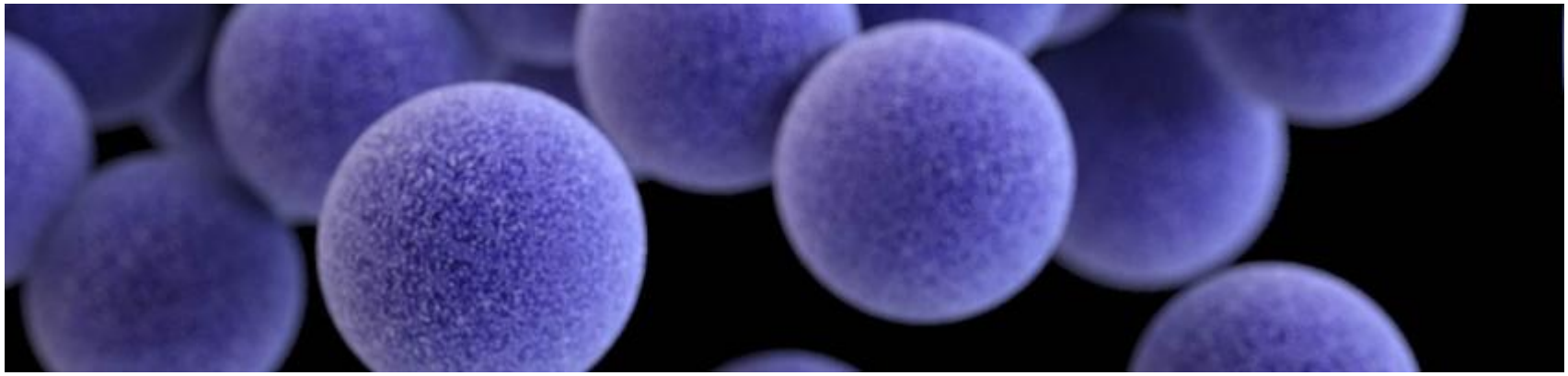
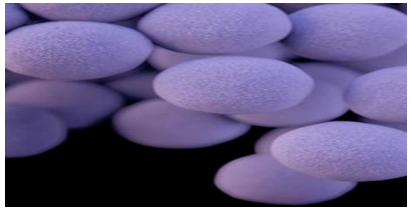


• Staphylococcus aureus

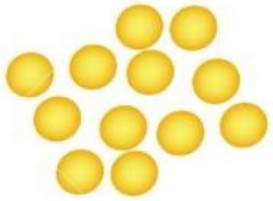
- Li Qingrong
- College of Life Science and Laboratory Medicine KMU

Staphylococcus aureus

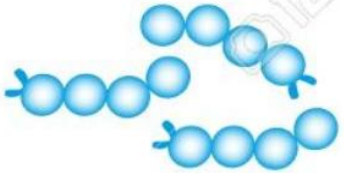


COCCI

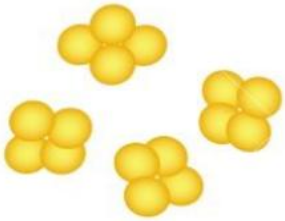
Gram positive



Staphylococcus



Streptococcus



Enterococcus

Staphylococcus aureus

Staphylococcus aureus

1880, a British surgeon named Sir Alexander Ogston first identified this bacteria in pus from a surgical abscess in a knee joint.

It is the main cause of soft tissue and skin infections



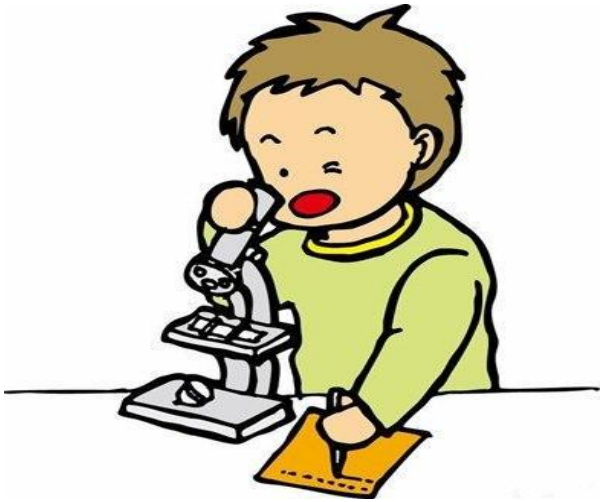
At the end of class,you will be able to learn:

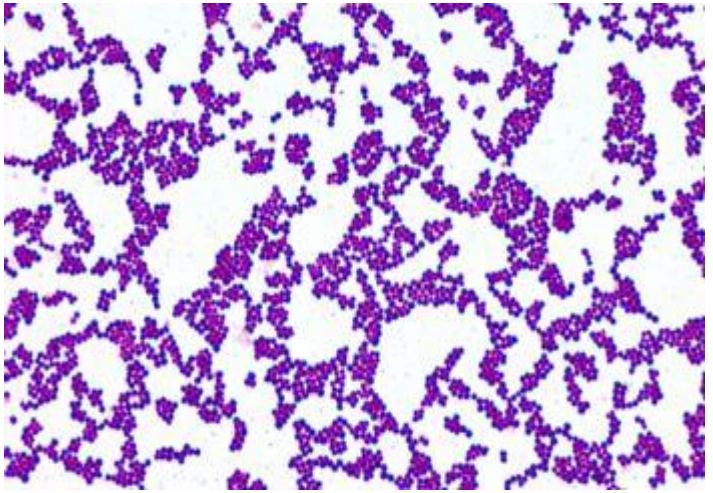
Staphylococcus aureus

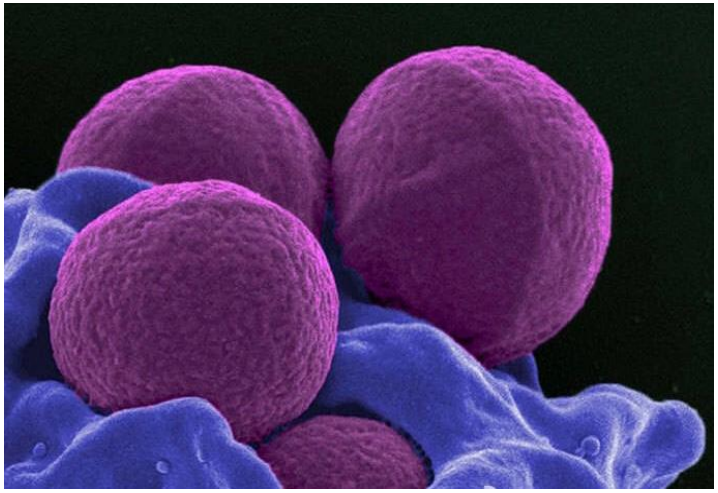
1. Genaral feature &Biological character
2. Clinical Diseases
3. Virulence Factors: Enzymes
   Virulence Factors: Toxins

General feature &Biological character

1、Microscopic Examination







Gram-positive spherical cells (0.5-1.5 μm) in singles, pairs, and clusters

General feature &Biological character

What kind of fruit does it look like ?







General feature & Biological character

2、Cultural Characteristics

Grow rapidly on many types of media

Smooth, yellow, round

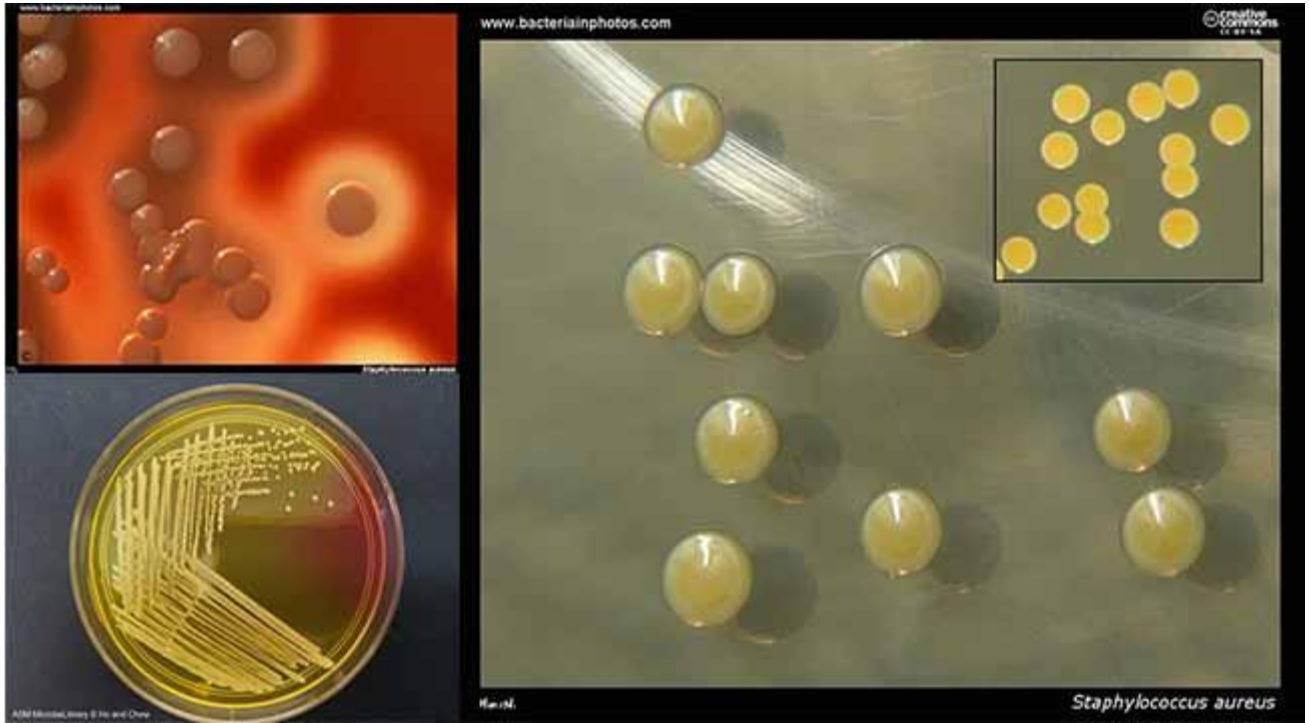
facultative anaerobic

37 ℃

PH:7.4

10%-15%NaCl

Zone of complete hemolysis



Staphylococcus aureus

1. Genaral feature &Biological character
2. Clinical Diseases
3. Virulence Factors: Enzymes
   Virulence Factors: Toxins

Clinical Diseases

- **Soft tissue and skin infections**

1. carbuncles
2. abscesses
3. cellulitis





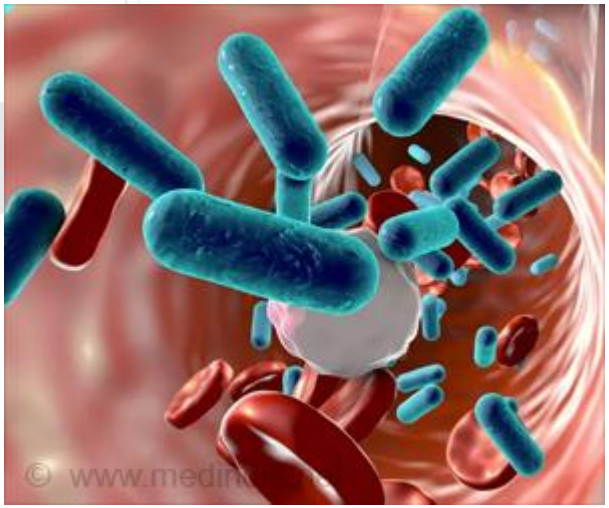


Clinical Diseases

- **Bacteremia Septicemia**

  Mostly results from surgery

  Bacteria may spread to other body sites







Clinical Diseases

- **Food poisoning**

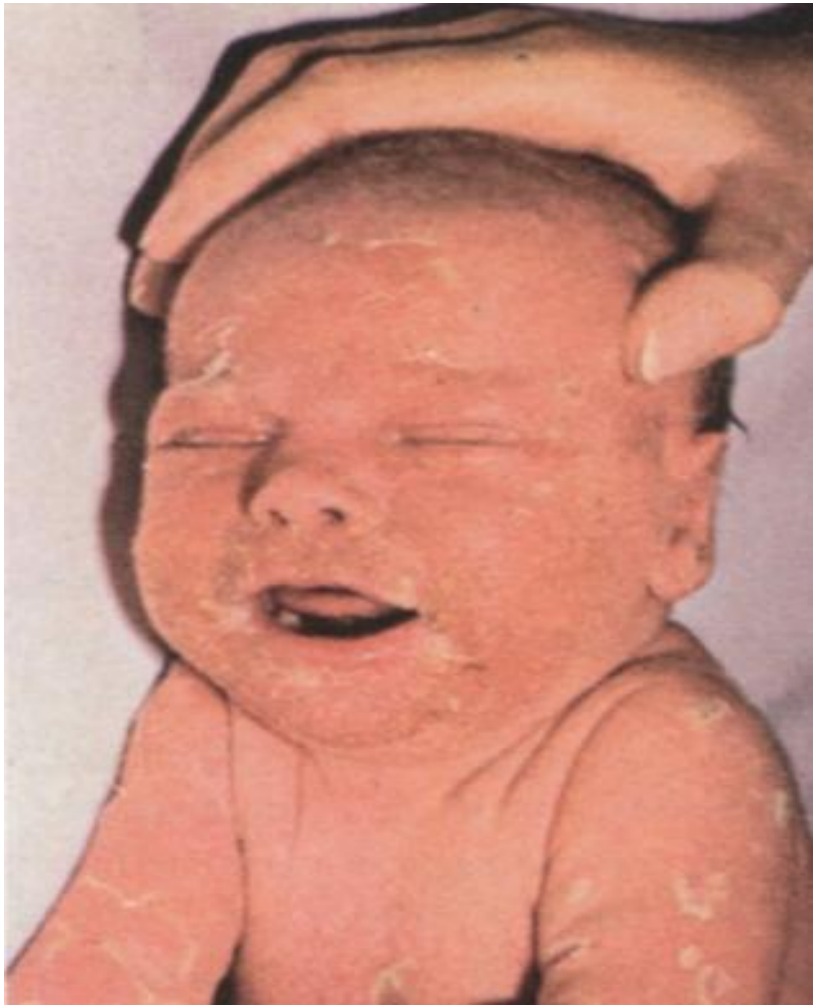
- Short incubation (1-8 hr).
- Violent nausea/vomiting
- watery diarrhea
- no fever



Clinical Diseases

- **Staphylococcal scalded skin syndrome (SSSS)**

1. large bullae with clear fluid that contains no bacteria or leukocytes.
2. Spreads rapidly.
3. baby



Clinical Diseases

Toxic Shock Syndrome

- It is a multisystem illness, characterized by:



High Fever



Headache



Vomiting



Diarrhoea



Conjunctival reddening



Hypotension



Skin rashes

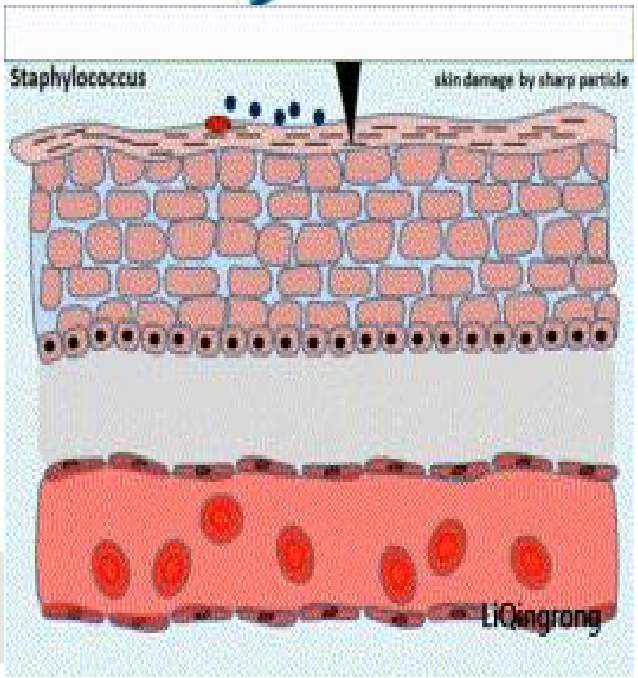


Kidney failure

Staphylococcus aureus

1. Genaral feature &Biological character
2. Clinical Diseases
3. Virulence Factors: Enzymes
   Virulence Factors: Toxins

Virulence Factors

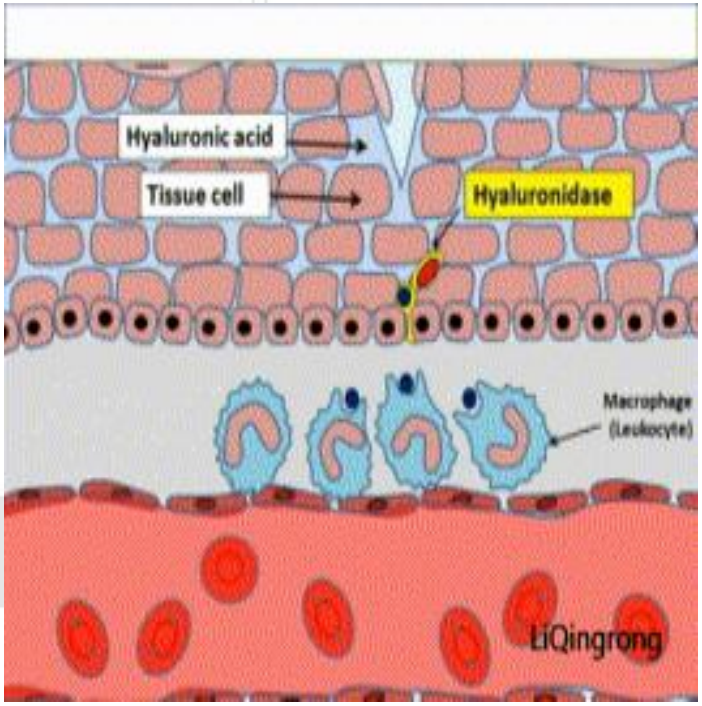


hyaluronidase

Go through the skin

enzyme	hyaluronidase
toxin	

Virulence Factors



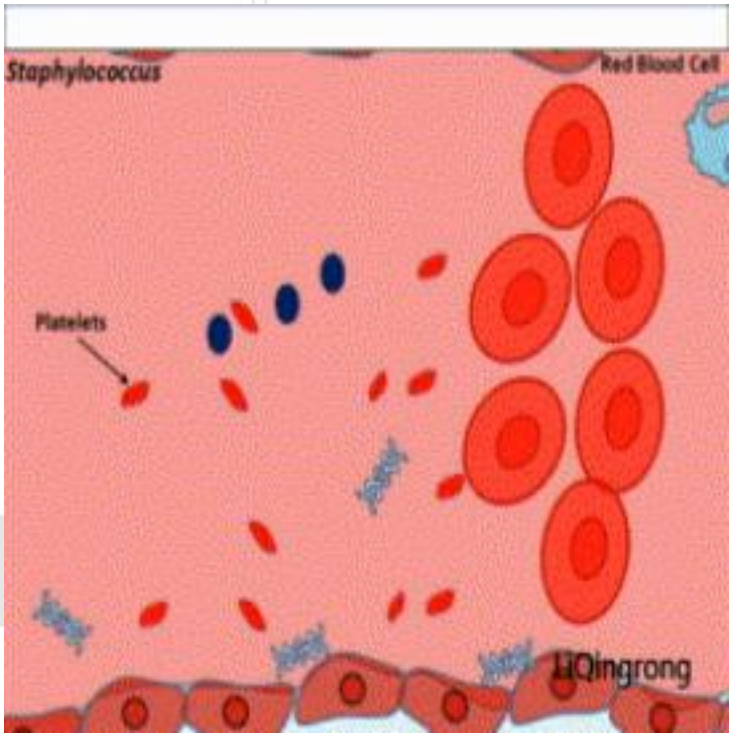
leucocidin

↓

Kill the leukocyte

enzyme	hyaluronidase
toxin	leucocidin

Virulence Factors



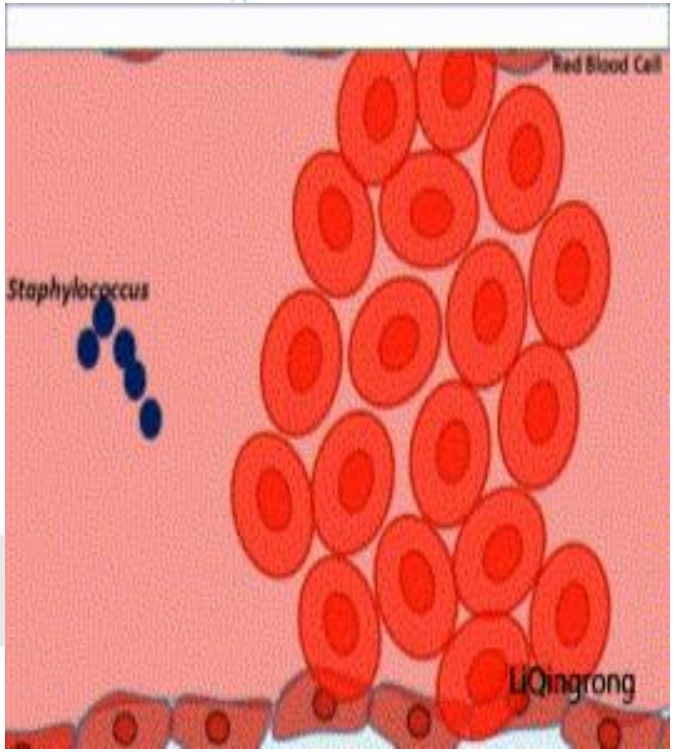
coagulase

↓

Protect S.aureus
Clotting of plasma

enzyme	Hyaluronidase coagulase
toxin	leucocidin

Virulence Factors



Haemolysin(cytotoxin)

↓

Kill erythrocyte

enzyme	Hyaluronidase coagulase
toxin	Leucocidin **cytotoxin**

Virulence Factors

Enzyme	1. Hyaluronidase 2. coagulase
Toxin	1. Leucocidin 2. cytotoxin 3. Enterotoxins → food poisoning 4. Toxic shock syndrome toxin → Toxic shock syndrome 5. Epidermolysis toxin → SSSS

SUMMARY

CASE

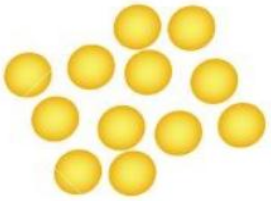
S.aureus

- General feature and biological character
- Clinical diseases
- Virulence factors

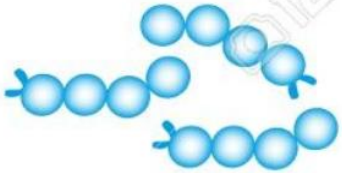
staphylococcus aureus

COCCI

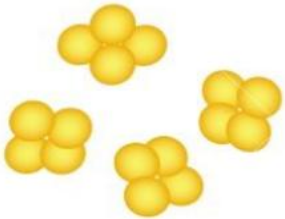
Gram positive



Staphylococcus



Streptococcus

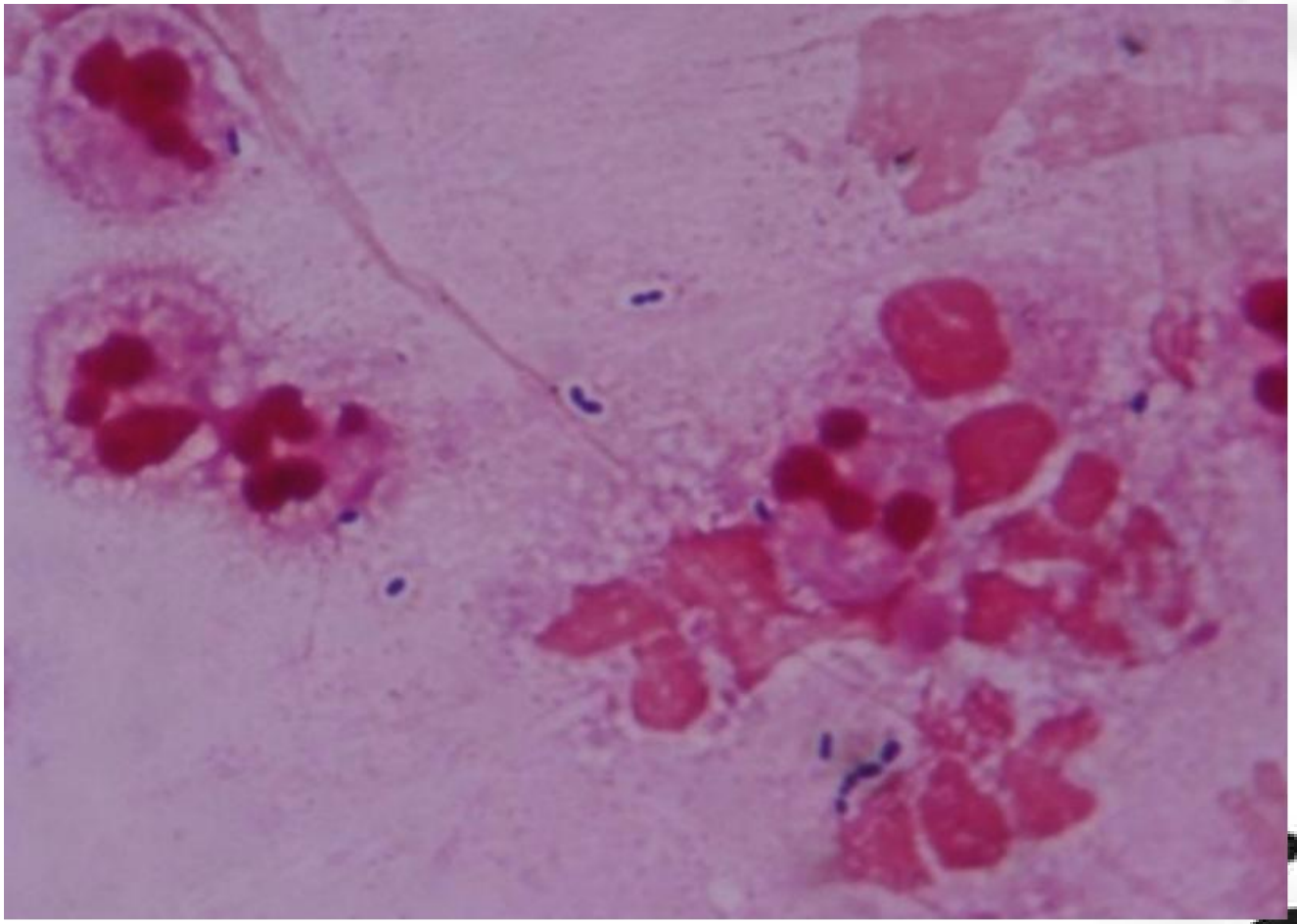


Enterococcus

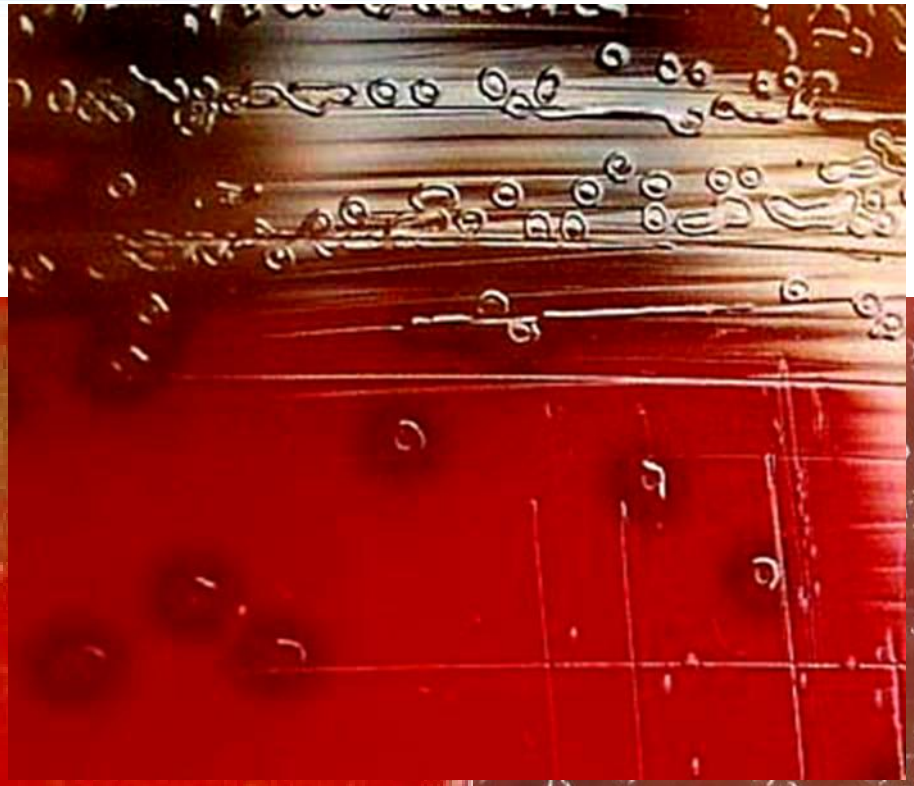
Sterptococococus pneumoniae

Sterptococococus pyogenes

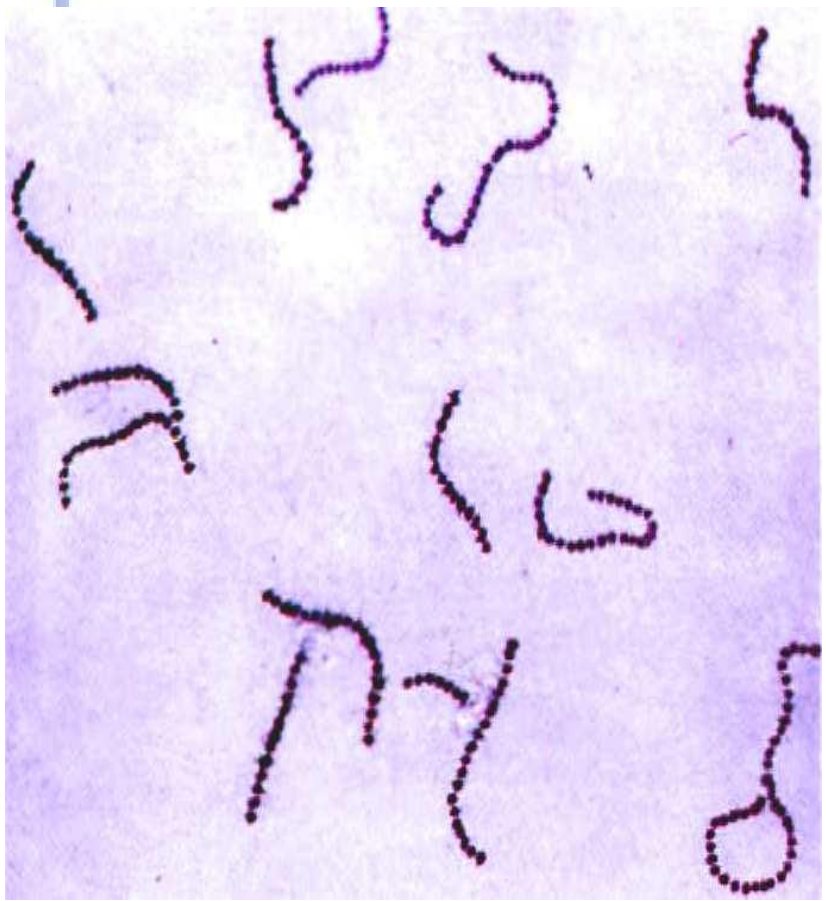
Sterptococcus pneumoniae

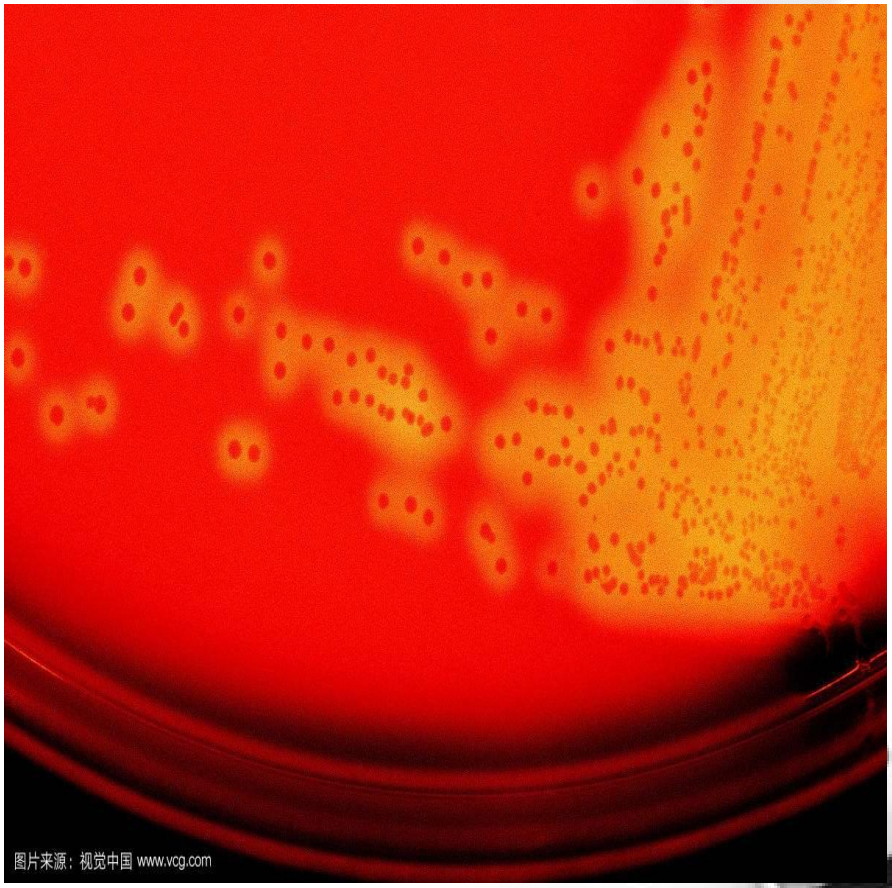


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Sterptococcus pyogenes





SUPERCOURSE, CHINA

Infection

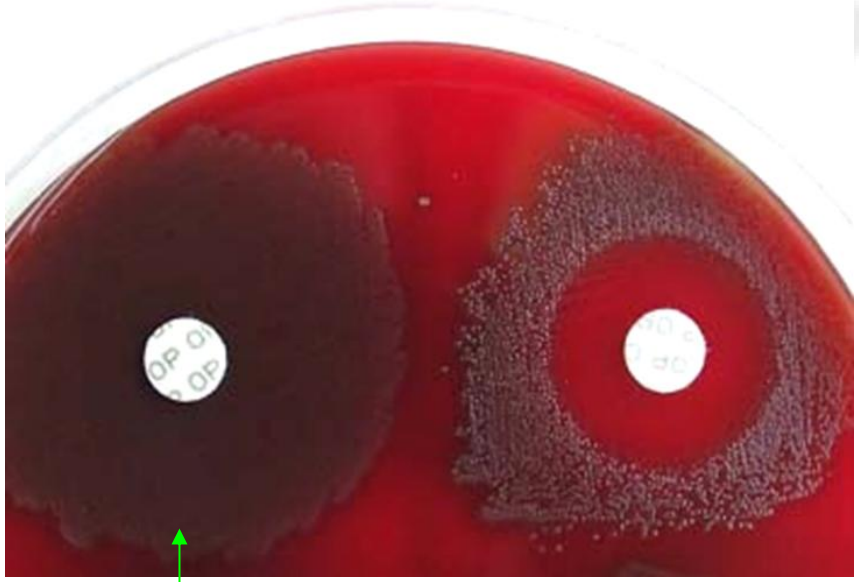
- acute respiratory infection
- Skin infection
- scarlatina



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Optochin exam:

>=14mm S

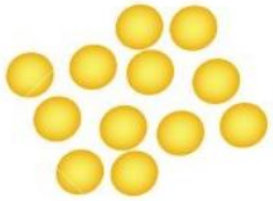


S. pyogenes (R)

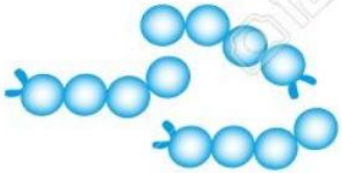
S. pneumoniae (S)

COCCI

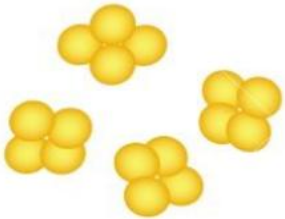
Gram positive



Staphylococcus



Streptococcus

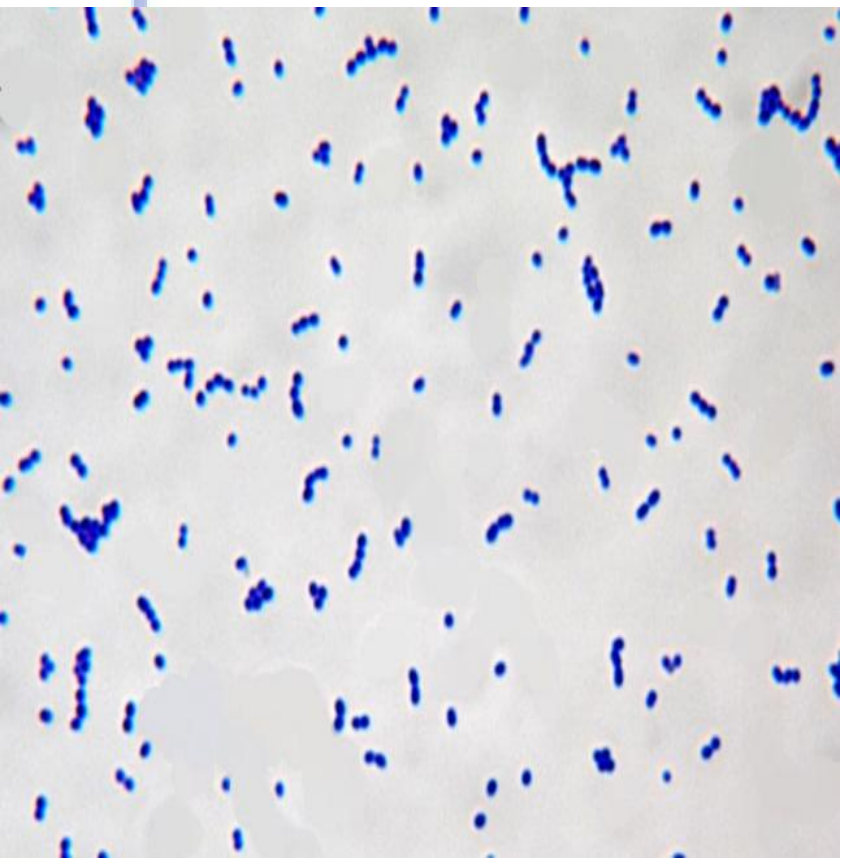


Enterococcus

E.faecalis

E.faecium

Enterococcus





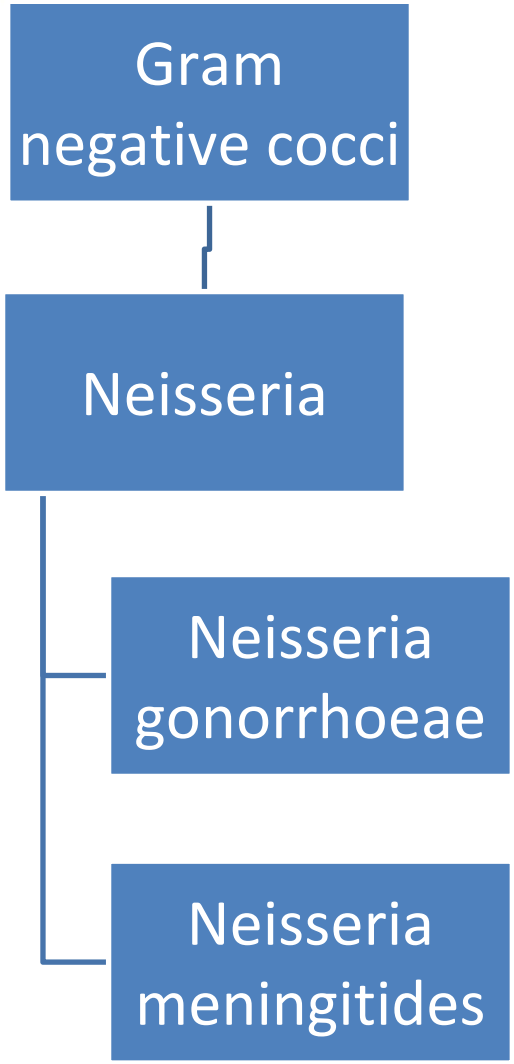
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Opportunistic infections

- immunocompromised patient

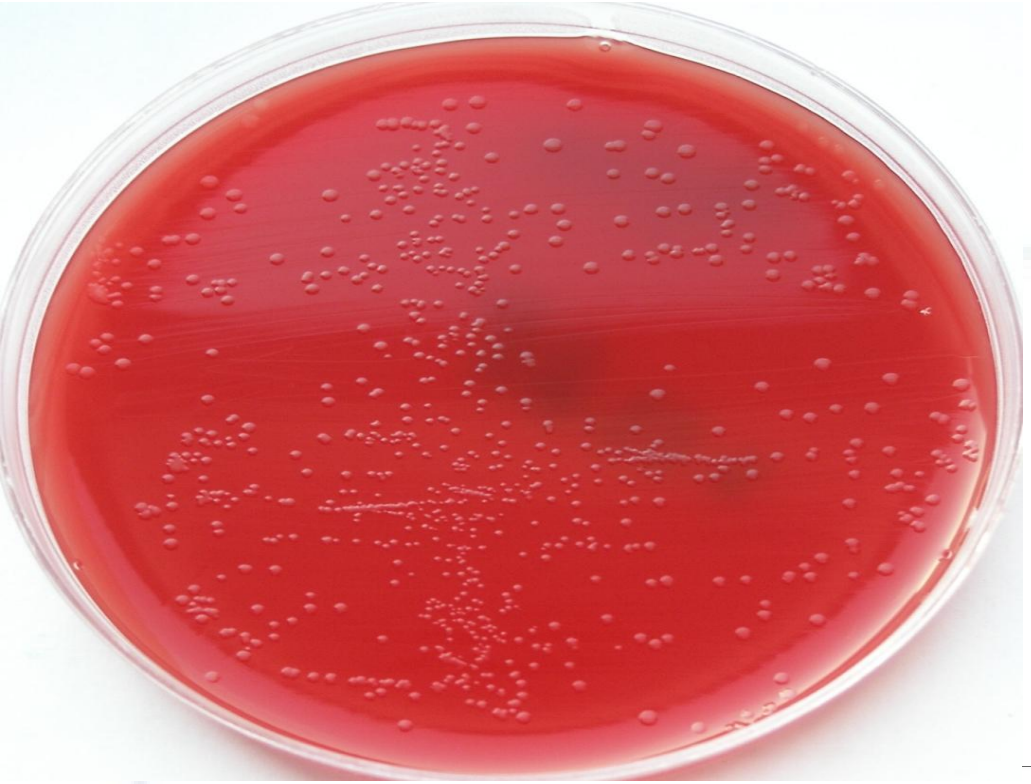


SUPERCOURSE, CHINA



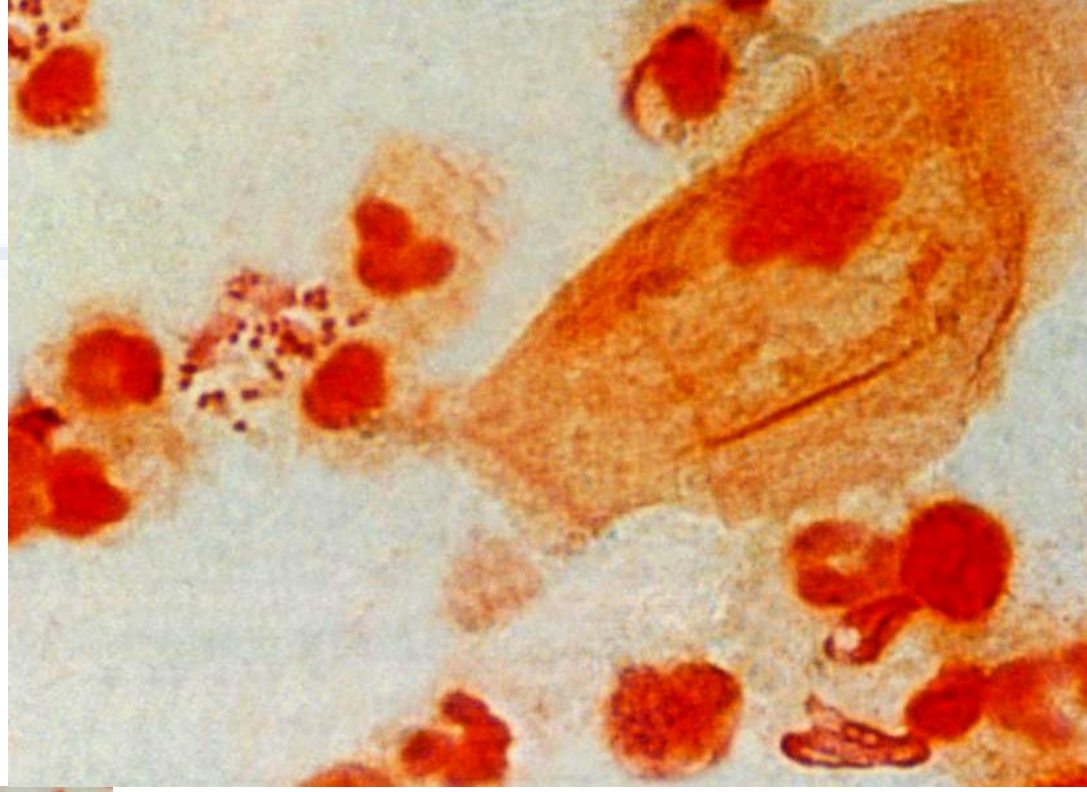


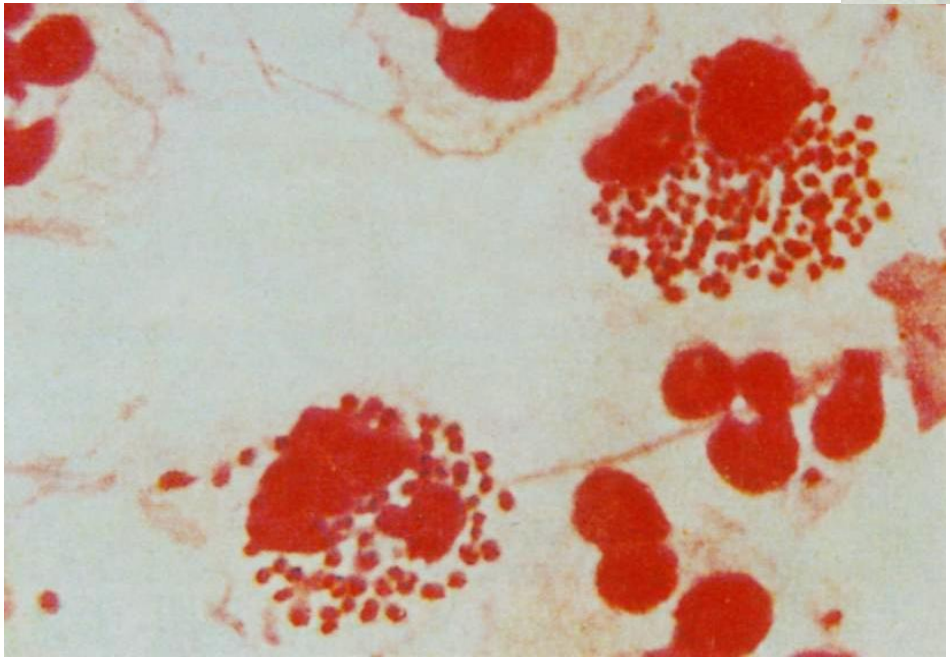
SUPERCOURSE, CHINA





SUPERCOURSE, CHINA



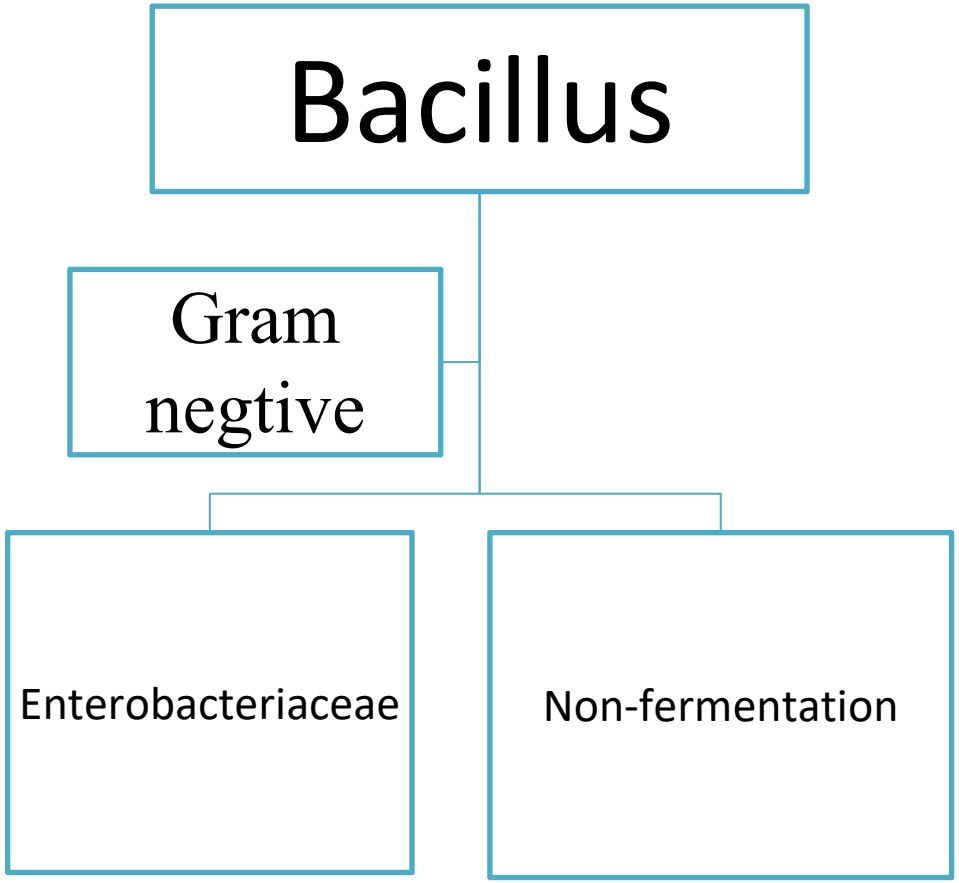


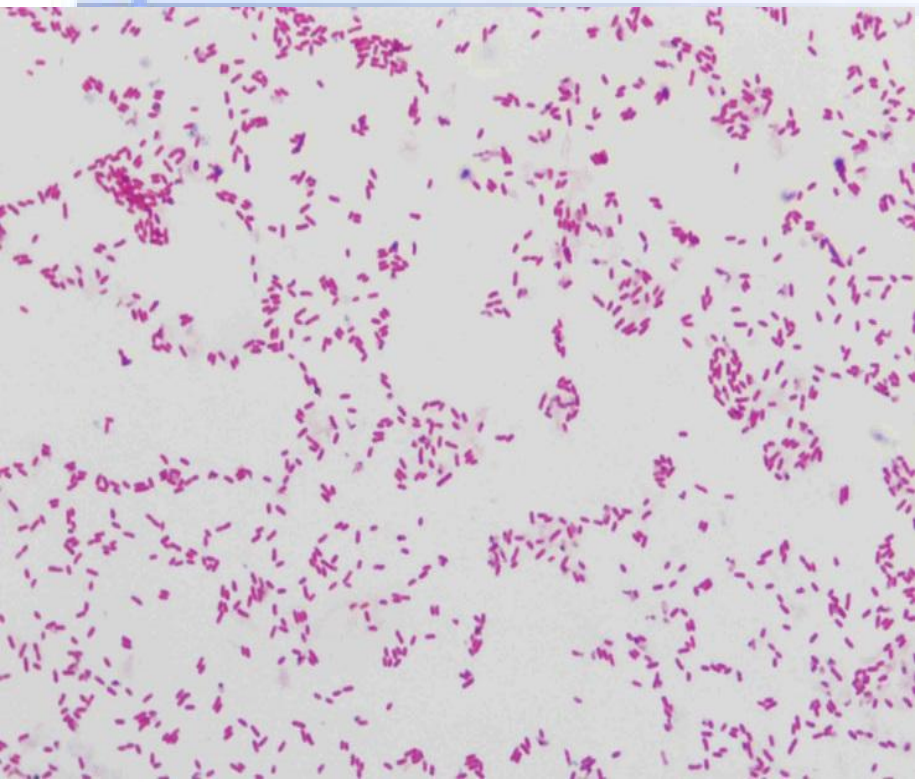


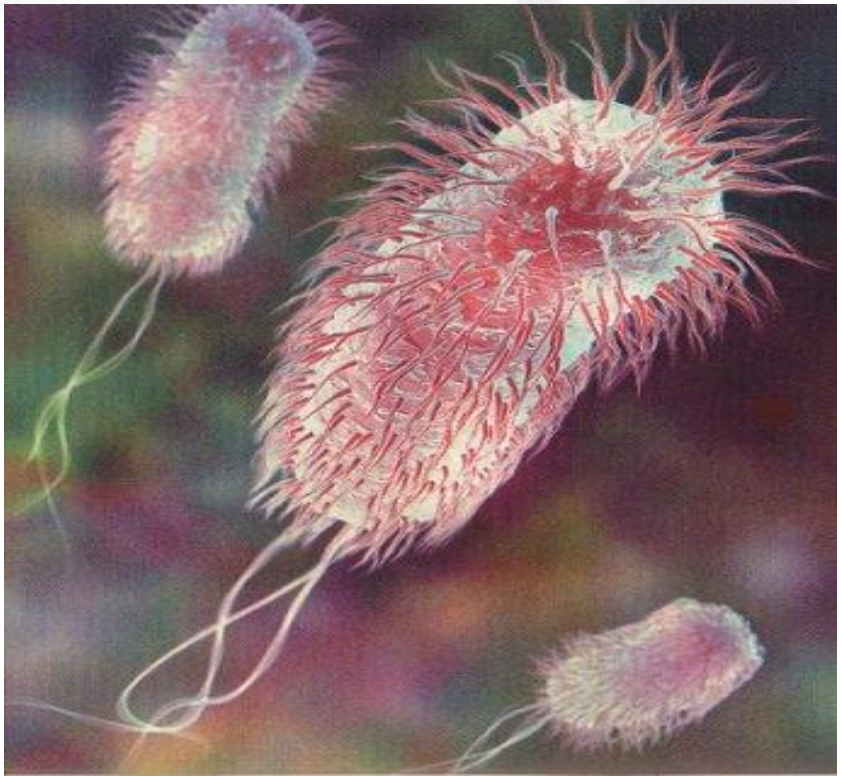
- N. gonorrhoeae
  genitals
  gonorrhoea

- N. meningitides
  CSF
  epidemic cerebrospinal meningitis




Bacillus
Gram negtive
Enterobacteriaceae
Non-fermentation



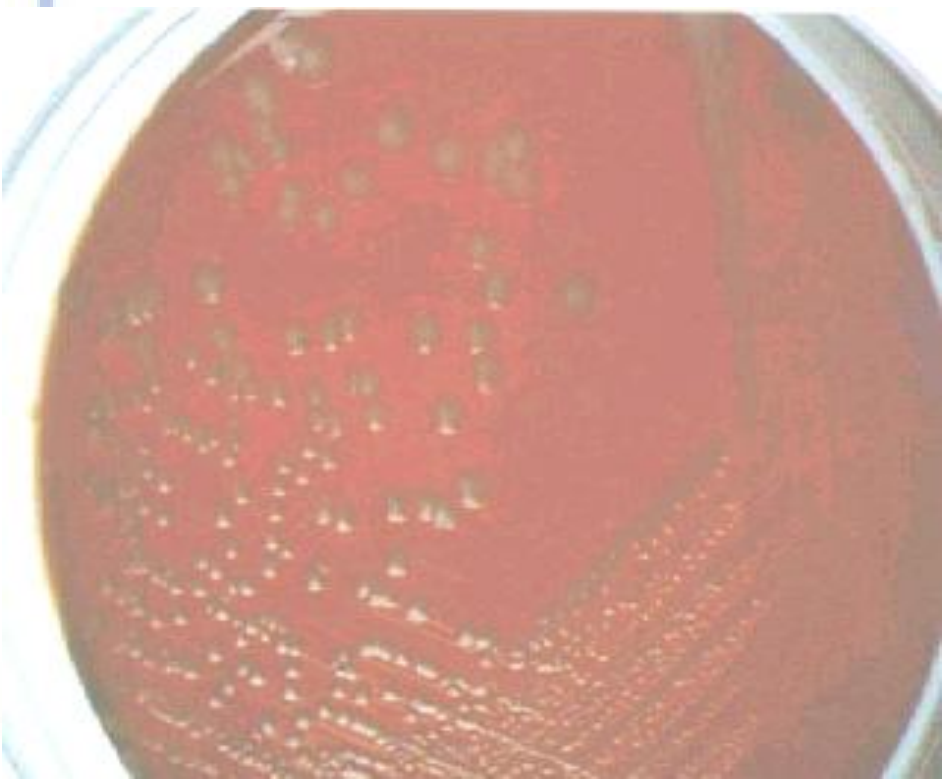


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- Enterobacteriaceae
  - Escherichia
    - E.coli
  - Klebsiella
    - K.peumoniae



E.coli





Infetion

- Intestinal infection

  diarrhea

- Extra intestinal infection

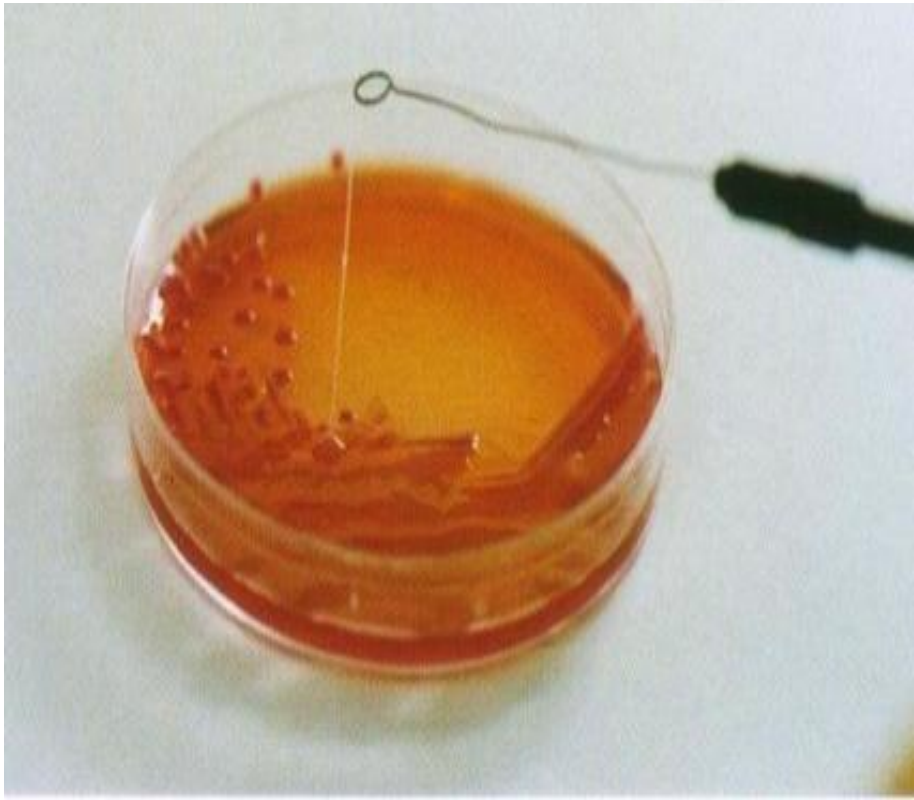
  urinary tract



SUPERCOURSE, CHINA

K.peumoniae





SUPERCOURSE, CHINA

infection

- Pneumonia
- Enteritis
- Intestinal infection



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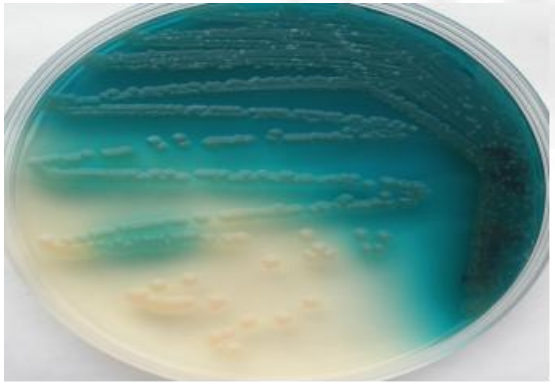
Non-fermentation

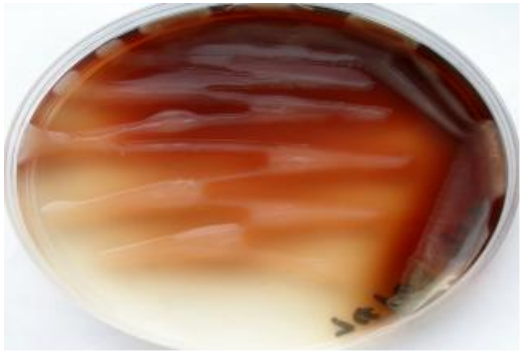
Pseudomonas

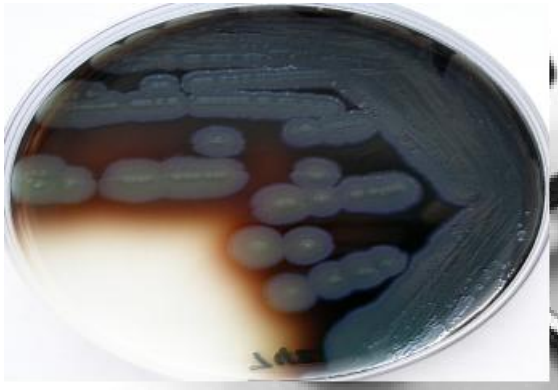
P.aeruginosa











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infection

- Wound infection
- Respiratory infection
- urinary tract infection
- septicemia



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Thank You!