

College of Pharmacy
Medical Microbiology
Second Stage



Flagellate of Blood And Tissues

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Lashmania

- parasites which cause a protozoan infection called Leishmaniasis.
- Discovered in 1900 by William Leishman in the spleen of a soldier at Dum Dum, India .
- 21 out of the 30 mammalian-infecting species of Leishmania cause disease in humans
- Transmitted by bite of infected sandy fly (vector borne disease).
- Infection with leishmania spp. can result in three types; visceral (VL), cutaneous (CL) and mucocutaneous (MCL) leishmaniasis.



Life Cycle

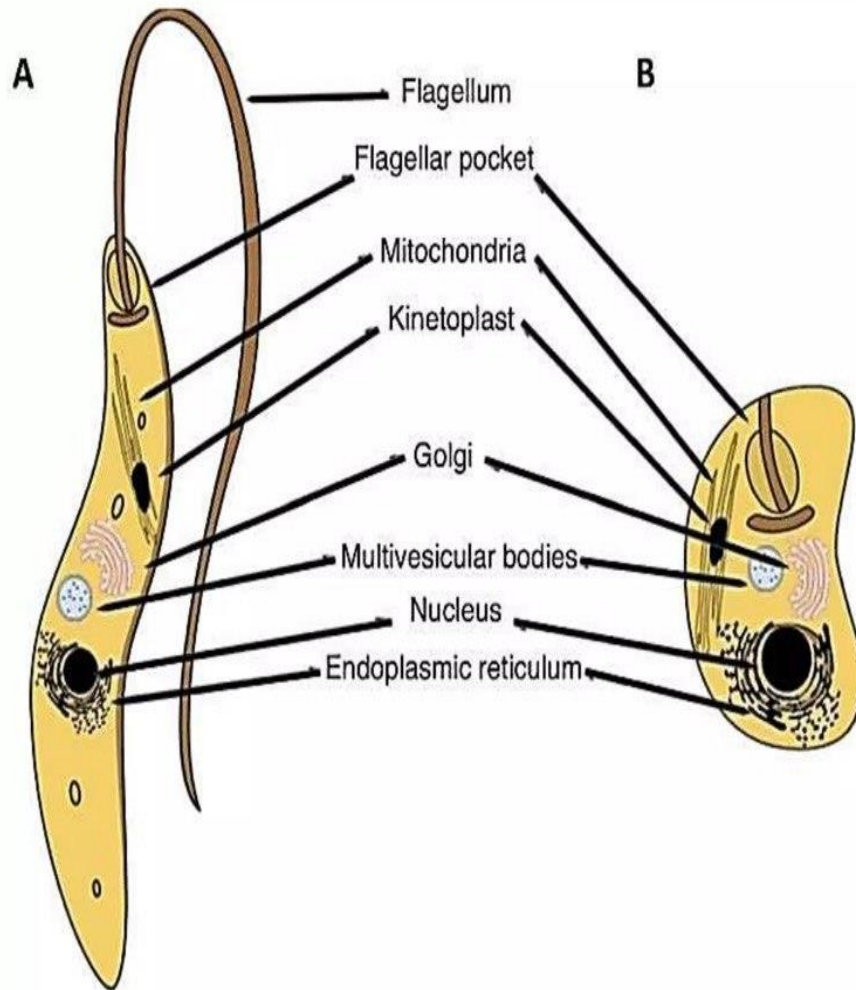
- Amastigote form (intracellular in humans).
- Promastigote form
- Causative Agent:
- Protozoan parasite *Leishmania tropica*.

Morphology

Two distinct form:

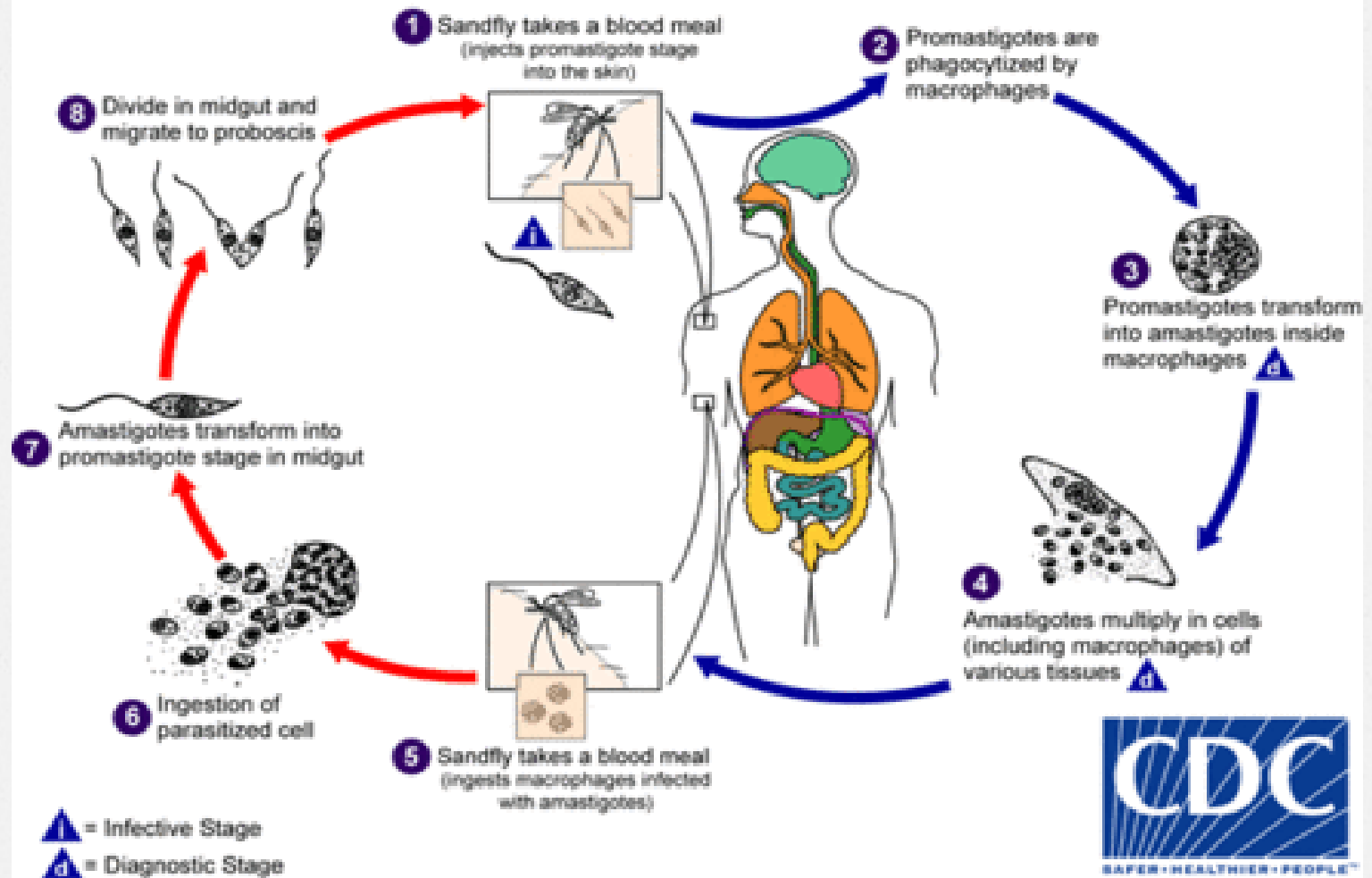
A. Promastigote form

B. Amastigote form



Sandfly Stages

Human Stages



<http://www.dpd.cdc.gov/dpdx>

Vector

- Phlebotomine sandflies (Phlebotomus species).
- Transmission:
- Sandfly bites.
- Reservoir hosts: Humans, rodents, and dogs.



Leishmaniasis

- Caused by Leishmania species, including Leishmania tropica.
- Global distribution:
- Endemic in parts of the Middle East, South Asia, and North Africa.

Clinical Manifestations

- Cutaneous Leishmaniasis:
- Incubation period: Weeks to months.
- Symptoms:
- Papule or nodule at the site of the sandfly bite.
- Progresses to a painless ulcer with raised borders and central crusting.
- Lesions may heal spontaneously but leave scars.

Diagnosis

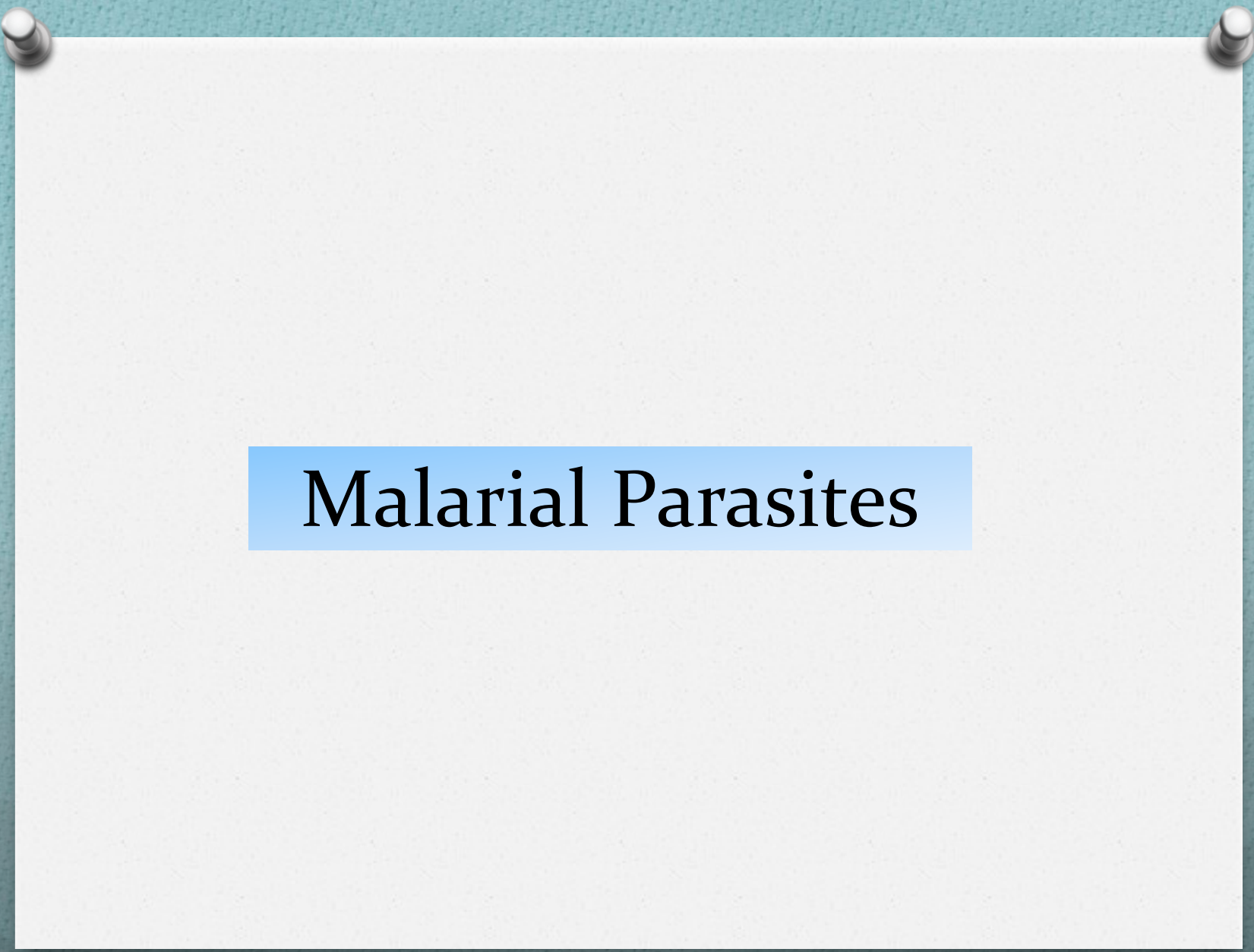
- Clinical Diagnosis:
- History of travel to endemic areas and characteristic skin lesions.
- Laboratory Diagnosis:
- Microscopy: Amastigotes in skin scrapings or biopsies.
- Culture: Promastigotes in specialized media.
- PCR: Highly sensitive and specific.
- Serology: Limited utility in cutaneous forms.

Systemic Treatment:

- Pentavalent antimonials.
- Liposomal amphotericin B (for extensive or refractory cases).
- Oral miltefosine (off-label use for cutaneous leishmaniasis).

Prevention and Control

- Personal Protective Measures:
 - Use of insecticide-treated bed nets and clothing.
 - Application of insect repellents.
- Vaccination:
 - No licensed vaccine, but research is ongoing.

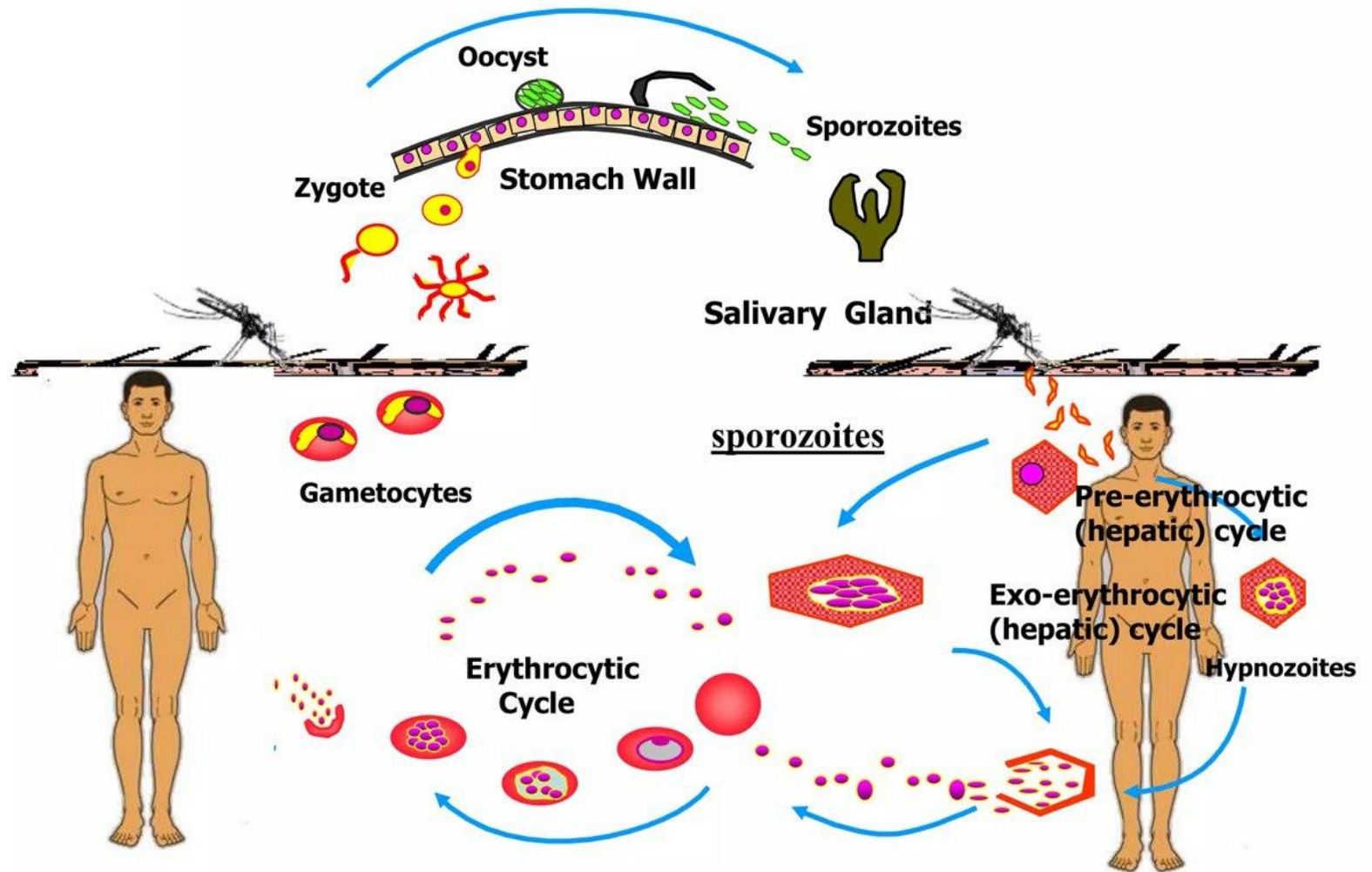


Malarial Parasites

Malaria

- o Malaria is a mosquito-borne infectious disease caused by intracellular protozoan parasite
- o Plasmodium.
- o Characterized by cycles of shaking, chills, fever, sweating and anaemia.
- o Affects 500 million and kills more than 1 million people each year.
- o Endemic in tropical and subtropical regions - Sub-Saharan Africa, Asia and Latin America.
- o In India, about 1.5 - 2 million cases and 1000 malarial deaths are reported annually (mostly from tribal, hilly and inaccessible areas).

LIFE CYCLE OF MALARIA



Plasmodium

- Plasmodium is a parasitic protozoa
- Causes malaria.
- Plasmodium, which infects red blood cells in mammals (including humans), birds, and reptiles, occurs worldwide, especially in tropical and temperate zones.

Species infecting human

- o *P. vivax*
- o *P. falciparum*
- o *P. malariae*
- o *P. ovale*

Vector

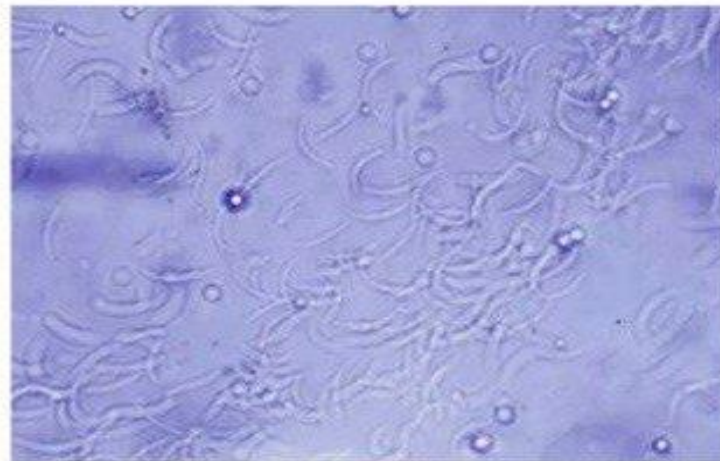
The female *Anopheles* sp. Mosquito.





Transmission

- sporozoites injected with **saliva**
- enter circulation
- trapped by liver (receptor-ligand)



Plasmodium have two hosts

- A vertebrate host in which reproduction is asexual (intermediate host): Human
- A blood-sucking insect, in which sexual reproduction takes place (definitive host)- mosquito.

The infective stage(For Human)

- o sporozoites.
- o The infective stage for the mosquito is the gametocytes.
- o In the intermediate host:
- o Liver stage: 6 - 14 days.
- o Blood stage: 48 - 72 hrs.
- o Incubation period: 21 days.

THANKS FOR
LISTENING...

