

LEISHMANIA

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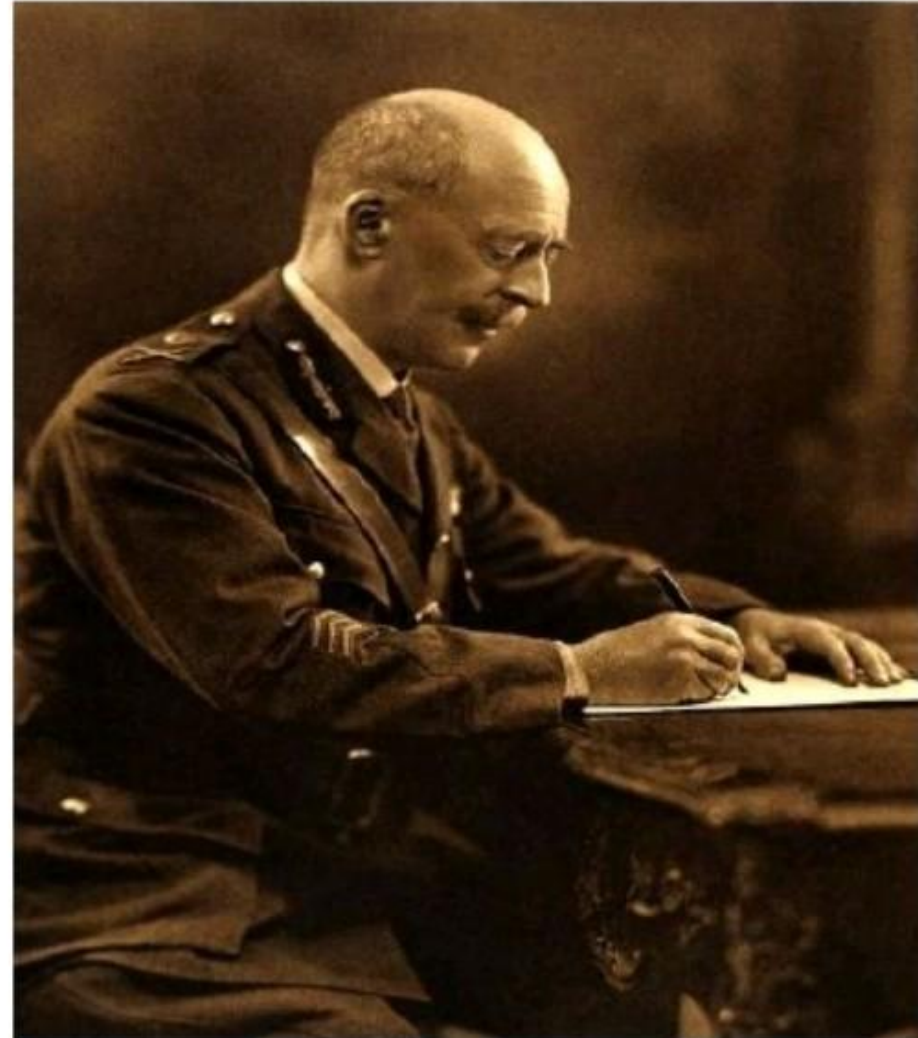
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SMIRNOVA



Sir William Leishman

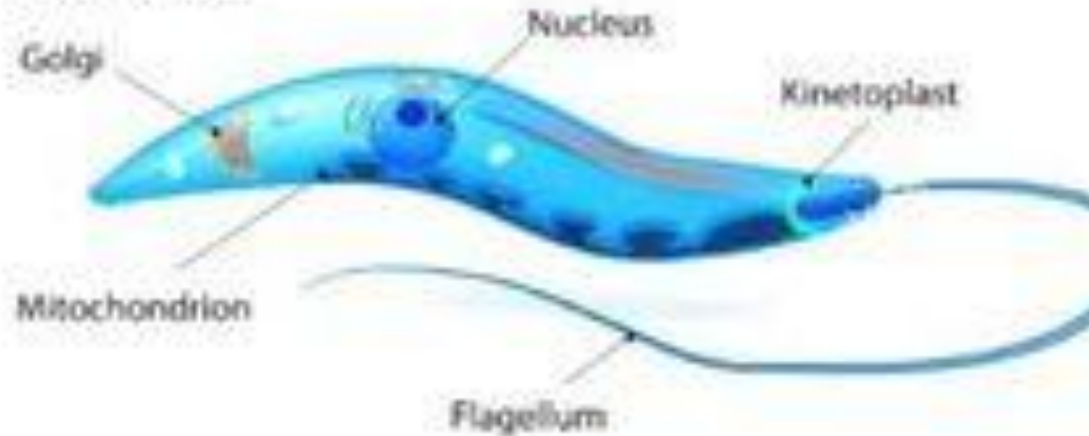
- 1900 – **Sir William Leishman** discovered *L. donovani* in spleen smears of a soldier who died of fever at **Dum-Dum**, India. The disease was known locally as Dum-Dum fever or kala-azar.



INTERODUCTION

Leishmaniasis affects some of the poorest people in the world. It is found in parts of Asia, Africa, the Americas and southern Europe. The disease is caused by the protozoan parasite Leishmania and is transmitted to humans through the bite of infected plebotomine sandflies.

Promastigote form



Amastigote form



Leishmaniasis is Neglected Disease

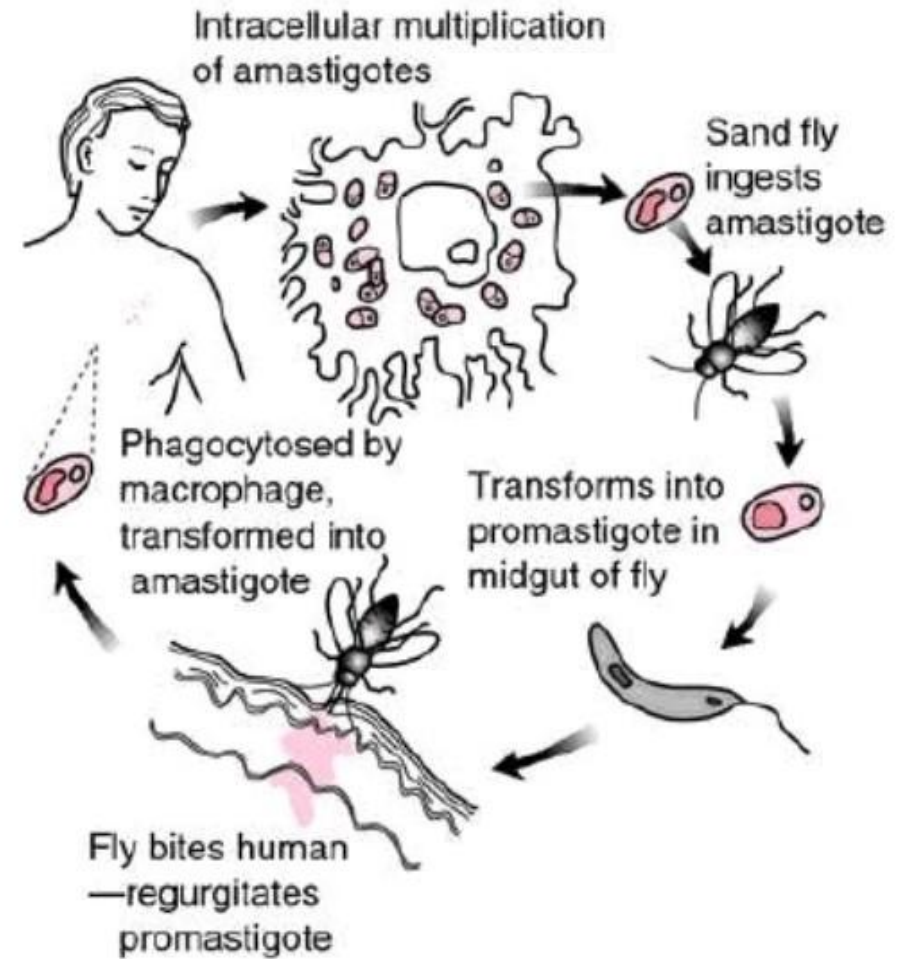
- Leishmaniasis is a globally important but neglected disease, affecting approximately two million people every year. For most people, infection results in a slow-to-heal skin ulcer. In others, however, the parasite targets the liver, spleen and bone marrow, leading to over 70,000 deaths annually.

The Parasite

- **Phylum** **Sarcomastigophora**
- **Order** **Kinetoplastida**
- **Family** **Trypanosomatidae**
- **Genus** **Leishmania**

Morphology and Life Cycle

- Amastigotes measure 2-3 micrometers, with a large nucleus and Kinetoplast.
- Amastigotes mainly live within cells of the RE system, but have been found in nearly every tissue and fluid of the body.



Life cycle

- The organism is transmitted by the bite of several species of blood-feeding **sand flies** (Phlebotomus) which carries the Promastigote in the anterior gut and pharynx. It gains access to mononuclear phagocytes where it transform into Amastigote and divides until the infected cell ruptures.

Morphology

- **Promastigote**

- **Amastigote**

Flagella

Kinetoplast

Golgi

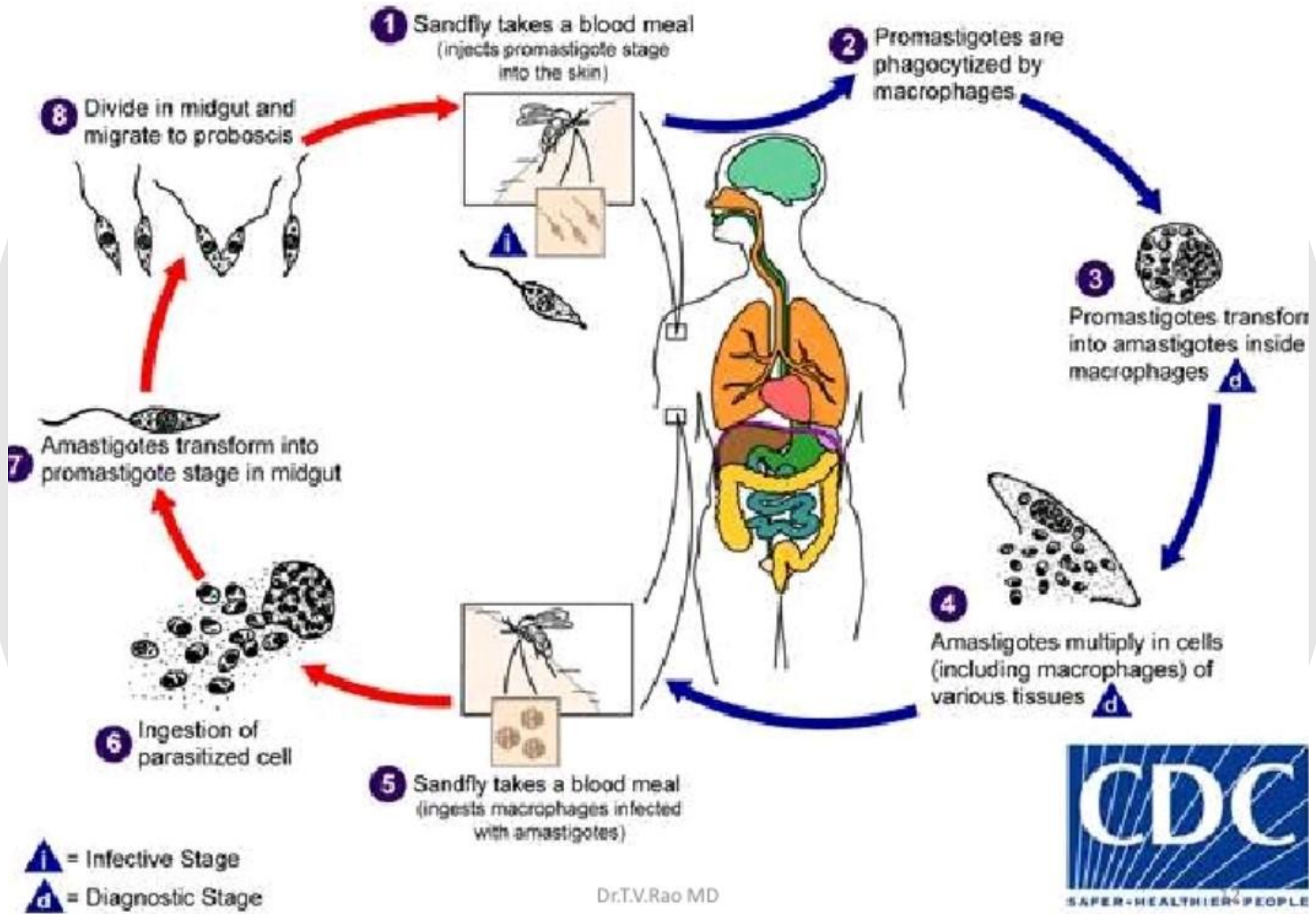
Nucleus

Sand fly- Vector



Primary stages

Human stages



Dr.T.V.Rao MD

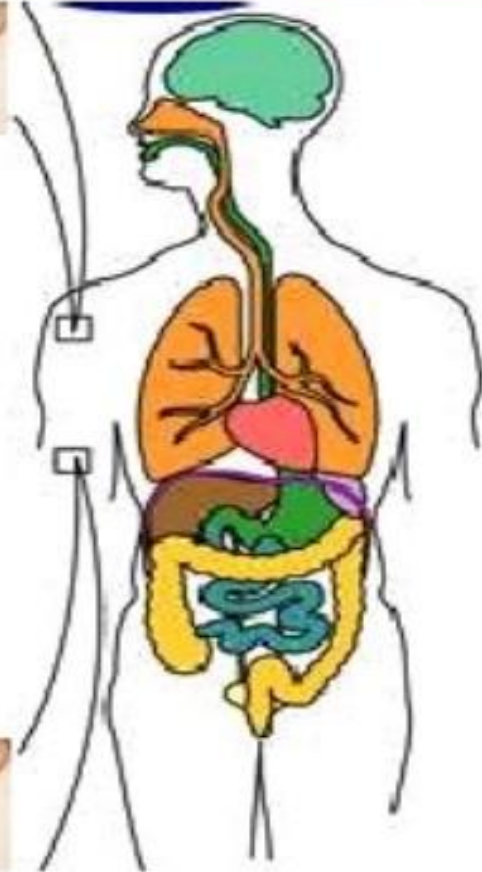
What is Kala-Azar

- Kala-azar means dark pigmentation which is characteristic of cases of visceral leishmaniasis. It is caused by Leishmania donovani bodies and may be present either in endemic, epidemic or sporadic forms. It is widely prevalent in India in epidemic form in states of **Bihar, Assam and Bengal**. Kala azar found in **East and North Africa** is a disease of young children and young adults, being more common in males as compared to females.

1- Sand-fly bites animal and ingests blood infected with



2- Sandfly bites human and injects *Leishmania* into skin



3- Another sandfly bites human and ingests blood infected with *Leishmania*

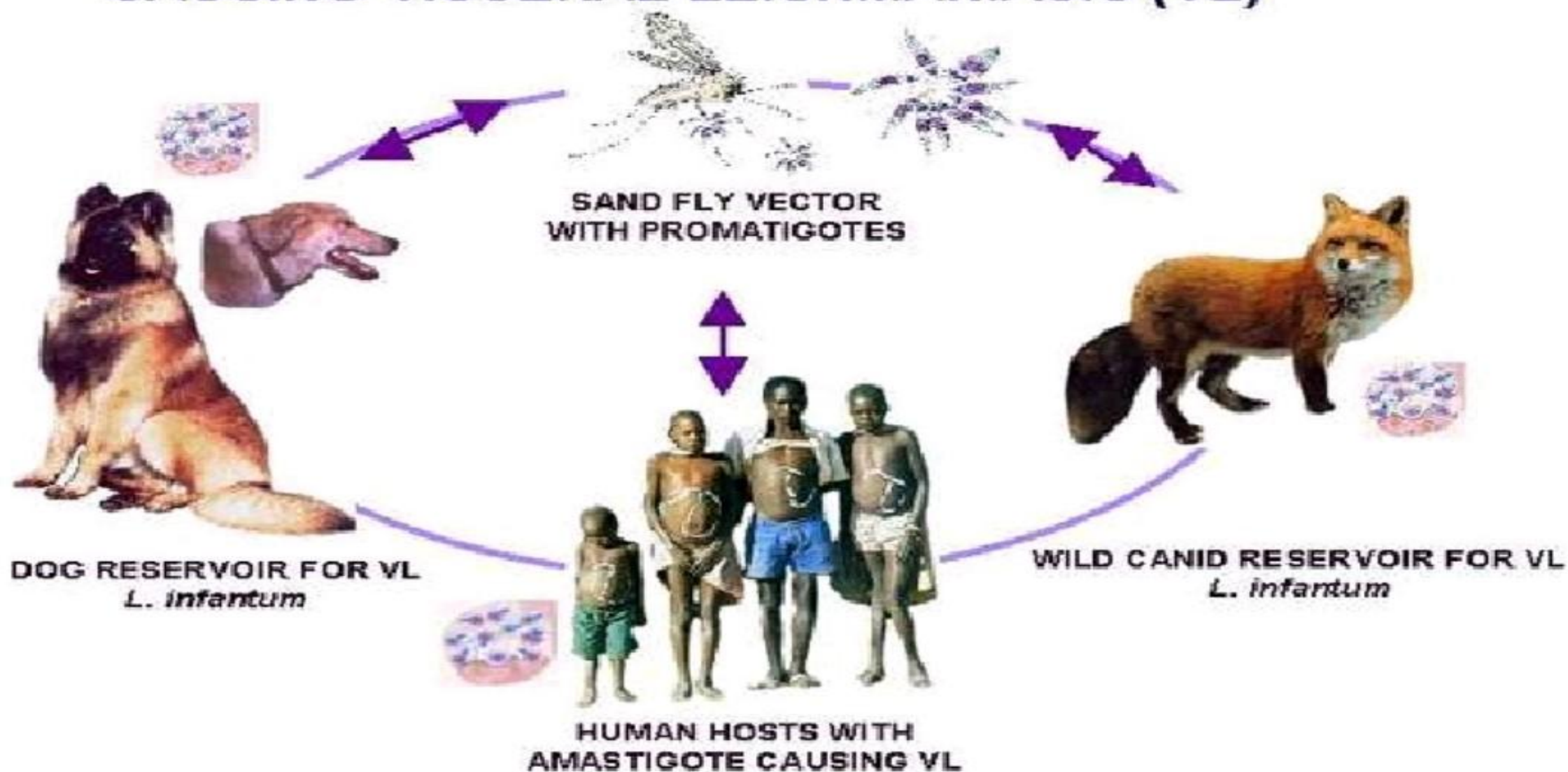
4- Cycle continues when sandfly bites another human or animal reservoir



Clinical types of cutaneous leishmaniasis

- **Leishmania major:** Zoonotic cutaneous leishmaniasis: wet lesions with severe reaction
 - ***Leishmania tropica:*** Anthropologic cutaneous leishmaniasis: Dry lesions with minimal ulceration
- Oriental sore** (most common) classical self-limited ulcer

LIFE CYCLE OF *LEISHMANIA* CAUSING VISCERAL LEISHMANIASIS (VL)

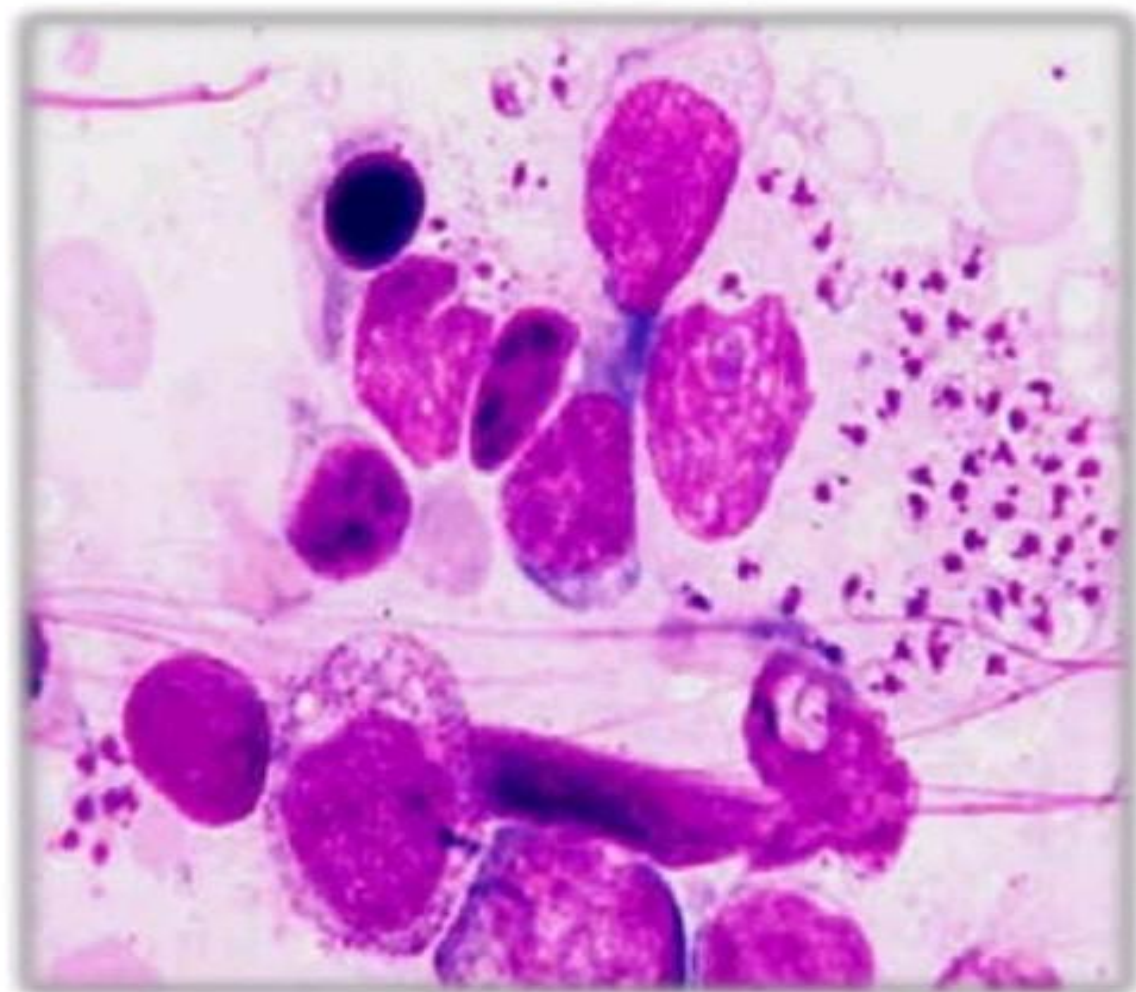


Pathogenesis

- Infections range from asymptomatic to progressive, fully developed kala-azar.
- Incubation period is usually 2 – 4 months.
- Symptoms – Begins with low-grade fever and malaise, followed by progressive wasting, anemia, and protrusion of the abdomen from enlarged liver and spleen.
- Fatal after 2 – 3 years if not treated.
- In acute cases with chills, fevers up to 104 degrees Fahrenheit, and vomiting; death may occur within 6 – 12 months.
- Immediate cause of death is usually an invasion of a secondary pathogen that the body is unable to combat.

L. donovani bodies

- L. donovani bodies may be demonstrated in buffy coat preparations of blood and bone marrow aspirate. Aspirates taken from enlarged lymph nodes show parasites in 60 percent of cases.



Visceral leishmaniasis

Diagnosis

(1) Parasitological diagnosis: METHOD

Bone marrow aspirate

Splenic aspirate

Lymph node

Tissue biopsy

1. microscopy

2. culture in NNN medium

Kala-azar prevention:

- In endemic areas with zoonotic transmission, infected or stray dogs should be destroyed.
- In areas with anthroponotic transmission, early diagnosis & treatment of human infections, to reduce the reservoir & control epidemics of VL, is extremely important.
- Serology is useful for screening of suspected cases in the field.
- No vaccine is currently available .

Treatment:

- Pentavalent antimony (Pentostam)
- Amphotericin B

Treatment of complications:

- Anemia
- Bleeding
- Infections etc.

Thank you!

