

A stylized, colorful illustration of a landscape. In the foreground, there are rolling green hills with a dark brown path winding through them. On the left, a green tree and a purple flower stand on a small hill. A red bird is flying in the sky above the tree. The background features more rolling hills in shades of blue and white, suggesting a distant horizon or sky.

# Lec.11 Clostridium

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# General characters

Large, blunt-ended rods  
that produce endospores

Most species are motile

Obligate anaerobe

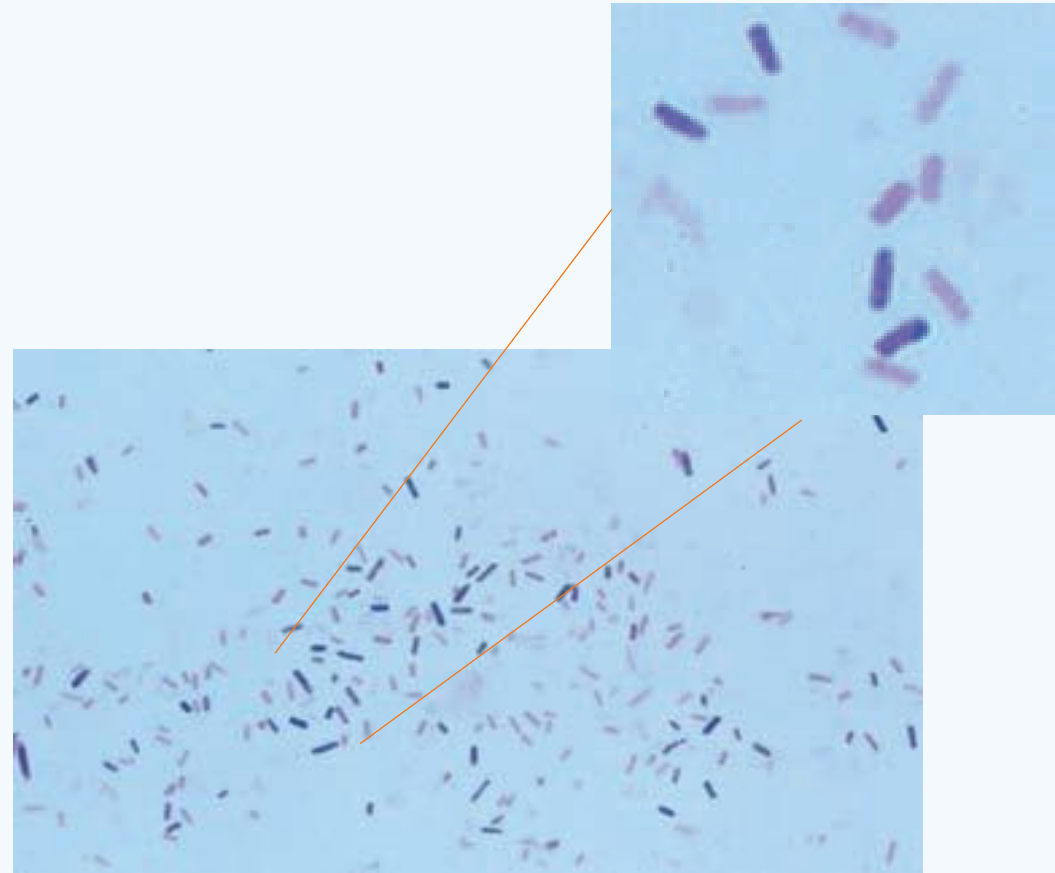
culture anaerobically on blood agar.



# *Clostridium perfringens*

Is a large, **nonmotile**, **gram-positive**, **encapsulated** bacillus. its vegetative form as part of the normal flora of the **vagina and gastrointestinal** (GI) tract. Its spores are found in soil.

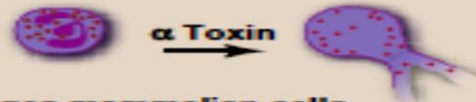
When introduced into tissue, however, ***C. perfringens*** can cause **anaerobic cellulitis** and **myonecrosis (gasgangrene)**. Some strains of also cause a common form of food poisoning.



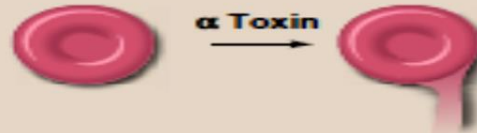


# ***Clostridium perfringens***

## **Exotoxins**

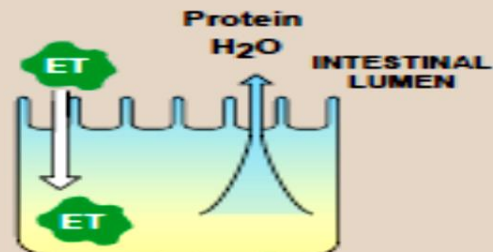


Damages mammalian cells, resulting in the release of lysosomal enzymes.



Lyses erythrocytes, leukocytes, and platelets.

## **Enterotoxin**



Toxin alters cell membrane, leading to loss of fluid and intracellular proteins.

## **Other degradative enzymes**



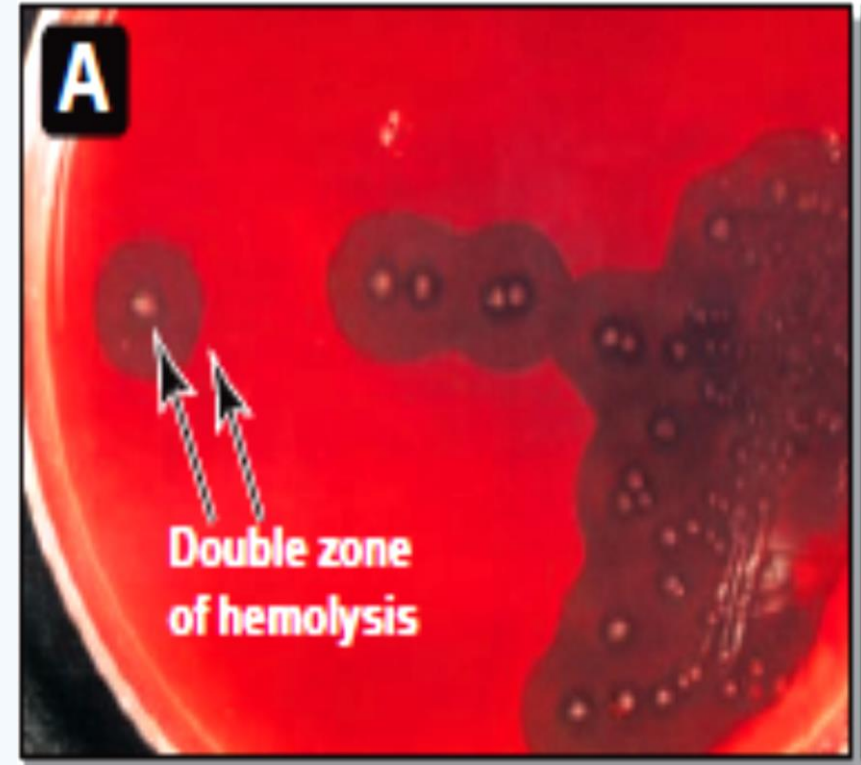
Degrades the viscous DNA in necrotizing tissue or exudates, aiding the spread of infection.



Disrupts the organization of ground substance, facilitating spread of infection.

# Laboratory identification

cultured anaerobically on **blood agar**, *C. perfringens* grows rapidly, producing colonies with a **unique double zone** of hemolysis due to production of  **$\alpha$  toxin** (partial hemolysis) and **perfringolysin O** (complete hemolysis)



# *Clostridium tetani*

## Distinguishing Features:

- large gram-positive,
- spore-forming rods;
- anaerobes;
- produces tetanus toxin.

*long, slender rod and round,  
terminal spore  
(racket-shaped bacillus)*

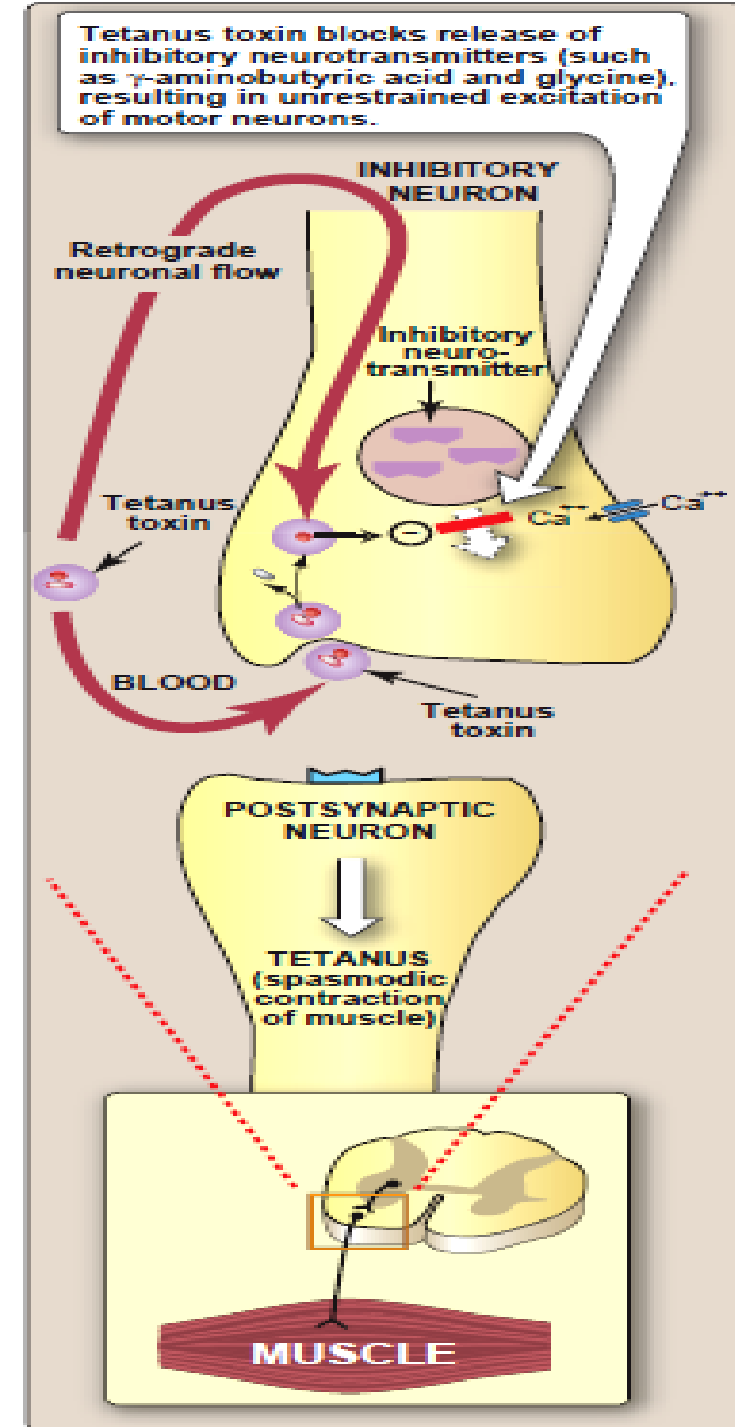


**Tetanus toxin, called tetanospasmin, is an** extremely potent toxin. It is transported from an infected locus by blood. it is produced as a single polypeptide that is cleaved to generate the mature toxin of two chains held together by a **disulfide bond**.

The heavy fragment (B, or binding subunit) mediates binding to neurons

and cell penetration of the light fragment (A, or activity subunit).

The A subunit blocks neurotransmitter release at inhibitory synapses, thereby causing severe, **prolonged muscle spasms**.





## Immunity:

Active immunization with tetanus toxoid (formalin inactivated toxin) prevents tetanus. It is usually administered to children as a triple vaccine with diphtheria toxoid and pertussis antigens (DTaP).

Tetanus immunoglobulin can be used to give immediate passive immunity to injury victims with no history of immunization.







Thank you

*Caption*