

Mustansiriyah University

College of science

Biology Dept.

Zoology

4th class

Zoonoses lab. (2)

Anthrax

Malignant Pustule, Malignant Edema,
Woolsorters' Disease, Ragpickers' Disease,
Maladi Charbon, Splenic Fever

Overview

- Organism
- History
- Epidemiology
- Transmission
- Disease in Animals
- Disease in Humans
- Prevention and Control

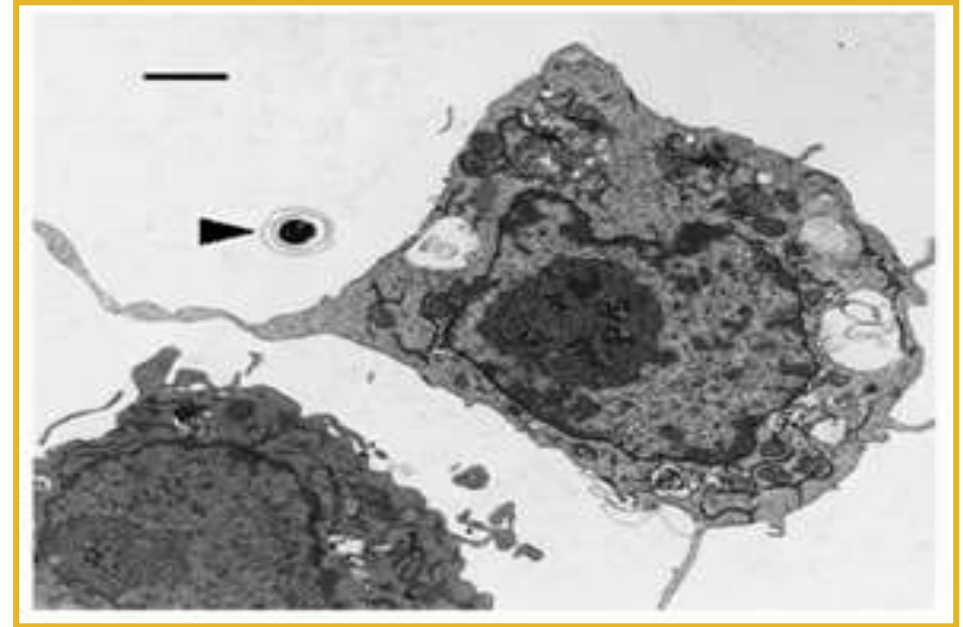
The Organism

- Bacillus anthracis
- Large, gram-positive, non-motile rod
- Two forms [**Vegetative, spore**]
- Over 1,200 strains
- Nearly worldwide distribution.





The Spore

- Sporulation requires:
 - Poor nutrient conditions
 - Presence of oxygen
- Spores
 - Very resistant
 - Survive for decades
 - Taken up by host .
- Lethal dose 2,500 to 55,000 spores



History

- Russia, 1979  94 people sick - 64 died
- South Africa, 1978-1980  Thousands of cattle died
10,738 human cases
182 known deaths
- Tokyo, 1993
Vaccine strain used
No human injuries

U.S., 2001

- 22 cases
- 11 cutaneous
- 11 inhalational; 5 deaths



BREAKING NEWS



(AP PHOTO)

Police officers gather outside the New York Times offices Friday as they investigate a letter containing a powdery substance sent to a reporter.

Anthrax confirmed in NYC

- Ashcroft to public: Do not open suspicious mail; instead, leave area and call authorities
- NBC employee tests positive for skin anthrax infection; expected to recover
- FBI says it has no evidence of connection between New York and Florida cases
- Health secretary: 'No proof whatsoever' of link to terrorism
- Anthrax found in Kazakhstan lab in routine U.S. Defense Department inspection

Anthrax found at offsite White facility

October 23, 2001 Posted: 10:08 PM EDT (0208 GMT)



"I don't have anthrax," President Bush said Tuesday.

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he said.

WASHINGTON
Bush said
when I con
I'll be safe
anthrax at
screens W

Asked by re
tested for a
taking antib
have anthra

"Our government is responding very quickly. We're working hard to find out who's doing this and bring them to justice. We're also working to develop measures necessary to protect American citizens and postal workers,"

Transmission

- Human Transmission
- Cutaneous
 - Contact with infected tissues, wool, soil
 - Biting flies
- Inhalational
 - Tanning hides, processing wool or bone
- Gastrointestinal
 - Undercooked meat

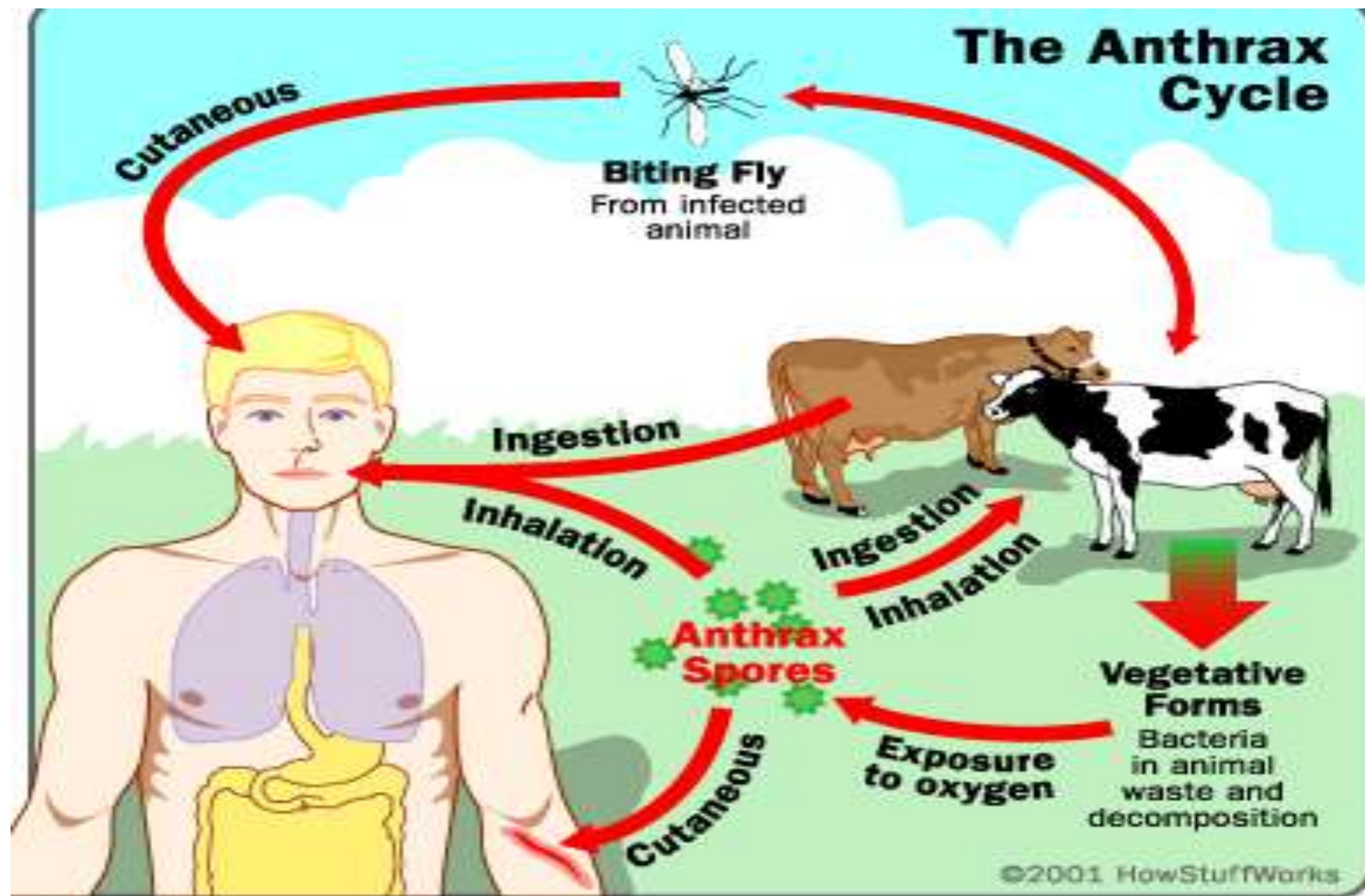


Human Transmission

- **Tanneries**
- **Textile mills**
- **Wool sorters**
- **Bone processors**
- **Slaughterhouses**
- **Laboratory workers**



The Anthrax Cycle



Cutaneous Anthrax

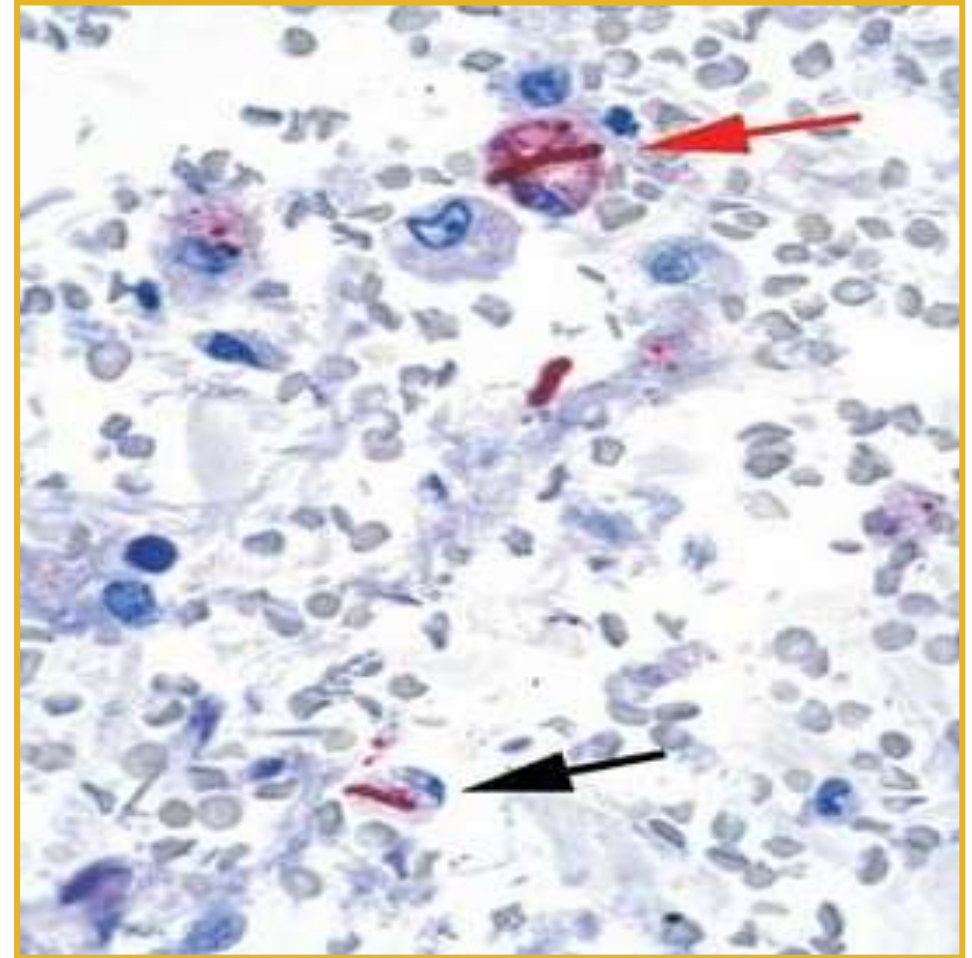
- 95% of all cases globally
- Incubation: 2 to 3 days
- Spores enter skin through open wound or abrasion
- Papule → vesicle → ulcer → eschar
- Case fatality rate 5 to 20%
- Untreated - septicemia and death

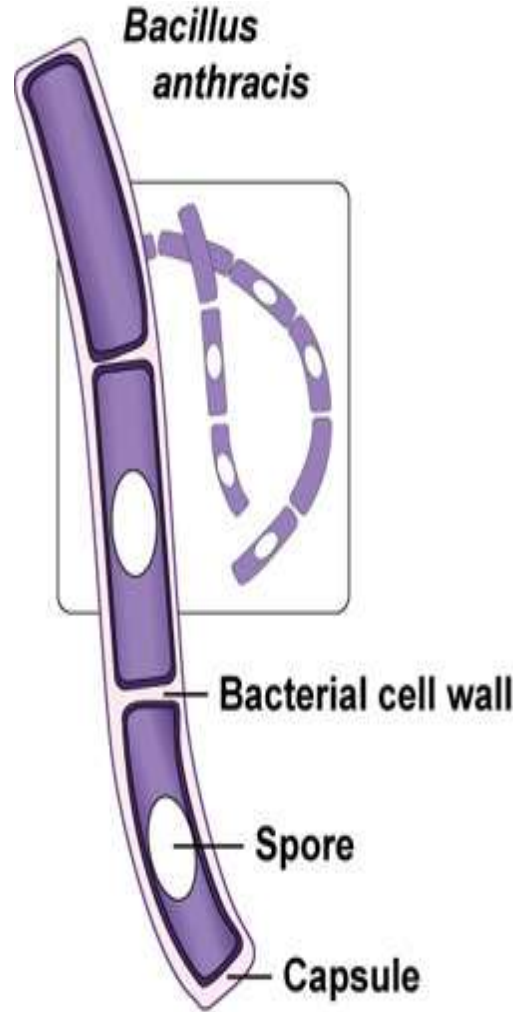


- **Gastrointestinal Anthrax**
- Incubation: 2 to 5 days
- Severe gastroenteritis common
- Consumption of undercooked or contaminated meat
- **Inhalational Anthrax**
- Incubation: 1 to 7 days
- Initial phase
- Nonspecific (mild fever)

Diagnosis in Humans

- Identification of *B. anthracis*
- Blood, skin, secretions
- Culture
- PCR
- Serology
- ELISA
- Nasal swabs





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Prevention and Control

- Humans protected by preventing disease in animals
 - Veterinary supervision
 - Trade restrictions
- Improved industry standards
- Safety practices in laboratories
- Post-exposure antibiotic prophylaxis

Vaccination

- **Cell-free filtrate**
- **At risk groups**
 - Veterinarians
 - Lab workers
 - Livestock handlers
 - Military personnel
- **Immunization series**
 - Five IM injections over 18-week period
 - Annual booster

