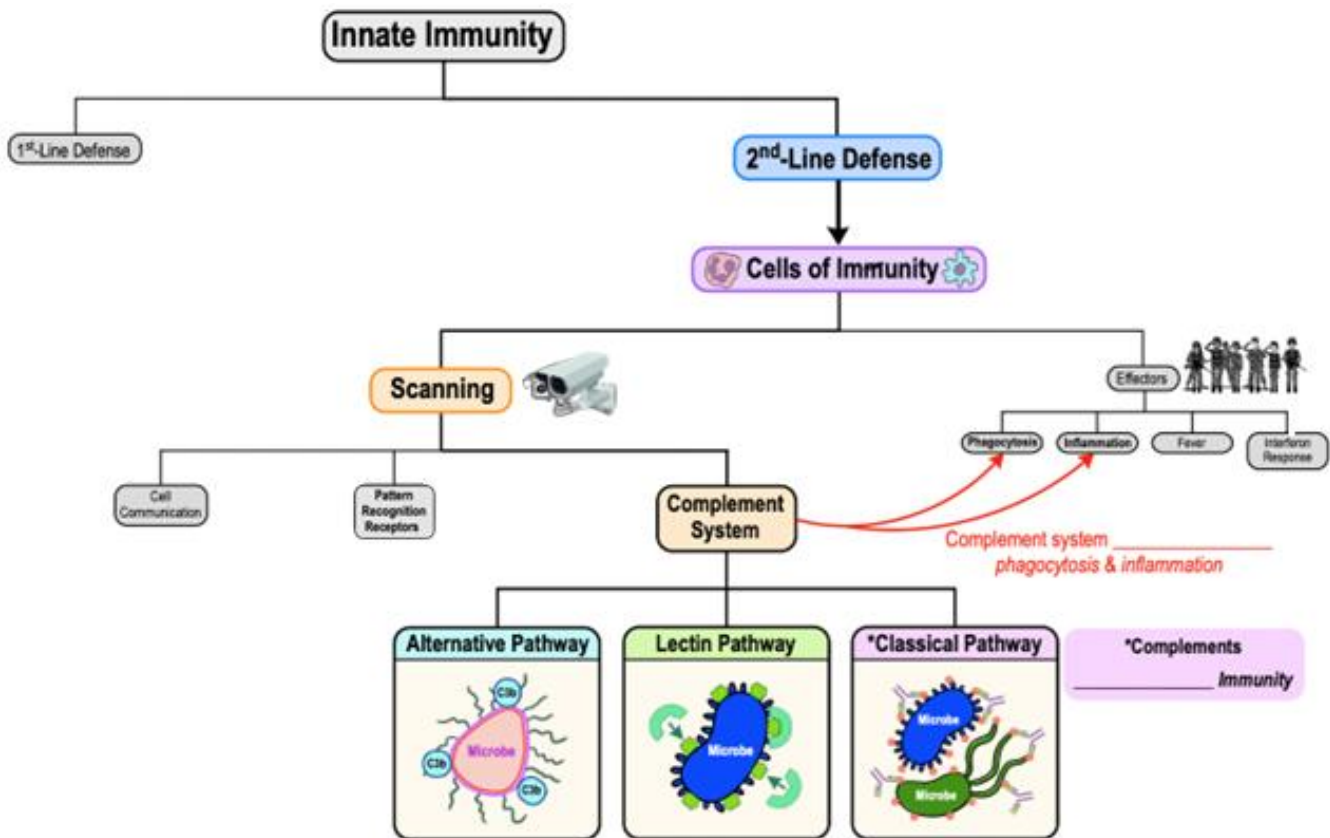


CONCEPT: INTRODUCTION TO THE COMPLEMENT SYSTEM

- _____ **System:** system of *inactive* proteins in blood initiating immune response when *activated* by infection.
 - Signals of microbes during infection activate proteins & a *cascade* of reactions generates a _____.
 - Responses include *removal of invading microbes & inflammation*.
 - Is not adaptable & it is considered part of _____ immunity.
 - HOWEVER, it “*complements*” (acts in combination with) _____ response of *adaptive immunity*.
 - Activated by one of 3 pathways: 1) *Alternative* 2) *Lectin* 3) *Classical*



PRACTICE: What does the word “complement” mean in the name complement system?

- This is a system of proteins that complements or enhances the abilities of the immune system to kill microbes.
- This is a system of proteins that replaces the innate immune system when the infection is too extreme.
- This is a system of proteins that competes with the adaptive immune system to kill pathogens.

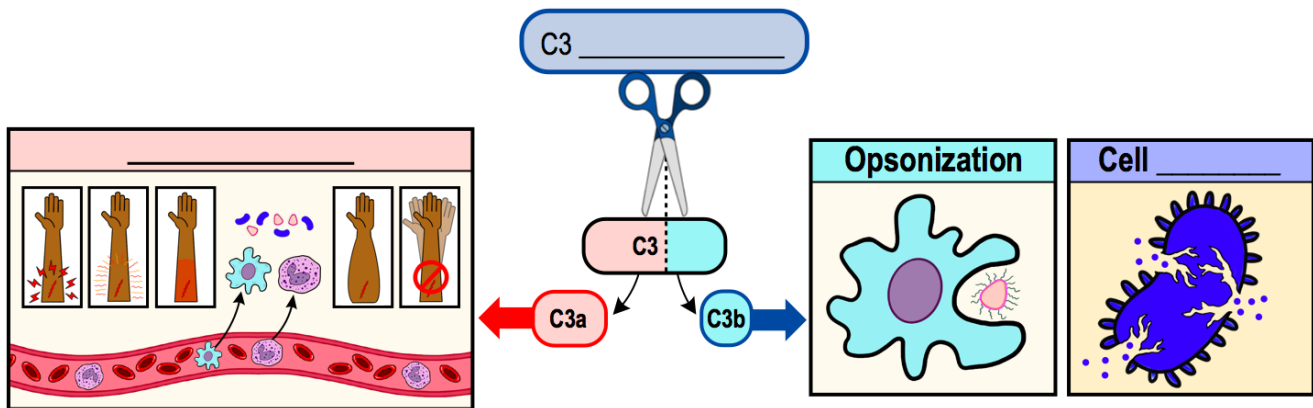
PRACTICE: Which of the following are results of activation of the complement system?

- Removal or destruction of microbes.
 - Inflammation.
 - Production of antibodies.
- 2 only.
 - 1 and 2.
 - 3 only.
 - 1, 2, and 3.

CONCEPT: INTRODUCTION TO THE COMPLEMENT SYSTEM

Proteins of the Complement System

- Complement proteins are designated with a letter ____ & numbered C1-C9 (order of *discovery*).
 - Proteins remain _____ until fragmented (activated fragments indicated by lowercase a & b).
- _____ is a *critical*, inactive complement protein that is activated by *C3 convertase*.
 - **C3 convertase**: enzyme that activates C3 by hydrolyzing (or fragmenting) it into C3 ____ & C3 ____.
 - C3a & C3b interact with other complement system components causing an _____ response.
 - *Recall*: Immune responses to complement activation include *opsonization*, *cell lysis*, & *inflammation*.



PRACTICE: If the complement proteins are always present in the body, then why are the results of the complement system not always occurring?

- a) The complement system proteins need to be activated by the invasion of a microbe.
- b) The complement system proteins are held in the lymph nodes until an infection occurs.
- c) The complement system proteins are inactive until cleaved by another complement protein.
- d) The complement system proteins are not always present and only translated when an infection occurs.
- e) A and B.
- f) A and C.
- g) D only.

PRACTICE: Place the steps of the complement system in the correct order (Order steps 1-3).

- _____ Opsonization, cell lysis of microbes, or inflammation occurs.
- _____ C3 convertase splits C3 into C3a and C3b.
- _____ C3a and C3b recruit other complement proteins to create an immune response.

CONCEPT: INTRODUCTION TO THE COMPLEMENT SYSTEM

Map of the Lesson on the Complement System

● Activation of the complement system can be *initiated* by one of ____ different pathways:

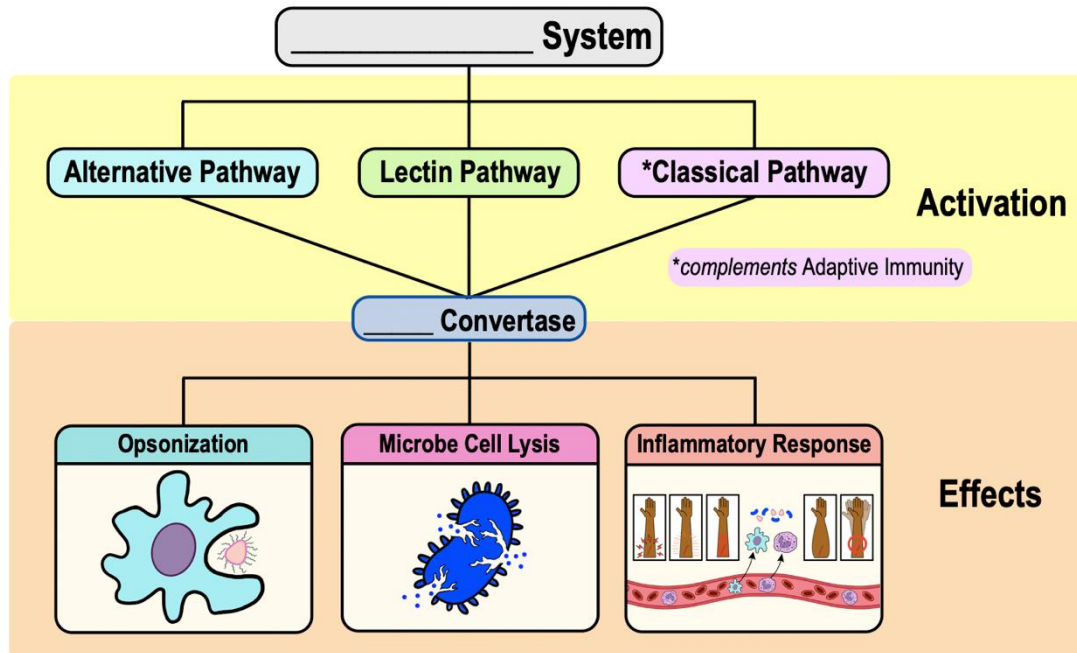
1) **Alternative Pathway**

2) **Lectin Pathway**

3) **Classical Pathway**

● Each pathway *differs* in initiation; however, all 3 pathways result in formation of the enzyme ____ **convertase**.

□ Results in 3 possible effects: 1) *opsonization* 2) *cell lysis of invading microbe* 3) *inflammatory response*.



PRACTICE: How do the three pathways of the complement system differ?

- The pathways differ in the resulting immune response they trigger.
- The pathways differ in the complement proteins that they activate.
- The pathways differ in what triggers the initiation of the pathway.

PRACTICE: The possible effects of the lectin pathway of the complement system are?

- C3 convertase formation.
- Opsonization of infecting microbes.
- Cell lysis of infecting microbes.
- Triggering the inflammatory response.
- All of the above.