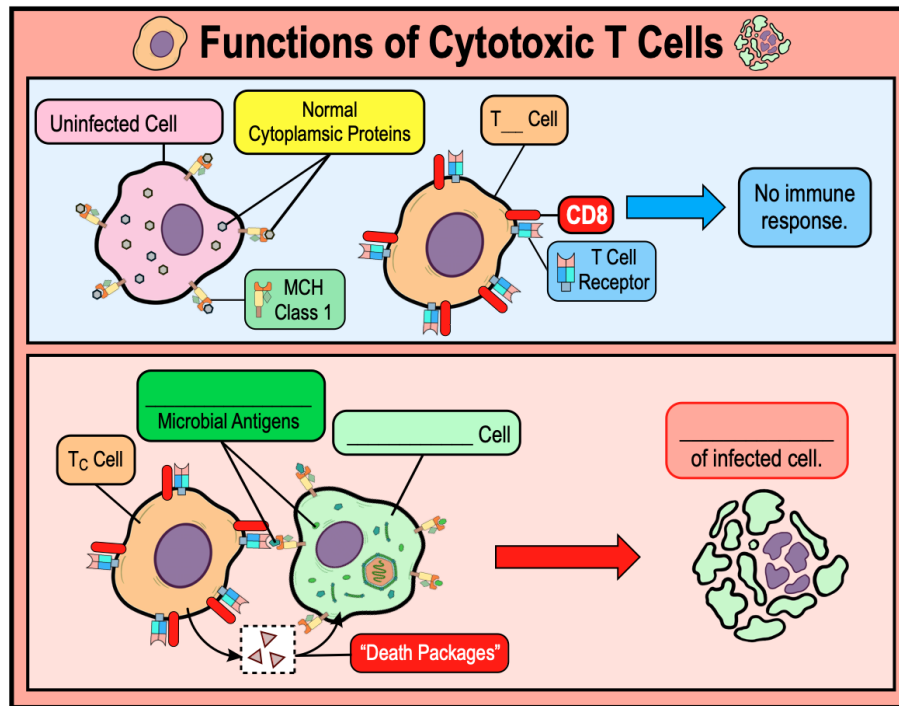


CONCEPT: FUNCTIONS OF T LYMPHOCYTES

Functions of Cytotoxic T Cells (T_C)

- Recall: T_C Cells target infected host cells presenting _____-cellular pathogens on MHC I & induce apoptosis.
- T_C Cells can distinguish between *uninfected* & *infected* host cells by what is presented on the MHC I molecules.
 - **Uninfected cells:** present *nonimmunogenic* _____-made peptides (does NOT elicit immune response).
 - **Infected cells:** present _____ microbial *antigens* (do elicit immune response).
- When T_C cell binds an infected cell, it releases proteases & *perforin* (creates _____ in the infected cell).
 - Proteases enter infected cell via pores & _____ cellular proteins, inducing *apoptosis*.
 - Apoptosis is a controlled way of killing infected cells *without* exposing pathogens to nearby healthy cells.
- T_C cells release *cytokines* to neighboring cells activating macrophages & increase antigen presentation on dendritic cells.



PRACTICE: Which statement is FALSE about cytotoxic T cells?

- a) They stimulate B cells.
- b) They destroy virus-infected cells.
- c) They recognize MHC I bound antigens on APCs.
- d) They induce apoptosis in infected cells.

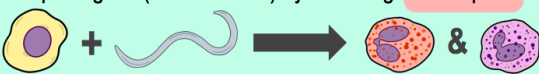
PRACTICE: T_C cells recognize epitopes only when the latter are held by

- a) MHC proteins.
- b) B cells.
- c) Interleukin-2.
- d) Granzyme.

CONCEPT: FUNCTIONS OF T LYMPHOCYTES

Types of Helper T Cells (T_H)

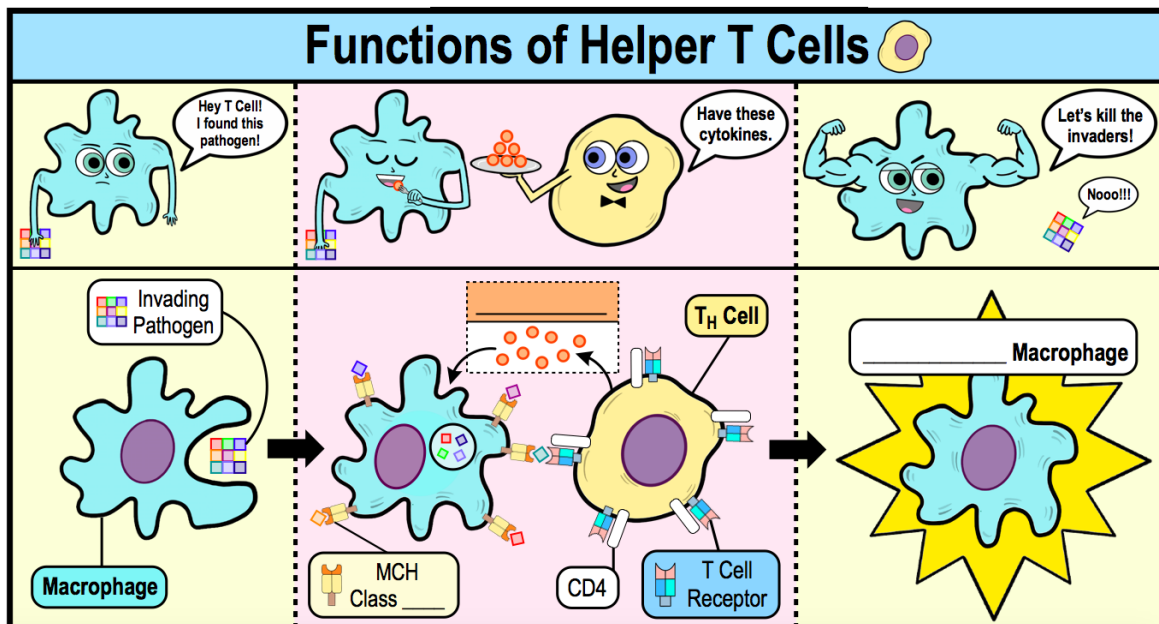
- Depending on signals provided by a dendritic cell, naive T_H cells differentiate into one of many effector T_H cell subtypes.
 - Each subtype of effector T_H cells produce different *cytokines* that control an immune response.

Types of Helper T Cells 	
T_H1 Cells 	Respond to _____ cellular pathogens (ex. viruses) by activating macrophages & _____ cells. 
T_H2 Cells 	Respond to _____ cellular pathogens (ex. helminths) by recruiting eosinophils & basophils . 
T_H17 Cells 	Respond to _____ cellular pathogens (ex. bacteria) by recruiting neutrophils . 

- For our lesson, we will consider functions of ALL T_H cell types as a group.

Functions of Helper T Cells (T_H): Activation of Macrophages

- *Recall:* Naive T_H cells are activated by *dendritic cells* via antigen presentation.
 - **T_H cells** make cytokines to *help* stimulate & activate immune cells (ex. macrophages & naive T_C & B cells).
- Macrophages routinely engulf, degrade, & process invading pathogens to present them as antigens on MHC ____.
- Effector T_H cells bind antigens presented on MHC II & produce cytokines that _____ the macrophage.
 - Stimulated macrophages *increase* production of lysozymes & antimicrobials to destroy invaders more effectively.
 - T_H cells can also release additional cytokines that activate *nearby* _____ cells as well.



CONCEPT: FUNCTIONS OF T LYMPHOCYTES

PRACTICE: Why are cytokines important signals for cell-mediated immunity?

- a) Cell-mediated immunity requires immune cells to communicate to perform most efficiently.
- b) Cytokines are signals that allow immune cells to communicate.
- c) Effector cells, like CD4 cells, use cytokines to activate other immune cells.
- d) Cytokines signal to specific immune cells to increase their destructive properties and destroy pathogens.
- e) A and B.
- f) C and D.
- g) All of the above.

PRACTICE: T_____ cells assist in the functions of certain B cells and other T cells.

- a) sensitized.
- b) cytotoxic.
- c) helper.
- d) natural killer.

PRACTICE: Which type of helper T cells are involved in fighting extracellular pathogens?

- a) T_H1 .
- b) T_H2 .
- c) T_H17 .
- d) A and B.
- e) B and C.
- f) All types of helper T cells help fight extracellular pathogens.