



17
part 2



Microbiology

Doctor 2018 | Medicine | JU

● Sheet

○ Slides

DONE BY

Basma AbuMahfouz

CONTRIBUTED IN THE SCIENTIFIC CORRECTION

...

CONTRIBUTED IN THE GRAMMATICAL CORRECTION

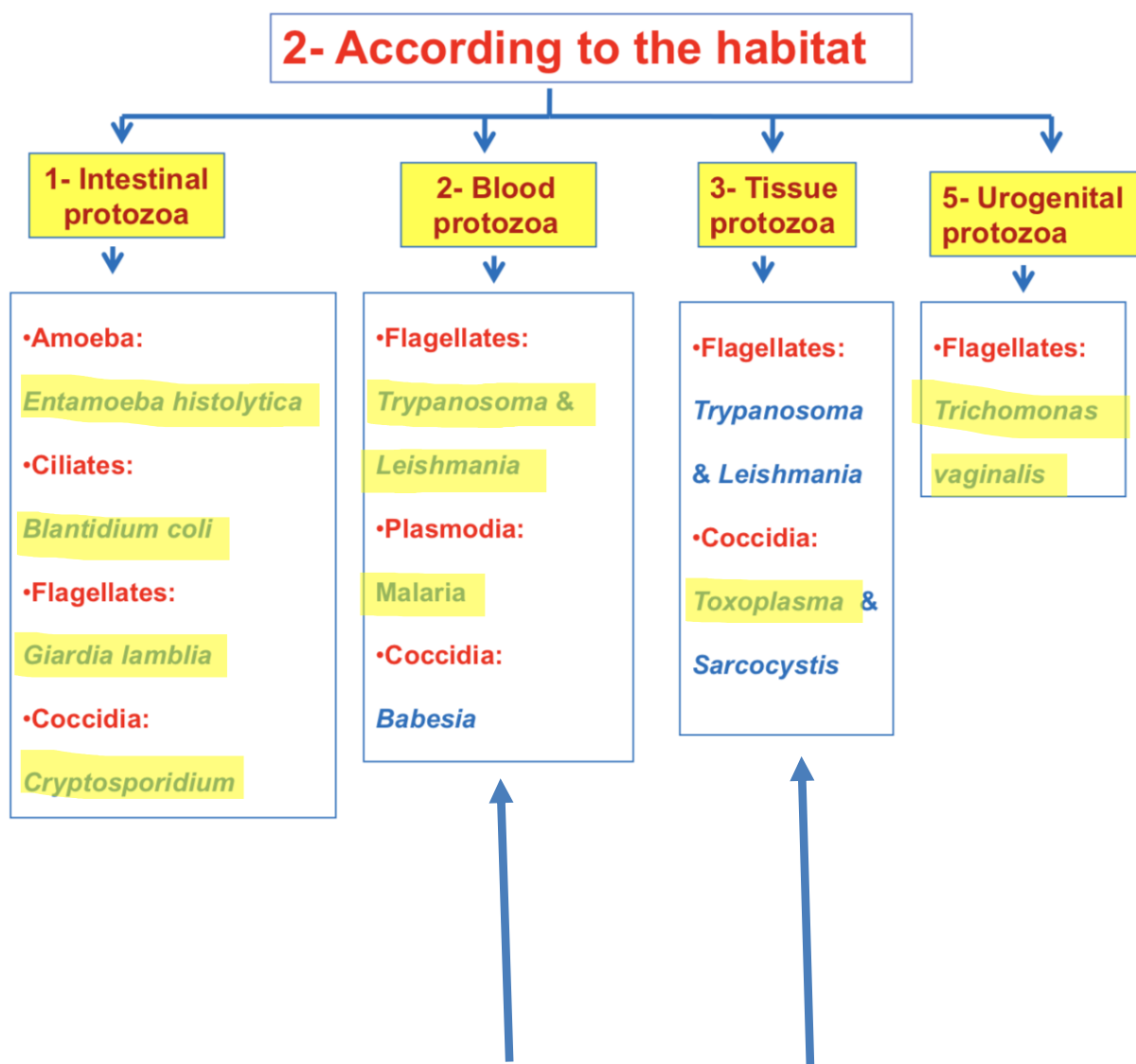
...

DOCTOR

Nader Alaridah

Followed...

In the previous sheet, we discussed intestinal and urogenital protozoan infections. This sheet will have the second two parts, which are blood and tissue protozoan infections.



Blood Protozoan Infections

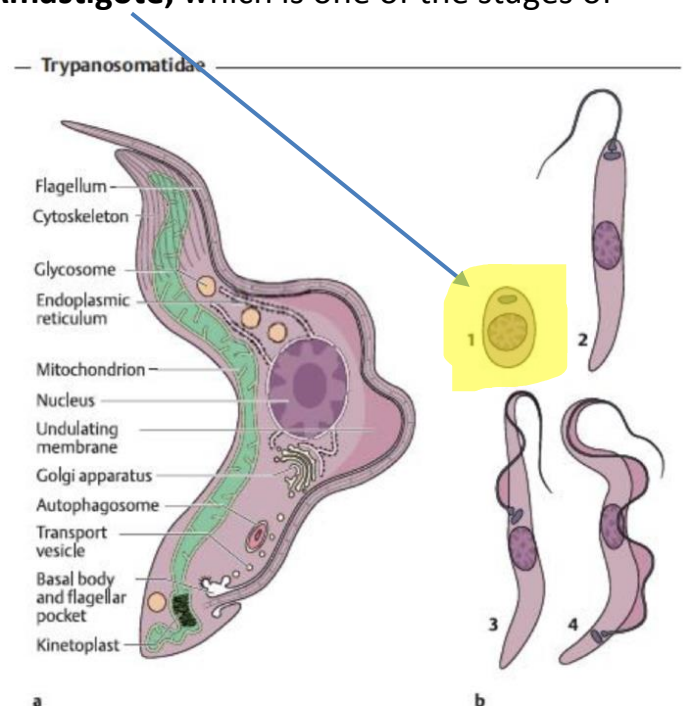
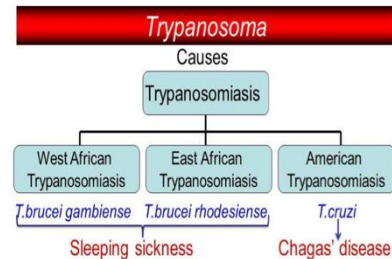
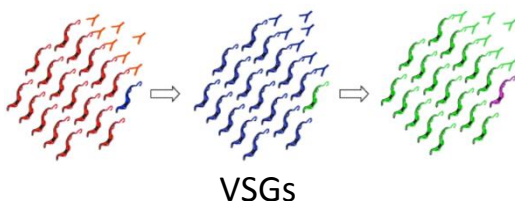
Blood protozoa that we will be discussing are three: two flagellates (Trypanosoma and Leishmania) and one plasmodium (Malaria which is caused by Plasmodium).

African trypanosomiasis : African sleeping sickness

American trypanosomiasis (Chagas' disease)

A) Trypanosoma:

- Trypanosoma is a blood flagellate that causes a disease called **Trypanosomiasis**.
- Trypanosomiasis has two major types caused by two different hosts:
African Trypanosomiasis caused by *T. Brucei* (sleeping sickness),
and **American Trypanosomiasis** caused by *T. Cruzi* (Chagas' diseases).
- Morphology is different in both types, mainly because African Trypanosomiasis is caused by an extracellular parasite, while American Trypanosomiasis is caused by an intracellular rounded parasite, called an **Amastigote**, which is one of the stages of life in *T. Cruzi*.
- *T. Brucei* makes VSGs (Variant Surface Glycoproteins). each time the antigenic coat changes, the host does not recognize the organism and must mount a new immunologic response, so this is basically a way it uses to survive.



African Trypanosomiasis

African Trypanosomiasis (sleeping sickness) has two types caused by two different parasites:

- 1) T. Brucei Gambiense: **West African** trypanosomiasis.
- 2) T. Brucei Rhodesiense: **East African** trypanosomiasis.

Both are caused by T. Brucei, and the vector for the parasite is the **Tsetse fly**.

(that's as far as you need to know about African Trypanosomiasis).



American Trypanosomiasis

Also has two types, north and south American Trypanosomiasis (Chagas' disease), (no details about both).

- The vector for transmission is the Reduviid bug (kissing bug).
- The bug puts its feces on the face of the host. The disease starts by rubbing the eye, causing a unilateral eyelid swelling. (this is an important sign, be aware of it).



B) Leishmania:

- Leishmania is a blood flagellate.
- It's an intracellular parasite.
- Leishmania targets macrophages or mono nuclear phagocytes.
- It's vector for transmission is the **female sand fly**. it can also be transmitted by blood transfusion, nasal secretions, organ transplantations and from pregnant mother to baby.
- It causes a disease called **Leishmaniasis**, and it has three types:

- **Cutaneous Leishmaniasis**, caused by *L. Tropica* and *L. Major*, and this is the most abundant type of Leishmaniasis. This type of Leishmaniasis is mostly shown on the face.



- **Mucocutaneous Leishmaniasis**, Caused by *L. Braziliensis*. It's also called Nasopharyngeal Leishmaniasis because it shows on the nose and mouth areas mostly.



- **Visceral Leishmaniasis**, caused by *L. Donovanii*.



C) Plasmodium:

- Plasmodium is a genus of parasitic alveolates, many of which cause malaria in their hosts. The parasite is transmitted by the female anopheline mosquito.

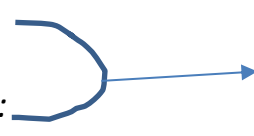
- It has five species:

1) *P. falciparum*: causes malignant tertian malaria الحمى الثلاثية الخبيثة

2) *P. malariae*: causes the classical malaria, and a quaternary fever حمى رباعية

3) *P. vivax*:

4) *P. ovale* :



These are the most common types,
and cause benign tertian malaria

5) *Plasmodium knowlesi*

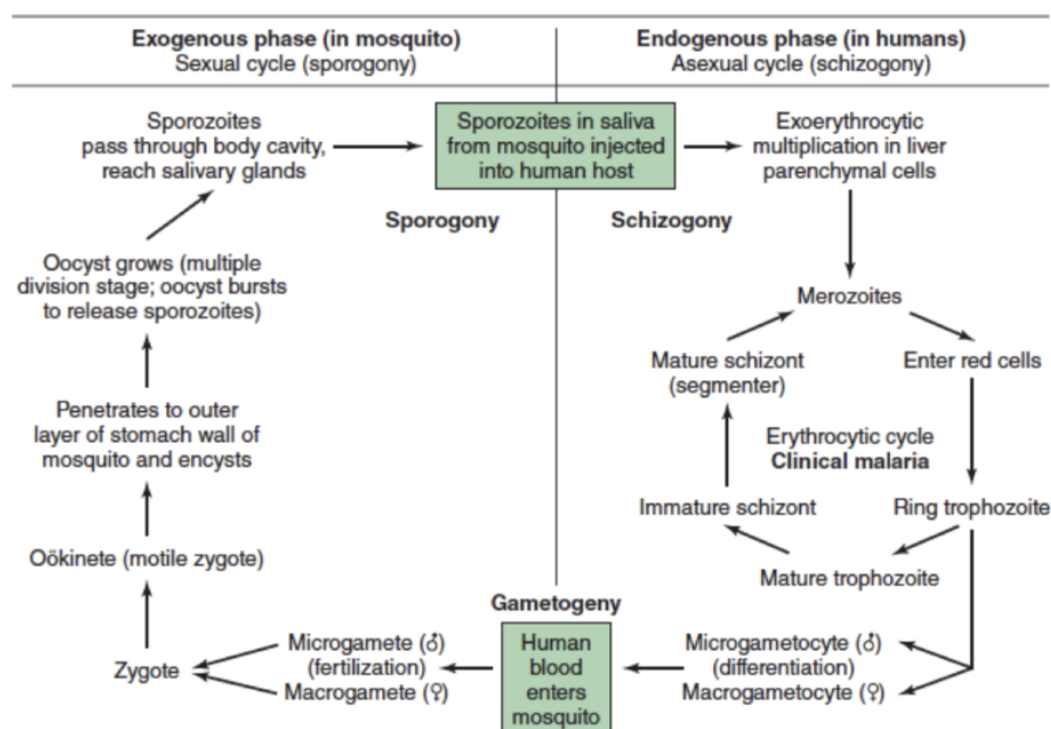
Life Cycle of Plasmodium

(Only understand the concept. This is by far the most important cycle.)

- When the vector takes a blood meal, **sporozoites** contained in the salivary glands of the mosquito are discharged into the puncture wound.
- Within an hour, these infective **sporozoites** are carried via the blood to the liver, where they penetrate hepatocytes and begin to grow, initiating the **pre-erythrocytic** or **primary exoerythrocytic cycle**.
- The **sporozoites** become round or oval and begin dividing repeatedly.
- Schizogony results in** large numbers of exoerythrocytic merozoites.

- Once these **merozoites** leave the liver, they invade the red blood cells (RBCs), initiating the **erythrocytic cycle**.
- A **dormant schizogony** may occur in *P. vivax* and *P. ovale* organisms, which remain quiescent in the liver.
- These resting stages have been termed **hypnozoites** and lead to a true relapse, often within 1 year or up to more than 5 years later.

Malaria life cycle



Laboratory diagnosis of Malaria

All you need to know is that we use thick and thin blood films, no more detail.

Therapy for Malaria

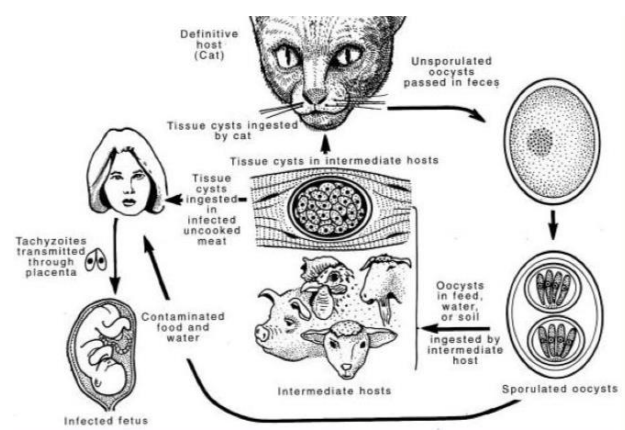
Tetracycline, ***doxycycline***, and ***clindamycin*** are used increasingly in combination with other antimalarials to improve their efficacy

Tissue Protozoan infections

We only have one tissue protozoa to discuss in this sheet:

A) *Toxoplasma gondii*:

- It's a coccidian protozoon.
- Cats are the vector host.
- Risky in pregnant women.



The end, thank you so much for bearing!