

### Naming of complement proteins:

- Complement proteins are usually designated by an **uppercase letter C** and are **inactive** until they are split into fragments (products).
- The proteins are numbered **C1 through C9**, named for the order in which they were discovered.
- The fragments are **activated proteins** and are indicated by the **lowercase letters a and b**.
- For example, inactive complement protein C3 is split into two activated fragments, **C3a and C3b**.
B) THE ALTERNATIVE PATHWAY.

• The alternative pathway is so named because it was discovered after the classical pathway.

• Unlike the classical pathway, the alternative pathway does not involve antibodies.

• The alternative pathway is activated by contact between certain complement proteins and a pathogen.
Overview of Complement Cascade

Converge at C3
Overview of Complement Cascade

Common Effector Molecules/Functions

‘Anaphylatoxins’
C3 and C5 convertases

**CLASSICAL PATHWAY**
- Antigen:antibody complexes (pathogen surfaces)
  - C1q, C1r, C1s
  - C4
  - C2

**MB-LECTIN PATHWAY**
- Mannan-binding lectin binds mannose on pathogen surfaces
  - MBL, MASP-1, MASP-2
  - C3b
  - B
  - D

**ALTERNATIVE PATHWAY**
- Pathogen surfaces

C3 convertase $s$

C3bBb
MAC inhibition

- Protectin (CD59), in the membrane, binds to C8 and C9, blocking the growth of the MAC. Vitronectin, in the serum, acts similarly.
Summary: COMPLEMENT SYSTEM

• Complement bridges the innate and the adaptive immune systems.
• It leads to chemotaxis.
• It opsonizes pathogens.
• It is a proteolytic cascade, much like blood clotting.