Trypanosoma brucei

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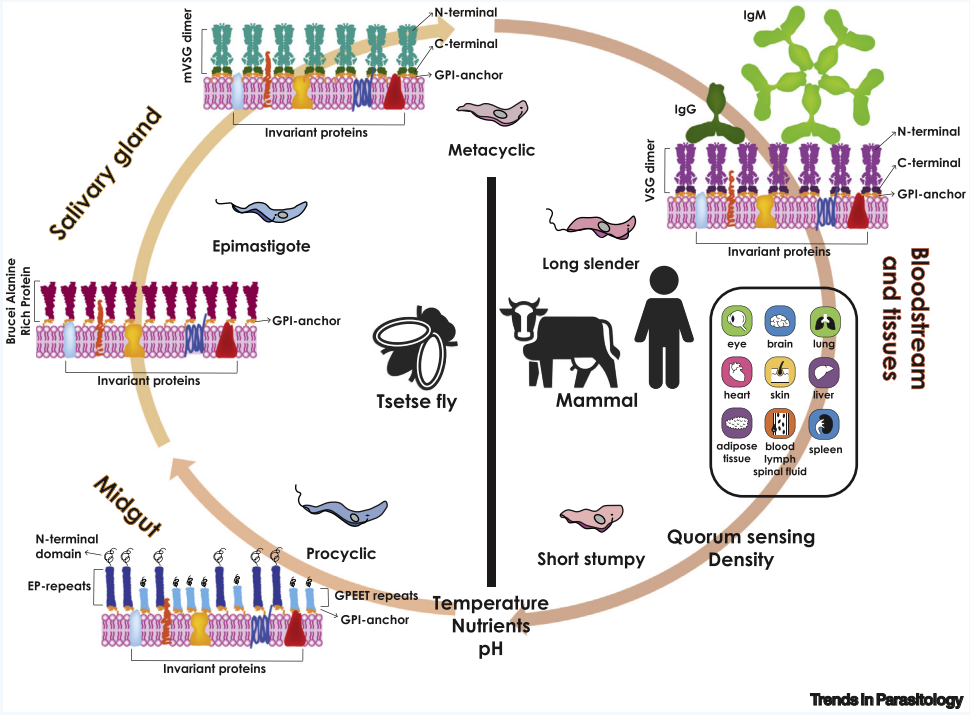
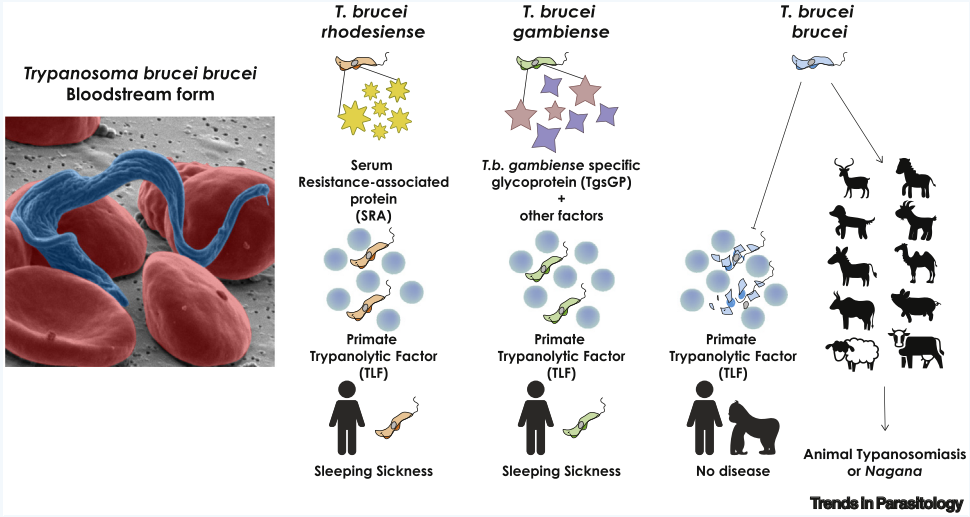


Trypanosoma brucei causes African trypanosomiasis in humans and nagana in domestic animals. This vector-borne parasite, transmitted by the tsetse fly, affects rural areas in sub-Saharan Africa. When injected by the fly, metacyclic-form parasites are introduced into the host dermis and then disseminate into the bloodstream as replicative long slender forms. Throughout its life cycle, *T. brucei* is entirely extracellular. To evade host antibody recognition, the parasite uses antigenic variation: it periodically changes a dense coat of only one kind of variant surface glycoprotein (VSG), drawing from a genomic repertoire of about 2000 VSG-encoding genes. Using quorum sensing mechanisms, slender forms develop into stumpy forms that are preadapted to the insect environment. Once taken up by the fly, the parasite replaces its VSG coat with procyclins and progresses through procyclic and epimastigote stages. Finally, the parasites become VSG-expressing metacyclic trypomastigotes.



KEY FACTS:

T. brucei possesses a unique organelle, the kinetoplast: a network of circular DNA inside a single mitochondrion.

The 35 Mb diploid genome contains three types of chromosome: megabase, intermediate, and minichromosomes.

The 11 megabase chromosomes contain the majority of transcriptionally active genes arranged in polycistronic units, as well as subtelomeric arrays of silent VSG genes.

Minichromosomes and intermediate chromosomes contain VSG genes and DNA repeats.

T. brucei typically invades tissues, including blood, lymph, bone marrow, skin, brain, eye, and heart.

DISEASE FACTS:

T. brucei is lysed by a primate serum component called trypanosome lytic factor (TLF), rendering it noninfectious to humans. *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense* are resistant to TLF and can infect humans.

Symptoms in the early stage of infection: fever, joint pain, and swollen lymph nodes. In the late stage the central nervous system is affected.

Detection of parasites in body fluids by microscopy is required for diagnosis.

After treatment, patients are monitored for relapse by a periodic check for parasites and leukocyte counts in the cerebrospinal fluid.

Affected populations live in areas with limited access to diagnosis and treatment, but human African trypanosomiasis is on its way to elimination in most endemic countries.

TAXONOMY AND CLASSIFICATION:

PHYLUM: Euglenozoa
CLASS: Kinetoplastida
ORDER: Kinetoplastida
FAMILY: Trypanosomatidae
GENUS: *Trypanosoma*
SPECIES: *T. brucei*

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Resources

www.cdc.gov/parasites/sleepingsickness/
www.who.int/trypanosomiasis_african/parasite/en/
https://tritrypdb.org/tritrypdb/

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