THE JOINT PATHOLOGY CENTER

The Trojan Dog: Sequestered *Trypanosoma cruzi* in the MWD Reproductive Tract and the Unseen Threat to Readiness

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Disclaimers and Disclosures

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LTC Anna-Maria Travis, DVM, MPA, DACVP has no conflicts to report.

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- Slide 10: Heart: Lymphoplasmacytic myocarditis, H&E stain, 40x objective. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
- Slide 11: Testis: Mixed inflammation effacing seminiferous tubules, H&E stain, 4x objective. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
- Slide 12, large photo: Intracellular amastigotes (arrows) in a seminiferous tubule, H&E stain, 40x objective. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
- Slide 12, inset: Unaffected seminiferous tubule, H&E stain, 40x objective. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
- Slide 13: Kinetoplast visible in amastigotes, H&E stain, 100x objective. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
- Slide 14, left photo: Intracellular amastigotes, TEM. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
- Slide 14, right photo: Prominent kinetoplast, TEM. VIRIN: N/A. LTC. Anna-Maria Travis / DoW. Public Domain. Original Histologic Image.
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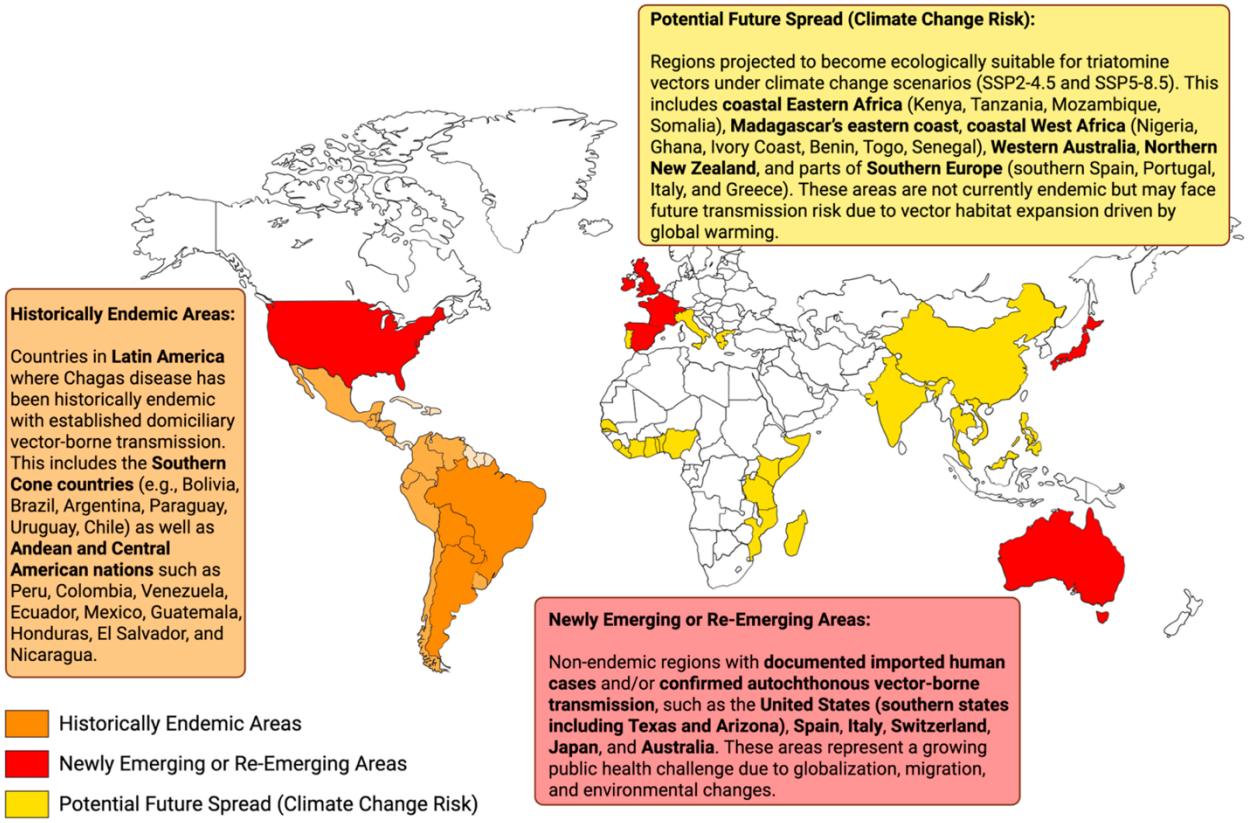
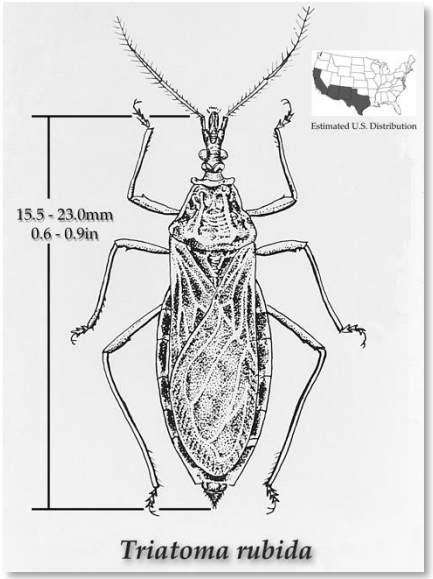
The Human Threat & Global Prevalence

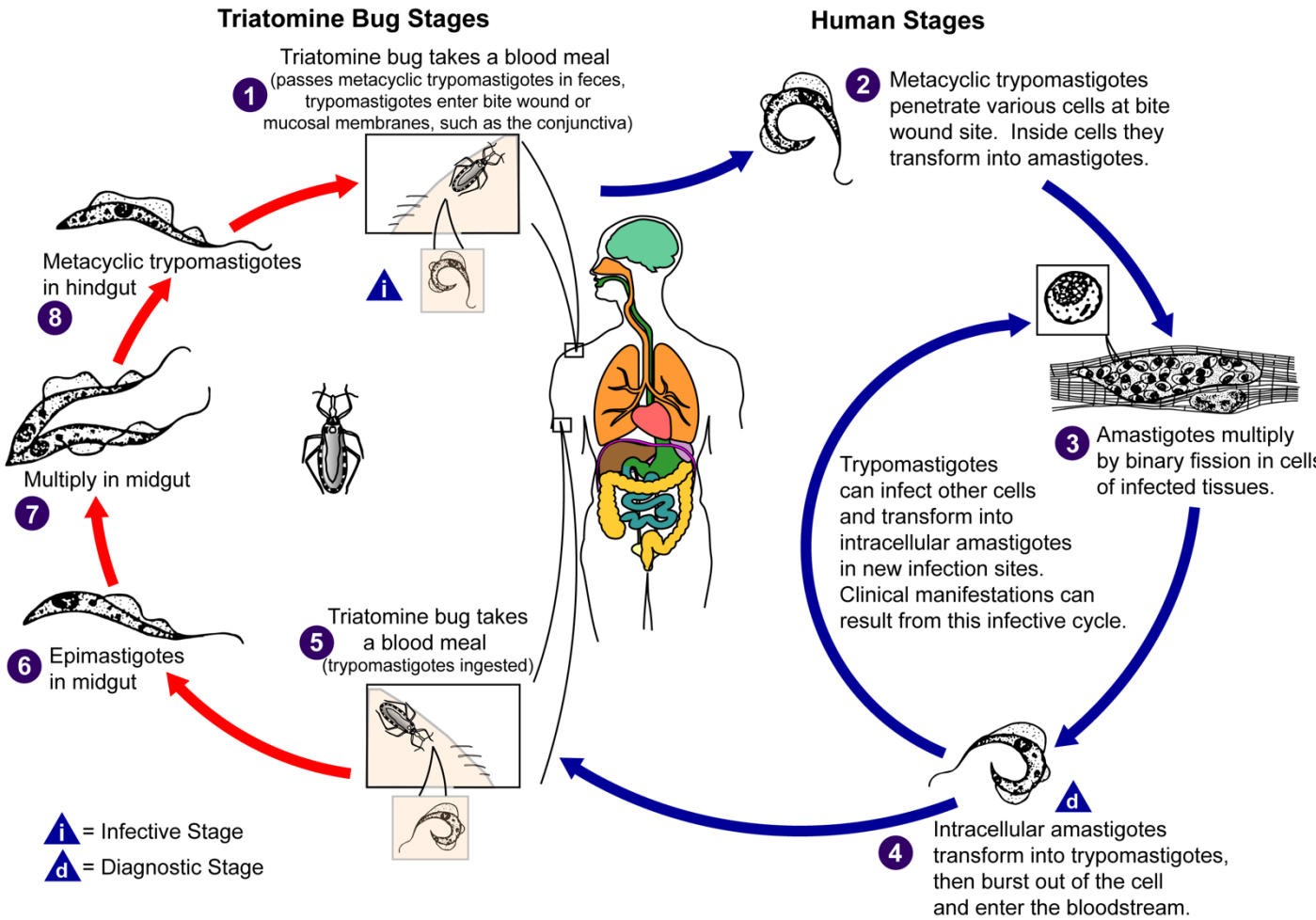


- **Ancient Pathogen:** *T. cruzi* DNA identified in 9,000-year-old Chilean and Peruvian mummies
- 100-year history of clinical recognition in **Latin America**
- Shift to **global/urban spread** (44 countries)
- 2025 Data: **38.9% prevalence** in U.S. Working Dogs

Vector Ecology & The Life Cycle

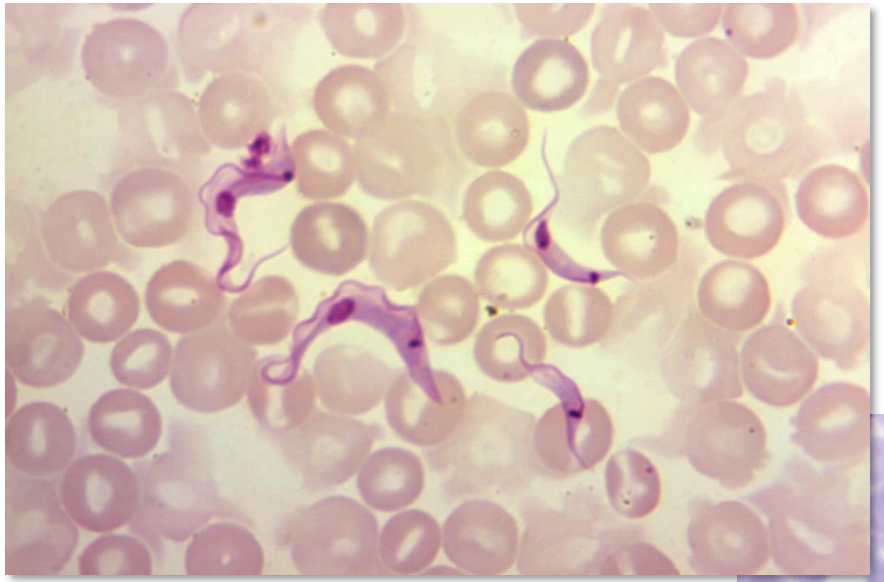
- Reduviidae/Triatomine (“**kissing bug**”) habitat (crevices, rocks) and nocturnal feeding
- **Epimastigote:** Replicating stage in the vector
- **Trypomastigote:** (“Boring whip”) Motile, infectious bloodstream stage
- **Amastigote:** (“Without a whip”) Intracellular multiplying stage

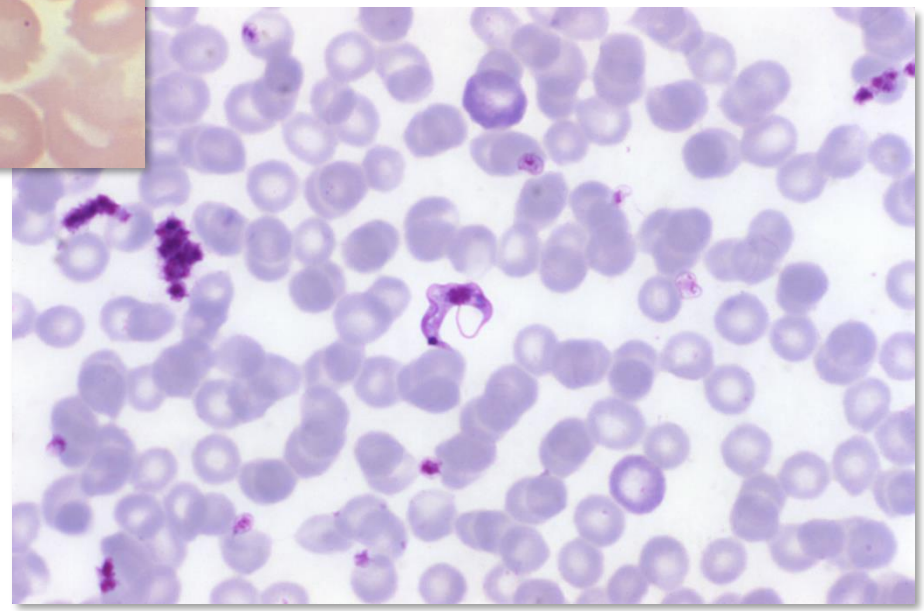




Clinical Presentation & Standard Diagnostics

- **Acute Phase:**
  Trypomastigotes in blood =
  Fever, lethargy / positive PCR
- **Chronic Phase:**
  Amastigotes sequestered in tissues = Heart failure, sudden death / negative PCR
- **Diagnostics:**
  IFA/ELISA vs. blood PCR



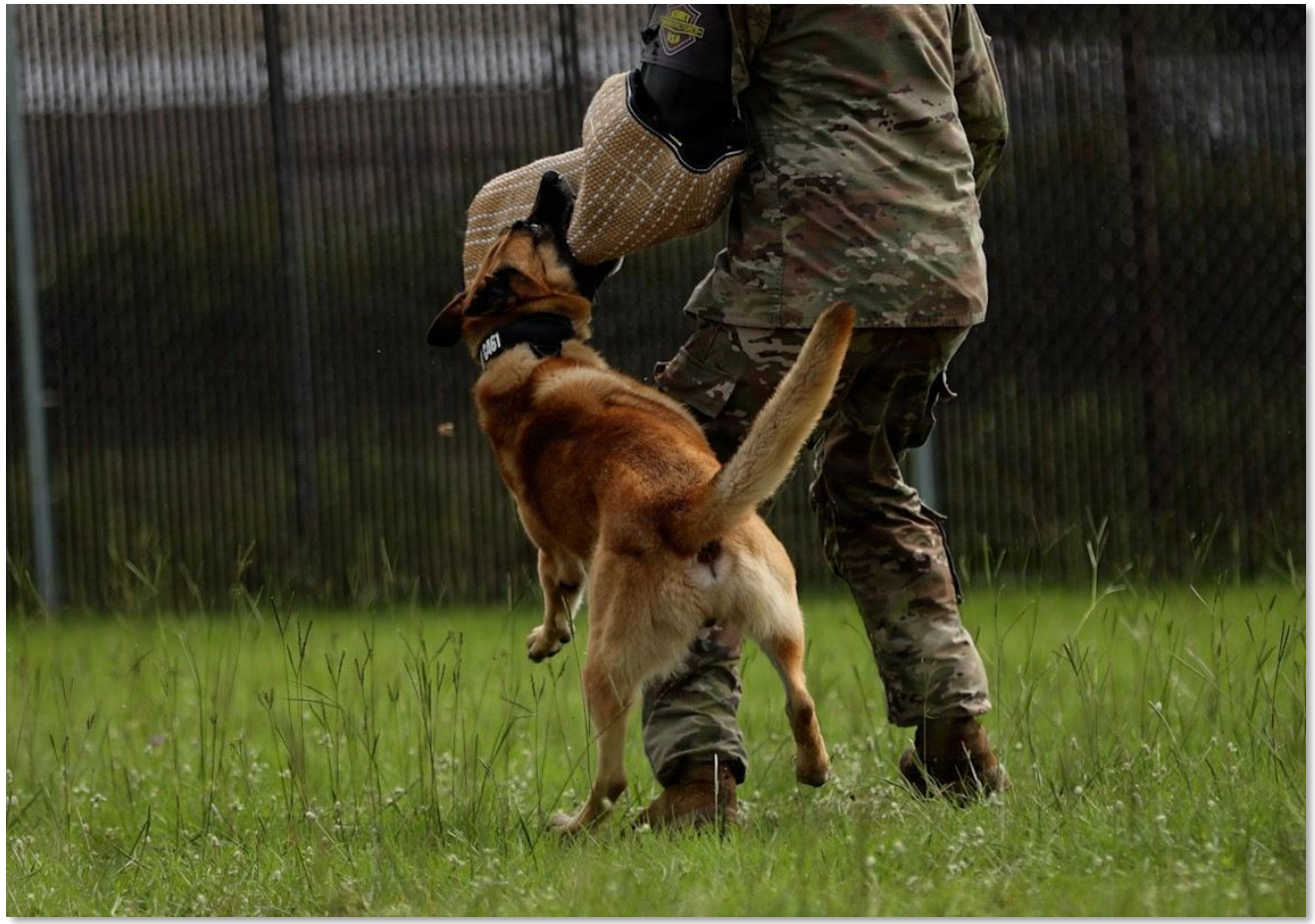


Sentinels, Treatment & Prevention

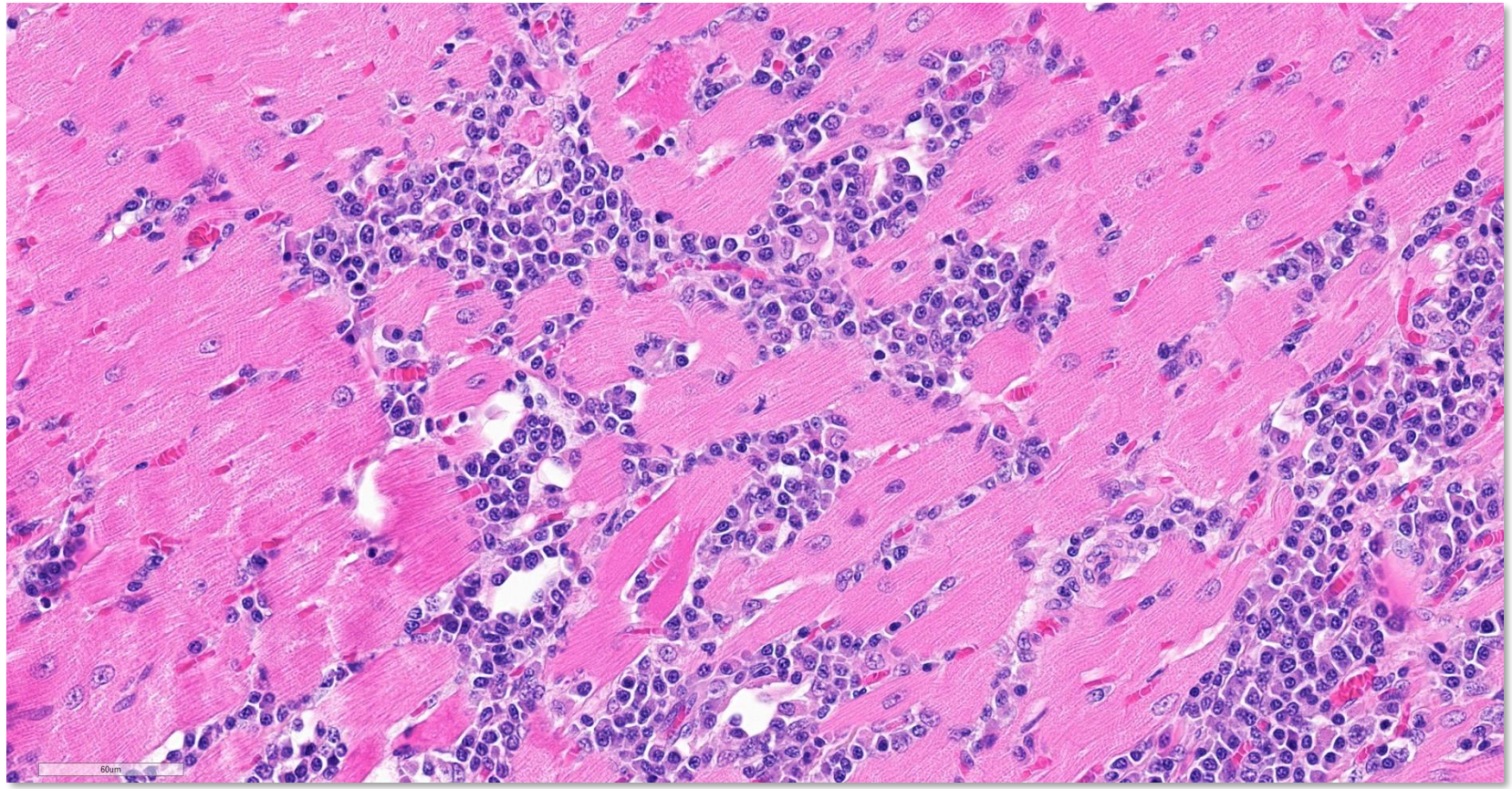
- MWDs as One Health **sentinels**
- **Treatment limits** (Benznidazole)
- **Prevention:** Environmental vector control and kennel security

Two Cases – Signalment & History

- MWD Zasti, 1.5yo M
  Belgian Malinois
- MWD Perec, 1.5yo M
  German shepherd dog



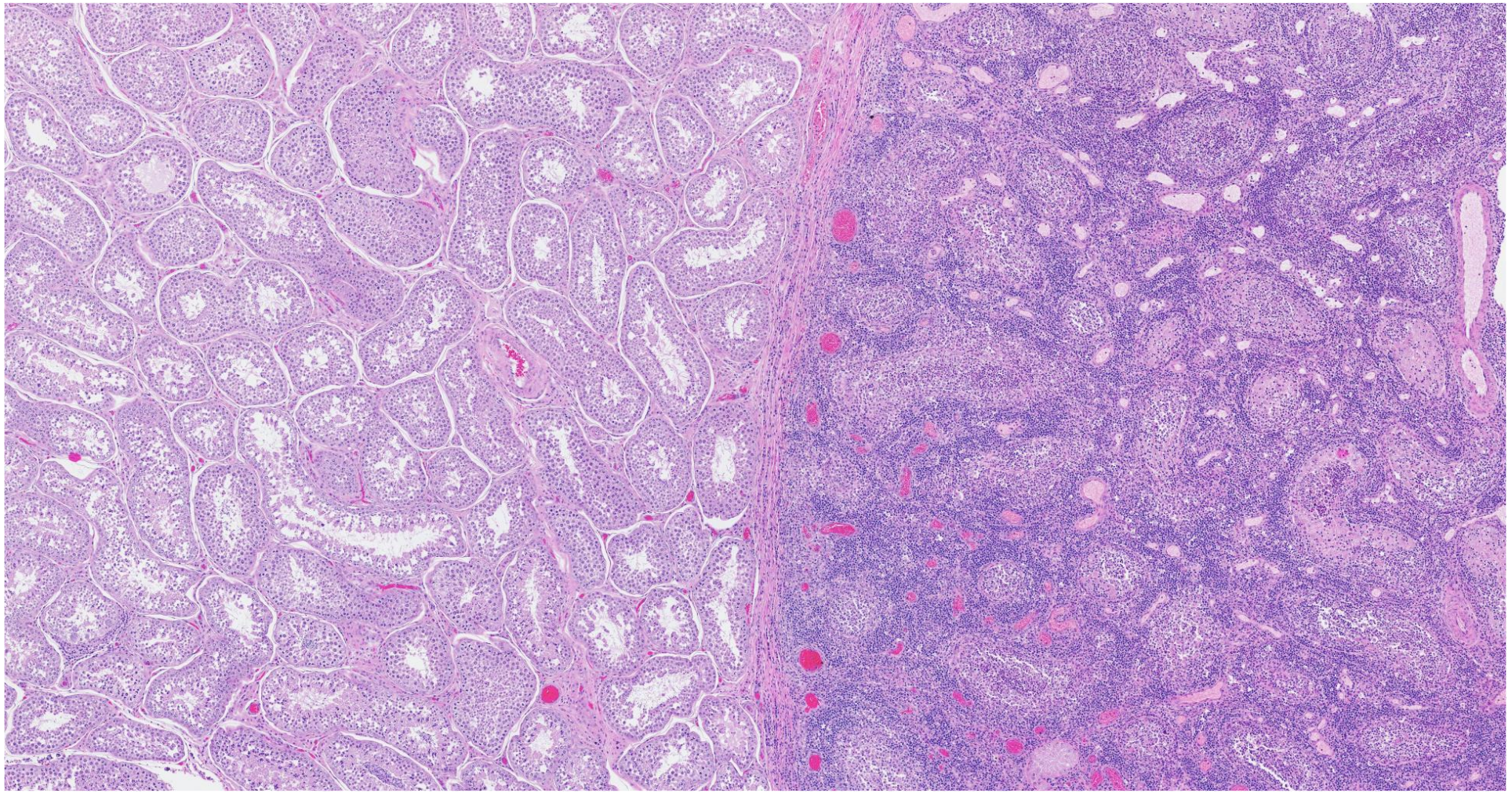
Diagnostics & Typical Lesions (Heart/CNS)



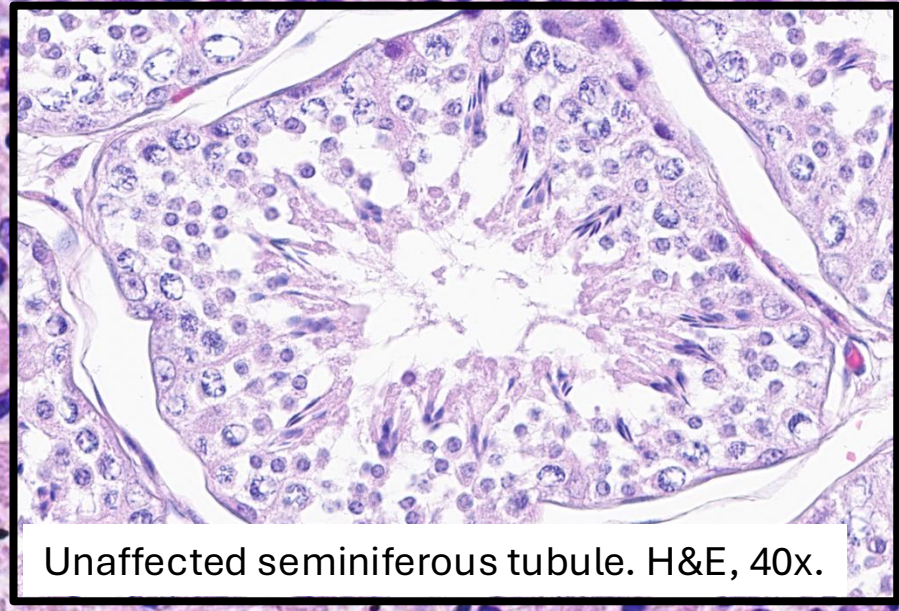
Heart: Lymphoplasmacytic myocarditis. H&E, 40x.

- **The Clinical Paradox:** Discordant lab results vs. identical tissue destruction
- **MWD Zasti (Malinois):** Blood PCR Negative
- **MWD Perec (GSD):** IFA Positive (1:4,096) = Active Antigenic Bombardment

The Seminiferous Surprise (Testicular Lesions)

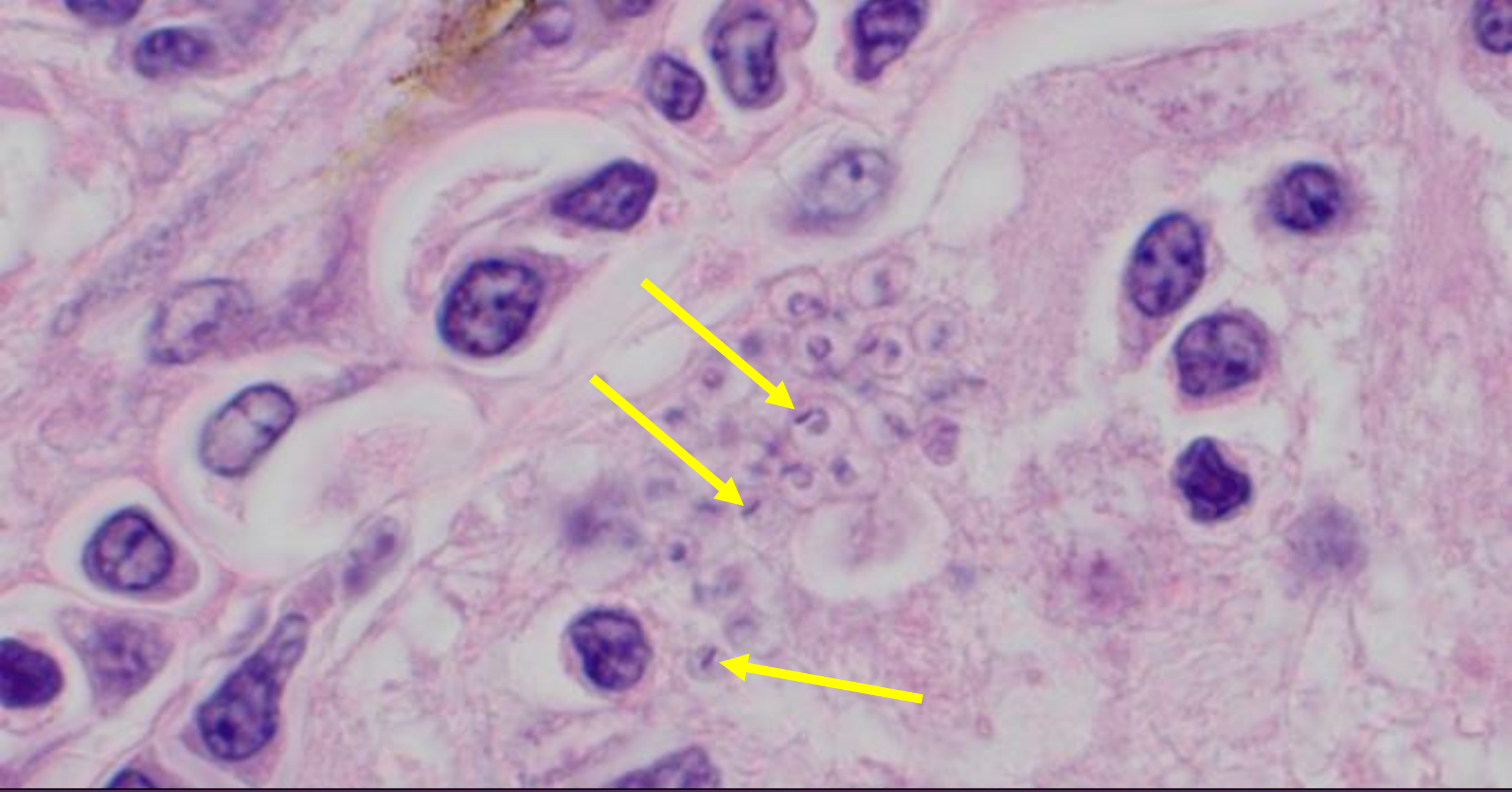


Testis: Mixed inflammation effacing seminiferous tubules. H&E, 4x.

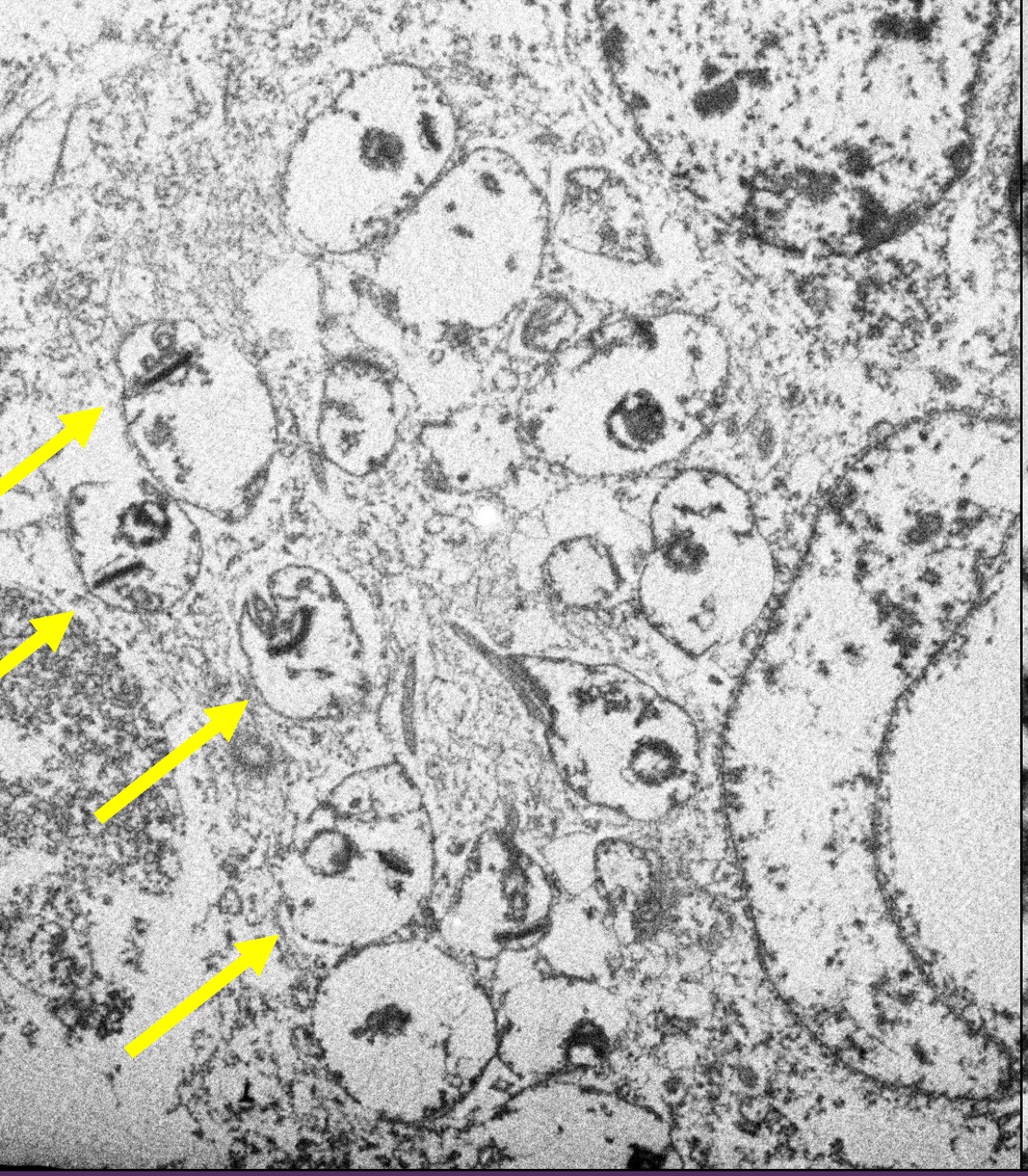


Unaffected seminiferous tubule. H&E, 40x.

Intracellular amastigotes (arrows) in a seminiferous tubule. H&E, 40x.



Kinetoplast visible in amastigotes. H&E, 100x (oil).

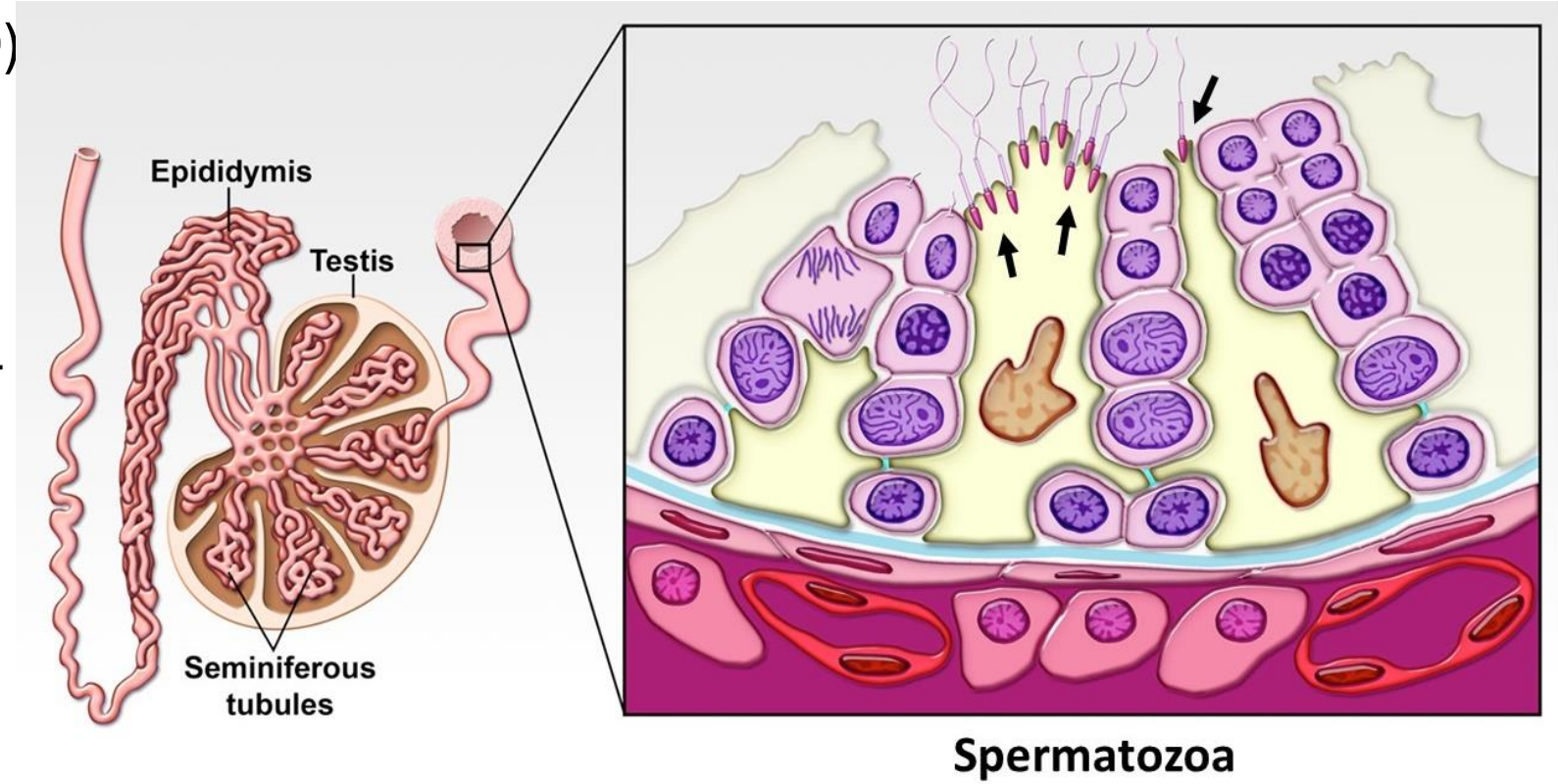


Intracellular amastigotes, TEM.

Prominent kinetoplast (star), TEM.

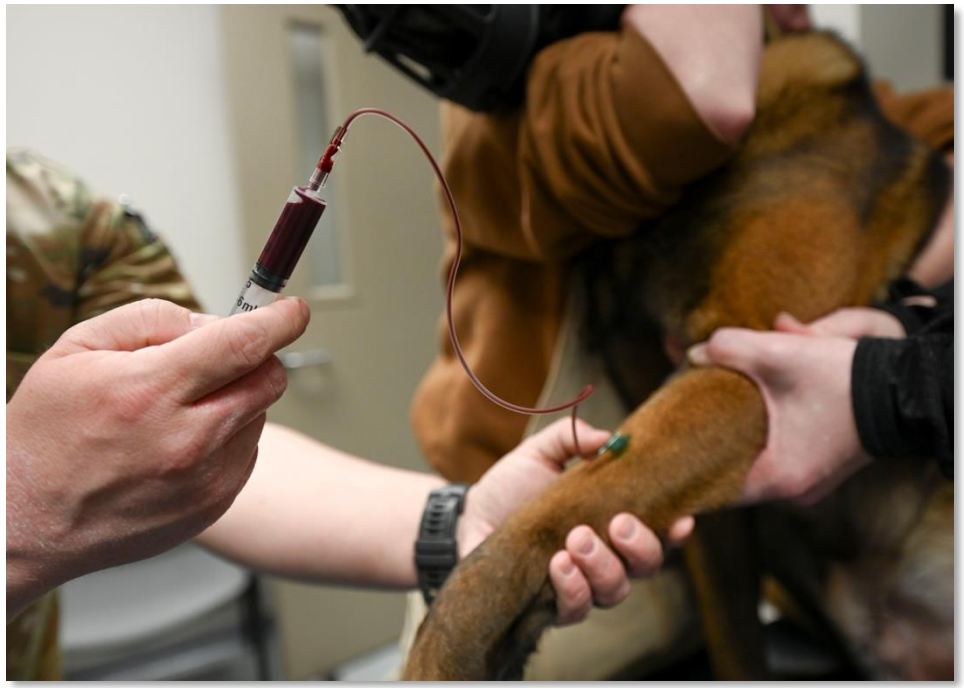
Literature Review- *T. cruzi* in Reproductive Organs

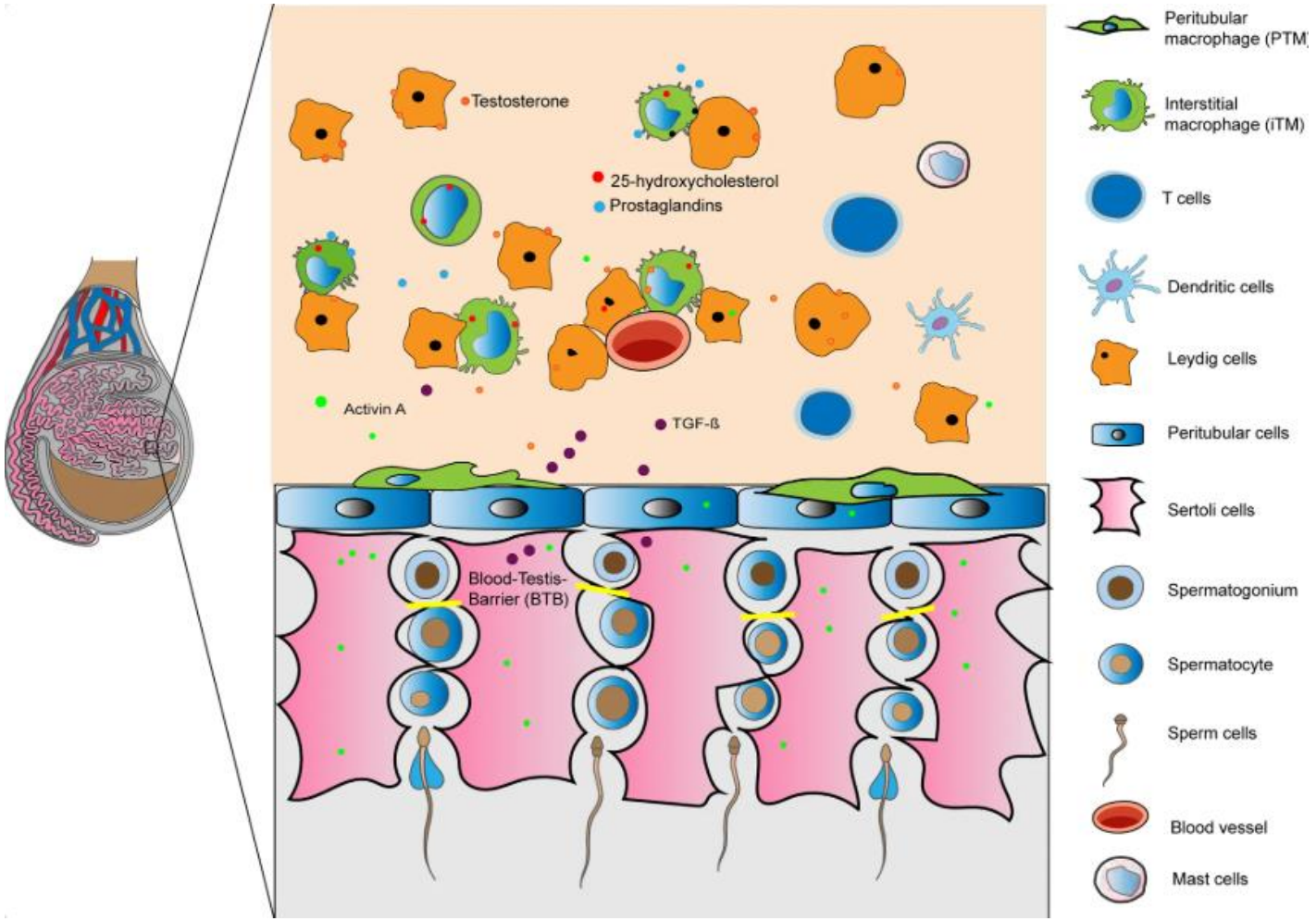
- Historical models (**Chagas 1909**)
- **Mouse models:** Targets myoid cells, sustentacular (Sertoli) cells, and spermatozoa
- **Dual Threat:** Transmission risk + direct fertility impacts
- Impacts on **female fertility** (abortions, neonatal death)



Implication 1 – Diagnostics & Immune Privilege

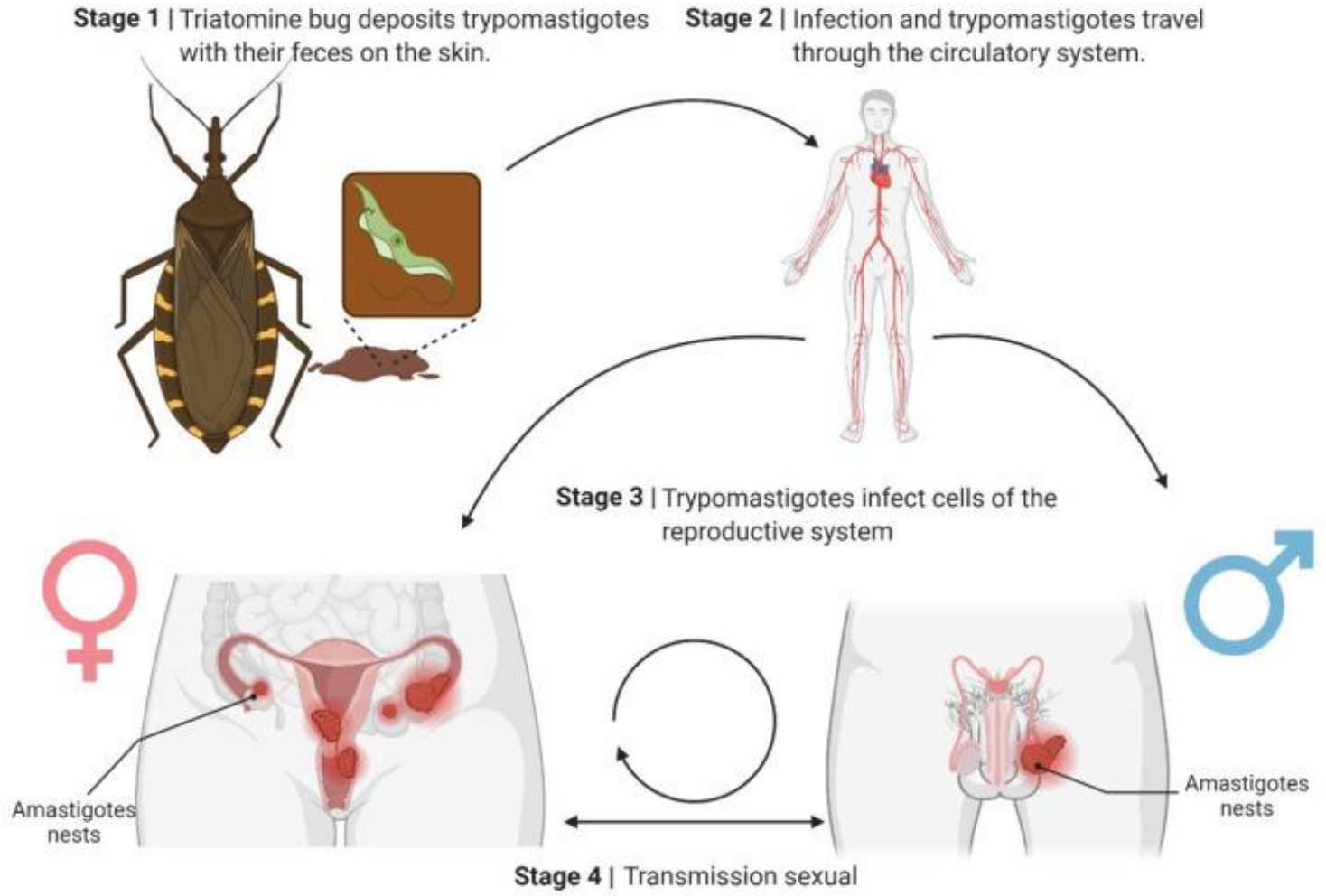
- The testis as an **immunoprivileged site**
- **False-negative** blood PCRs





Implication 2 – Sexual Transmission Risk & Breeding Programs

- **Male-to-female transmission** proven in models
- Risk to **artificial insemination**
- **Multi-generational Threat:** Disease in breeding females and surviving puppies
- **Delayed Manifestation:** Puppies may appear healthy until later in life
- **Compounding Diagnostic Failure:** Sequestered infections evade standard screening



Implication 3 – Global Spread

- **Bypassing the vector**
- **Global mobility**
- Call for a **retrospective study**

Conclusions & The One Health Imperative

- **The Trojan Horse:** Sequestered infections turn healthy-appearing assets into hidden reservoirs
- **Breeding & Globalization:** Sexual transmission threatens the MWD pipeline and bypasses vector control
- **The One Health Sentinel:** Undetected canine infections leave Warfighters exposed to unmitigated vector threats

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Still awake?