

# THE BLOOD-BORNE FLAGELLATES

- Two of the many genera of hemoflagellates are pathogenic to humans, *Leishmania* and *Trypanosoma*.

# Leishmaniasis

- *Leishmaniasis refers to a group of infections caused by the flagellate protozoa of the genus Leishmania*
- Transmission to humans is by the bite of the female sandfly of the genus *Phlebotomus* or *Lutzomyia*



- **There are 3 clinical forms *of this disease*:**

1. Cutaneous leishmaniasis

2. Mucocutaneous leishmaniasis

3. Visceral leishmaniasis

# Life cycle

- Infected sandfly injects **promastigotes** into the skin
- Promastigotes lose their flagella, enter the **amastigote** stage, and invade **macrophages**.
- The amastigotes reproduce, killing the host cell. Following their release, they can invade other cells
- A sandfly bites an infected person, and acquires amastigotes. These divide in the fly's gut, producing promastigotes.

# Cutaneous Leishmaniasis (oriental sore)

- Caused by *Leishmania tropica*
- It is characterized by ulcerating single or multiple skin sores. Most cases spontaneously heal, but the ulcers leave unsightly scars



# Mucocutaneous Leishmaniasis

- Caused by *Leishmania brasiliensis*
- The parasite attacks tissue at the mucosal-dermal junctions of the nose and mouth, producing multiple lesions.
- Death by bacterial secondary infection may occur.



# Visceral Leishmaniasis (Kala-azar)

- Caused by *Leishmania donovani*.
- The parasite initially infects macrophages, which, in turn, migrate to the spleen, liver, and bone marrow.
- Symptoms include intermittent fevers and weight loss. The spleen and liver enlarge, and jaundice may develop.
- Most cases (over 90%) are fatal if untreated.

# Trypanosomiasis

- *Trypanosomiasis refers to two chronic, eventually fatal, diseases*
  1. *African sleeping sickness*
  2. *American trypanosomiasis (Chagas' Disease)*



# African sleeping sickness

- Caused by *Trypanosoma brucei rhodesiense* and *Trypanosoma brucei gambiense*, which is transmitted by the blood-sucking bite of a **tsetse** fly.
- The motile flagellated form called a **trypomastigote** spreads bloodstream to the lymph nodes and central nervous system (CNS) causing inflammation.
- This inflammation produces the characteristic lethargy and, eventually, continuous sleep and death

# Chagas' Disease

- (*Trypanosoma cruzi*, the American Trypanosome)
- *T. cruzi* survives in wild animal reservoirs such as rodents, opossums, and armadillos. The vector is the **reduviid bug, also called the kissing bug**.