CONCEPT: AFFINITY MATURATION

●How does our immune system ensure mass production of the *most* ***EFFECTIVE*** antibody during an infection?

●As B cells proliferate, _____ occur in *variable* region of BCR/antibody genes, causing changes in antigen binding.

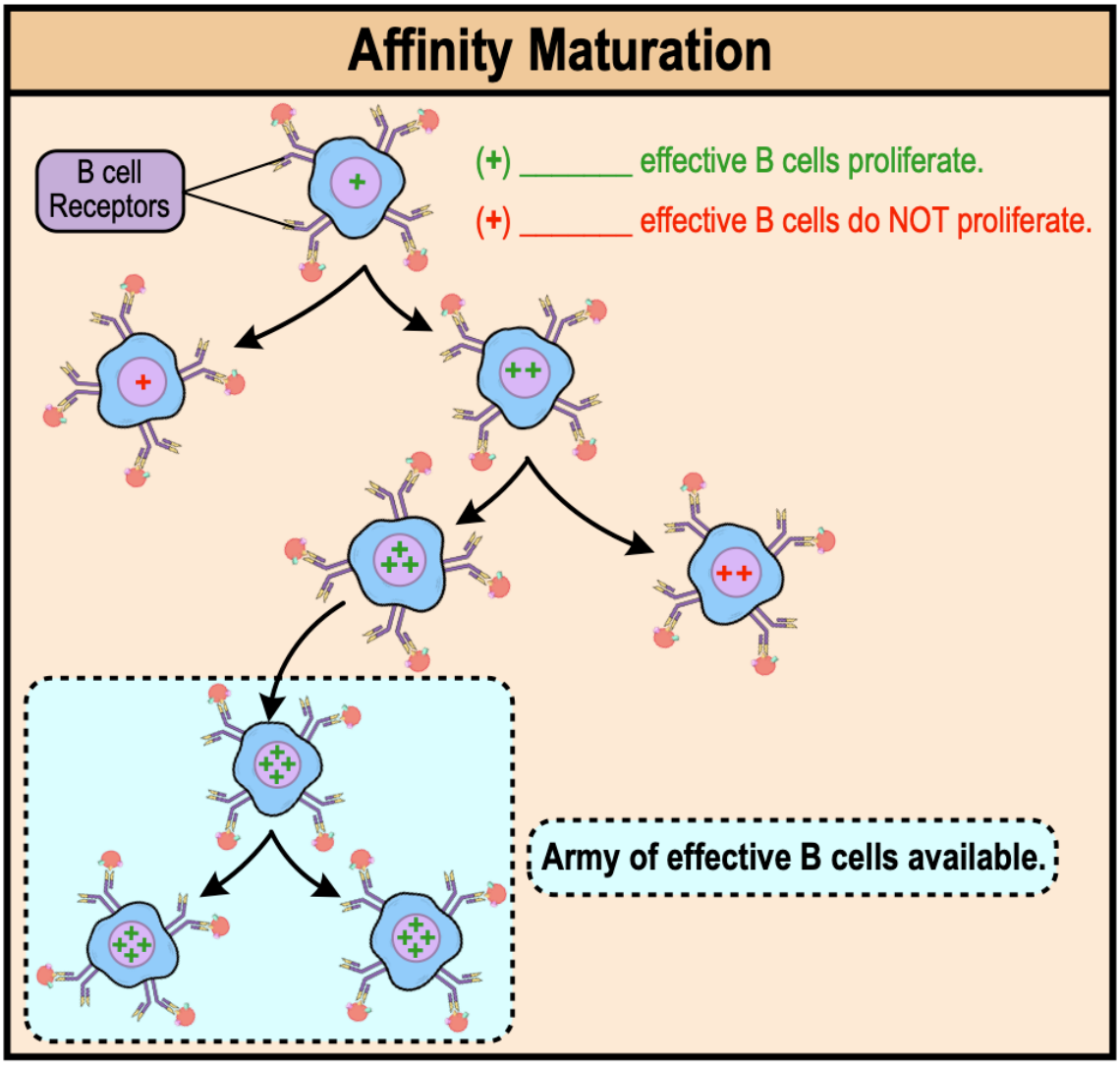
□ These *mutations* & changes in the BCR/antibody's ability to bind its antigen leads to _____ *maturation.*

●**Affinity Maturation:** form of natural selection among B cells allowing for mass production of _____ *effective* antibody.

□ B cells with *mutations* in BCRs that allow them to bind *MORE* effectively are _____ likely to proliferate.

□ B cells with *mutations* in BCRs that allow them to bind *LESS* effectively are _____ likely to proliferate.

□ Over time, the *majority* of B cells during an infection are able to bind the antigen more & more *effectively*.



●Between *antibody class switching* & *affinity maturation*, over time, plasma cells produce much more effective antibodies!!!

CONCEPT: AFFINITY MATURATION

PRACTICE: True or False? The process of affinity maturation generates antibodies with an increasing capacity to bind antigens and thus to more efficiently bind to, neutralize, and eliminate microbes.

a) True.
b) False.

PRACTICE: How does an antibody's ability to bind an antigen increase as B cells multiply?

a) Genetic rearrangement of the DNA encoding the antibody's constant region occurs with each B cell generation.
b) Genetic mutations of the DNA encoding the antibody's variable region occur with each B cell generation.
c) Variation in the amino acid sequence of the antibody stem occurs & allows the antibody to bind various antigens.
d) Genetic mutations of the DNA encoding the antibody occur changing the antibody into a BCR.

PRACTICE: Which of the following statements about antibody affinity maturation is ***true***?

a) It is a form of natural selection ensuring only antibodies that most effectively bind the antigen are produced.
b) It occurs when mutations happen in the DNA encoding the variable region of the antibody.
c) It ensures that only B cells with BCRs that effectively bind the antigen are allowed to proliferate.
d) After an affinity maturation cycle, the majority of the B cell population will create antibodies that bind the antigen.
e) A and B.
f) B and C.
g) All of the above are true about affinity maturation.