

**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.

Leishmania 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 leishmaniasis**: 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 Leishmaniasis).

2) Leishmania donovani

(Visceral leishmaniasis).

Stage of life

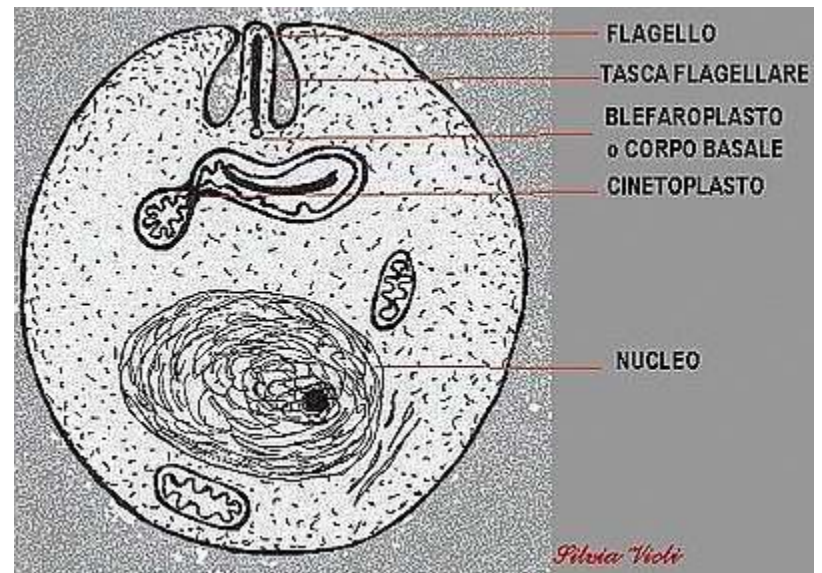
- Only have 2 stages of life:

1) **Amastigote**

2) **Promastigote**

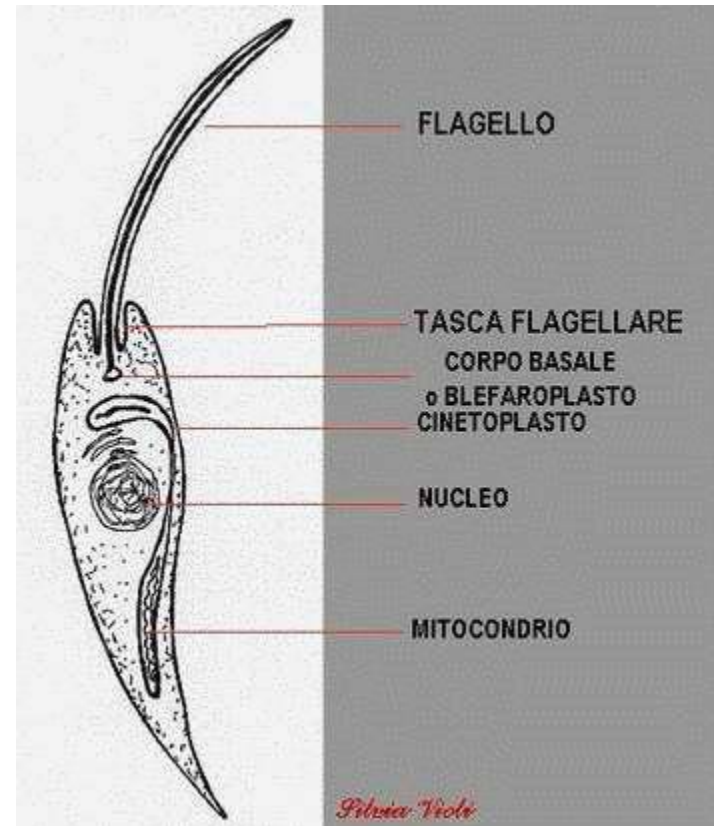
Amastigote

- Shape: **oval** to **round**
- Nucleus: **One**,
eccentric.
- Kinetoplast: **Present**,
Consisting of **dot-like blepharoplast**, with
small **axoneme** and **prabasal body**.
- Flagellum: **absent**.



Promastigote

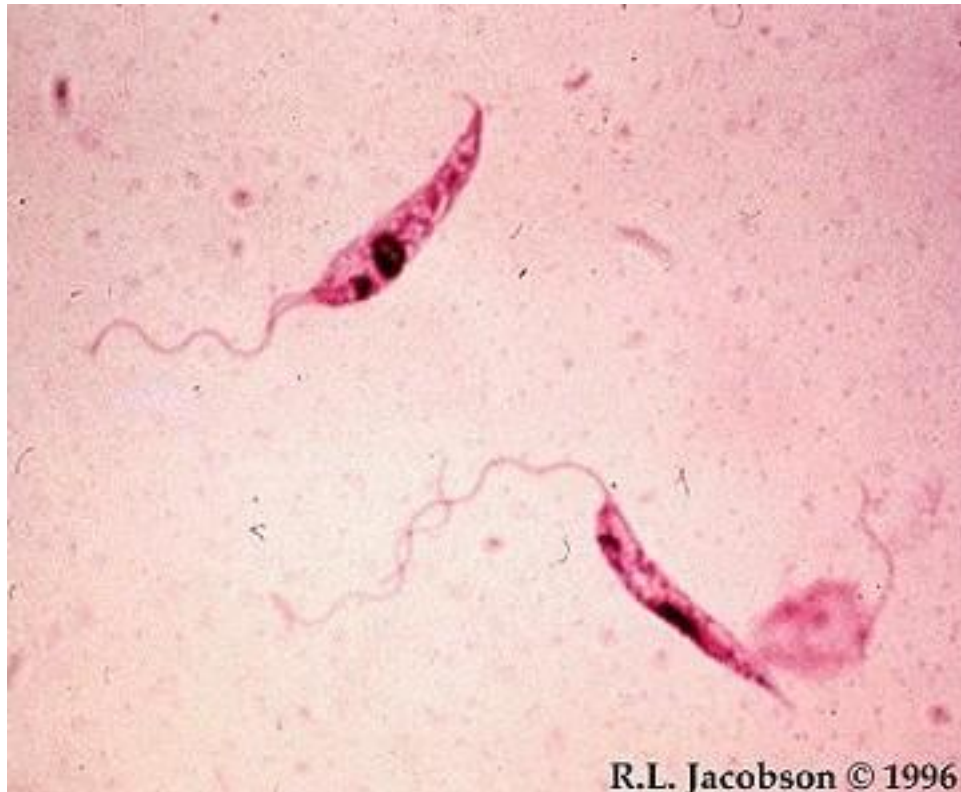
- Shape: **long** and **slender**.
- Nucleus: **one, central**.
- Kinetoplast: **Anterior end** of the organism, **no undulating membrane**.
- Flagellum: **Single, anterior free flagellum**.



Leishmania tropica complex –Cutaneous Leishmaniasis

- Cause a chronic disease: **cutaneous leishmaniasis**.
- 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



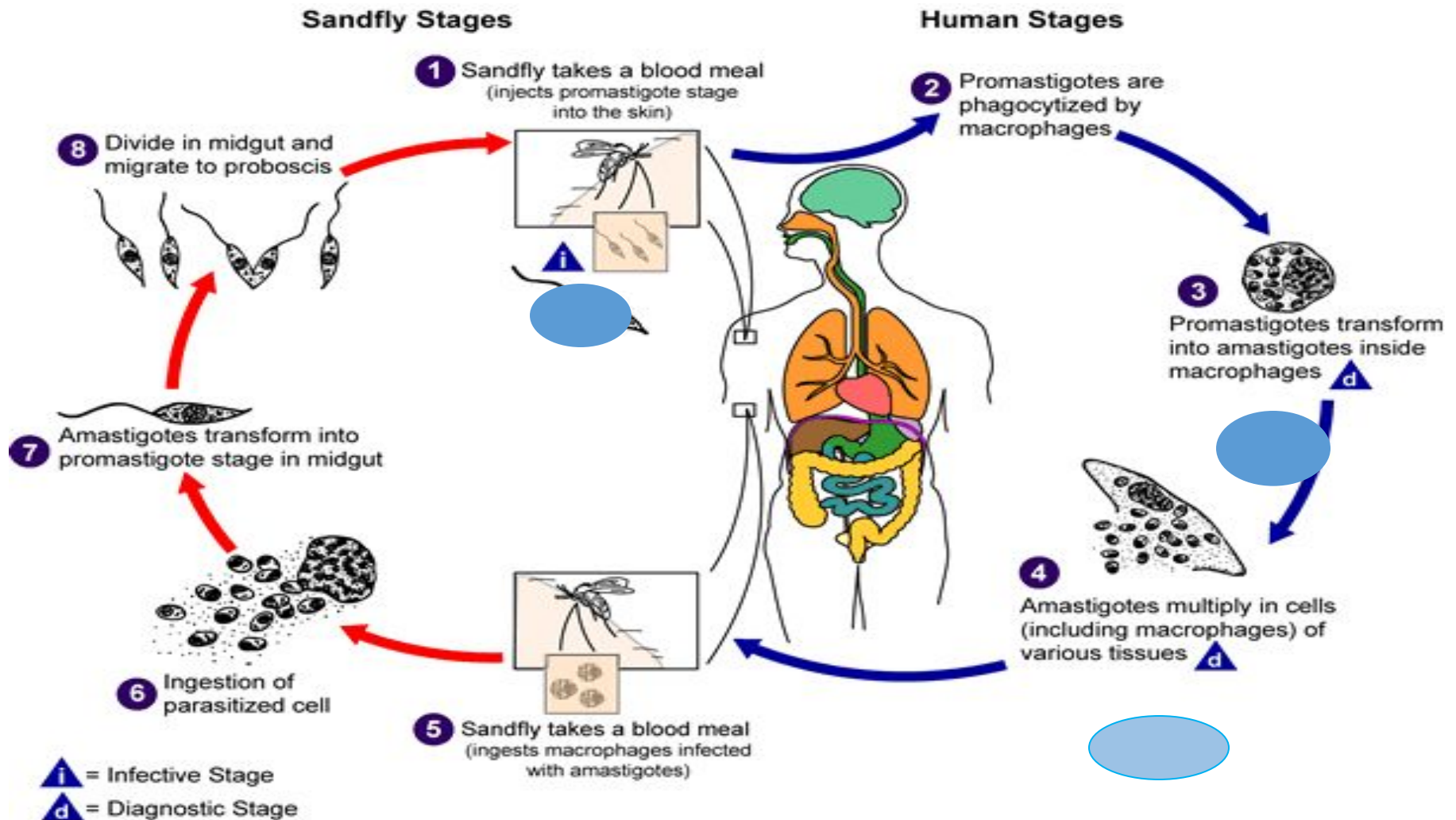
Name of disease (**Cutaneous Leishmaniasis**)

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:



Name of disease:

Visceral leishmaniasis

Morphology

- Visceral leishmaniasis 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)
 - *Lutzomyia* sandfly remains the vector.

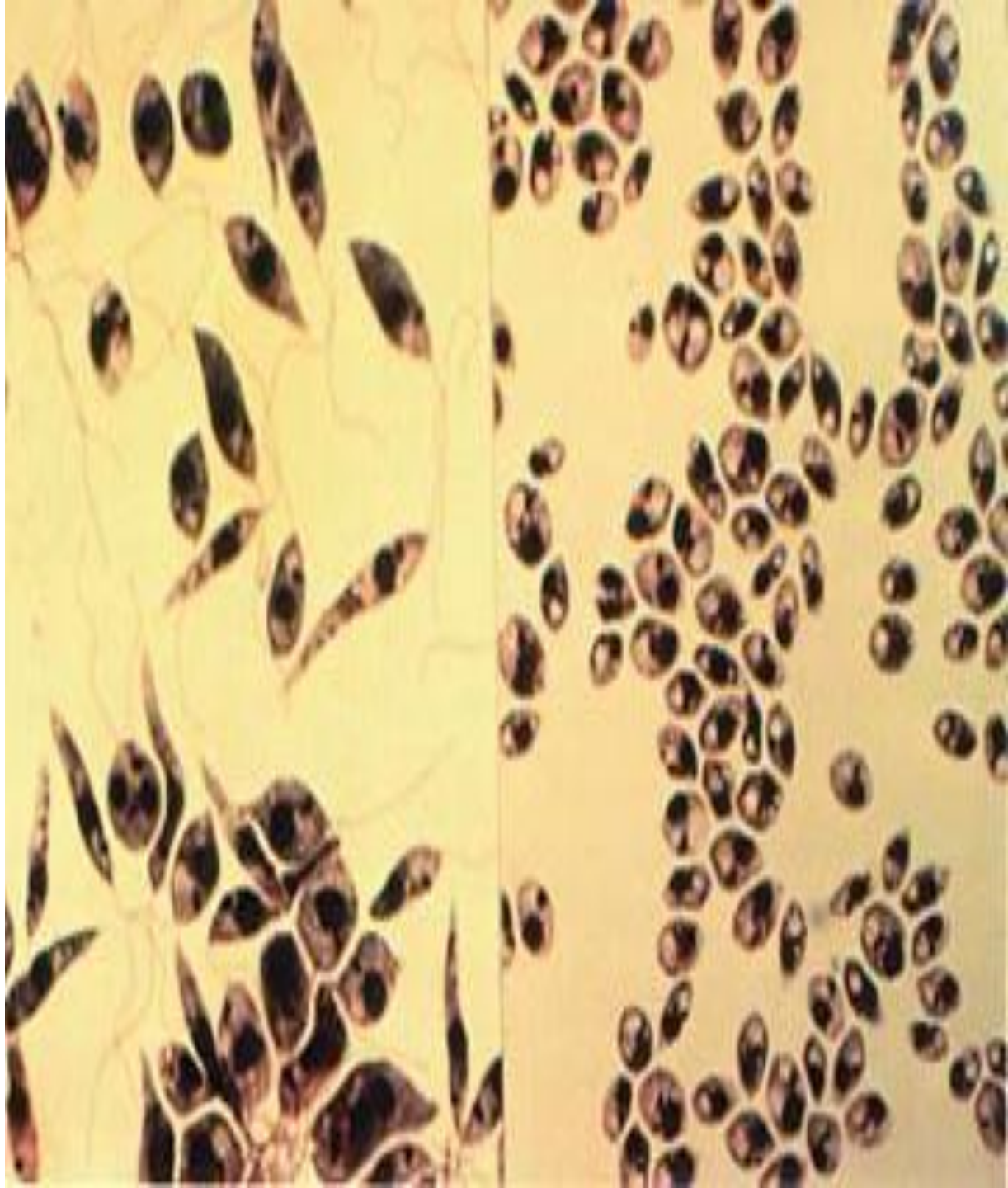
Diagnosis

- 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

