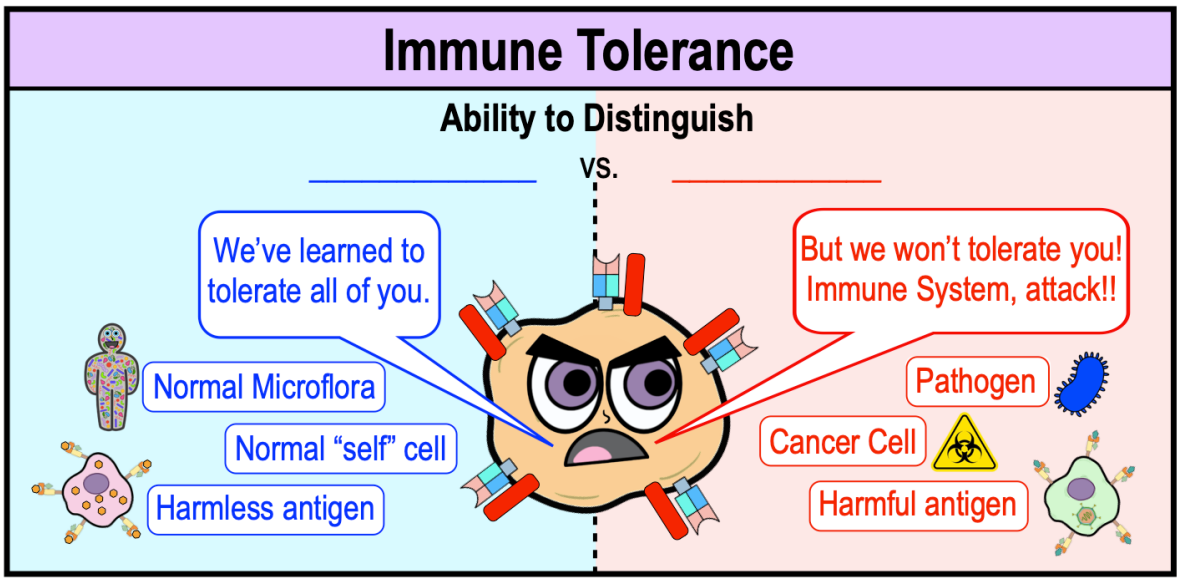
CONCEPT: IMMUNE TOLERANCE

●Our immune system must build *immune tolerance* to _____ an inappropriate response to *harmless* antigens.

□ **Immune Tolerance:** the ability of our immune system to ignore (or _____) any given molecule.

□ Goal: generate immune tolerance to ONLY _____ antigens.

□ Without immune tolerance, our immune system would attack our own cells, causing *autoimmune disease*.

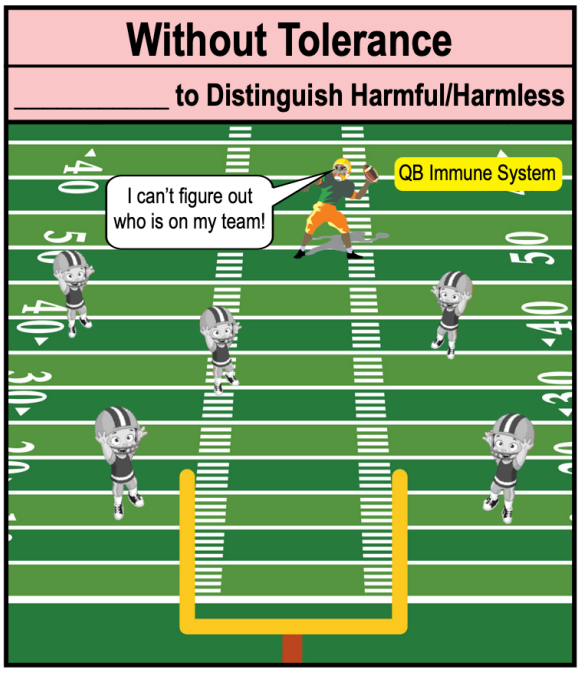


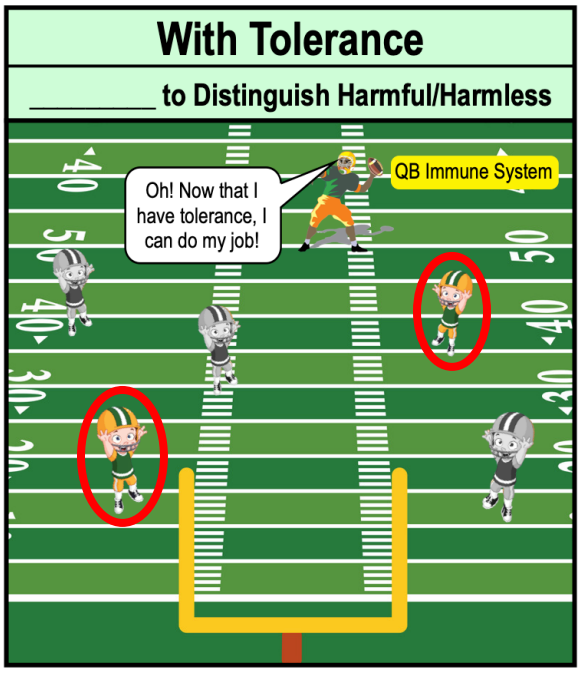
Football Analogy for Immune Tolerance

●**Immune tolerance:** ability for immune system (QB) to distinguish between harmful (opponent) & harmless (teammates)

□ *Without* tolerance, our immune system can _____ distinguish between harmful & harmless.

□ _____ tolerance, our immune system CAN distinguish between harmful & harmless & do its job properly.





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Central vs. Peripheral Tolerance

●Sometimes, our adaptive immune response mistakenly produces *self-reacting* T & B cells that harm our own cells.

□ To prevent this, our body builds-up a **tolerance** by strictly controlling T & B cell development.

●There are _____ types of tolerance mechanisms controlling T & B cell development:

1) Central Tolerance: negative selection of mature T & B cells _____ leaving primary lymphoid organs.

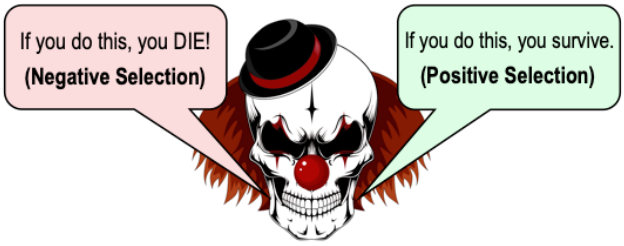
□ Elimination/removal of _____-reacting T & B cells by *apoptosis*.

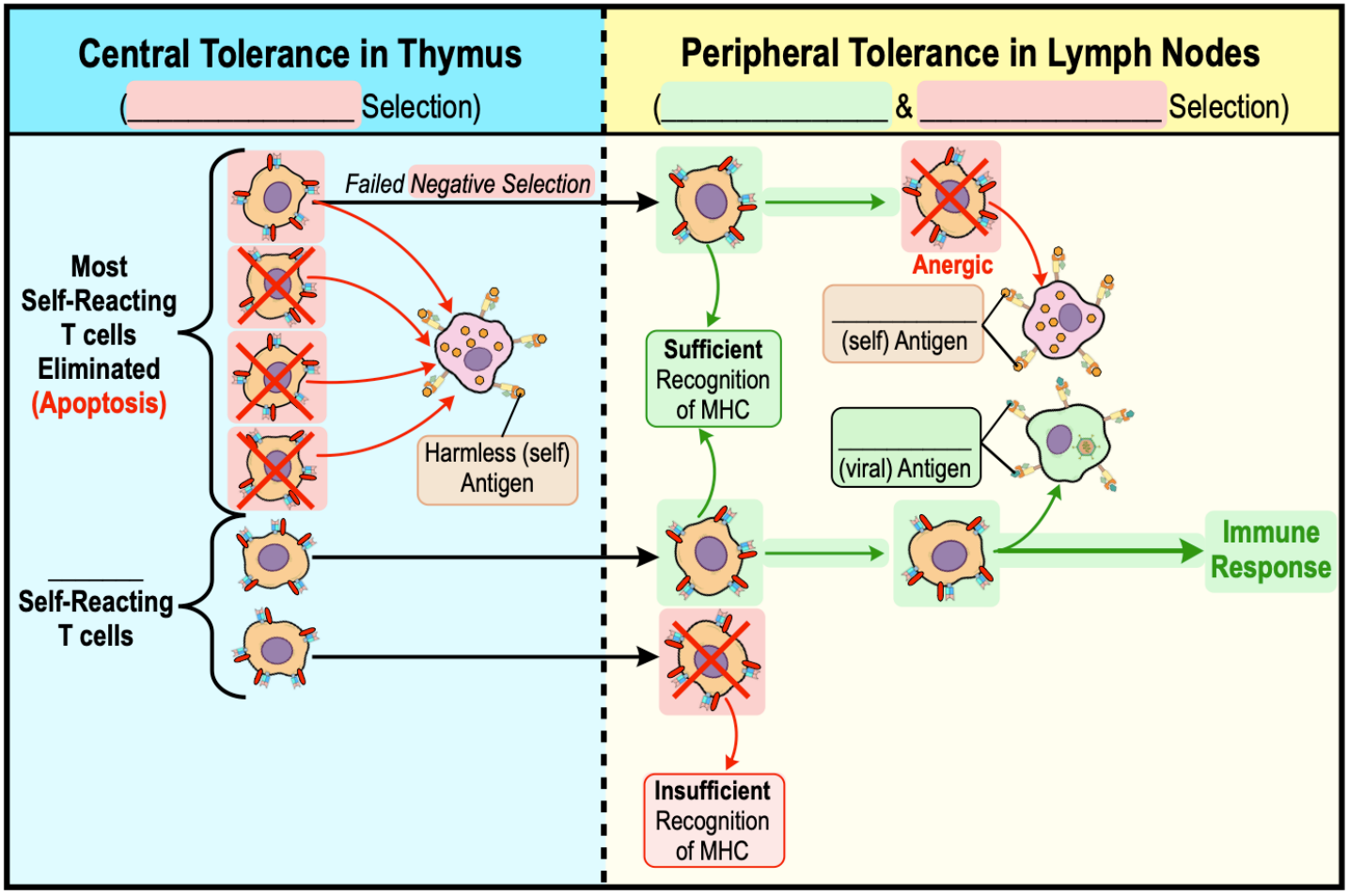
2) Peripheral Tolerance: selection of mature T & B cells _____ leaving primary lymphoid organs.

□ Ex: Positively selects T cells that bind *any* MHC & negatively selects T cells that bind harmless antigens.

□ Self-reacting T & B cells become _____ (unresponsive) & eventually undergo apoptosis.

●Tolerance mechanisms are so strict that approximately 95% of T & B cells undergo apoptosis.





CONCEPT: IMMUNE TOLERANCE

PRACTICE: The most important function of peripheral tolerance is to:

a) Eliminate mature B & T lymphocytes that bypassed central tolerance from reacting to self-cells.
b) Eliminate inactive B & T lymphocytes from peripheral blood.
c) Eliminate self-reacting B & T lymphocytes before they enter central tolerance.
d) Eliminate mature B & T lymphocytes from the bone marrow.

PRACTICE: Where do T cells undergo central tolerance selection?

a) Bone marrow.
b) Pancreas.
c) Thymus.
d) Liver.
e) Brain.

PRACTICE: What is immunological tolerance?

a) The ability of the immune system to remove lymphocytes that recognize and attack foreign antigens.
b) The ability of the immune system to differentiate between self and non-self antigens.
c) The ability of the immune system to create antibodies that most effectively bind foreign antigens.
d) The ability of the immune system to tolerate a certain amount of pathogens before triggering an immune response.

PRACTICE: Which of the following is NOT a consequence of the immune system lacking an immune tolerance?

a) The immune system cells will only recognize and attack foreign antigens.
b) The immune system cells will recognize and attack foreign and self-antigens.
c) The immune system will attack self-cells causing autoimmune diseases.
d) The immune system will not remove T and B lymphocytes that bind to self-antigens.