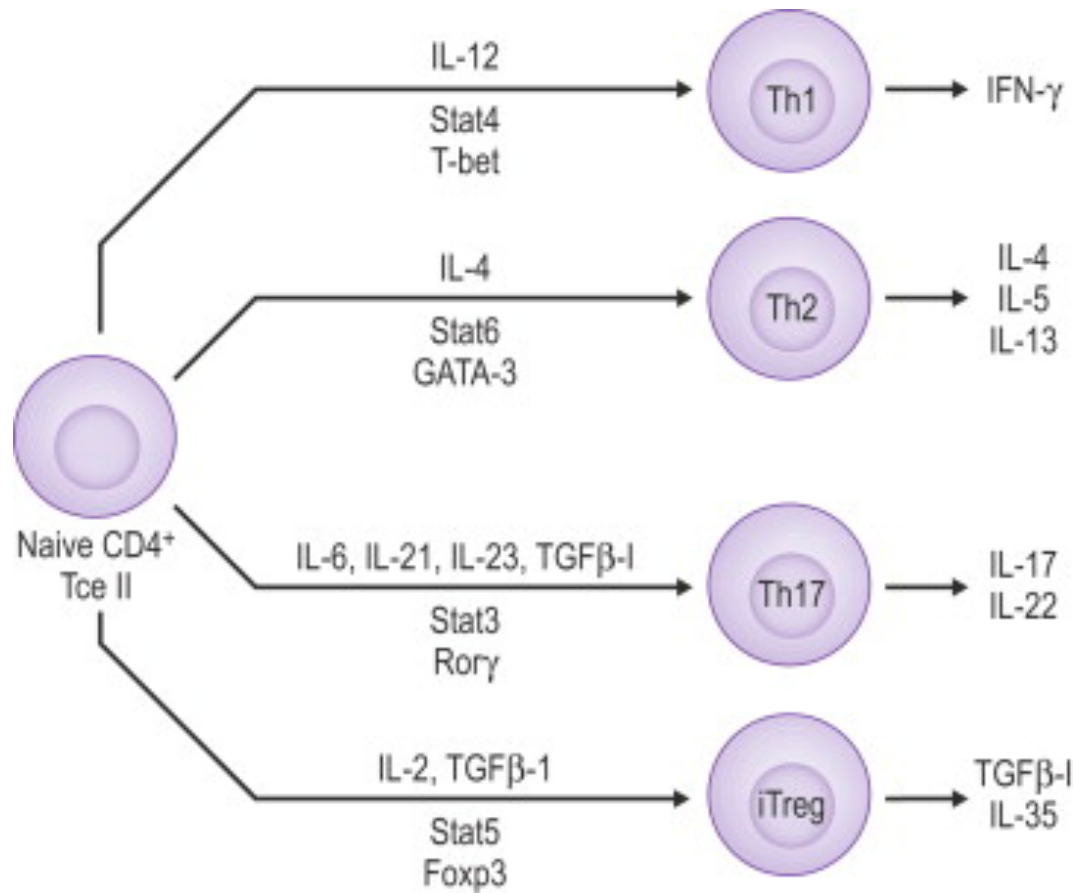


Immune effector mechanisms

Intracellular pathogens

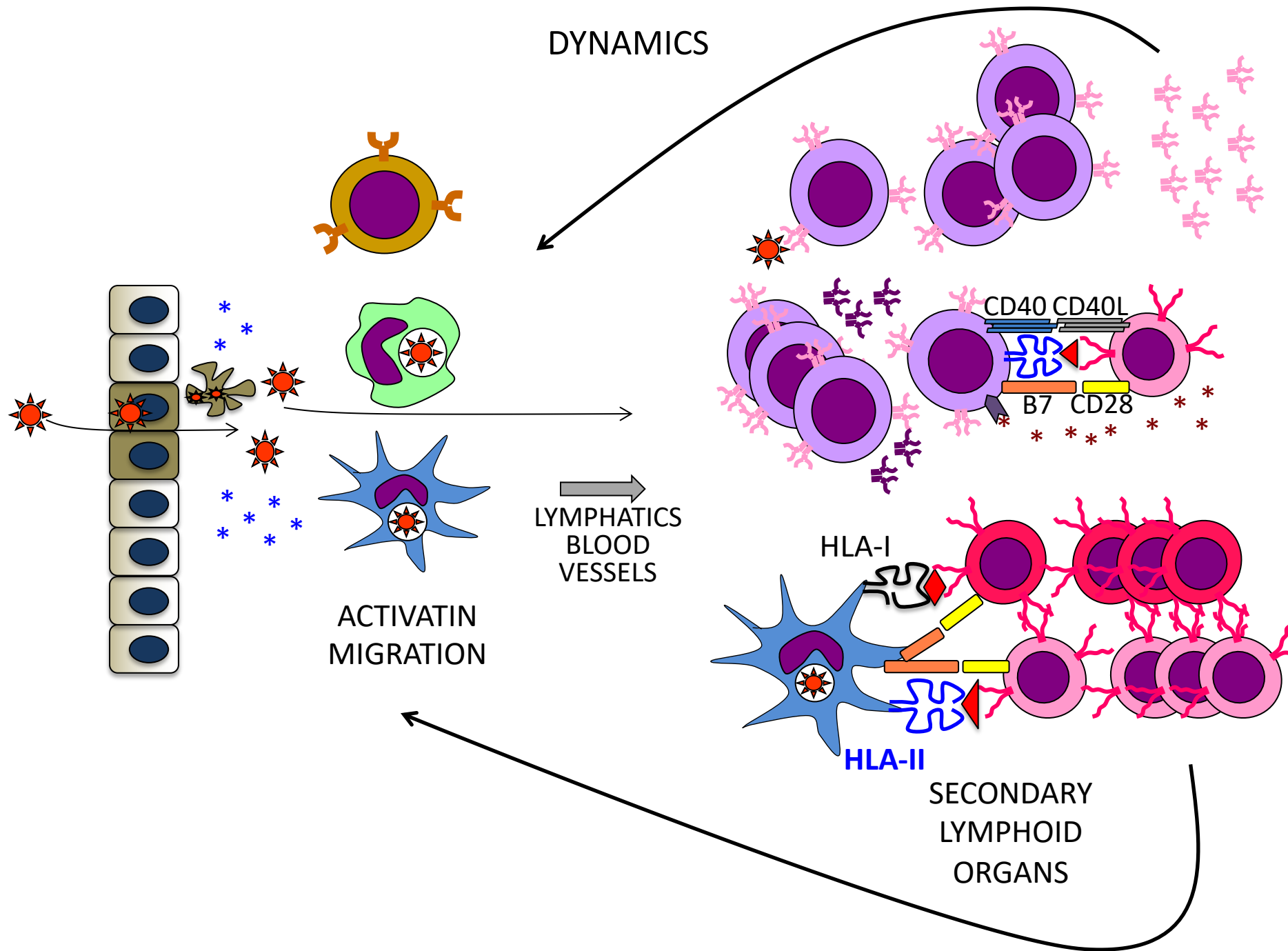
T CD4 – helper - differentiation



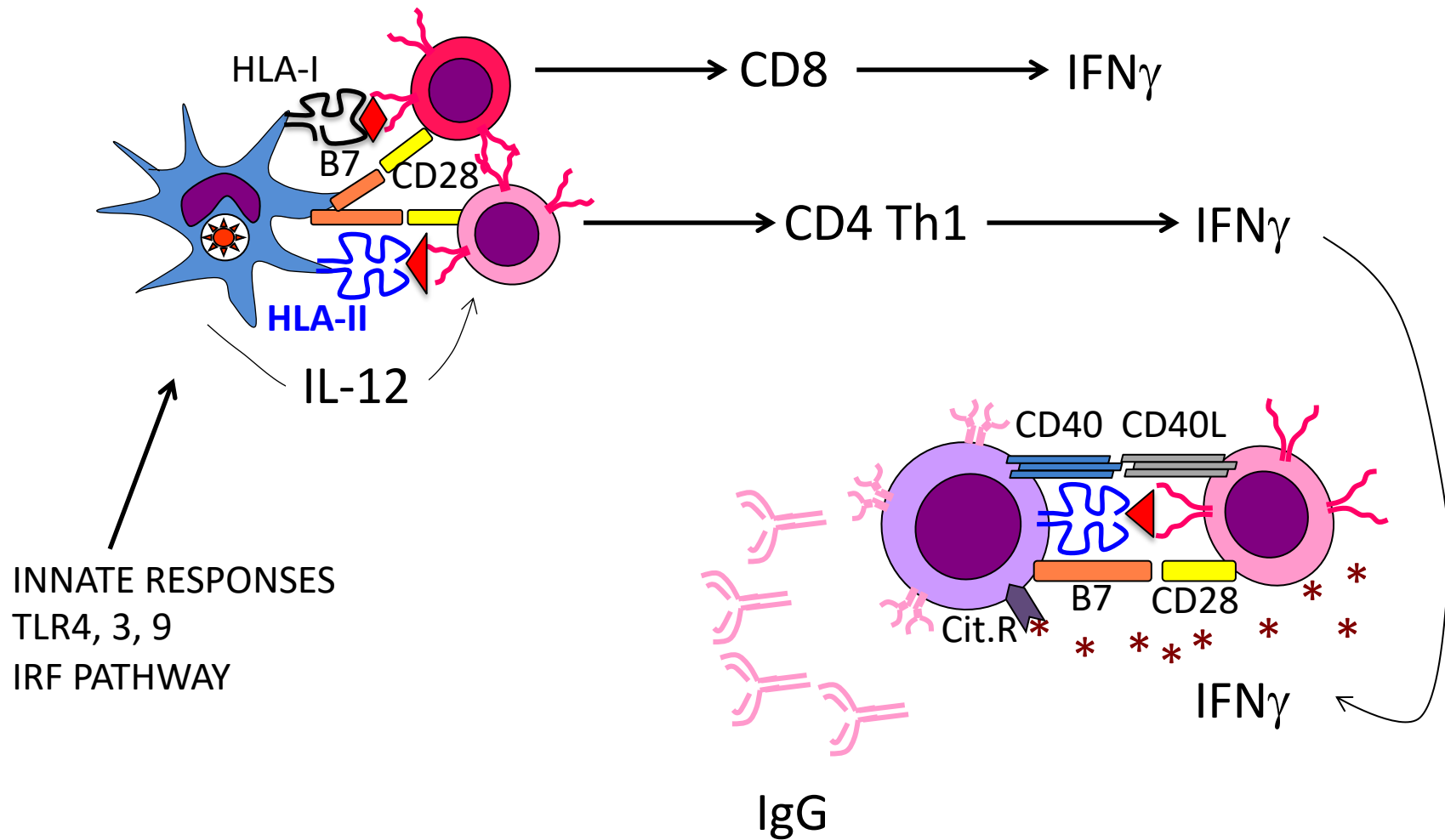
Dynamics

Response profile – focus on CD4 Th1

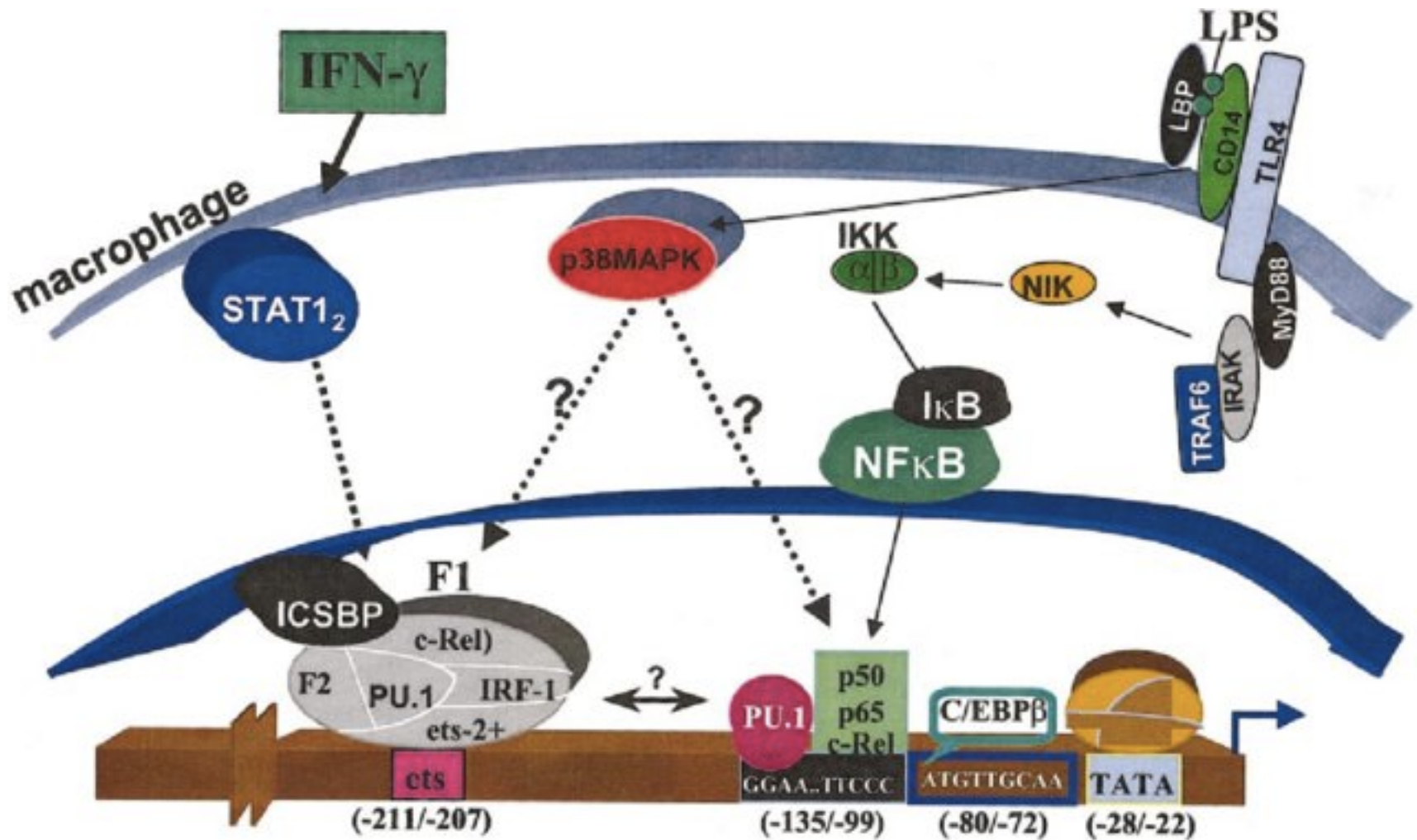
Effector mechanisms- CD8, CD4 Th1, humoral



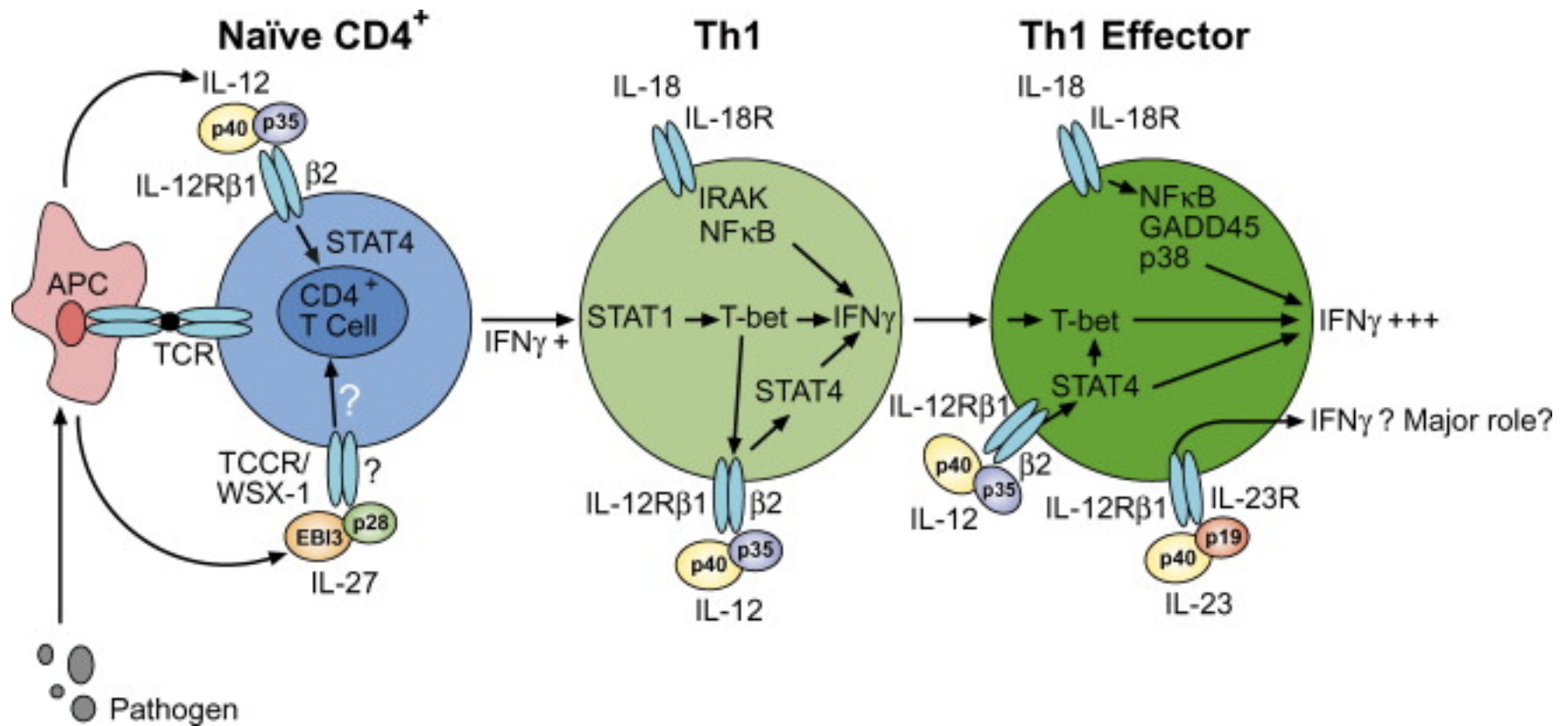
TH1 RESPONSE



INDUCTION OF IL-12 EXPRESSION

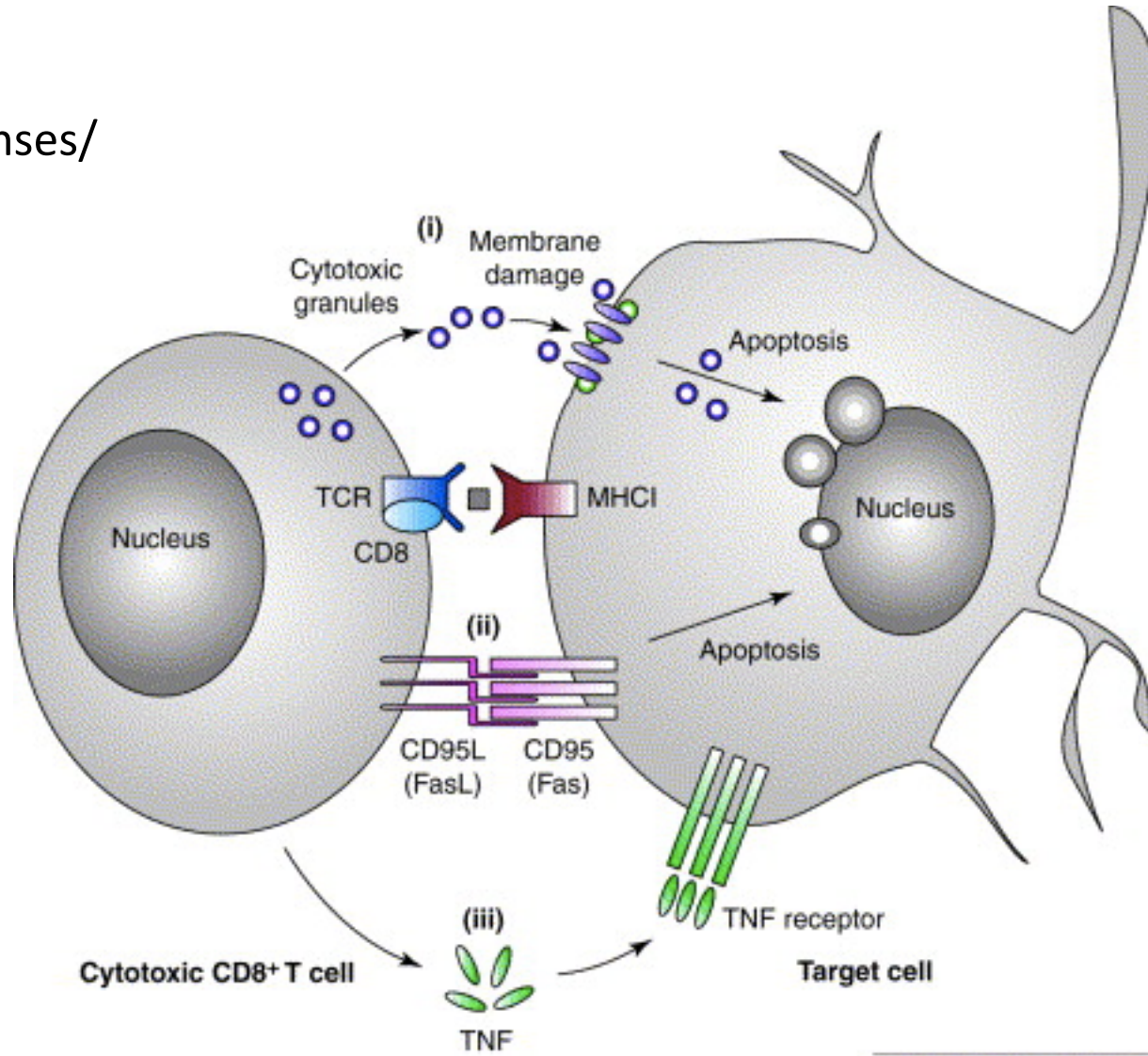


Th1 differentiation

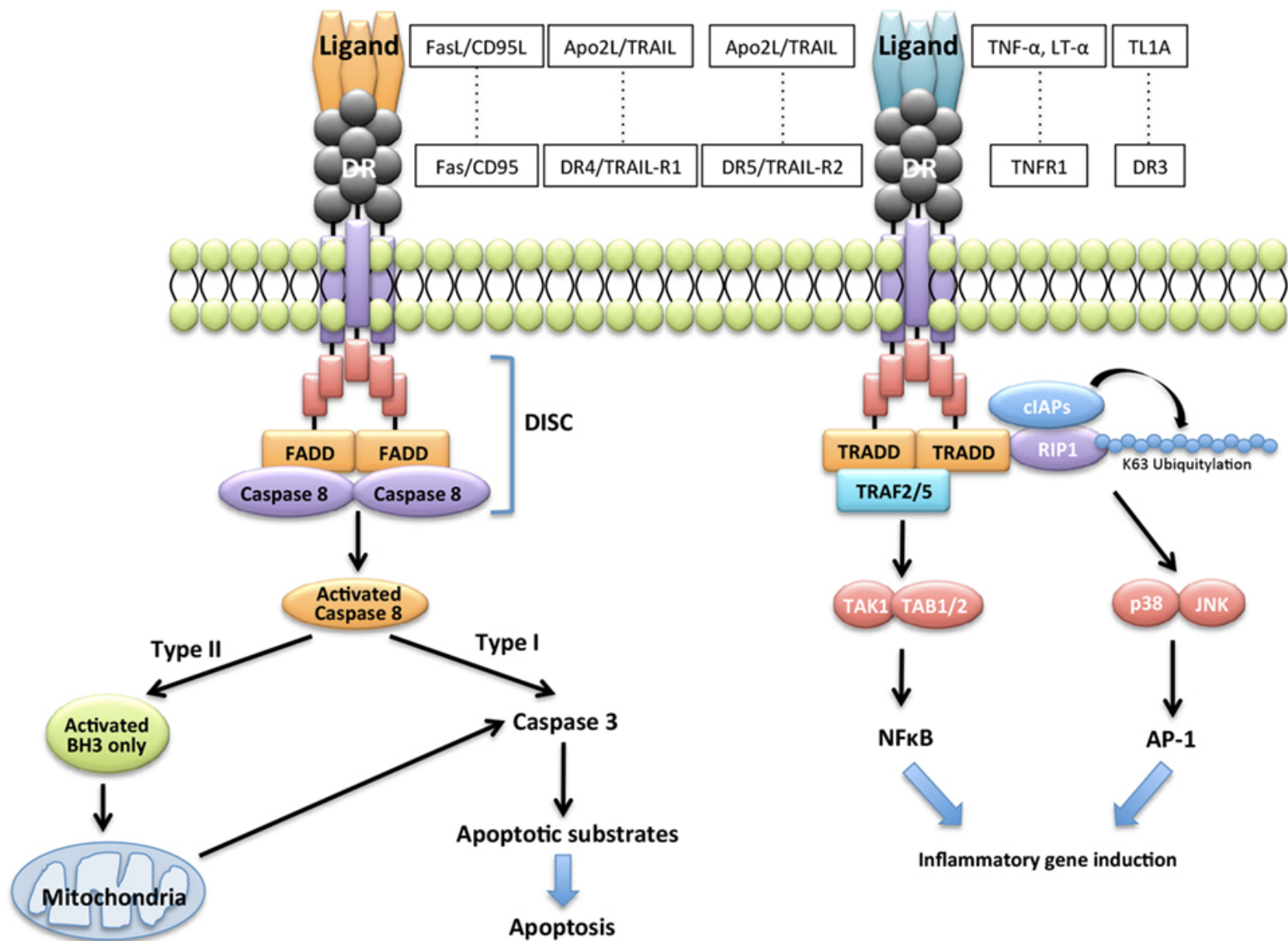


EFFECTOR MECHANISMS – CELLULAR RESPONSES

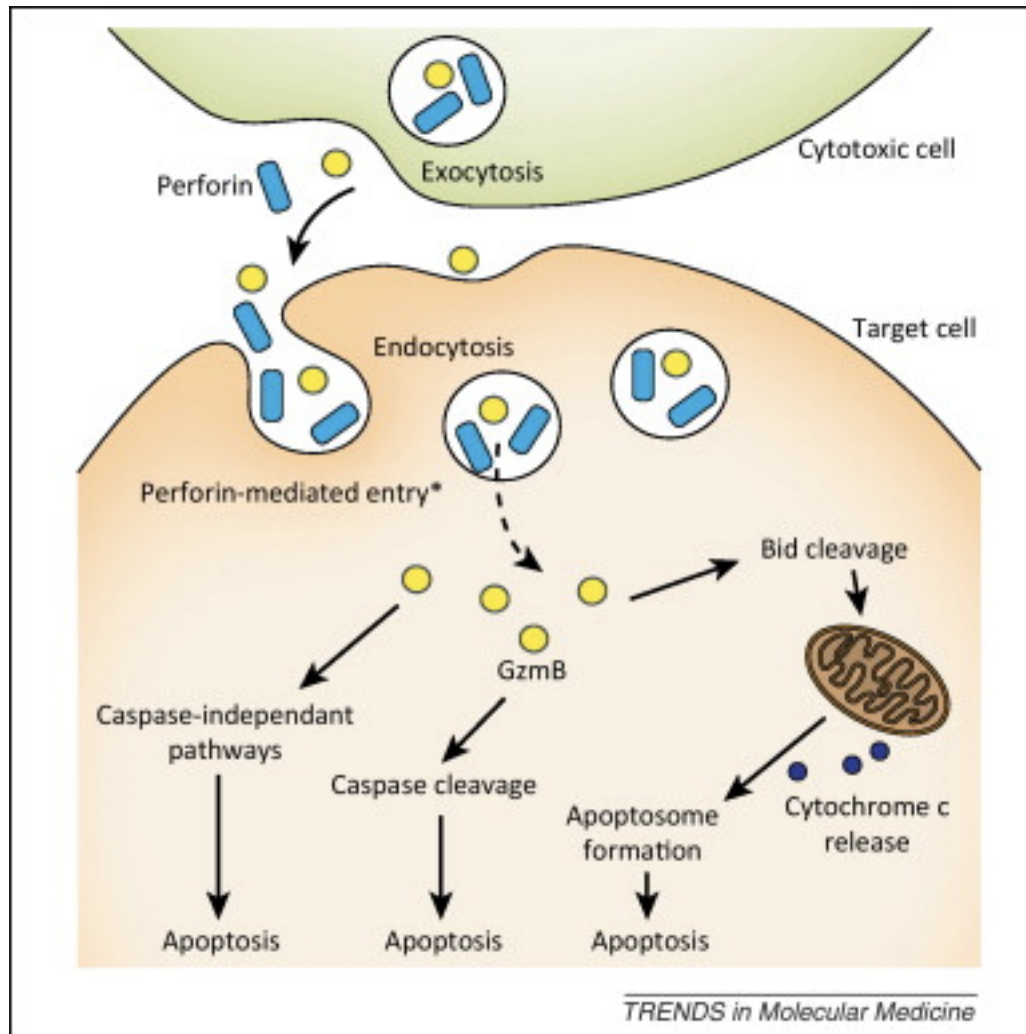
CD8 responses/
NK



TNFR family and cell death induction

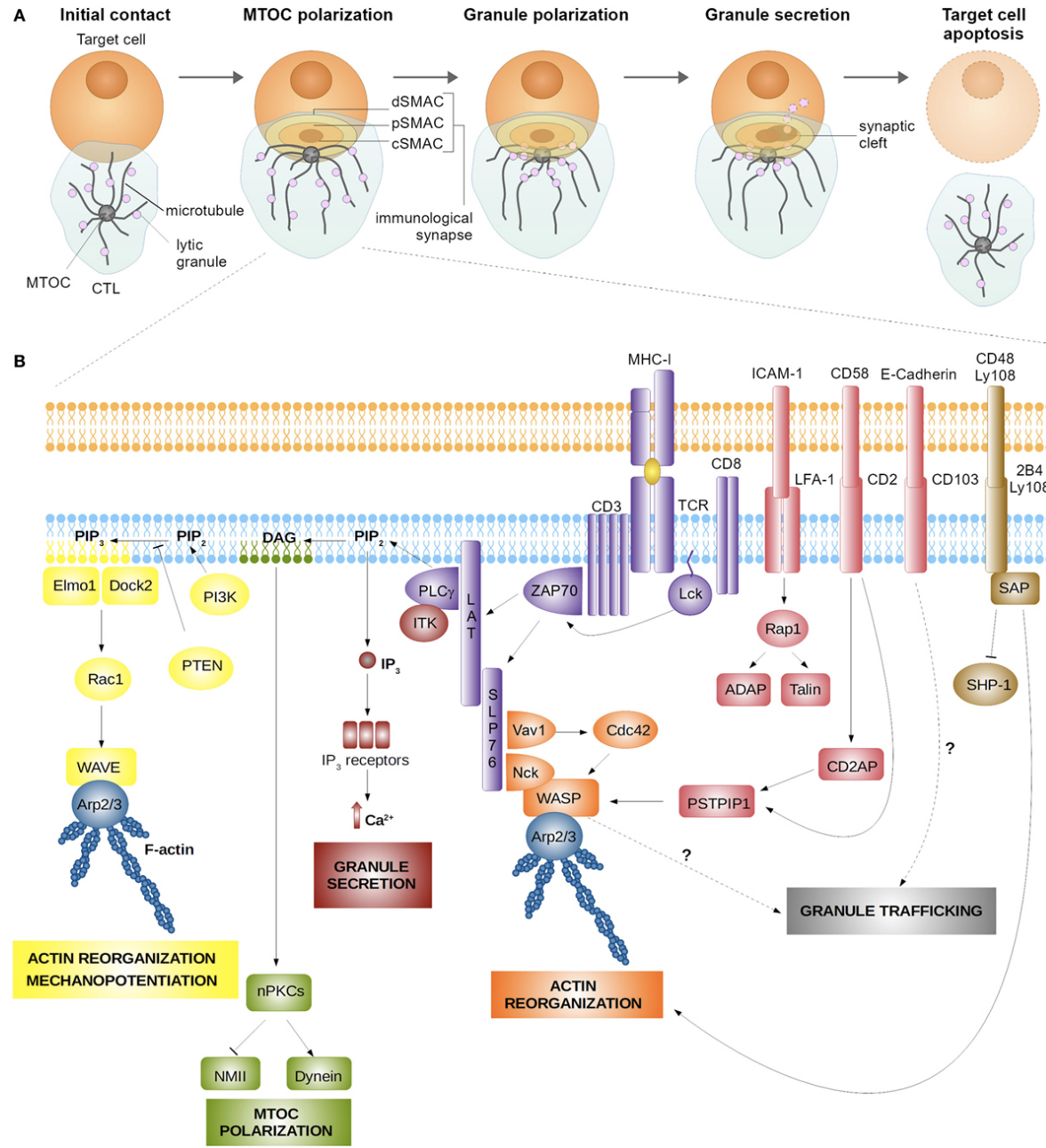


Perforin/Granzyme B

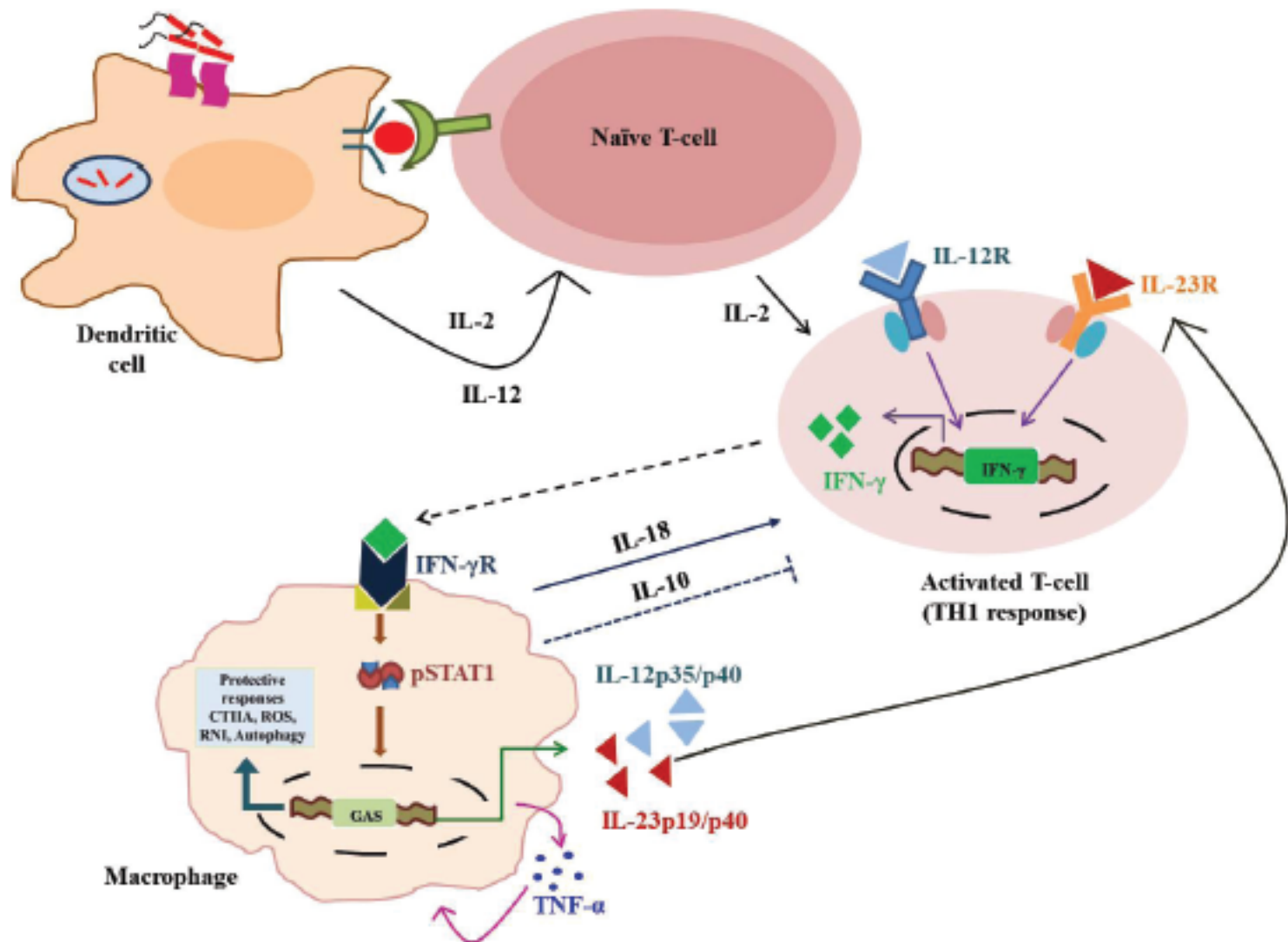


Contents of the dense core	Specialized function
Perforin	Pore formation; disruption of endosomal trafficking
Granulysin	Microbicidal agent
Calreticulin	Calcium and perforin binding
Granzymes	A to M
Dipeptidylpeptidase I (cathepsin C)	Activation of granzymes
Chondroitin sulfate proteoglycans	Complexes to granzymes
Resident lysosomal proteins (periphery of granule)	
Mannose 6-phosphate receptor	Protein trafficking
H ⁺ -ATPase	Granule acidification
Cathepsin D	Protease
Cathepsin L	Protease
Arylsulfatase	
β-Hexosamidase	
β-Glucuronidase	
CD63	
Lamp 1	
Lamp 2	

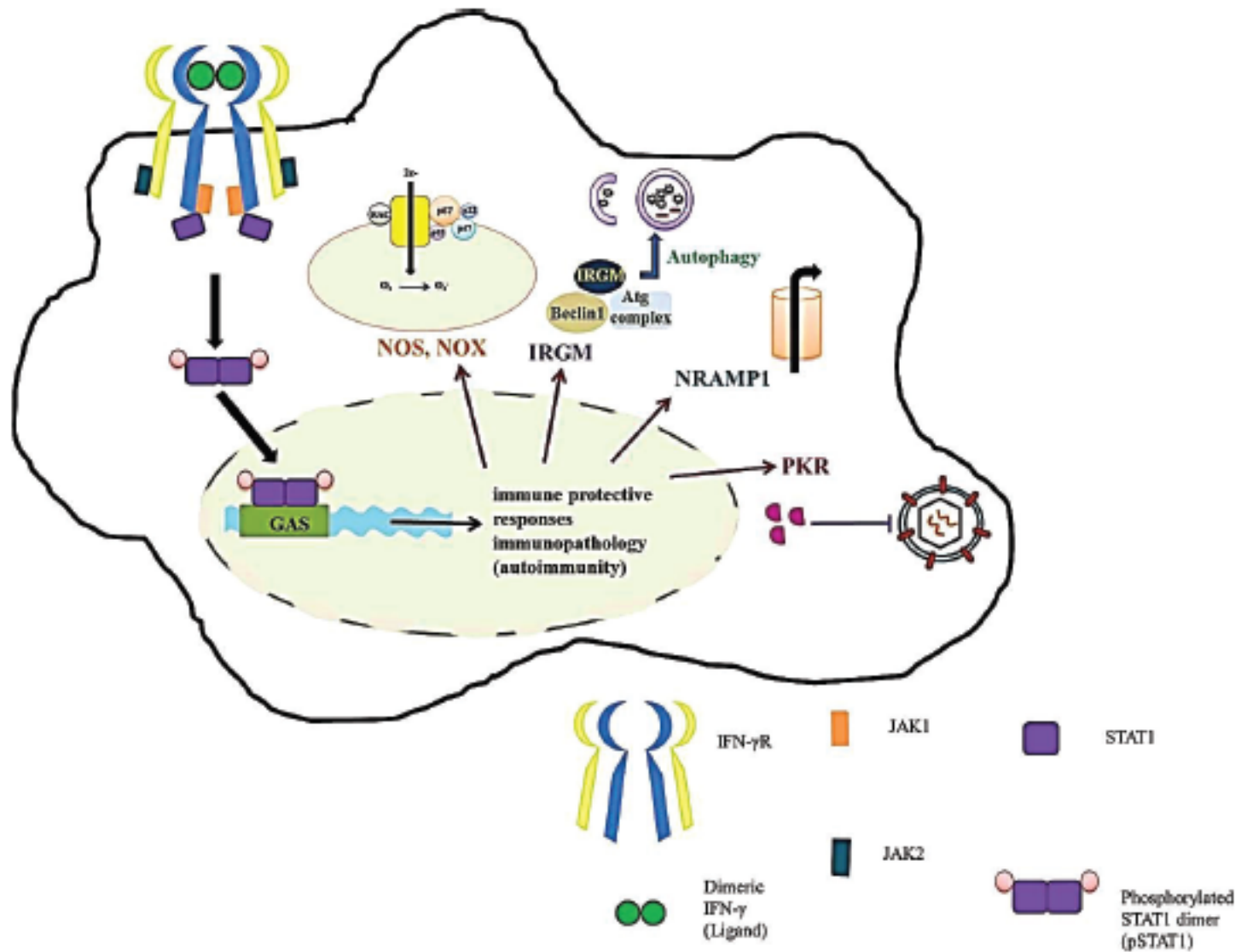
CITOTOXIC IMMUNE SYNAPSE



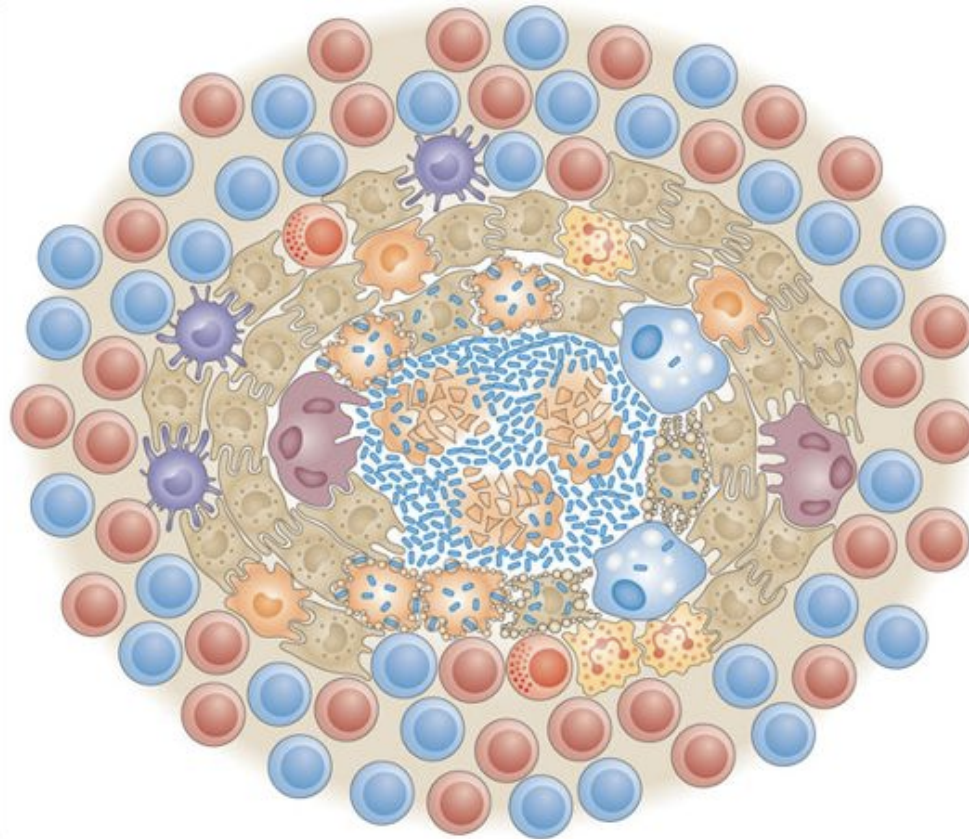
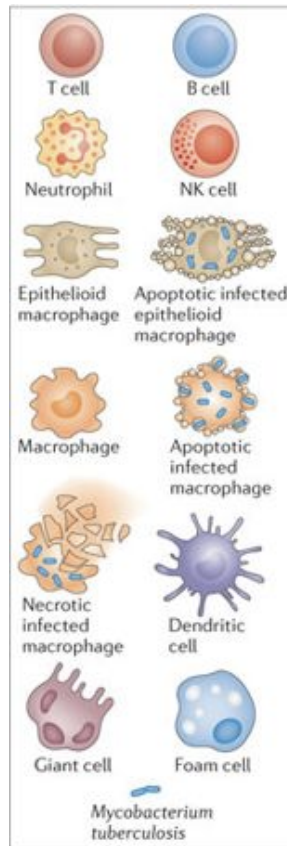
CD4 Th1 CELLS ACTIVATE MACROPHAGES



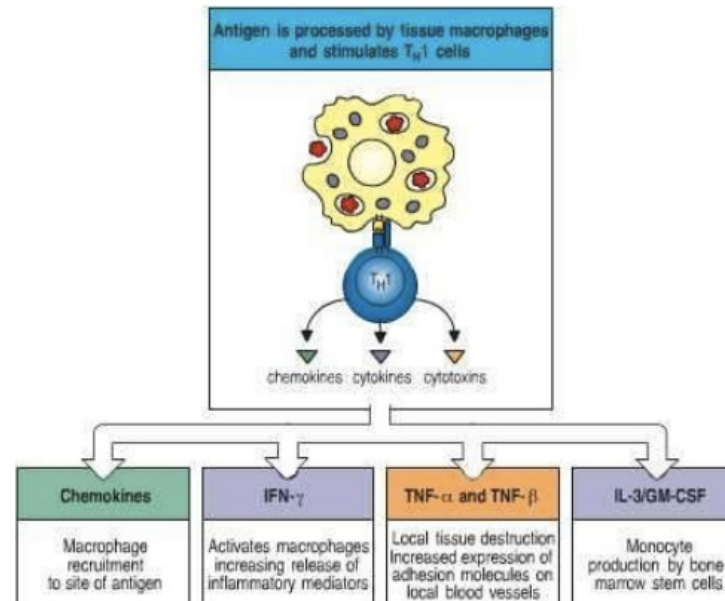
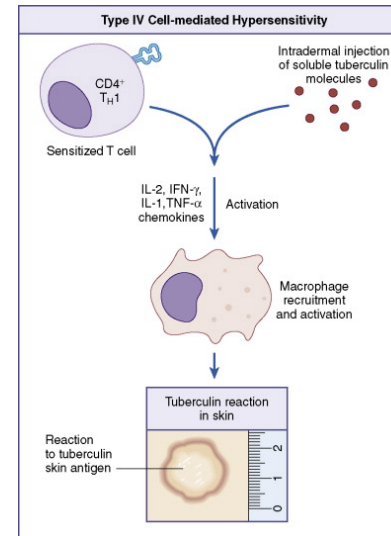
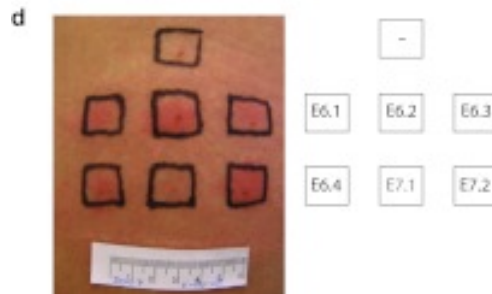
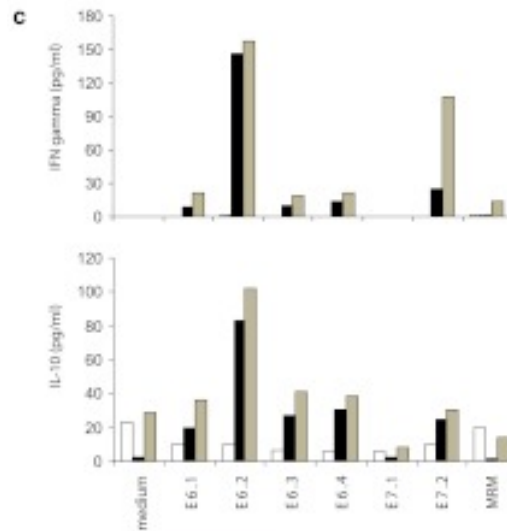
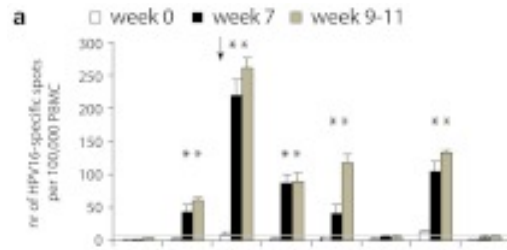
IFN γ EFFECTS ON MACROPHAGES



GRANULOMAS – RESULT OF CD4 Th1 response against Tb



DELAYED TYPE HYPERSENSITIVITY RESPONSE



HUMORAL RESPONSES – IgG

Th1 – IFN γ – isotype switch to IgG

Antibody dependent cytotoxicity

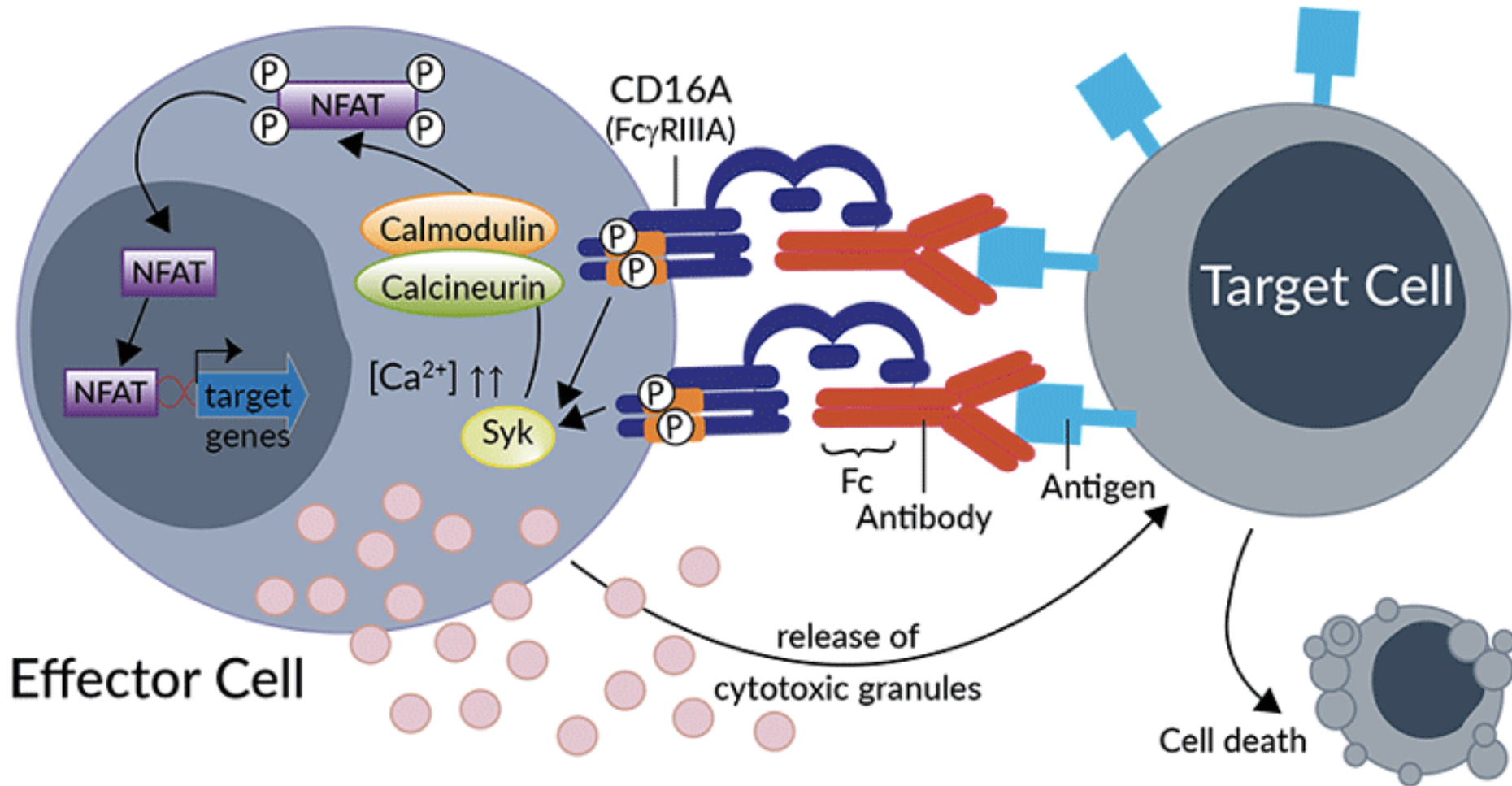
Antibody dependent phagocytosis

Complement activation

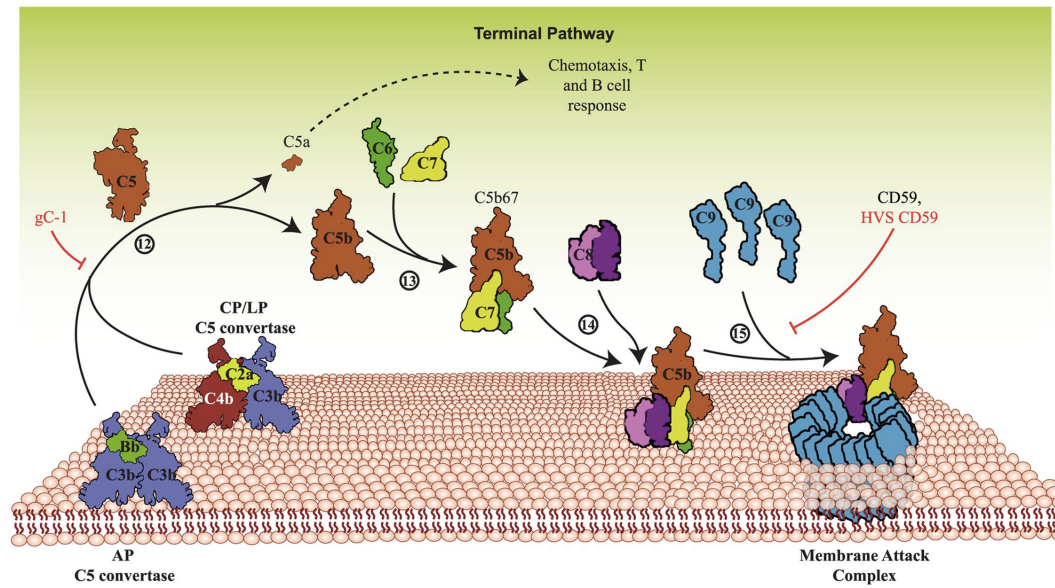
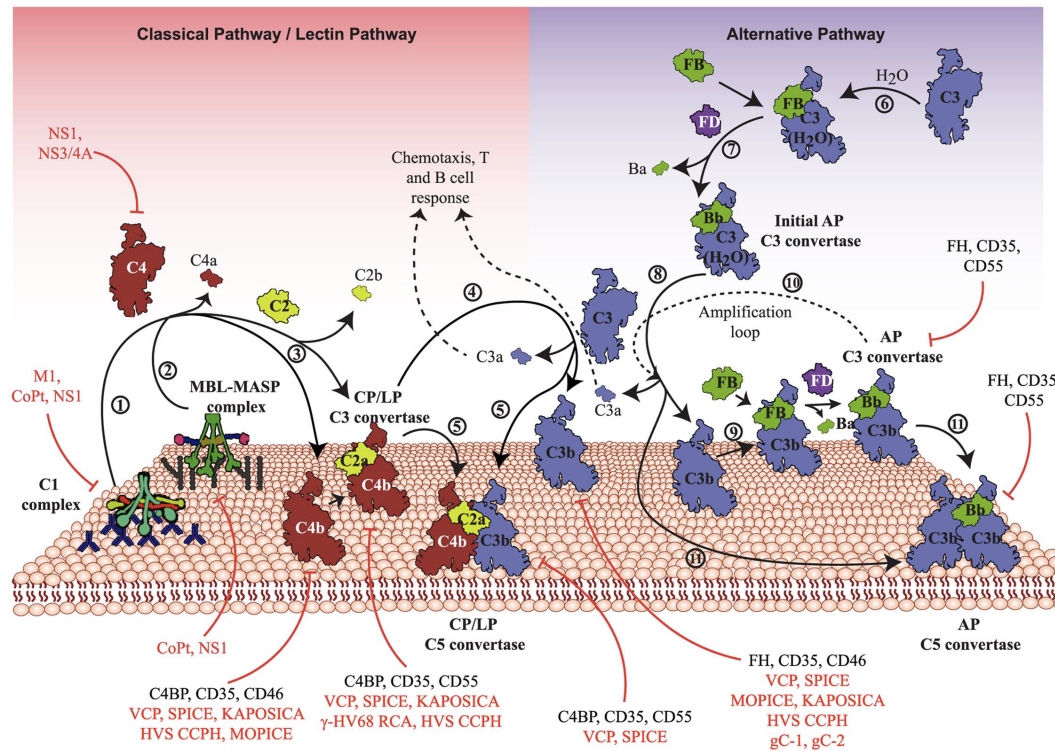
Neutralization

ADCC

Signaling events upon antibody-dependent cellular cytotoxicity



ACTIVATION OF THE COMPLEMENT SYSTEM



NEUTRALIZATION

