Microbiology

Subject :

Lec no : 2

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وقل رب زدني علماً

2. Algae

- Description: photosynthetic aquatic eukaryotes
- Can be both unicellular and multicellular
- Most algae live in fresh or sea water where they can either be free-floating or attached to the bottom
- Types: brown, red, green
- All algae contain a pigment called chlorophyll and they make their own food by photosynthesis
- Diseases: *Alexandrium* causes Paralytic Shellfish Poisoning (PSP) "is a serious illness caused by eating shellfish contaminated with algae that produce harmful toxins and can be fatal to humans"

3. Fungi

الفطريات

- Description: a group of eukaryotic organisms that includes microorganisms such as yeasts (1 الخميرة), molds (2 العفن), and mushrooms (3 فطر)
- Nutrient absorbers (بتوخذ الغذاء من اللي حواليها), plant decomposers (تساعد على تحلل النباتات), does not contain chlorophyll (حتى لو كان لونها أخضر)
- ~100 human pathogens
- Types: yeasts (unicellular fungi), molds (filamentous fungi)
- Diseases: ringworm (طفح جلدي) (pictured), athlete's foot (القدم الرياضية) (لما يكون المريض كتير يلبس الحذاء بجلع الفطريات بين أصابعه), etc.

*يميز الفطريات أنها تتبرعم من نفسها وتتكاثر ( ) بالإضافة أنها تحمل ألياف أثناء التكاثر

4. Helminthes

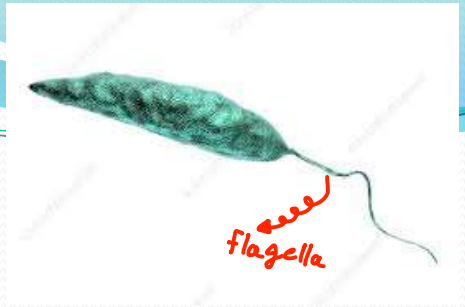
- Description: are worm-like parasites that survive by feeding on a living host to gain nourishment and protection, sometimes resulting in illness of the host
- Multicellular animal parasites, engulfers and absorbers
- Types: flatworms, roundworms, tapeworm, etc
- Diseases: hook worm, tape worm, etc.

الديدان الشريطية

خطاف

هو بحزز أسنانها بدم المريض وتتغذى منه ممكن | الدم فيصيبه فقر دم

بتعوت على الجسم تتغذي على الأكل اللي بوصل المعدة تسبب ضعف شديد وفقدان الوزن.



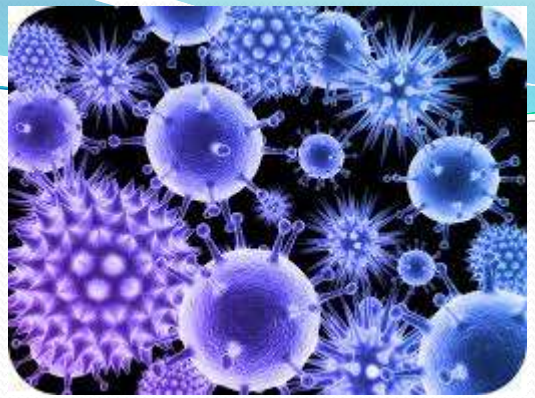
5. Protozoa

- Description: is an informal term for single-celled eukaryotes, either free-living or parasitic, which feed on organic matter such as other microorganisms or organic tissues and debris.
- unicellular , flagellates, ciliate
- Types: eukaryotes, engulfers and absorbers
- wet conditions, no cell wall, ~30 human pathogens
- Diseases: malaria, giardiasis, amoebic dysentery, etc.

Caused by: Female Anopheles Mosquitoes

(bacteriophage virus)

6. Viruses



- Description: is a small infectious agent that replicates only inside the living cells of an organism. (وما بتكاثر إلا بالـ Host)
- Viruses can infect all types of life forms, from animals and plants to microorganisms, including bacteria and archaea
- viruses are not cells but some viruses do have lipid envelopes (acellular),
- Diseases: common cold, flu, HIV, etc. Corona

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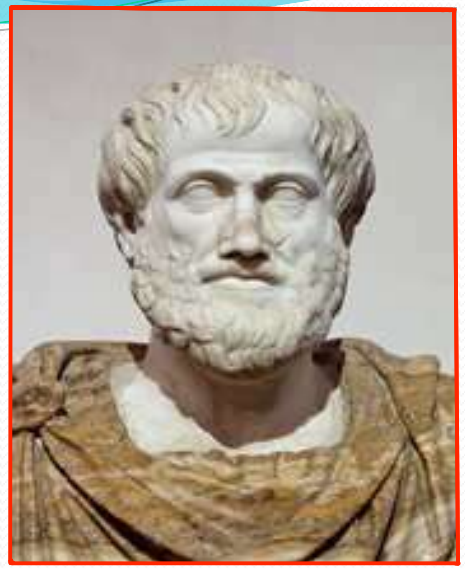
مش مطالب بالتواريخ القادمة

مطالب بحفظ أسماء العلماء مع الإكتشاف

History



Aristole believed that living things generate from non-living matters "Spontaneous generation" 350 BC

This belief remained unchallenged for more than 2000 years.

Robert Hooke, 1665

Little boxes – cells

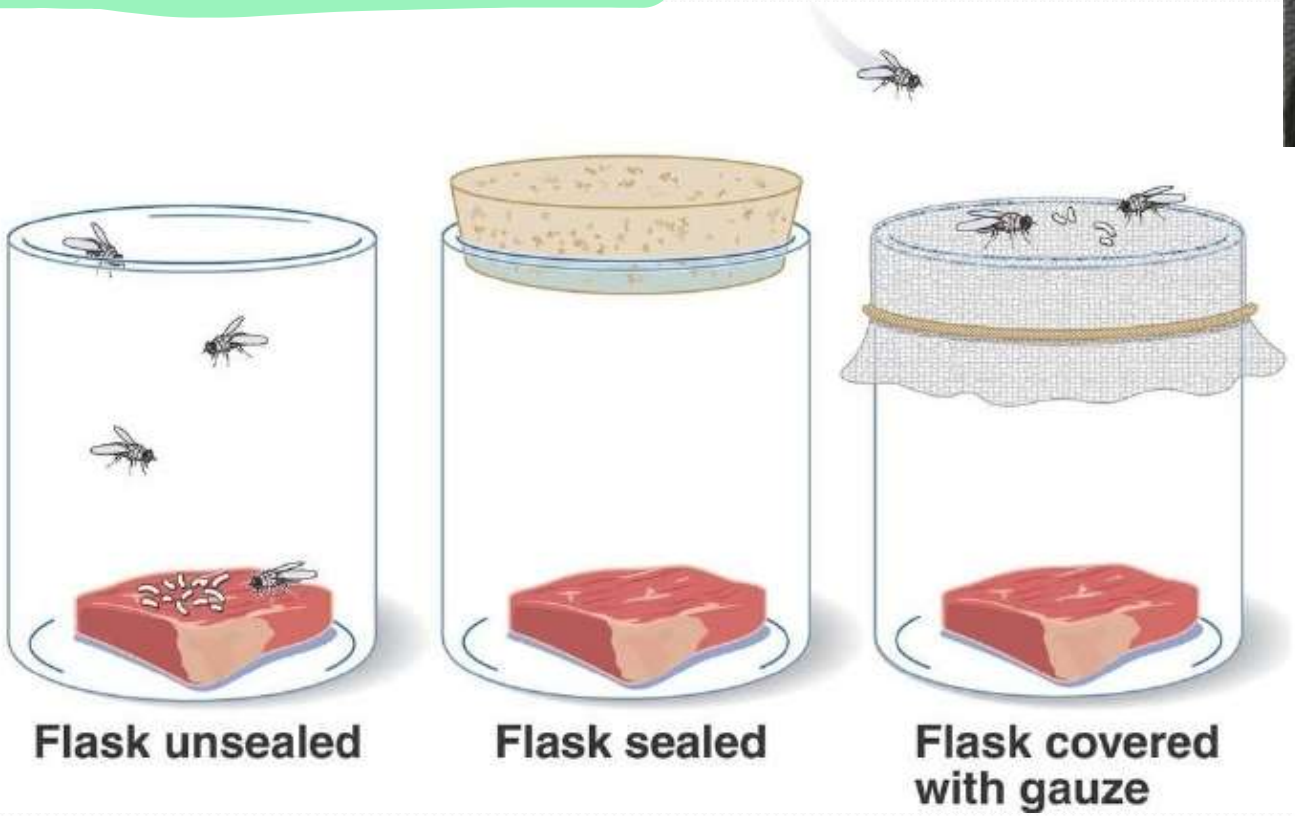
Cell theory – all living things are made up of cells

Hooke's microscope was capable of showing large cells, it lacked the resolution so he didn't see the microbe

Francesco Redi, 1668

Meat exposed to flies became infested

- they claimed that fresh air was needed for spontaneous generation.

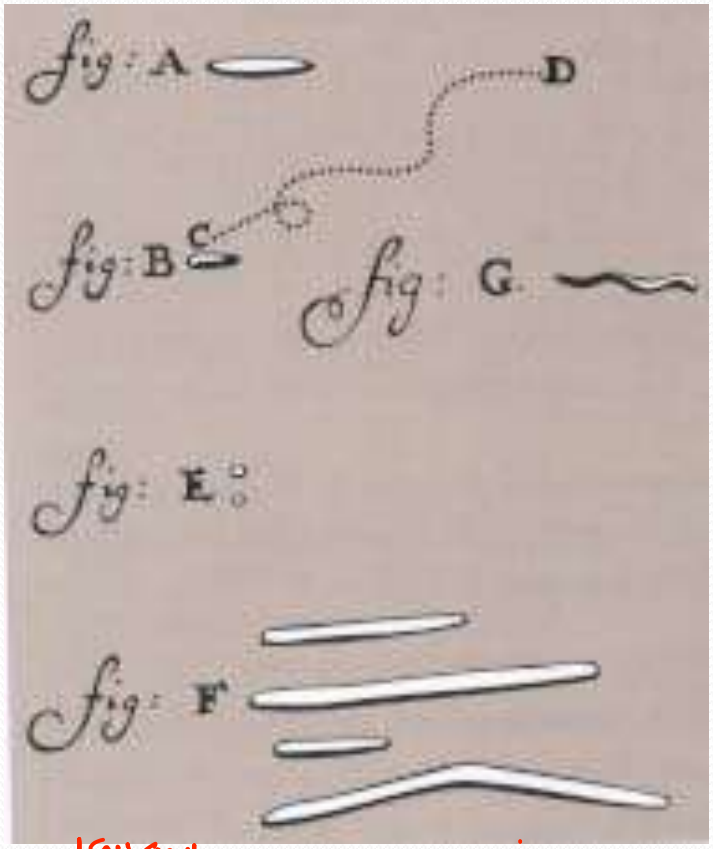


The father of microbiology

ح يجي عليه سؤال بالإمتحان

Anton van Leeuwenhoek, 1674

1st person to actually see living microorganisms



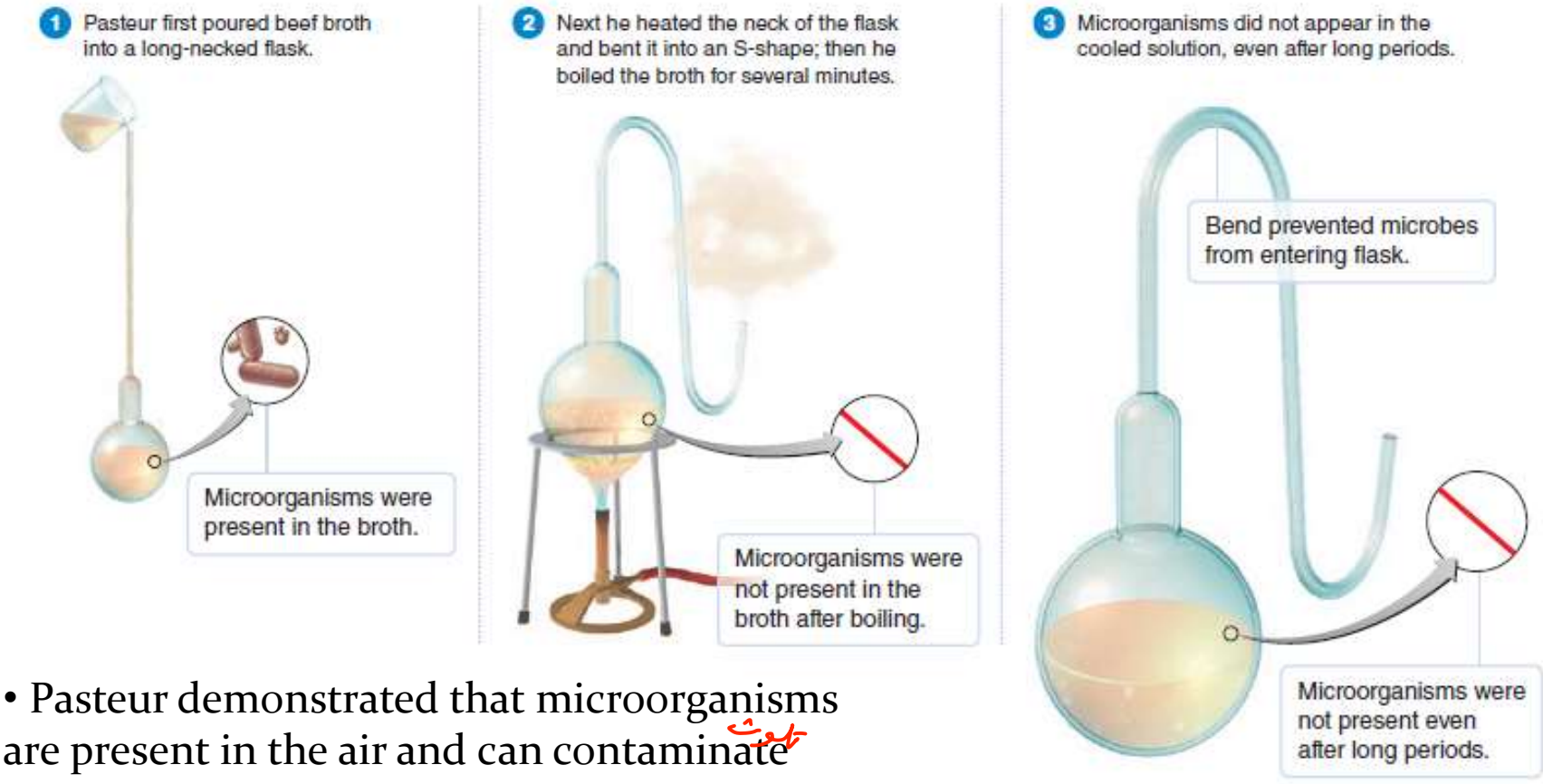
Wee animalcules

صغير حلزوني الشكل

(b) Microscope replica

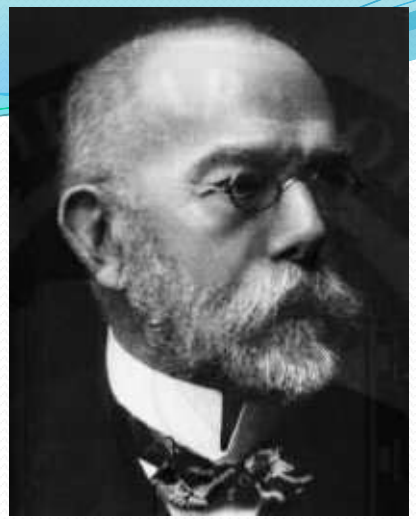
Louis Pasteur , 1861

Disproving the Theory of Spontaneous Generation

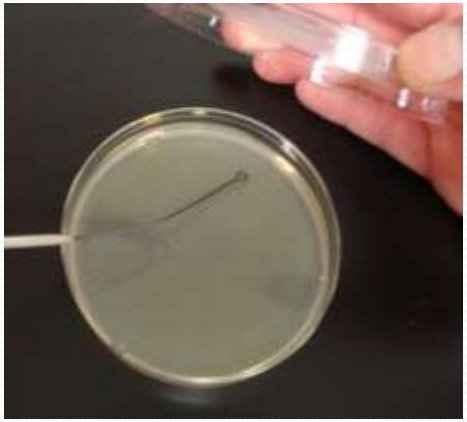


- Pasteur demonstrated that microorganisms are present in the air and can contaminate sterile solutions, but that air itself doesn't create microbes.

Robert Kock, 1876



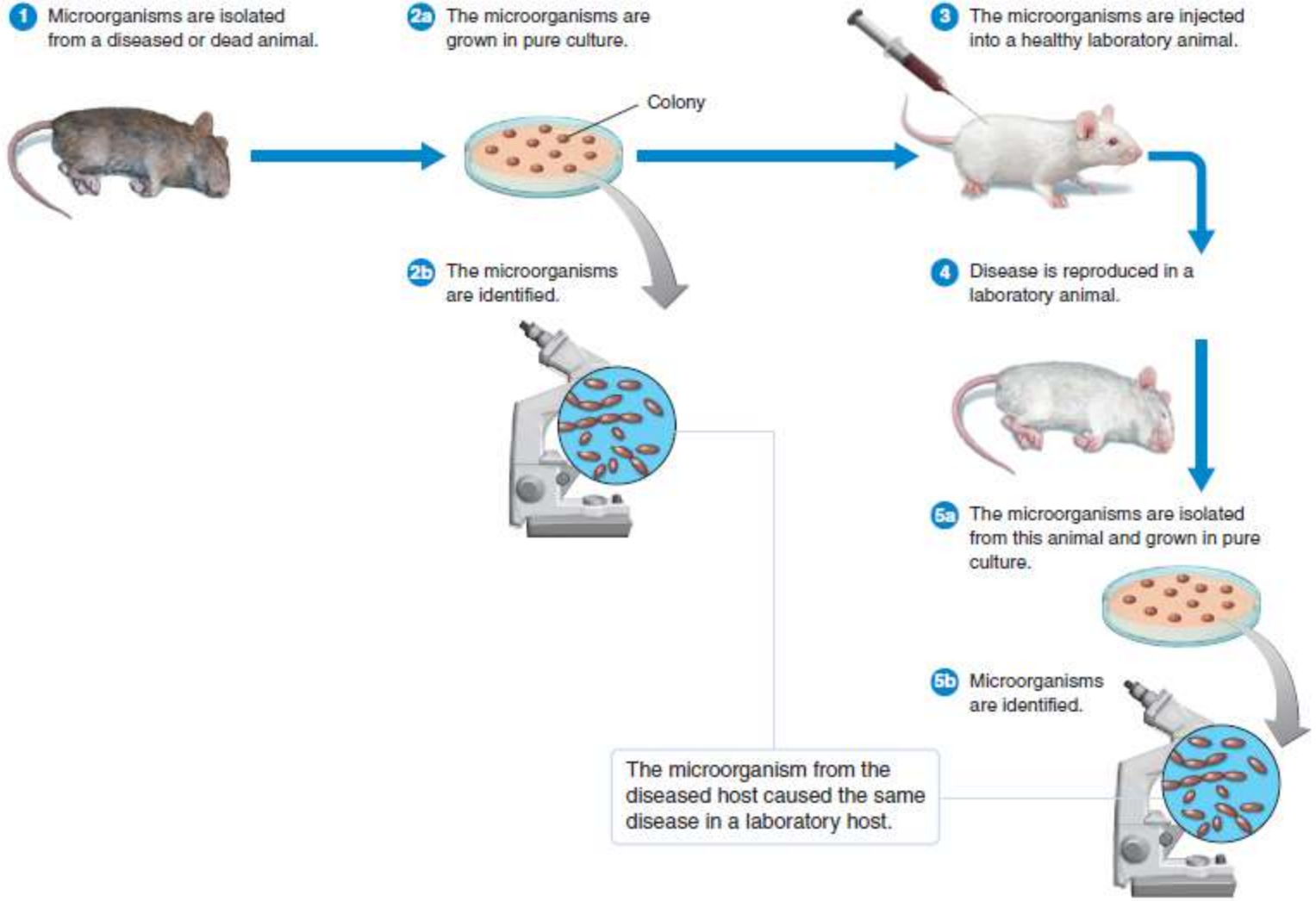
- Experimented with **medium** to grow bacteria
- Using **agar** (a gelatin-like product derived from seaweed) الأغشاب البحرية
- Add various **nutrients** necessary to grow certain organisms.
- He provided proof that a bacterium causes anthrax (**Koch's postulates**) used to prove that a specific microbe causes a specific disease



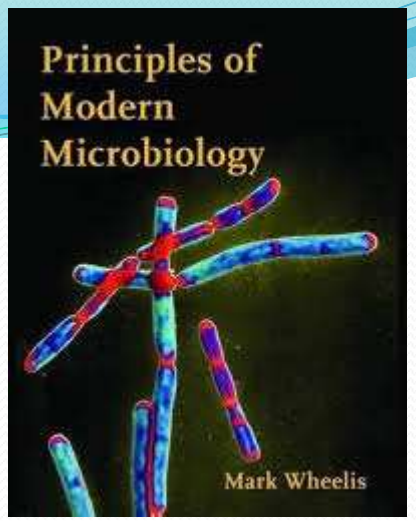
Koch's postulates : Understanding Disease

- Pathogen must be present in all cases of disease (نظرية خاطئة)
- Pathogen must be isolated and grown in lab in pure culture
- Pathogen from pure cultures must cause disease when inoculated (تلقيح) into healthy, susceptible lab animal
- Same pathogen must be isolated from the diseased lab animal

Robert Kock experiment



Modern Microbiology



- Molecular biology
- Immunology
- Recombinant DNA and genetic engineering
- Laboratory Medicine and pathology
- Prevention and treatment
- Emerging infections: AIDS, SARS, CORONA, etc

Microbes Benefit to Humans

- Bacteria are primary decomposers (محللات)
- Microbes produce various food products
- Microbes produce Antibiotics
- Bacteria synthesize chemicals that our body needs, but cannot synthesize (Vitamin b and K)
- Normal microbial flora prevents potential pathogens from gaining access to our body
- Using bacteria to control the growth of insects
- Using microbes to clean up pollutants (الملوثات) and toxic wastes
- Bacteria can be manipulated to produce enzymes and proteins they normally would not produce (insulin)
- Microbes form the basis of the food chain

Thank you…