BLOOD & TISSUE FLAGELLATES/ HAEMOFLAGELLATES lab5

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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.

Trypanosoma sp.

- ***Trypanosoma gambiense***

- cause: West African sleeping sickness

- ***Trypanosoma rhodesiense***

- cause: East African sleeping sickness

- ***Trypanosoma cruzi***

- cause: American trypanosomiasis or 'Chagas' disease.



Tsetse fly (*Glossina palpalis*)

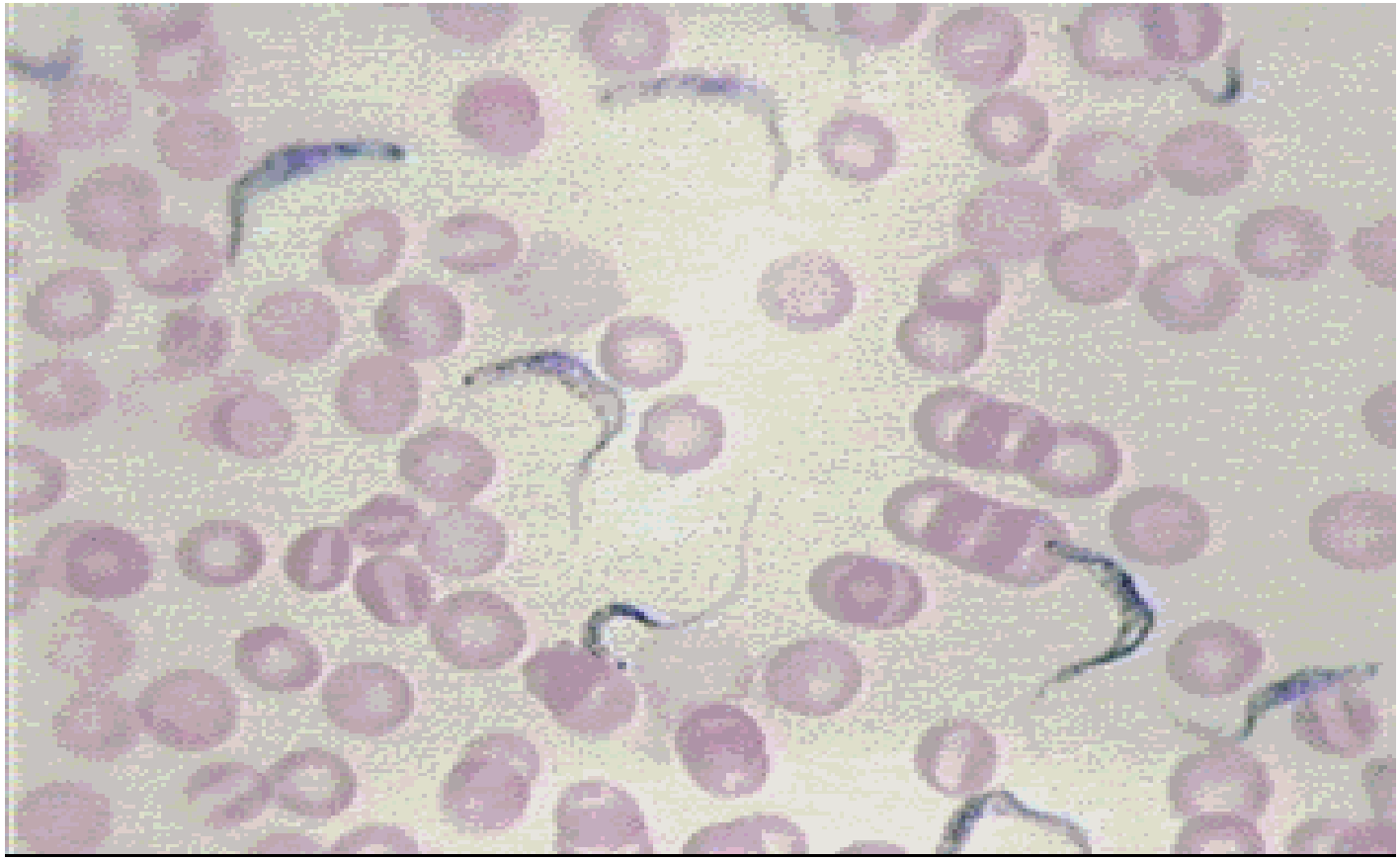
Trypanosoma gambiense

- Cause West African sleeping sickness.
- "tsetse fly belt" is a large area of Africa that has reported cases of African sleeping sickness.
- Vector/ intermediate host: *Glossina* (tsetse) fly.

West African (West African sleeping sickness) sleeping sickness

- Also known as Gambian trypanosomiasis.
- Can be found in the wet lowlands and rainforest of west and central Africa where the tsetse breed in the moist areas around riverbanks.
- Chronic course- ends with central nervous involvement and death after several years of durations.

T. gambiense

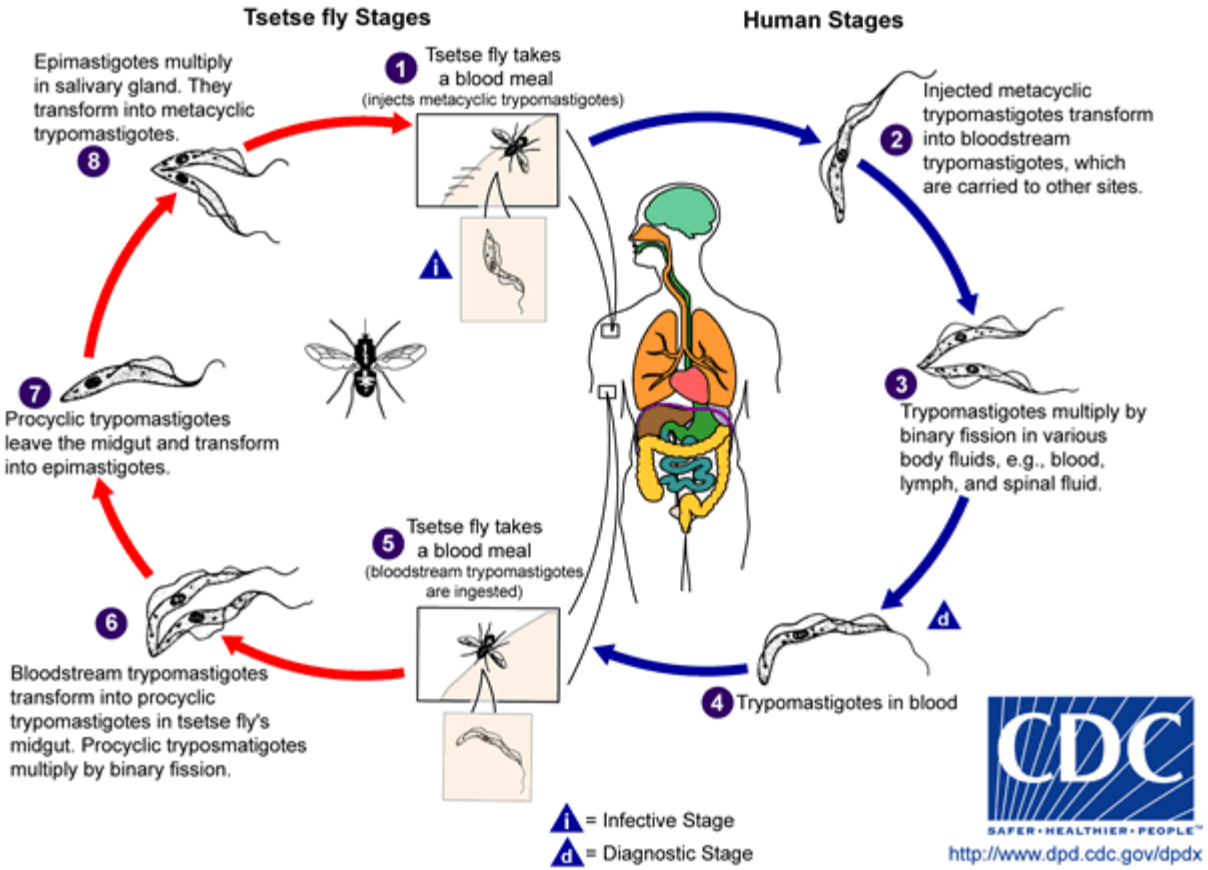


Trypanosoma rhodesiense

- Course of East African sleeping sickness
- 1st isolated from a patient in Rhodesia
- Clinical presentation- more fulminant course and severe symptoms
- The incidence is far less than Gambian disease but if left untreated – death will ensure within several weeks to months rather than years.



Life cycle of *T.sp.*



Diagnosis

- By demonstration of trypanosomes in

- Chancre fluid , blood , tissue fluid aspirated from enlarged lymph nodes , bone marrow biopsy.

- Microscopic examination(wet preparation should be examined for the motile trypanosomes.

- A smear should be fixed , stained with Giemsa.

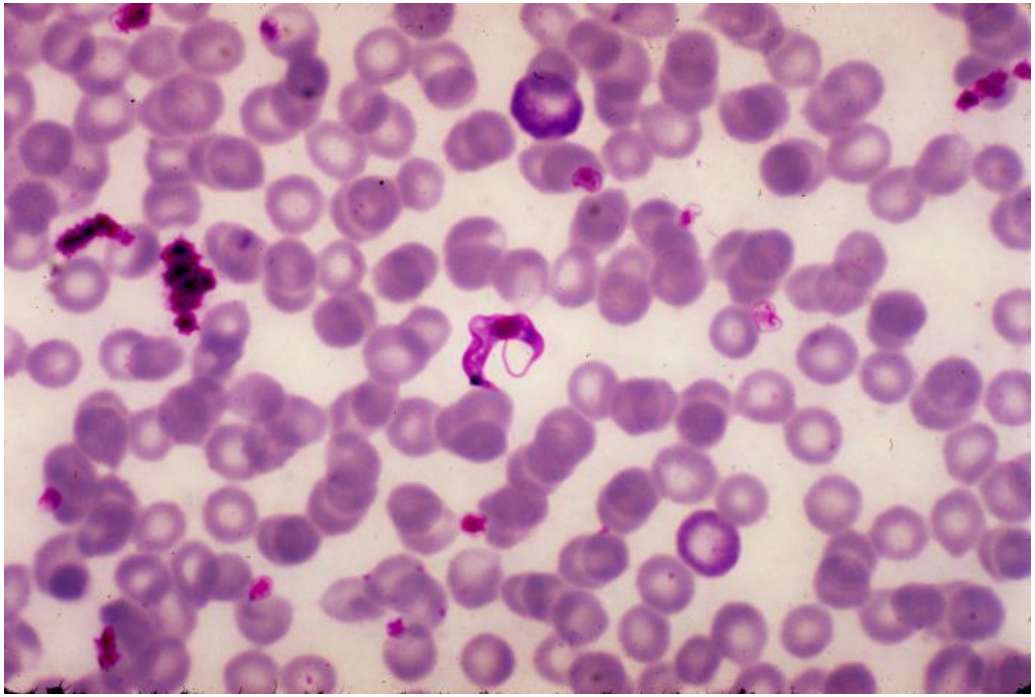
- Concentration technique – centrifugation
- Serologic technique – antibody detection

Trypanosoma cruzi

- **Cause of American type trypanosomiasis/ Chagaś disease.**
- **Chagas disease: named for the Brazilian medical student, Carlos Chagas – who has discovered the parasite in 1909.**
- **Has an intracellular amastigote stage that develops in cardiac, brain and visceral tissues.**
- **Also has trypomastigotes in the peripheral circulation.**

- **The parasite has (C ,U) or S-shaped**
- **12-30μ in length , central nucleus , large round kinetoplast or ovoid in shape sub-terminal in situation.**
- **Trypomastigotes are the only stage found in the blood of an infected person.**
- **Intracellular phase it is typical amastigote about(1.5-5μ) in diameter with large nucleus and deeply staining rod like or spherical kinetoplast.**
- **The epimastigote stage is not seen in humans but can be found in the midgut of triatomes that have ingested trypomastigotes from an infected host.**

Trypanosoma cruzi



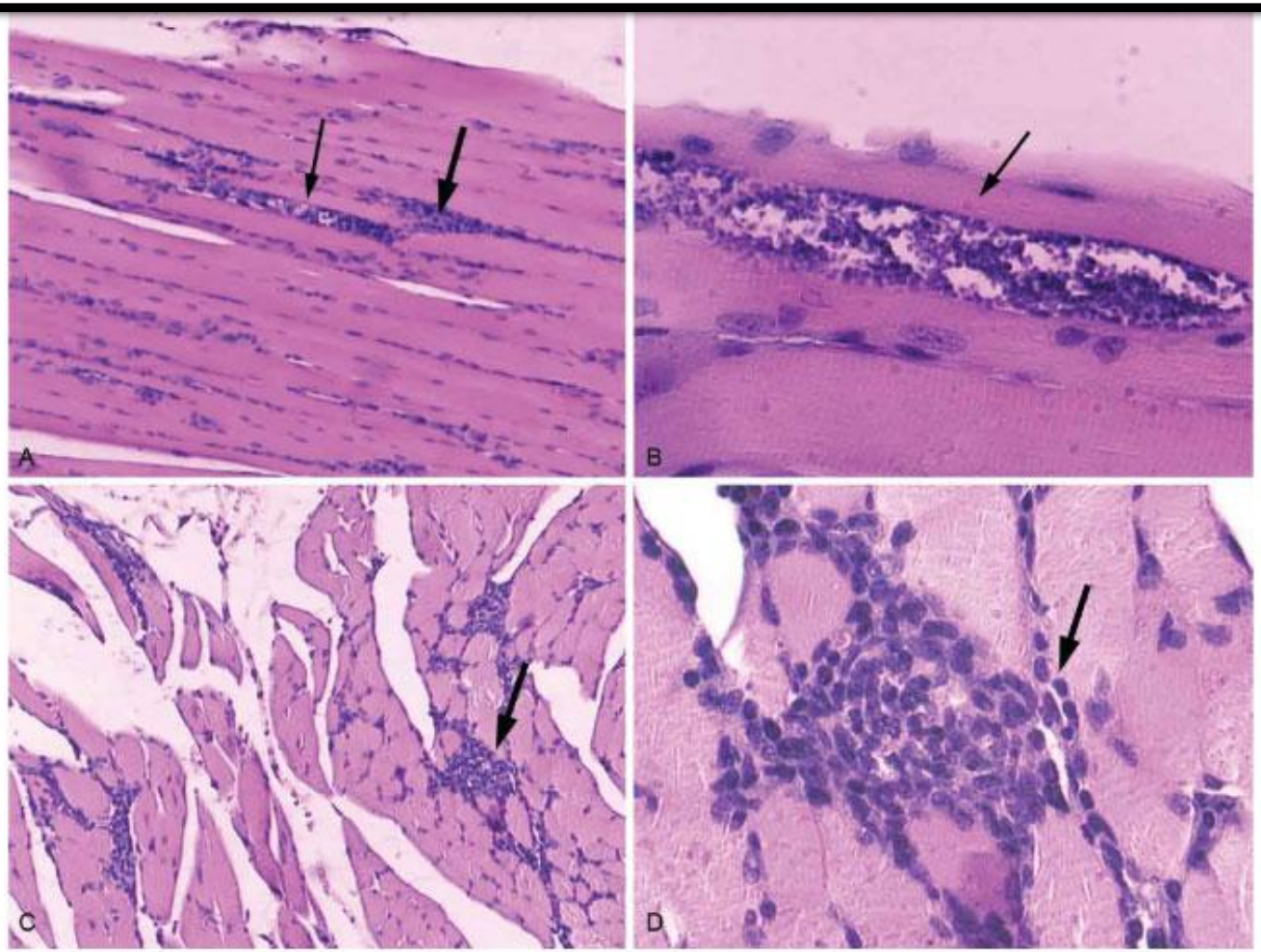
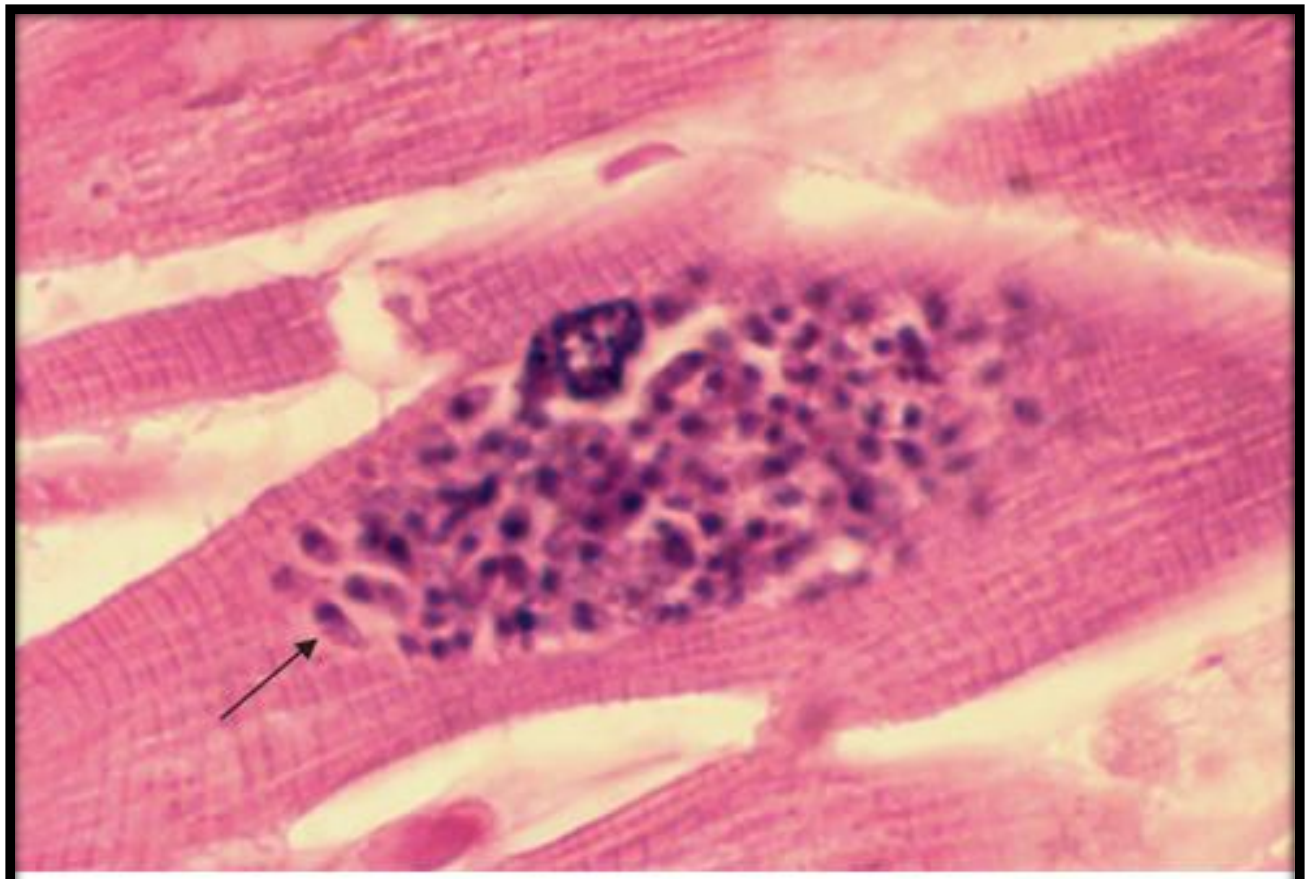
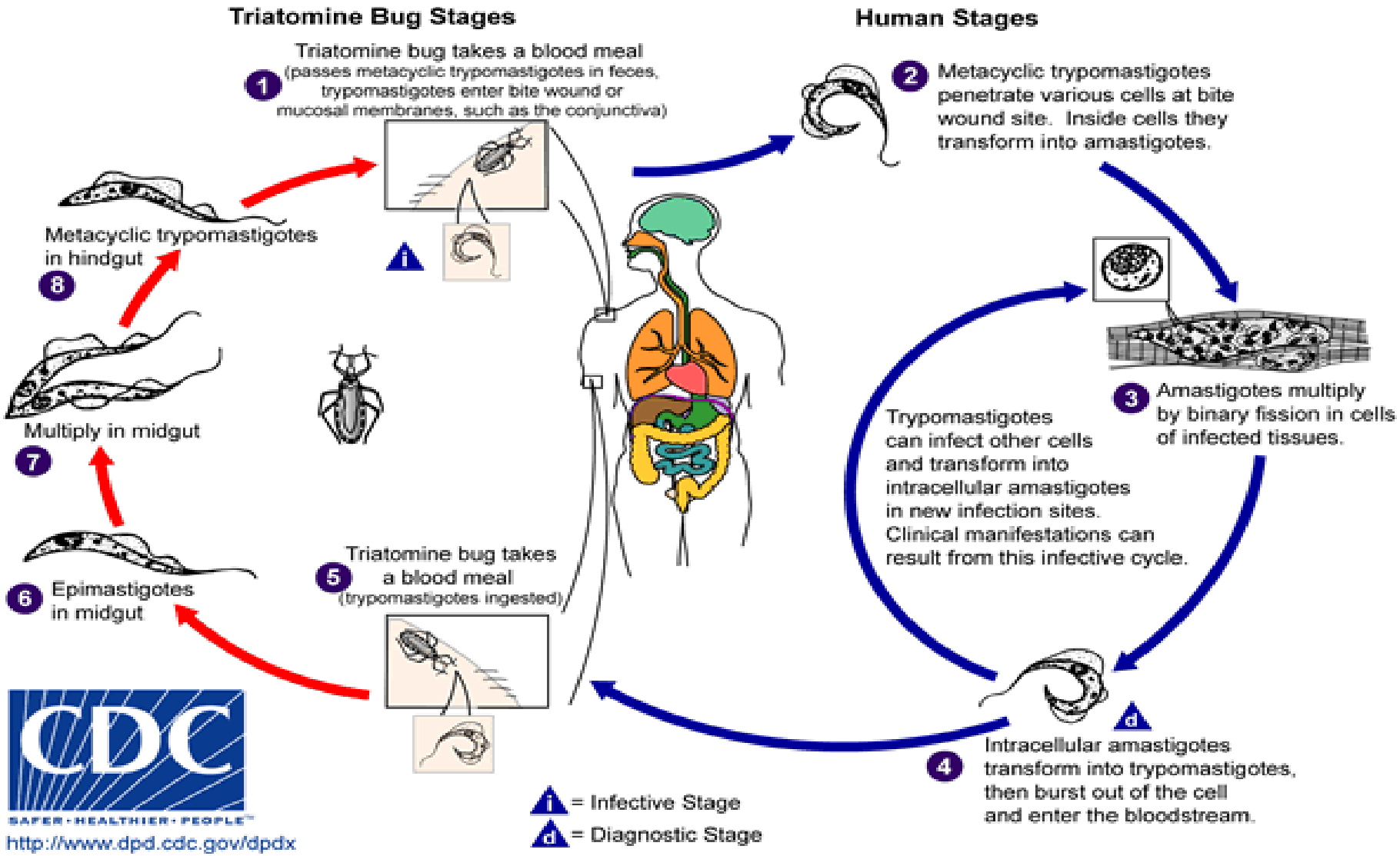


Fig. 5: histological sections of skeletal muscles. A, B: control groups show nests of amastigotes (thin arrows) and mononuclear cells infiltration (thick arrow); C, D: representative sections from mice vaccinated with L-EPI of *T. rangeli* SC-58 strain. Infected mice show focal mononuclear cell infiltrates (thick arrows). No amastigote nest was observed (A, C: 100X; B, D: 400X).



Source: Warren Levinson: Review of Medical Microbiology and Immunology, 14th Edition, www.accessmedicine.com
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Life cycle of *T. cruzi*



Trypanosoma cruzi vector

- **Triatomine bug (*Triatoma infestans*) defecating on the wound after taking a blood meal**



Reduviid bug - triatoma species



Diagnosis

- **Acute phase**
  - **Giemsa stained buffy coat blood smear.**
  - **Biopsy specimen – find trypomastigotes and amastigotes.**
- **Chronic phase**
  - **Xenodiagnosis.**
  - **Culture on NNN media.**
  - **Serology – IHA , IFAT , ELISA .**

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