BLOOD & TISSUE FLAGELLATES/ (HAEMOFLAGELLATES)

Leishmania spp.

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Morphologic forms

There are 4 morphologic forms seen in hemoflagellates:

1) **Amastigote**
2) **Promastigote**
3) **Epimastigote**
4) **Trypomastigote**

-**they can exist in two or more of the 4 morphologic forms → depending on the species.**

Leismania sp.

- **Can cause:**

1) **Cutaneous leishmaniasis: a localized infection of the capillaries of the skin.**
2) **Mucocutaneous leishmaniasis: cause lesions of the skin and mucous membranes, specifically of the oral and nasal mucosa.**
3) **Visceral/ systemic leismaniasis: more generalized symptoms leading to enlargement of the internal organs, especially the liver, lymph nodes and spleen.**

Leishmania sp.

- **Divided into :**

1) Leishmania tropica

(Cutaneous Leismaniasis).

2) *Leishmania donovani*

(Visceral leishmaniasis).

Stage of life

- **Only have 2 stages of life**:

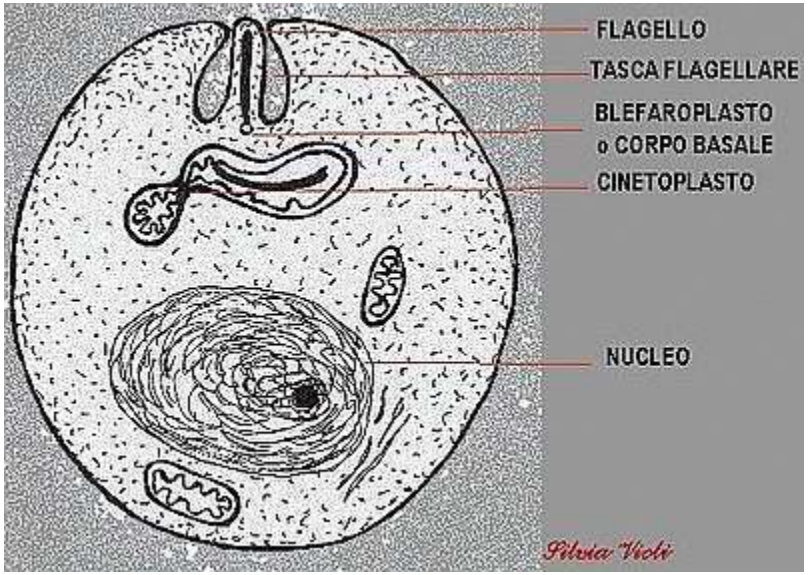
1) **Amastigote**
2) **Promastigote**

Amastigote

- Shape: **oval** to **round**
- Nucleus: **One**, eccentric.
- Kinetoplast: **Present**,

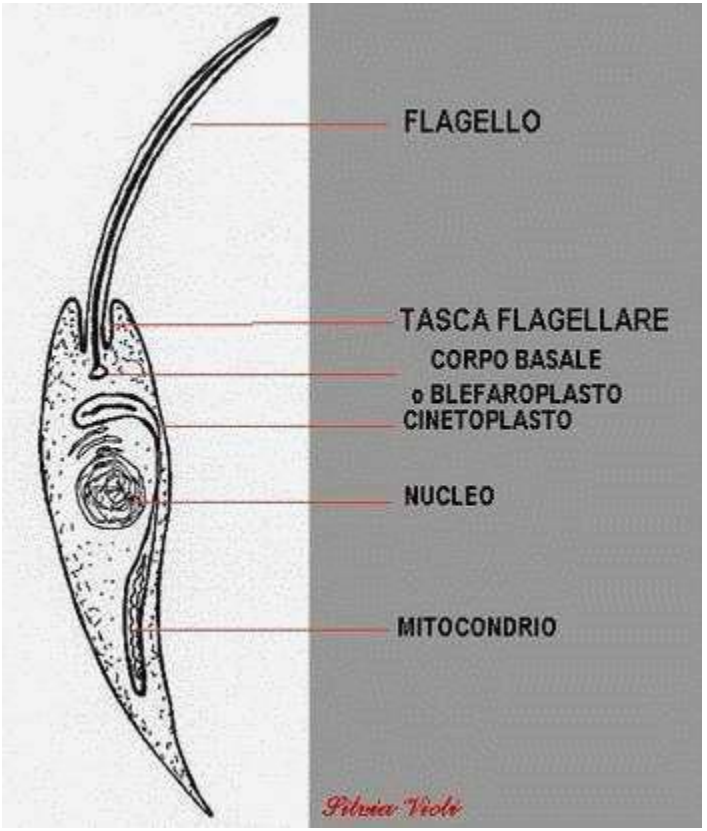
Consisting of **dot-like blepharoplast**, with small **axoneme** and **prabasal body**.

- Flagellum: **absent.**



Promastigote

- Shape**: long** and **slender**.
- Nucleus: **one**, **central**.
- Kinetoplast: **Anterior end** of the organism, **no undulating membrane**.
- Flagellum: **Single, anterior free flagellum.**



Leishmania tropica complex –Cutaneous Leismaniasis

- **Cause a chronic disease: cutaneous leishmanisis.**
- **Also known as Oriental sore, Delhi boil and dry or urban cutaneous leishmaniasis.**
- **Characterized by: production of dry, raised, ulcerated lesions at bite sites.**
- **Vectored by: tiny sandflies of the genera *Phlebotomus*.**

Leishmania tropica (promastigote)



Vector: *Phlebotomus* sandfly



Sandfly vs mosquito



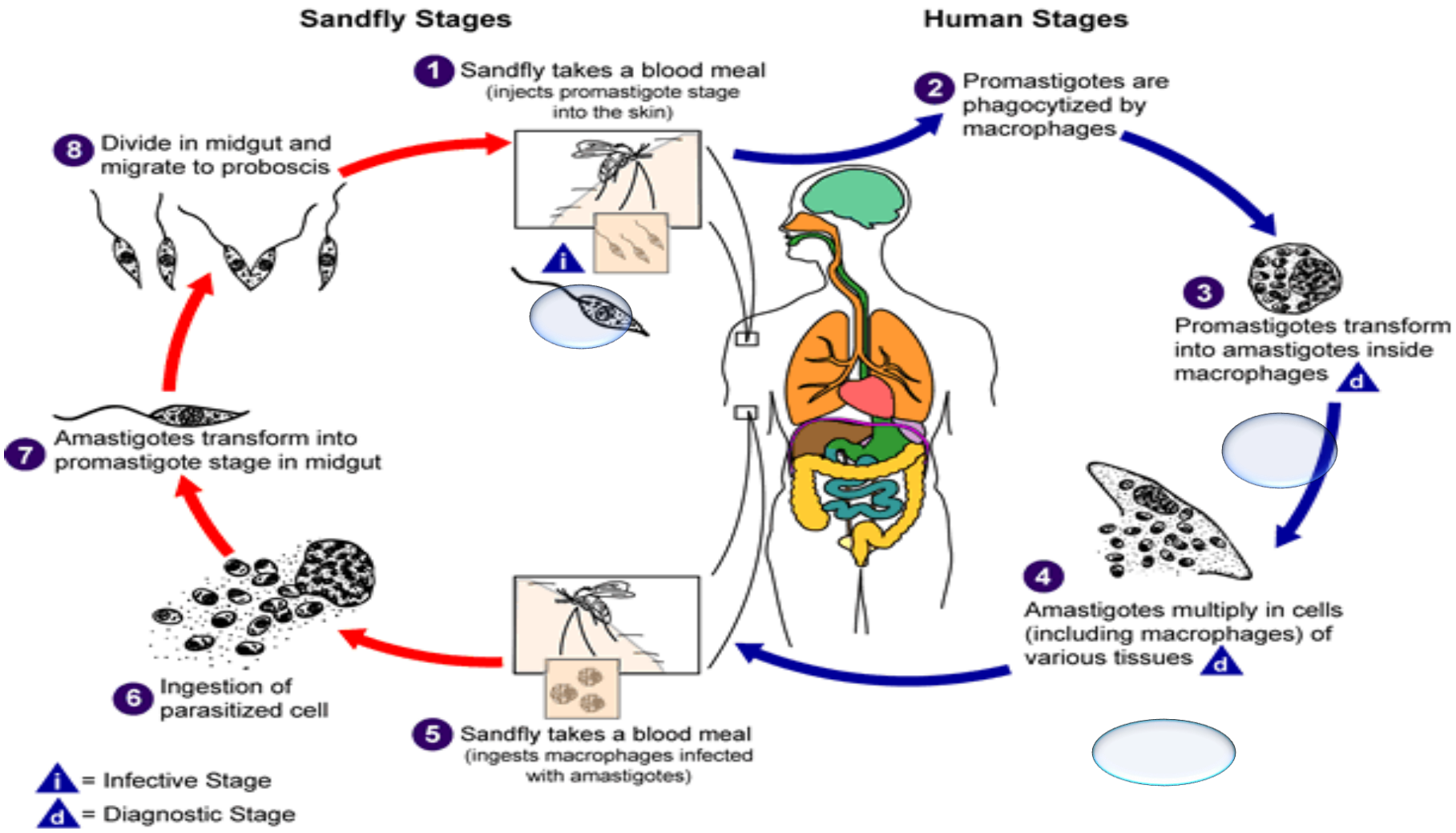
Name of disease (Cutaneous Leismaniasis)
Causes (*Leishmania tropica)*





Skin lesion from a person with cutaneous leishmaniasis (CDC/Dr. D.S. Martin).

Life cycle(infective and diagnostic stage)



Laboratory Diagnosis

- **Montenegro (leishmanin) skin test**

-delayed hypersensitivity reaction provoked by a suspension of killed leishmanial promastigotes administered intradermally.

-local inflammatory reaction appears at the site of injection within 48-72 hours.

- **Microscopy examination.**
- **Isoenzyme studies.**
- **Molecular diagnostic technique- PCR**
- **Serologic test – ex: (indirect fluorescent antibody assay).**

Name of parasite:

Leishmania donovani

Name of disease:

Visceral leishmaniasis

Morphology

- **Visceral leishmanisis also known as Kala Azar or dum-dum fever.**
- **The most severe of the Leishmaniasis.**
- ***Leishmania donovani* complex –parasitize the reticuloendothelial cells, viscerotropic, infected macrophages remaining fixed or disseminate throughout the body.**

- ***Phlebotomus*** **sandfly remains the vector.**

- **In the New World (Central and South America) – *Lutzomiya* sandfly remains the vector.**

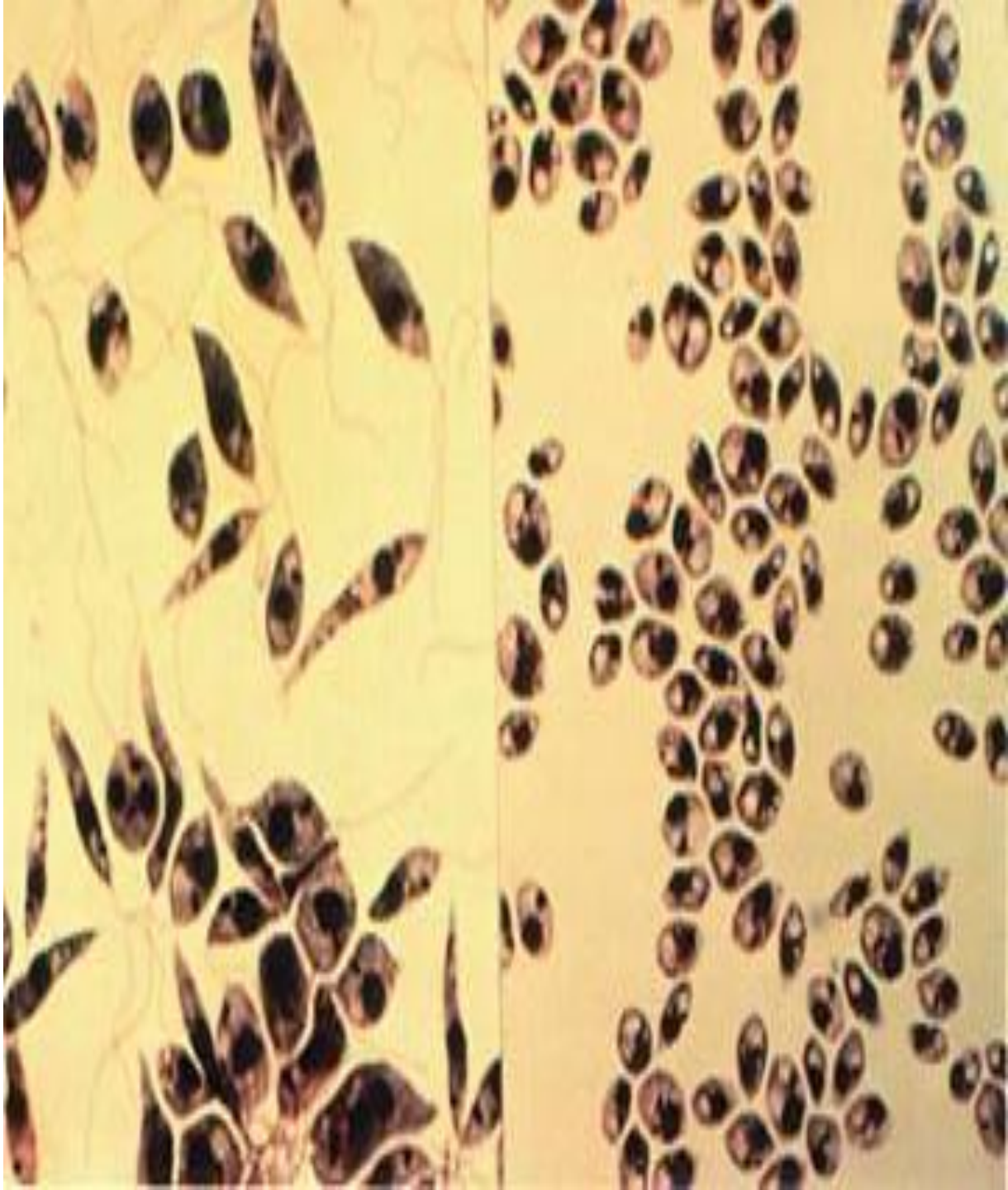
Diagnosis

- **Tissues Biopsy**
- **Direct examination of stained smears.**
- **Cultivation.**
- **Serologic test.**
- **Direct agglutination test (DAT).**
- **Complement fixation test (CF).**
- **Indirect fluorescence technique.**
- **Molecular diagnostic technique.**
- **Montenegro skin test (not reactive in people with active disease).**

- **Promastigotes** (left)

- **Amastigotes** (right) of *Leishmania* parasites.

Parasites have been fixed in Giemsa stained.



- **Name of parasite:**
  Leishmania donovani

Name of disease:
Visceral leishmaniasis

