Figure 1A

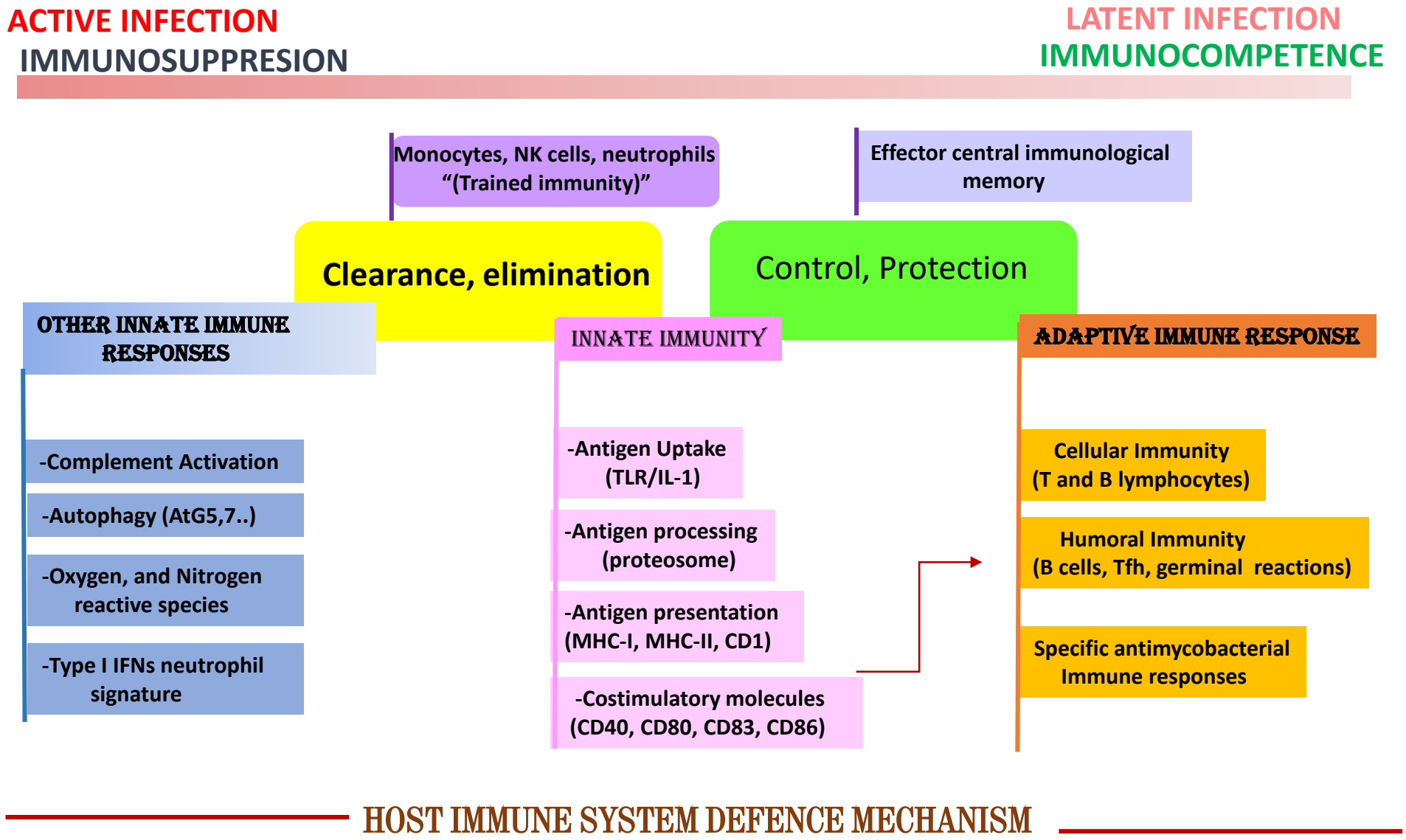

ACTIVE INFECTION
IMMUNOSUPPRESION
LATENT INFECTION
IMMUNOCOMPETENCE
Monocytes, NK cells, neutrophils "(Trained immunity)"
Effector central immunological memory
Clearance, elimination
Control, Protection
OTHER INNATE IMMUNE RESPONSES
INNATE IMMUNITY
ADAPTIVE IMMUNE RESPONSE
-Complement Activation
-Autophagy (AtG5,7..)
-Oxygen, and Nitrogen reactive species
-Type I IFNs neutrophil signature
-Antigen Uptake (TLR/IL-1)
-Antigen processing (proteosome)
-Antigen presentation (MHC-I, MHC-II, CD1)
-Costimulatory molecules (CD40, CD80, CD83, CD86)
Cellular Immunity (T and B lymphocytes)
Humoral Immunity (B cells, Tfh, germinal reactions)
Specific antimycobacterial Immune responses
HOST IMMUNE SYSTEM DEFENCE MECHANISM

Figure 1B

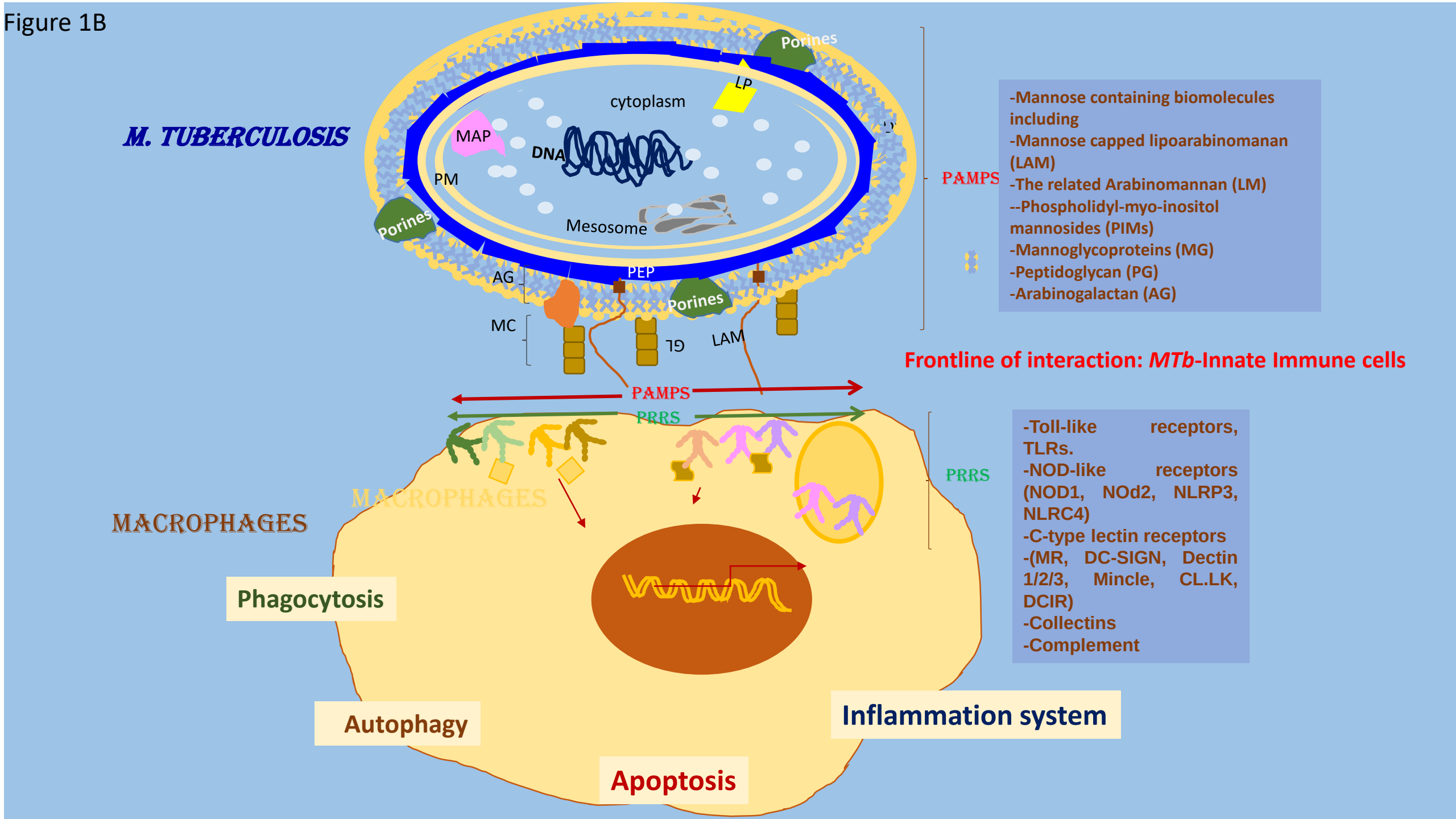

M. TUBERCULOSIS
Porines
LP
cytoplasm
MAP
DNA
PM
Porines
Mesosome
AG
PEP
Porines
MC
GL
LAM
PAMPS
-Mannose containing biomolecules including
-Mannose capped lipoarabinomanan (LAM)
-The related Arabinomannan (LM)
--Phospholidyl-myo-inositol mannosides (PIMs)
-Mannoglycoproteins (MG)
-Peptidoglycan (PG)
-Arabinogalactan (AG)
Frontline of interaction: MTb-Innate Immune cells
PAMPS
PRRS
MACROPHAGES
MACROPHAGES
PRRS
-Toll-like receptors, TLRs.
-NOD-like receptors (NOD1, NOd2, NLRP3, NLRC4)
-C-type lectin receptors
-(MR, DC-SIGN, Dectin 1/2/3, Mincle, CL.LK, DCIR)
-Collectins
-Complement
Phagocytosis
Autophagy
Inflammation system
Apoptosis

Figure 2A

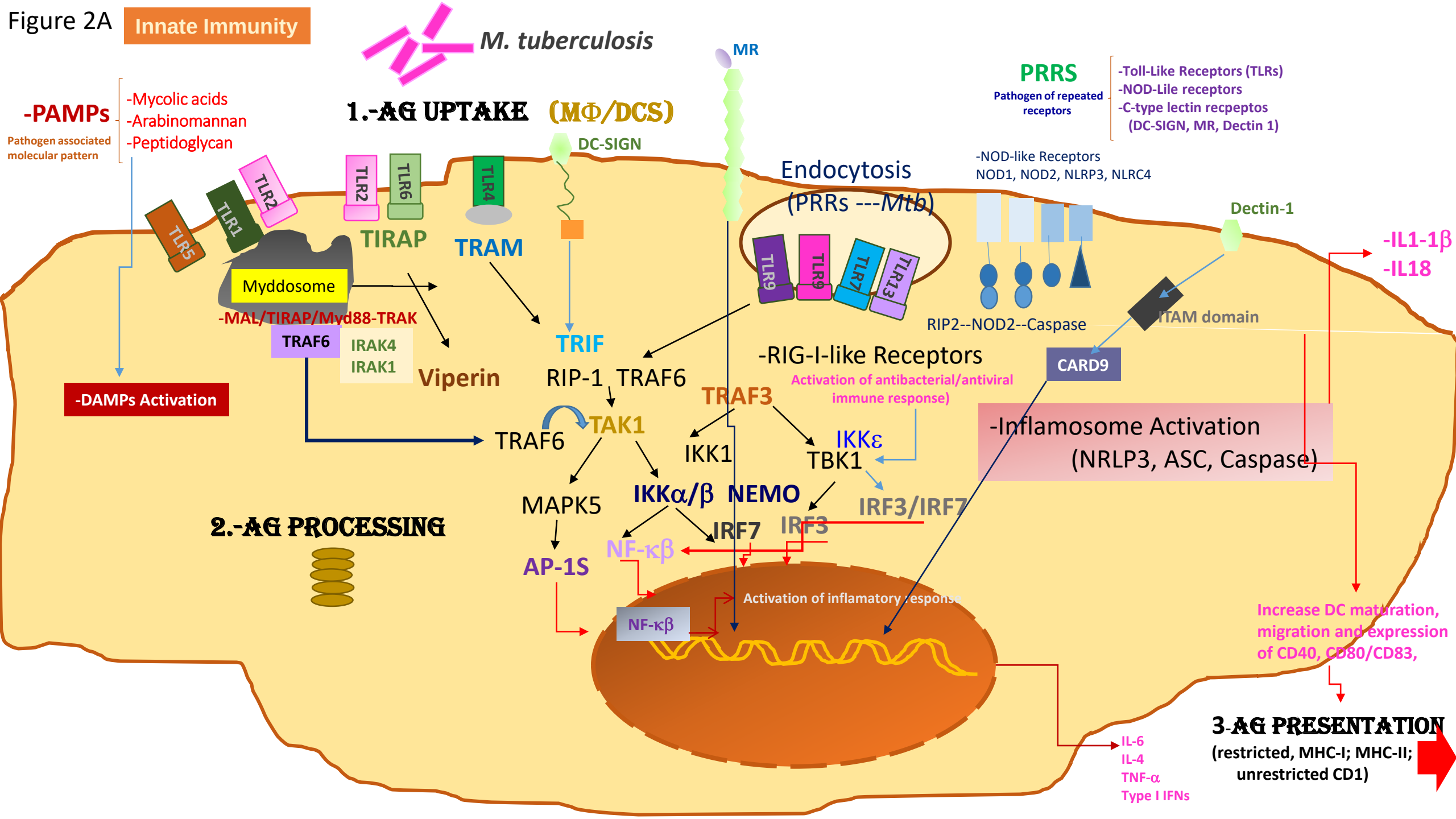

Innate Immunity
M. tuberculosis
MR
PRRS
Pathogen of repeated receptors
-Toll-Like Receptors (TLRs)
-NOD-Lile receptors
-C-type lectin recpeptos
(DC-SIGN, MR, Dectin 1)
-PAMPs
Pathogen associated molecular pattern
-Mycolic acids
-Arabinomannan
-Peptidoglycan
1.-AG UPTAKE (MΦ/DCS)
DC-SIGN
Endocytosis
(PRRs ---Mtb)
-NOD-like Receptors
NOD1, NOD2, NLRP3, NLRC4
Dectin-1
TLR5
TLR1
TLR2
TLR2
TLR6
TLR4
TLR9
TLR9
TLR7
TLR13
TIRAP
TRAM
Myddosome
-MAL/TIRAP/Myd88-TRAK
TRAF6
IRAK4
IRAK1
Viperin
TRIF
RIP-1
TRAF6
RIP2--NOD2--Caspase
ITAM domain
CARD9
-IL1-1β
-IL18
-RIG-I-like Receptors
Activation of antibacterial/antiviral immune response)
-DAMPs Activation
TRAF3
TAK1
TRAF6
IKK1
IKKε
TBK1
-Inflamosome Activation
(NRLP3, ASC, Caspase)
MAPK5
IKKα/β
NEMO
IRF3/IRF7
IRF7
IRF3
2.-AG PROCESSING
NF-κβ
AP-1S
Activation of inflamatory response
NF-κβ
Increase DC maturation, migration and expression of CD40, CD80/CD83,
IL-6
IL-4
TNF-α
Type I IFNs
3-AG PRESENTATION
(restricted, MHC-I; MHC-II; unrestricted CD1)

Figure 2B
2.

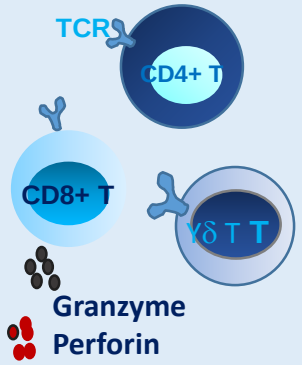
Adaptive Immunity

Cellular Immunity

-T cell activation

CD4+; CD8+; Yδ T cells

-T cell differentiation



-IFN-γ
-IL-12
-IL-4
-IL-10
-TGF-β
-IL-17

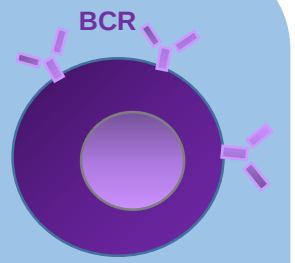
Th subsets
Th1
Th2
Th3
Th17
Tfh

Humoral Immunity

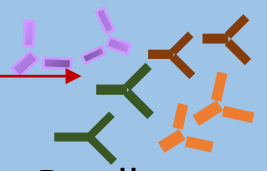
-B cell activation

B lymphocytes

-Plasma cell differentiation
(antibody production)



Germinal reactions
Ig class switching, somatic hypermutation



-High affinity plasma blasts
-Long-lived protective memory B cells

Production of high Abs

IgG, IgA
IgG1; IgG2a, IgG3)

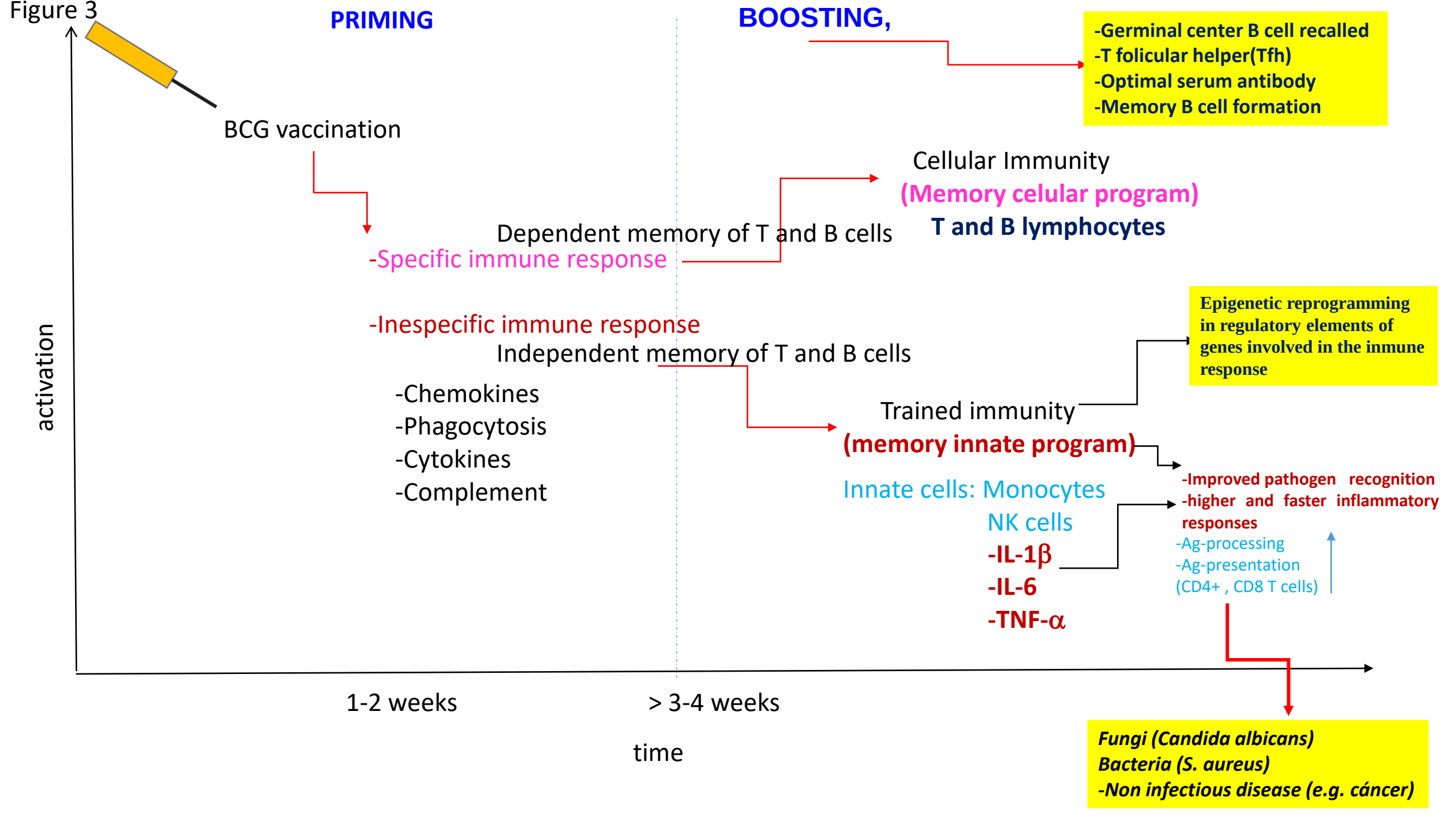
with diverse effector functions

In **pulmonary tuberculosis**.**TH17-IL17** migration of homing cells

IMMUNOLOGICAL MEMORY
-EFFECTOR MEMORY T CELLS
-CENTRAL MEMORY T CELLS
-MEMORY RESIDENT T CELLS

Adaptive Immunity

Figure 3


PRIMING
BOOSTING,
-Germinal center B cell recalled
-T folicular helper(Tfh)
-Optimal serum antibody
-Memory B cell formation
BCG vaccination
Cellular Immunity
(Memory celular program)
T and B lymphocytes
Dependent memory of T and B cells
-Specific immune response
-Inespecific immune response
Independent memory of T and B cells
-Chemokines
-Phagocytosis
-Cytokines
-Complement
Epigenetic reprogramming in regulatory elements of genes involved in the inmune response
Trained immunity
(memory innate program)
Innate cells: Monocytes
NK cells
-IL-1β
-IL-6
-TNF-α
-Improved pathogen recognition
-higher and faster inflammatory responses
-Ag-processing
-Ag-presentation
(CD4+ , CD8 T cells)
activation
1-2 weeks
> 3-4 weeks
time
Fungi (Candida albicans)
Bacteria (S. aureus)
-Non infectious disease (e.g. cáncer)