Trends in Parasitology | Parasite of the Month

Schistosoma mansoni

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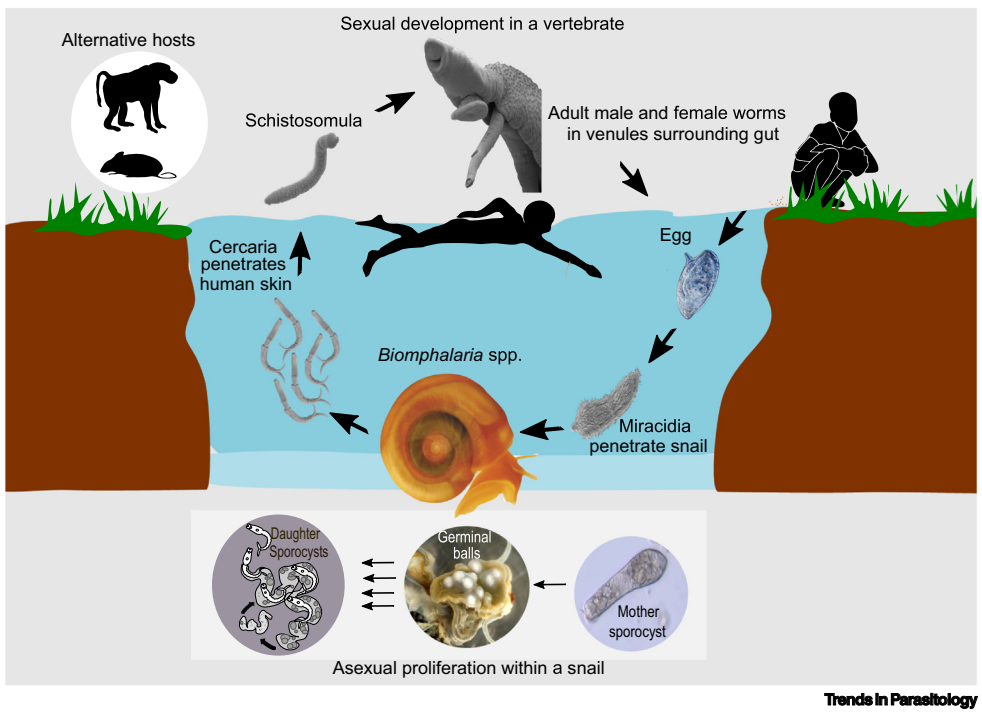
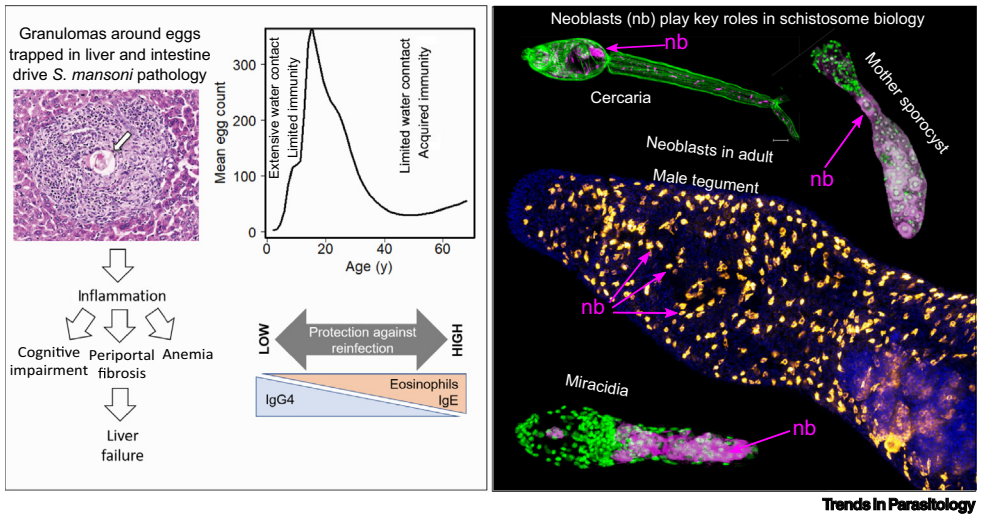


Schistosoma mansoni is the causative agent of intestinal schistosomiasis and infects ~54 million people annually, causing significant mortality and morbidity. This parasitic trematode is endemic in sub-Saharan Africa and the Middle East, and colonized South America during the transatlantic slave trade. Parasites transition between five distinctive body plans, with asexual proliferation in the snail host and sexual proliferation in the vertebrate host, and motile free-living stages**.** Transmission results from contact with water containing infected *Biomphalaria* spp. snails. Infection prevalence and intensity peaks in school-age children; both reduced water contact and acquired immunity reduces infection in adults. Pathology in the human host results from granulomas that form around eggs trapped in the liver and gut. There is no effective vaccine available: treatment of infected patients with praziquantel is the mainstay of control efforts.



KEY FACTS:

The *S. mansoni* life cycle is easily maintained in the laboratory using *Biomphalaria* spp. snails and hamster or mouse vertebrate hosts.

The parasite's genome (363 Mb, 10 144 protein genes, 7 autosomes, ZW sex determination) has been fully sequenced and assembled.

Developing a functional tool kit for this organism includes methodology for cell and stem cell biology, and functional genetic analysis (RNAi, transfection, and CRISPR).

The experimental tractability, biomedical importance, and developed genomic and cell biology resources make *S. mansoni* ideal for investigating both fundamental and applied aspects of helminth biology.

DISEASE FACTS:

Pathology results from granulomas around eggs trapped in the liver, leading to portal hypertension and liver failure. Heavy infections are associated with elevated pathology.

Diagnosis by fecal egg counts or circulating cathodic antigen test.

Adult worms remain in the bloodstream for many years and avoid immune destruction by continuous renewal of the tegument, but they do not cause pathology.

The human immune response to invading schistosomulae is predominantly T helper (Th)1, while the egg antigens stimulate a Th2 response.

S. mansoni infection castrates and reduces survival of the snail host, leading to strong coevolutionary interactions between snails and parasites.

TAXONOMY AND CLASSIFICATION:

PHYLUM: Platyhelminthes
CLASS: Trematoda
ORDER: Diplostomida
FAMILY: Schistosomatidae
GENUS: *Schistosoma*
SPECIES: *S. mansoni*

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Resources

https://parasite.wormbase.org/Schistosoma_mansoni_prjea36577/Info/Index/ (Genomic)
www.afbr-bri.org/schistosomiasis/ (Reagents: Schistosomiasis Resource Centre)
http://hydra.bio.ed.ac.uk/ (Conferences: Parasitic Helminths: New Perspectives in Biology and Infection)

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