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Schistosoma mansoni

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SUMMARY

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 to 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.

Keywords

trematode; pathology; neoblasts; praziquantel; epidemiology

KEY FACTS

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

The parasite genome (363Mb, 10,144 protein genes, 7 autosomes, ZW sex determination) is 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).

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Resources

https://parasite.wormbase.org/Schistosoma_mansoni_prjea36577/Info/Index/ (Genomic)

<https://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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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 do not cause pathology.

The human immune response to invading schistosomulae is predominantly Th1, 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.

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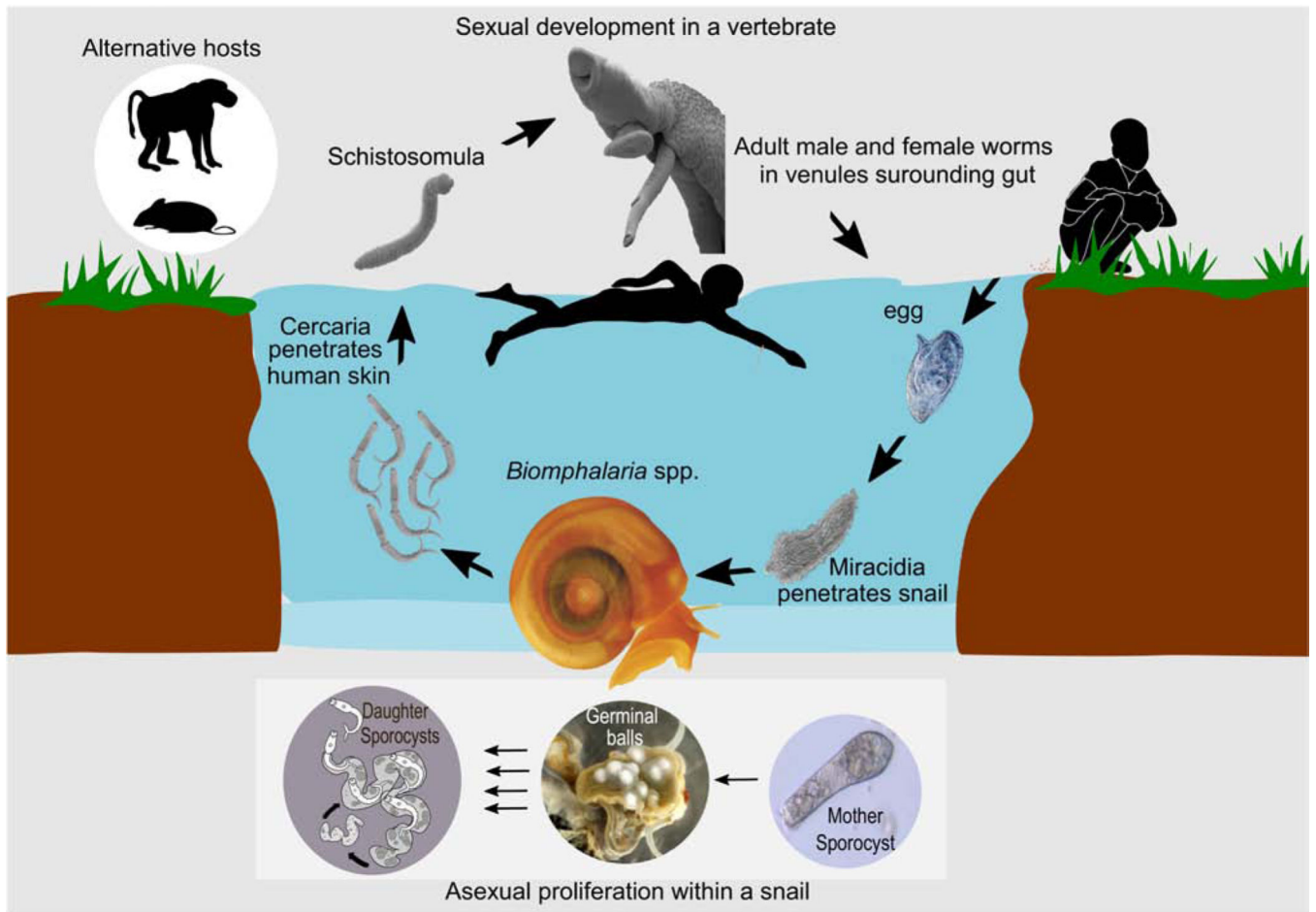
TAXONOMY AND CLASSIFICATION

PHYLUM	Platyhelminthes
CLASS	Trematoda
ORDER	Diplostomida
FAMILY	Schistosomatidae
GENUS	<i>Schistosoma</i>
SPECIES	<i>S. mansoni</i>

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Figure 1.

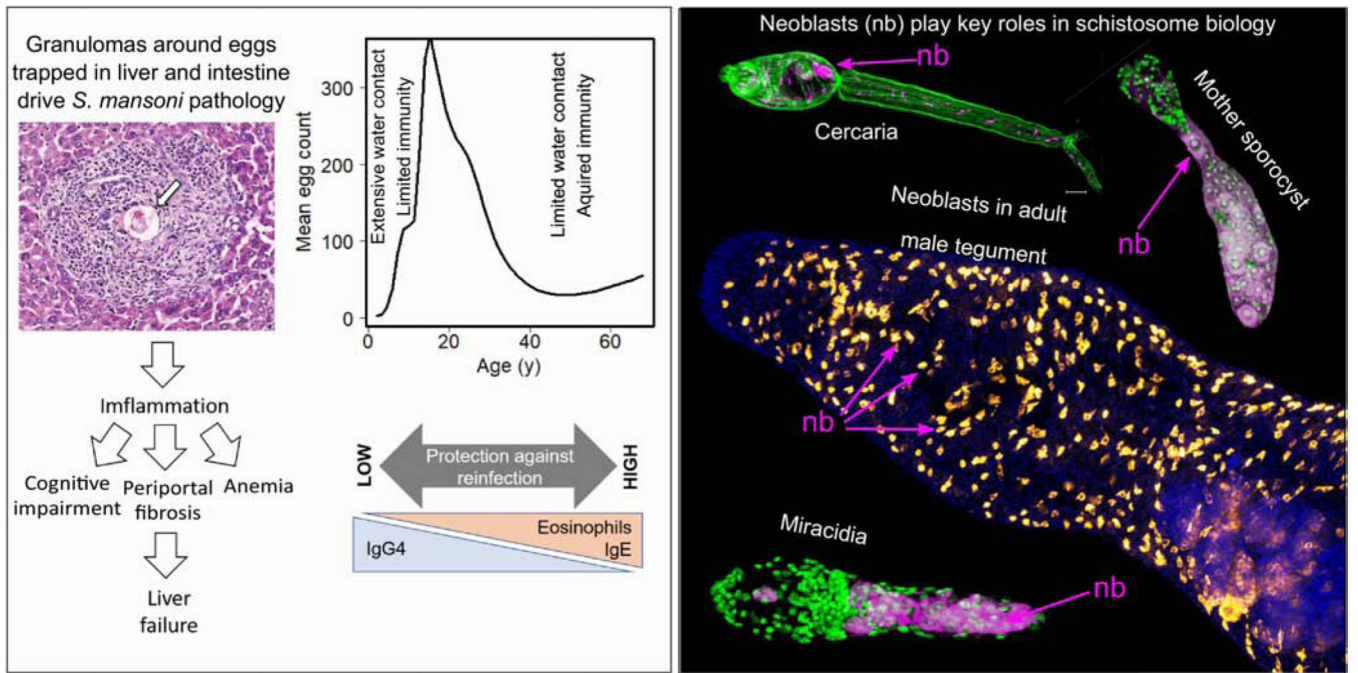


Figure 2.