bacteria and parasites	Activation of B cells to secrete Ig to eliminate extracellular bacteria/toxins

Figure 6.2 Janeway's Immunobiology, 8ed. (© Garland Science 2012)