

Figure 7-14 Immunobiology, 7ed. (© Garland Science 2008)

# II- Cellules de l'immunité adaptative Lymphocytes Ty $\delta$

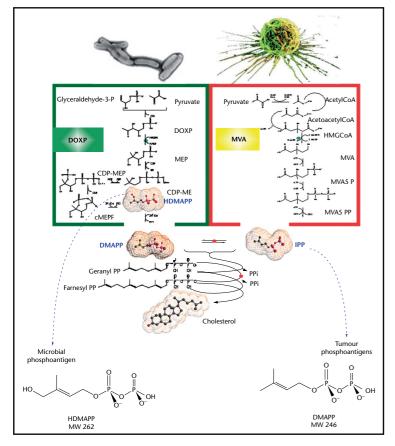
Sous population lymphocytaire T minoritaire

Sous population lymphocytaire T non conventionnelle: expression d'un récepteur T non conventionnel

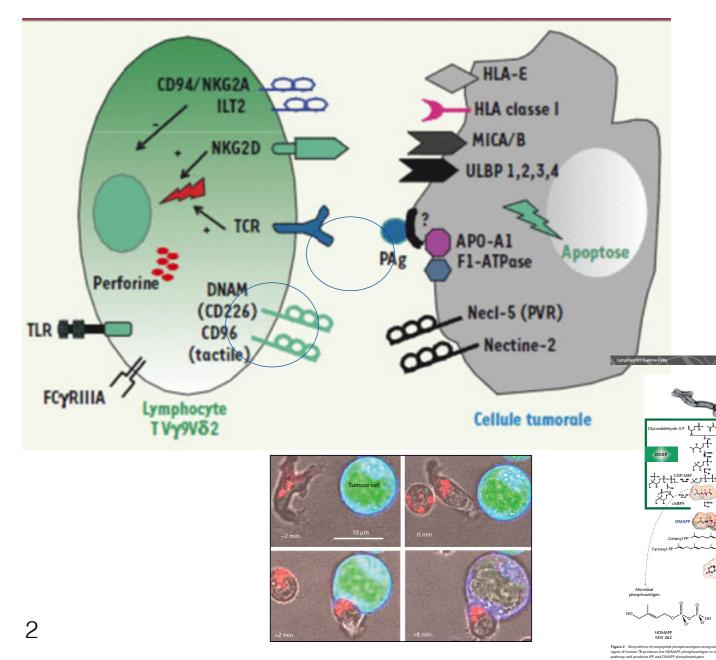
Reconnaissance des phospho-antigenes de façon CMH indépendante

Localisation au niveau épithélial et muqueuses

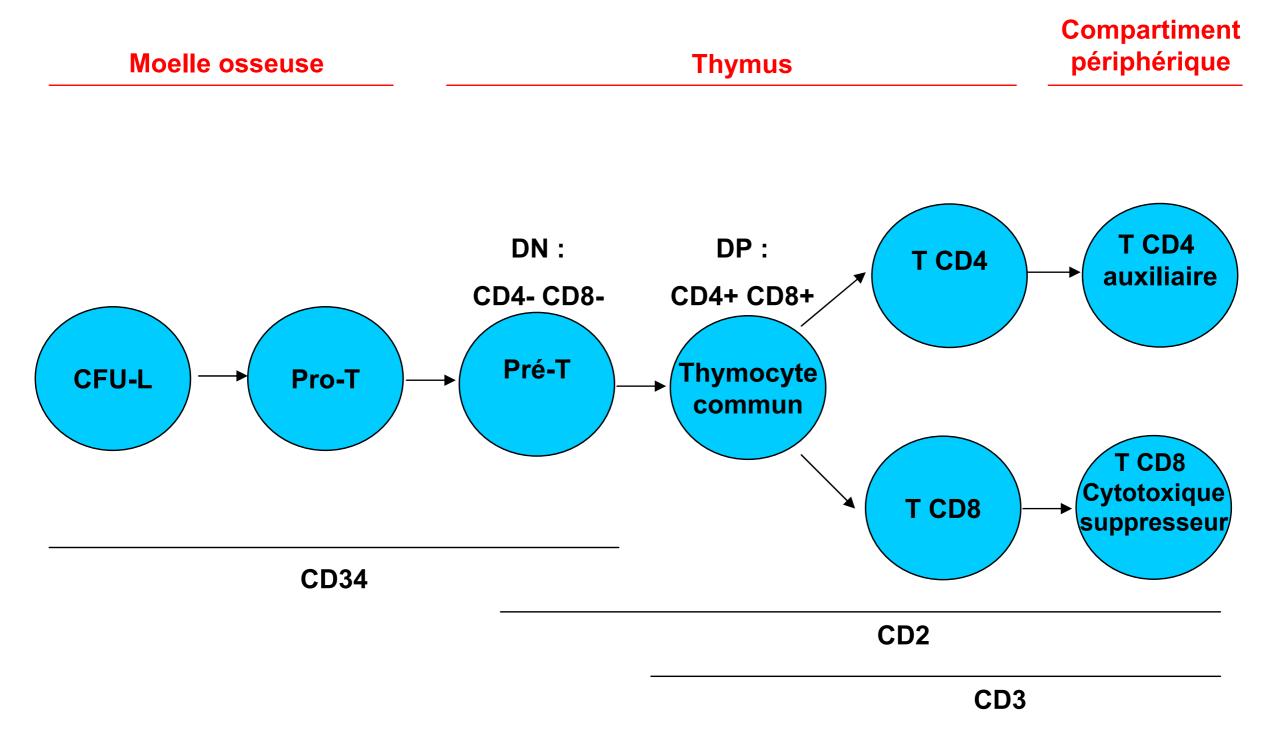
Maturation intra et extra-thymique



voies de synthèse des phospho-antigenes



# **II- Cellules de l'immunité adaptative** Lymphocytes $T\alpha\beta$



Surface	Function	Double-negative Double-positive Single-positive   DN1 DN2 DN3 DN4   proliferation proliferation CD4 CD8 TCR   CD44+ CD44+ CD44+ CD44+   CD44+ CD44+ CD44+   CD25+ CD44+ CD44+	Export to periphery CD3'acg)'4'8' small resting 'double-positive' thymocytes CD4'8' small resting 'CD4'8' Small resting 'Stopper to periphery
Kit	Signaling		
Notch	Signaling		
CD44	Adhesion molecule		Subcapsular
CD25	IL-2 receptor		double-negative thymocytes
pTα	Surrogate		Cortex DN2 Cortical epithelial
CD3	Signaling		Immature Cell
CD4	Correceptor	either CD4	Cortico- medullary
CD8	Co-receptor	or CD8	junction dendritic cell
			Mature CD4+8 <sup>-</sup> or CD8+4 <sup>-</sup>
Rearrangement		[	Medulla DN1 venule venule macrophage
D-J <sub>β</sub>			venule macrophage
ν-dj <sub>β</sub>			
V-J <sub>α</sub>			

CD3'4'8' able-negative' thymocytes

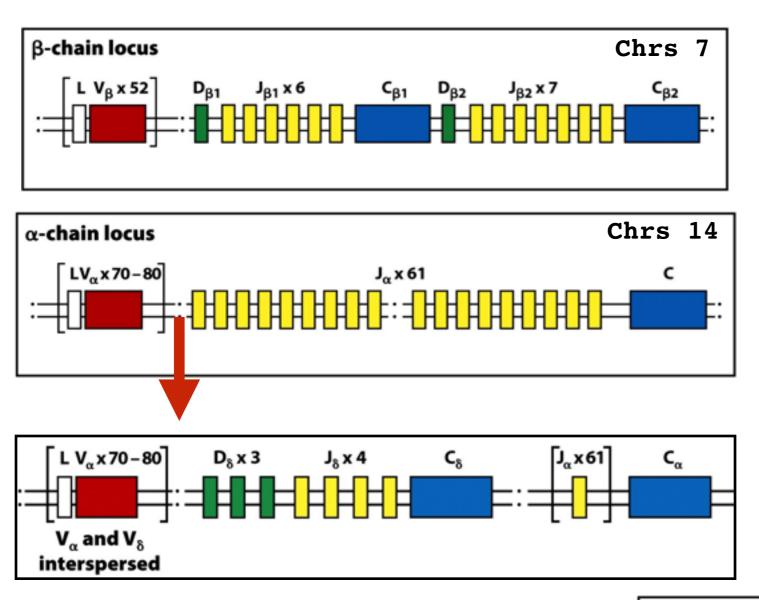
:8"CD3" CD4-8CD3\*pTa:6\*4\*8

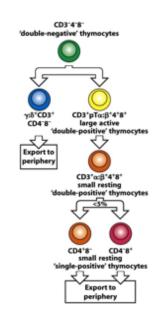
large active positive' thymocyte

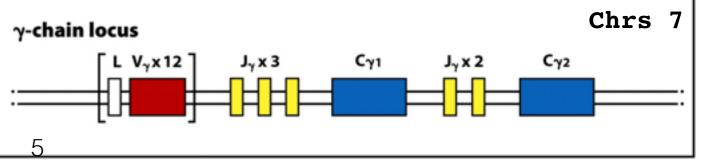
### II- Cellules de l'immunité adaptative

### Lymphocytes $T\alpha\beta$

les segments géniques codants les TCRs







#### Processus de réarrangement génique

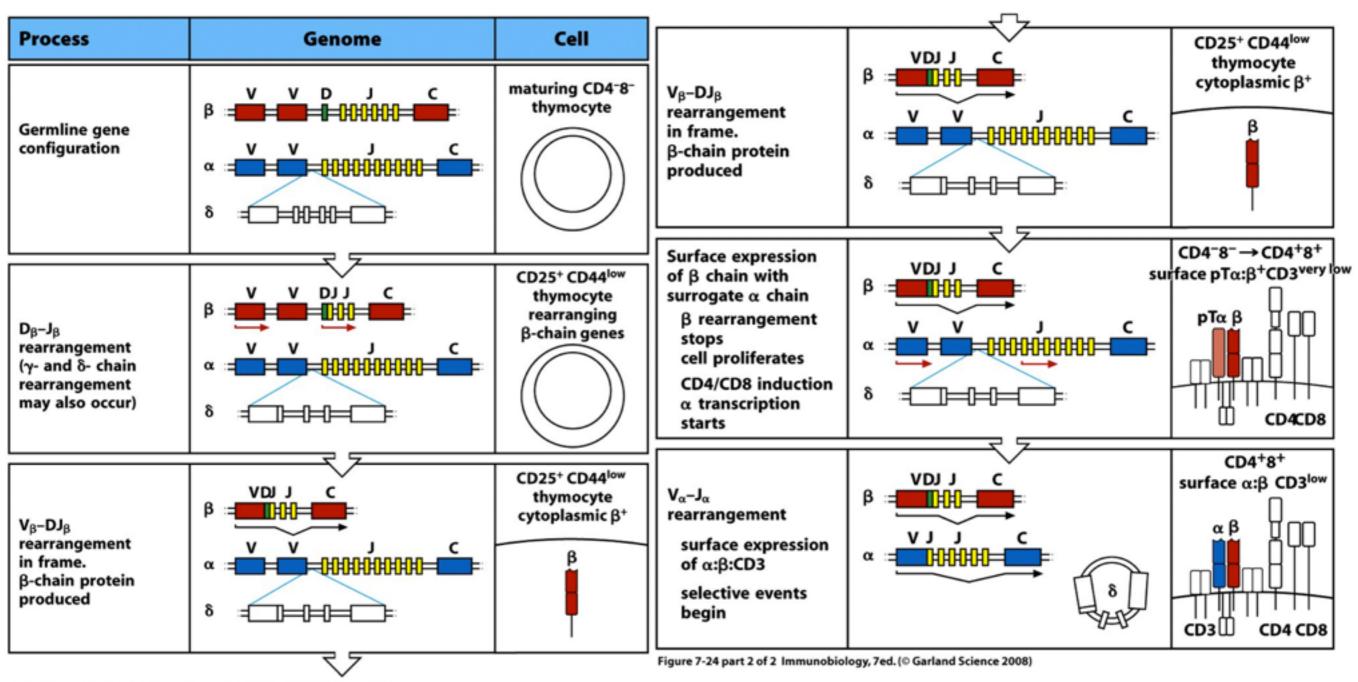


Figure 7-24 part 1 of 2 Immunobiology, 7ed. (© Garland Science 2008)

# **II- Cellules de l'immunité adaptative** Lymphocytes $T\alpha\beta$

#### Processus de réarrangement génique

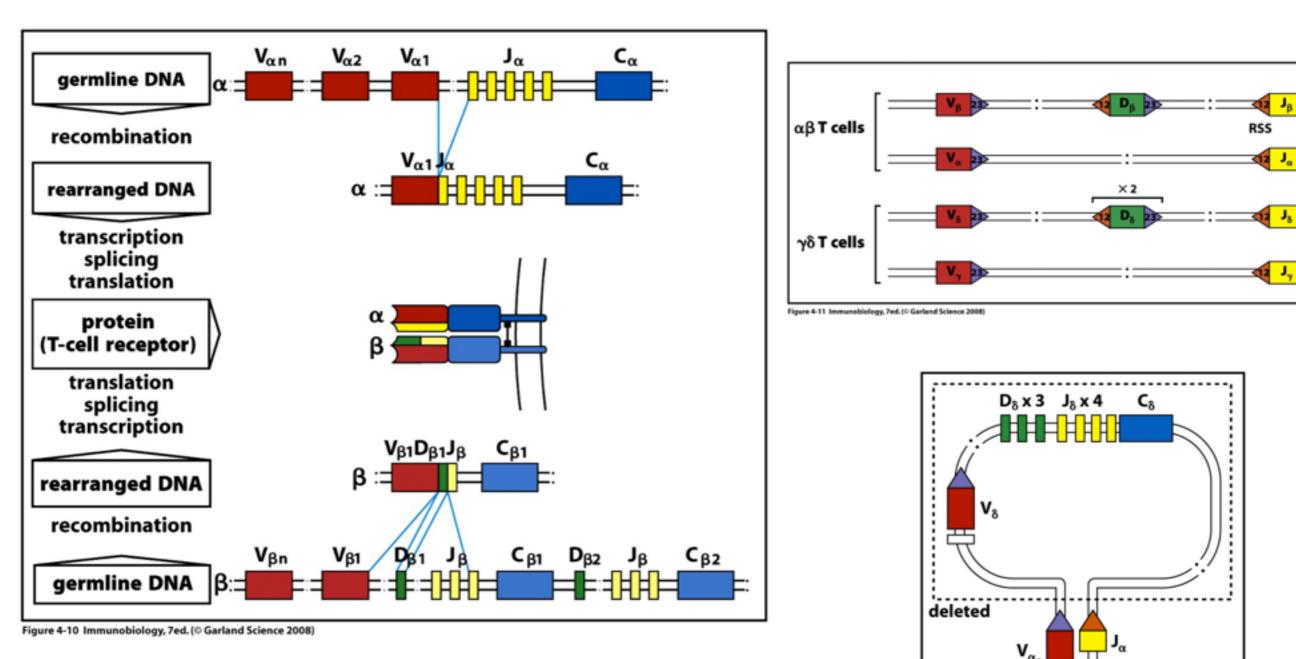


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#### Processus de réarrangement génique

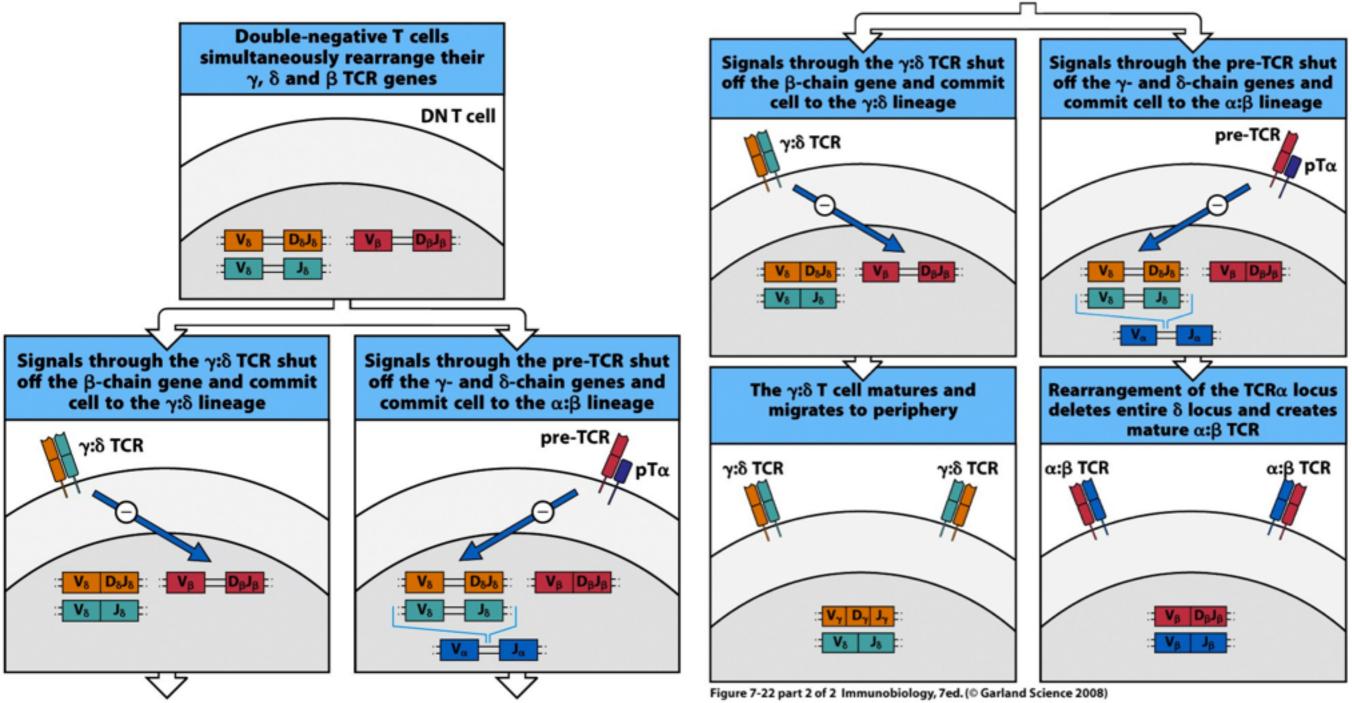
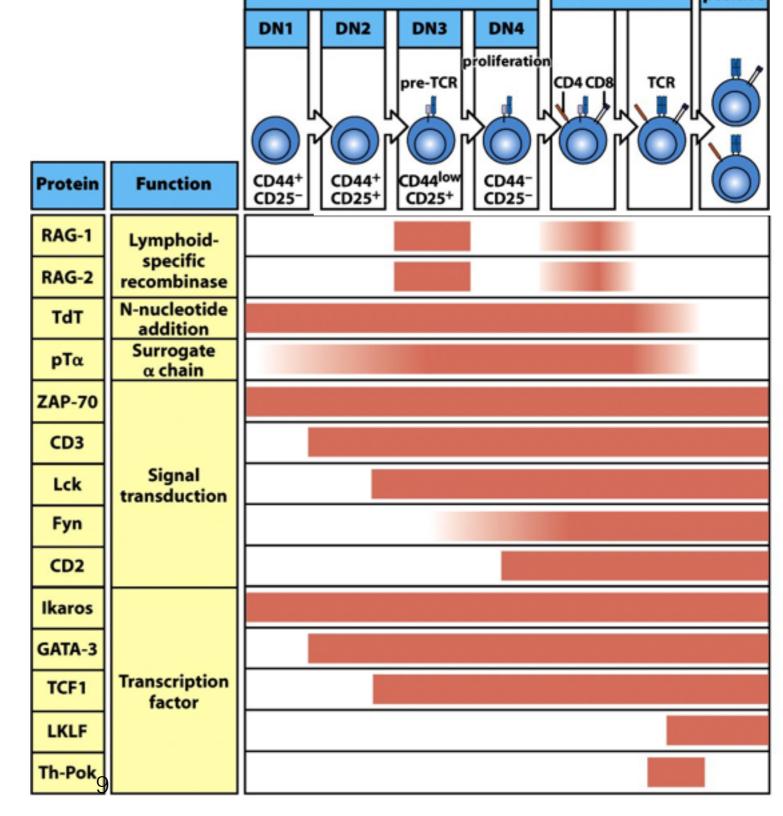


Figure 7-22 part 1 of 2 Immunobiology, 7ed. (© Garland Science 2008)

#### Processus de réarrangement génique

	Double-negative				Double-positive		Single- positive	
		DN1	DN2	DN3	DN4			
		10	pre-TCR	proliferation				
Surface molecule	Function	CD44 <sup>+</sup> CD25 <sup>-</sup>	CD44 <sup>+</sup> CD25 <sup>+</sup>	CD44 <sup>low</sup> CD25 <sup>+</sup>	CD44- CD25-			$\bigcirc$
Kit	Signaling							
Notch	Signaling							
CD44	Adhesion molecule							
CD25	IL-2 receptor							
ρΤα	Surrogate							
CD3	Signaling							
CD4	Co-receptor							either CD4
CD8	co-receptor							or CD8



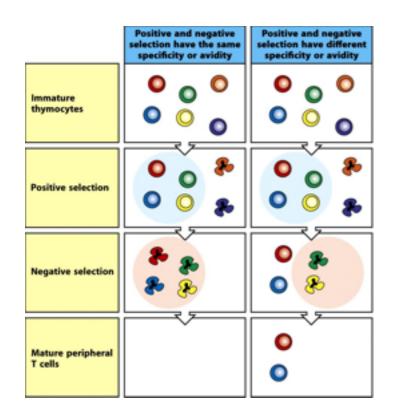
**Double-negative** 

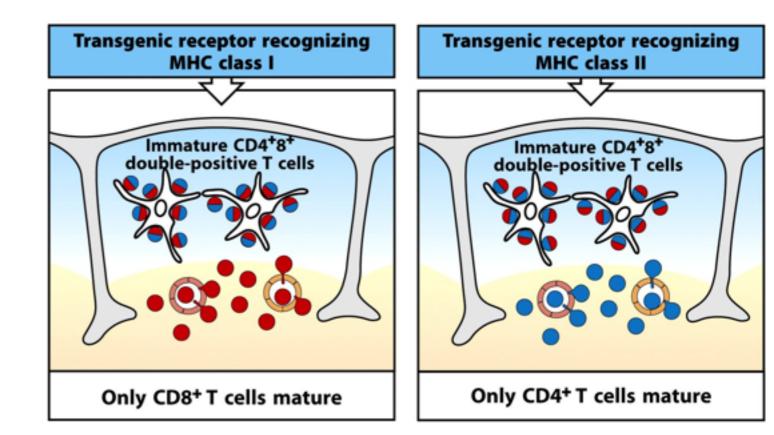
Single-

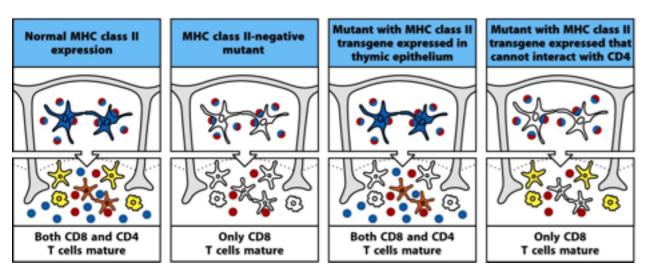
positive

**Double-positive** 

### **II- Cellules de l'immunité adaptative Lymphocytes** $T\alpha\beta$ : sélections positive et négative

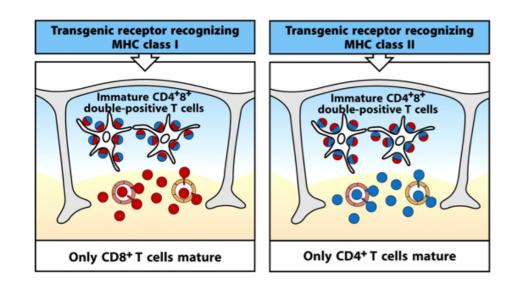


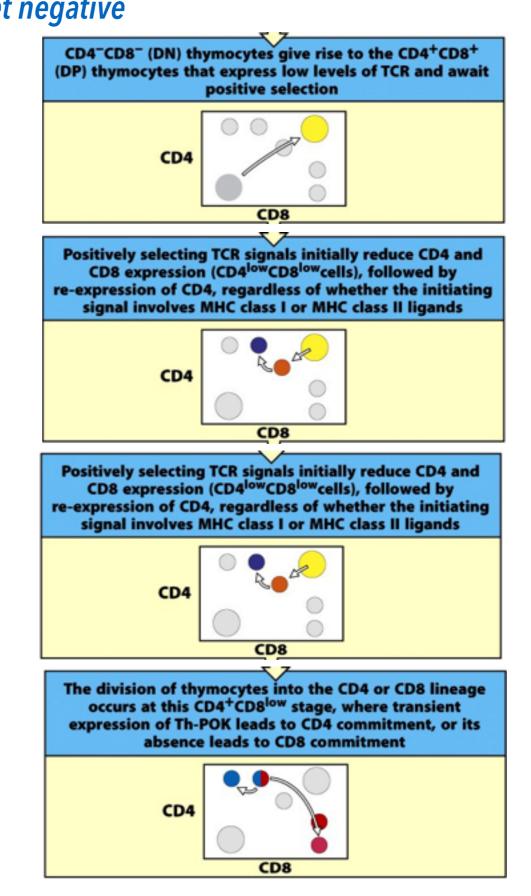


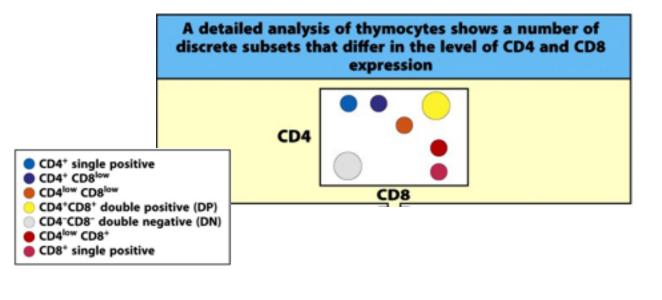


### **II- Cellules de l'immunité adaptative** Lymphocytes $T\alpha\beta$ : sélections positive et négative

11







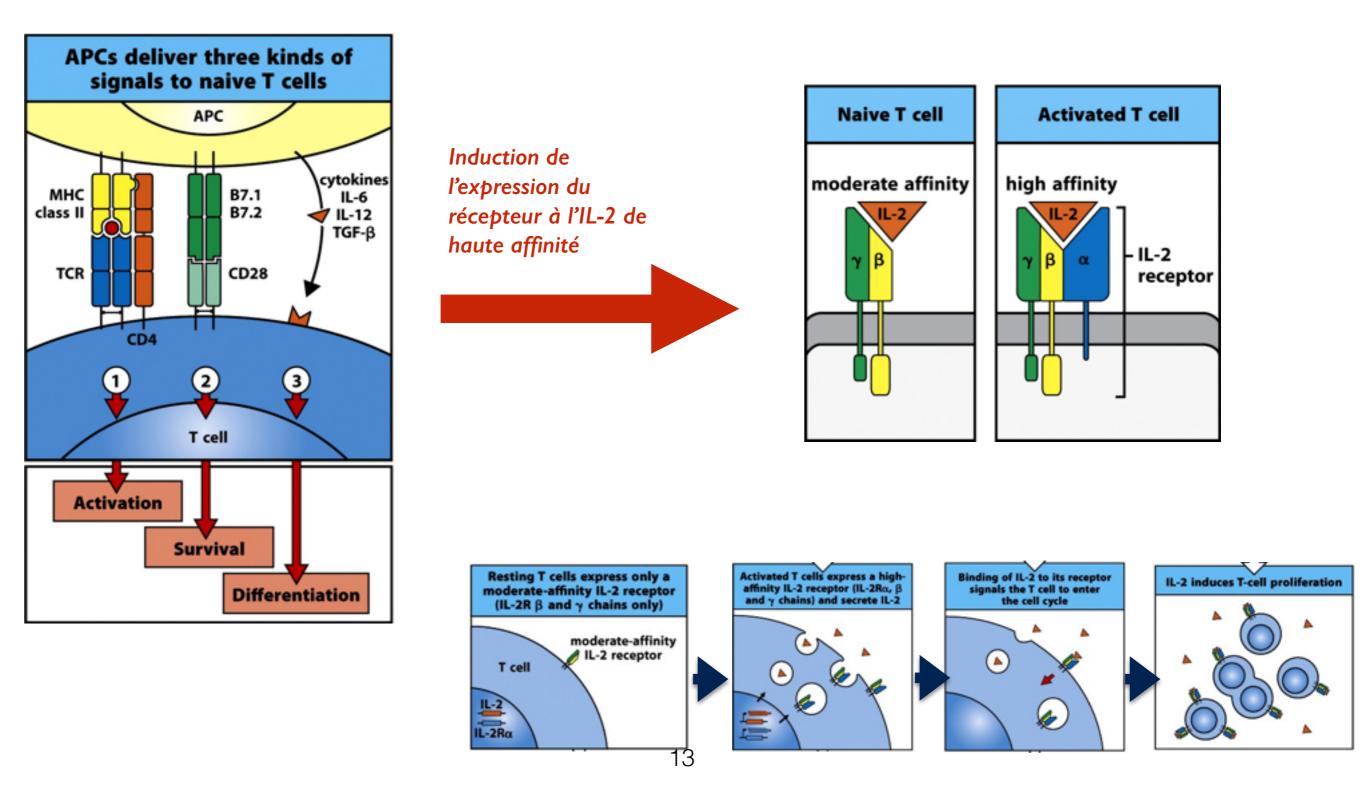
#### II- Cellules de l'immunité adaptative Diversité TCR & BCR

12

Element	Immuno	globulin	α:β <b>T-cell receptors</b>		
Liement	н	κ+λ	β	α	
Variable segments (V)	40	70	52	~70	
Diversity segments (D)	25	0	2	0	
D segments read in three frames	rarely	-	often	_	
Joining segments (J)	6	5(κ) 4(λ)	13	61	
Joints with N- and P-nucleotides	2	50% of joints	2	1	
Number of V gene pairs	1.9	x 10 <sup>6</sup>	5.8 x 10 <sup>6</sup>		
Junctional diversity	~3	x 10 <sup>7</sup>	~2 x 10 <sup>11</sup>		
Total diversity	~5	к 10 <sup>13</sup>	~10	0 <sup>18</sup> Event	

	Event	Process	Nature of change	Process occurs in:	
_				B cells	T cells
	V-region assembly	Somatic recombination of DNA	Irreversible	Yes	Yes
	Junctional diversity	Imprecise joining, N-sequence insertion in DNA	Irreversible	Yes	Yes
	Transcriptional activation	Activation of promoter by proximity to the enhancer	Irreversible but regulated	Yes	Yes
	Switch recombination	Somatic recombination of DNA	Irreversible	Yes	No
	Somatic hypermutation	DNA point mutation	Irreversible	Yes	No
	IgM, IgD expression on surface	Differential splicing of RNA	Reversible, regulated	Yes	No
	Membrane vs secreted form	Differential splicing of RNA	Reversible,	Yes	No

L'interaction entre les lymphocytes T et les cellules présentatrices de l'antigène induit un cascade de signalisation intracellulaire au niveau des lymphocytes.



#### Processus d'activation séquentielle

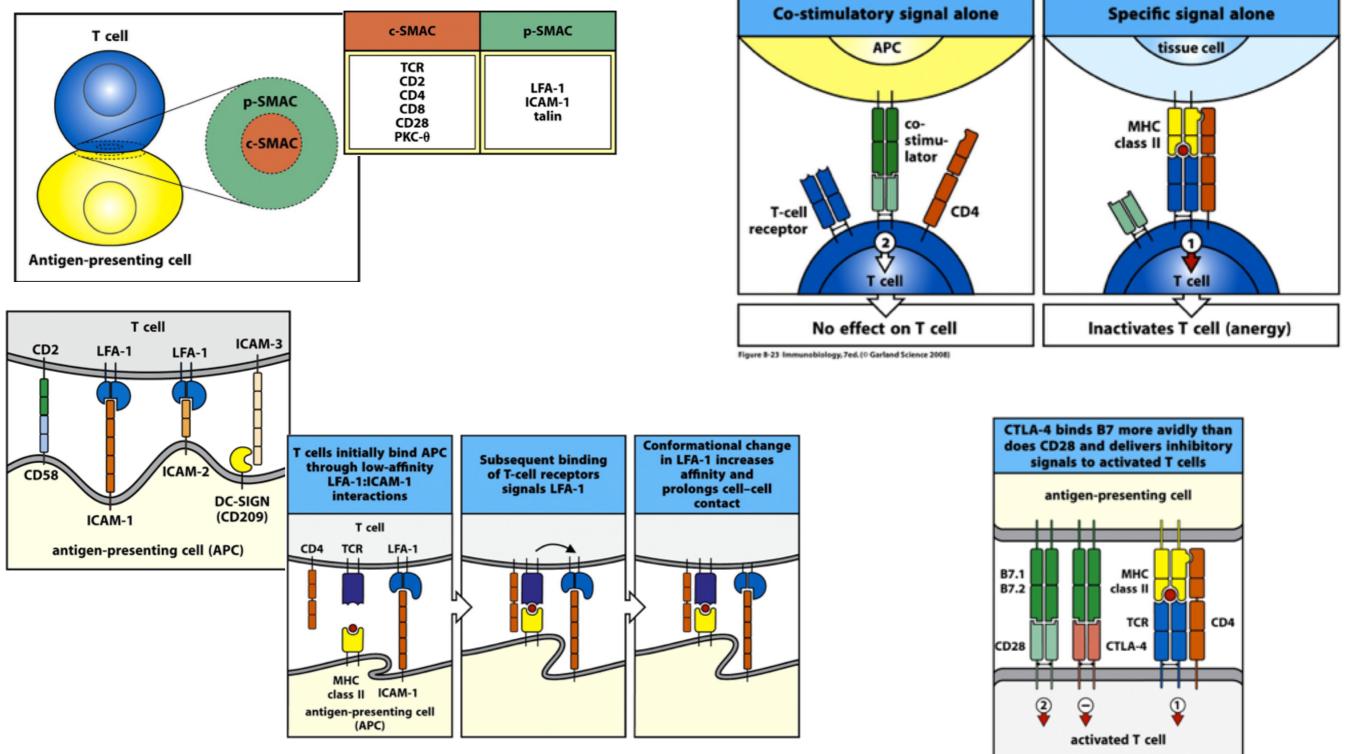


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Les molécules CD4 & CD8

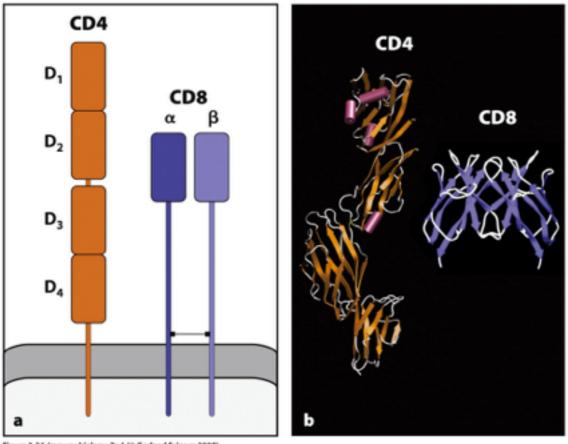


Figure 3-24 Immunobiology, 7ed. (© Garland Science 2008)

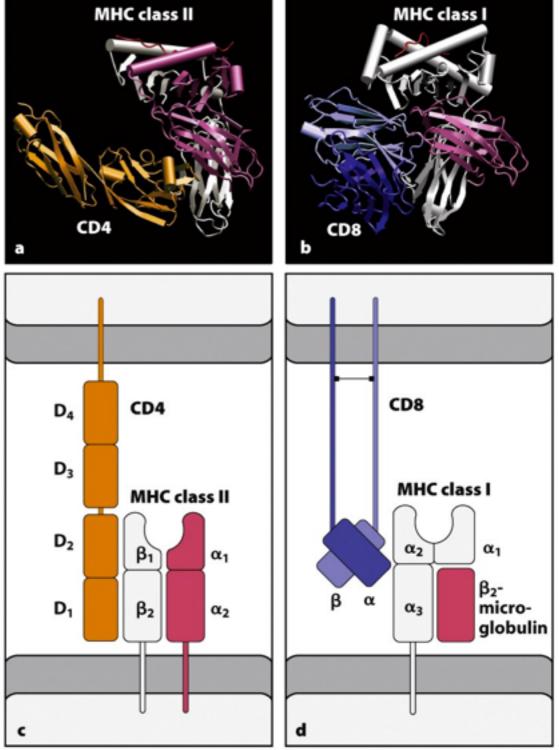
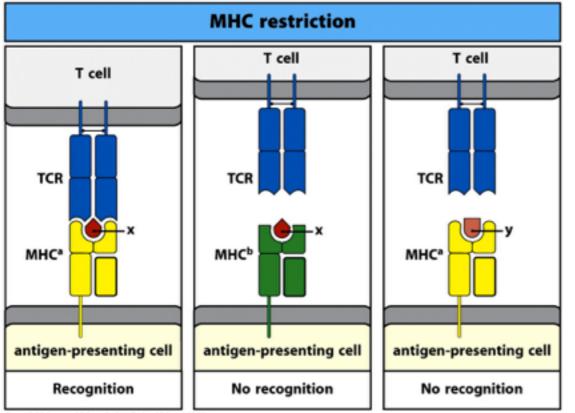


Figure 3-25 Immunobiology, 7ed. (© Garland Science 2008)

Interaction TCR-CMH et notion de restriction CMH



Peptide-independent Foreign peptide:self Peptide-dependent MHC binding binding binding T cell T cell T cell TCR TCR TCR nonself nonself self MHC MHC MHC class II class II class II antigen-presenting cell antigen-presenting cell antigen-presenting cell Figure 5-21 Immunobiology, 7ed. (0 Garland Science 2008)

Figure 5-20 Immunobiology, Ted. (© Garland Science 2008)