علم الأحياء الدقيقة

Microbiology

مقدمة

Introduction

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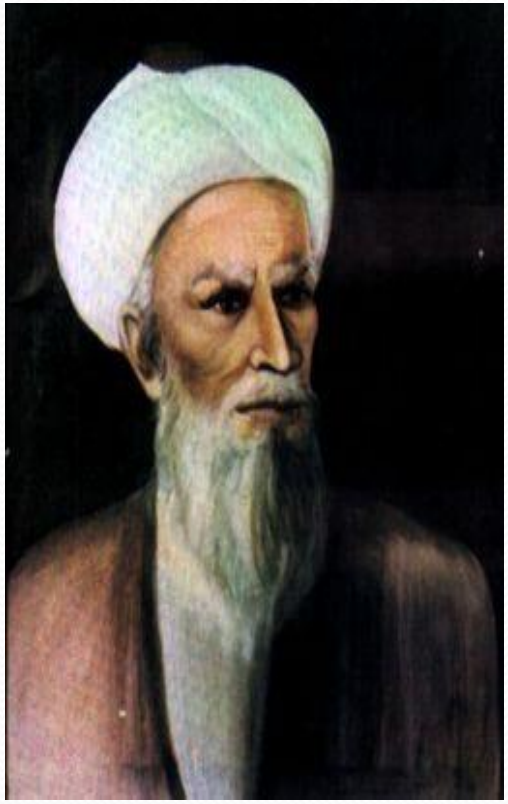
مكتب ٢ ب ٤٥

History of Microbiology

- **Mohammad Ibn-Zakariya-Abu Bakr Al-Razi (Rhazes)**

(250-311 H, 865-923 G).

- He was the first scientist to differentiate between the "smallpox" and "measles", and presented a detailed description of the two diseases, and symptoms of each.

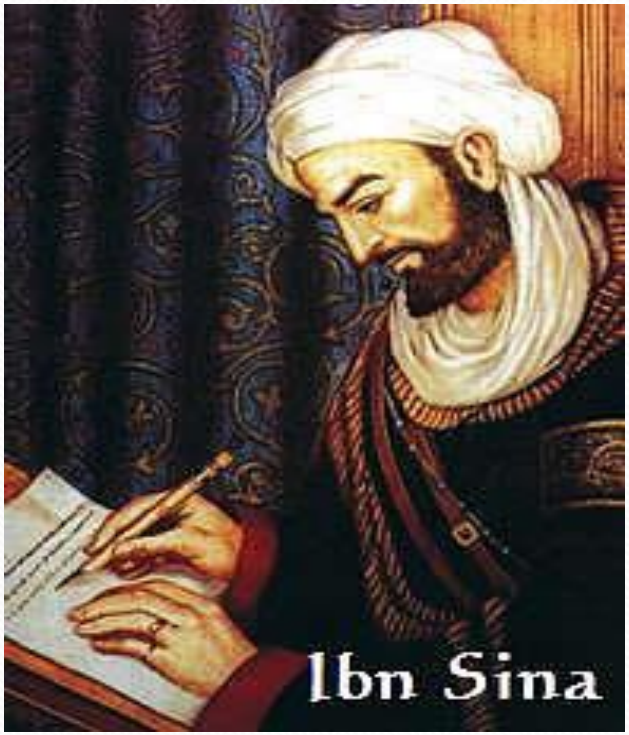


History of Microbiology

- **Abū al-Qāsim Khalaf ibn al-‘Abbās Al-Zahrāwī (324-400 H, 936-1013 G).**
- An Arabian scientist was known in the medicine field. Wrote in medical encyclopedia and also books on open abscess and treated warts.

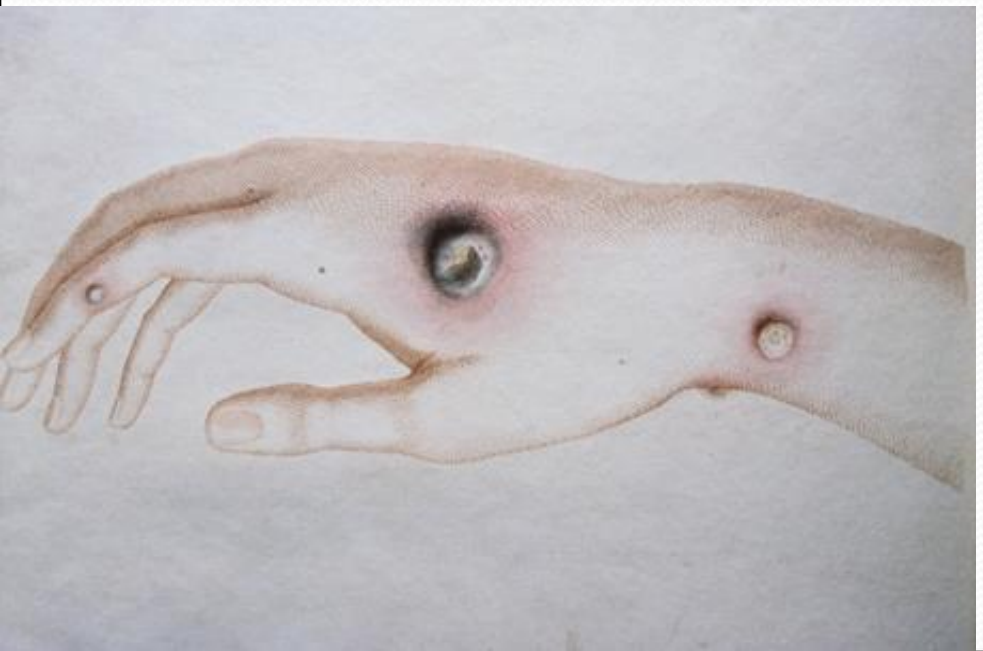
History of Microbiology

- **Abū Alī al-Ḥusayn ibn Abd Allāh ibn Sīnā (Ibn Sina) (368-424 H , 980-1037 G).**
- His book ***The Canon of Medicine*** was one of the best references in medicine and pharmacology know for describing infectious diseases and quarantine them as control procedures.
In Pharmacology, he discussed how to effectively test new medicines.



History of Microbiology

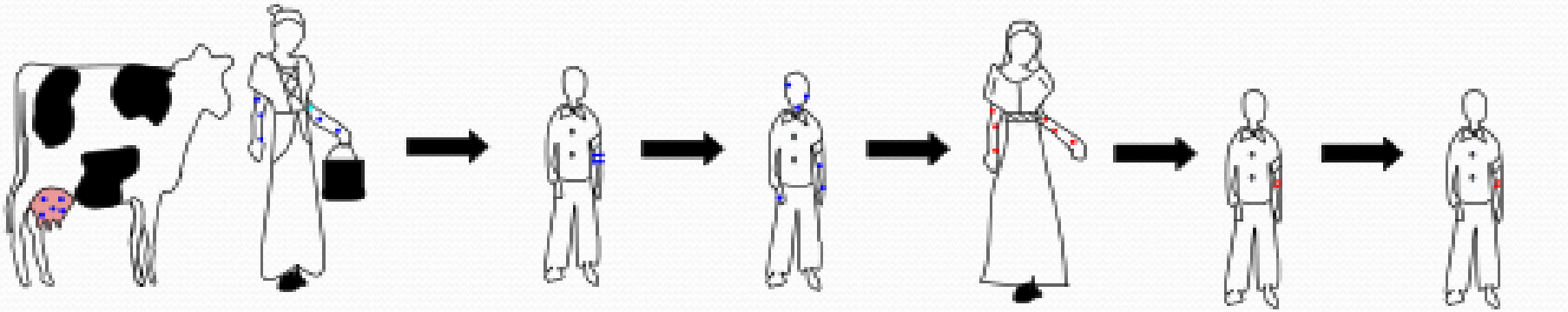
- **Edward Jenner (1749-1823 G).** An English physician and scientist known for the **1st world vaccine**.
- Jenner and smallpox: Injecting James Phipps.



Cowpox on Sarah Nelmes Hand.

History of Microbiology

Jenner's



History of Microbiology

- **Louis Pasteur, a chemist, scientist, and inventor (1822–1895).**
- "A father of microbiology".
  - Vaccines development- anthrax, cholera, TB, rabies.
  - Infections caused by germs→ Healthcare awareness for surgeons.
  - Food safety- "*Pasteurization*".

History of Microbiology

- **Robert Koch (1843-1910).**
  - Discovery of the causative agent Anthrax, *Bacillus anthracis*.
  - The causative agent of cholera, *Vibrio cholerae.*
  - The causative agent of tuberculosis, the slow-growing bacterium, *Mycobacterium tuberculosis*.
  - Developing the technique of growing bacteria (Isolating pure culture on solid media).

History of Microbiology

- **Robert Koch- Four postulates:**
  - The organism must always be present, in every case of the disease.
  - The organism must be isolated from a host containing the disease and grown in pure culture.
  - Samples of the organism taken from pure culture must cause the same disease when inoculated into a healthy, susceptible animal in the laboratory.
  - The organism must be isolated from the inoculated animal and must be identified as the same original organism first isolated from the originally diseased host.

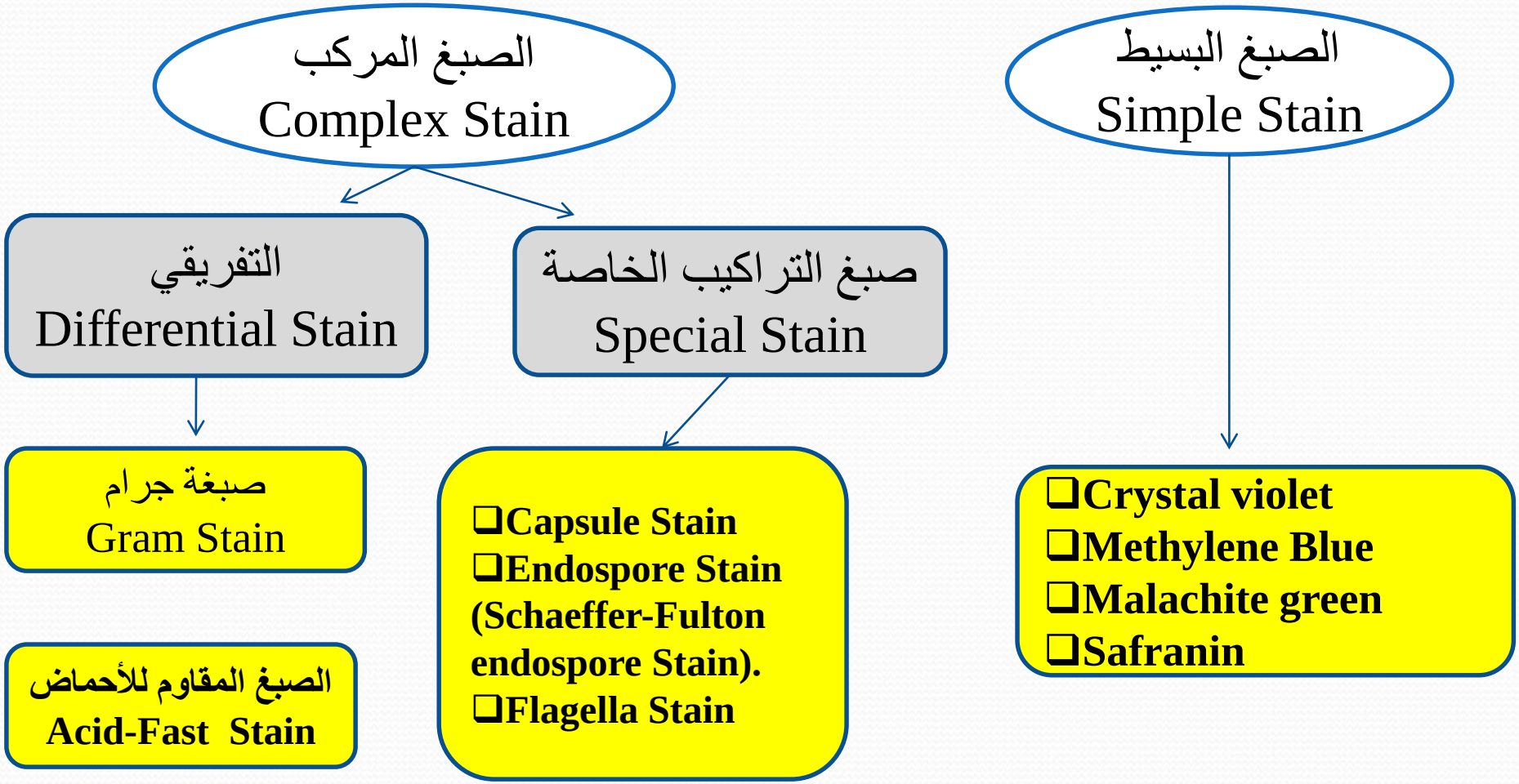
Methods of studying microorganisms

- Microscopes, Centrifugation, Filtration.
- Solid and liquid media-simple and complex.
- Live cell cultures, animal models.
- Samples collection:
  - Inoculation.
  - Incubation.
  - Isolation.
  - Inspection.
  - Identification.

أنواع المجاهر
Microscope Types

- الضوئي
  Light
  - الساطع
    Brightfield
  - المظلم
    Darkfield
  - متباين الطور
    Phase contrast
  - متباين التداخل التفريقي
    Differential interference contract
  - الوميضي
    Fluoresence
- متحد البؤر
  Confocal
- الالكتروني
  Electron
  - النفاذ
    Transmission
    10000-100000x
  - الماسح
    Scanning
    1000-10000x
- الصوتي الماسح
  Scanning acoustic
- المسبار الممسوح
  Scanned-probe
  - المسح النفقي
    Scanning tunneling

Microbial Cells Staining



QUESTIONS??