Schistosoma haematobium, Egyptian Strain, Liver from Exposed Golden Syrian LVG Hamsters

Catalog No. NR-59712

For research use only. Not for use in humans.

Contributor and Manufacturer:

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Product Description:

Flatworm Classification: *Schistosomatidae*, *Schistosoma*
Species: *Schistosoma haematobium*
Strain: Egyptian
Host: *Mesocricetus auratus* (Golden Syrian LVG hamster)
Original Source: The Egyptian strain of *Schistosoma haematobium (S. haematobium)* was originally isolated circa 1950 from an unknown location in Egypt. The laboratory stock of the Egyptian strain of *S. haematobium* was later mixed with an isolate that was thought to be obtained from Cairo by the Naval Medical Research Unit III, in 1977 to produce the current Egyptian strain of *S. haematobium*.[1]
Comments: *S. haematobium* is a species of trematode worm which causes the chronic parasitic disease schistosomiasis. Worldwide, more than 200 million people are infected and 700 million are at risk, primarily in areas with poor sanitation.[2]

Infection occurs through contact with larval-stage schistosomes (cercariae) that are released by freshwater snails. The cercariae penetrate human skin and travel through blood vessels to the lower urinary tract where they mature. Mature *S. haematobium* parasites deposit eggs in the bladder. Some of these eggs are then passed through human urine into water to re-infect the snail host and continue the parasite's life cycle. Schistosome eggs that remain in the human body cause an immune response and damage to internal organs.[3] For laboratory infections *Bulinus truncatus* were exposed to *S. haematobium* miracidia and 5-6 weeks post-exposure were tested for cercariae.[4] Hamsters were percutaneously exposed to cercariae and housed at the Biomedical Research Institute (Rockville, MD) until 3.5-4 months post-infection. Thereafter, hamsters were euthanized, and their livers removed for axenic egg isolation.

Material Provided:

NR-59712 consists of liver(s) from male Golden Syrian LVG hamsters (Charles River Laboratories) exposed to ~350 cercariae of *S. haematobium* and euthanized at 3.5-4 months post-infection. Livers are collected following hamster perfusion.

Packaging/Storage:

Liver(s) are placed in a 50cc tube with cold saline and shipped in an insulated shipper with cold packs. Upon arrival, the livers should be processed to isolate parasite eggs.

Collection of *Schistosoma* Eggs[5]:

1. Place the livers in cold 1.2% NaCl.
2. Homogenize in a laboratory blender for 30 seconds until the liver is a smooth consistency.
3. Place the homogenate in the top tier (420 µm) of stainless-steel sieves and allow it to pass through the tier of stacked sieves, from the largest pore size on top to the smallest pore size on the bottom tier while rinsing the tissue continuously on the top sieve with a spray apparatus containing 1.2% NaCl. Agitate the sieves throughout the entire process to ensure that most of the eggs will pass through to the lowest sieve.
4. For best results, re-homogenize the homogenate trapped on the top sieve in a laboratory blender and pass the homogenate through the sieves again, using the technique described.
5. Remove the upper three sieves; the fluid remaining in the lowest sieve (45 µm pore size) will contain the eggs.
6. Pour the suspension into a glass petri dish and add 1.2% cold NaCl so that the dish is about ½ full. The egg suspension will contain eggs of several stages of maturation. Cold NaCl will keep most of the eggs from hatching into miracidia; keep eggs on ice in between swirling. To enrich the population for mature eggs, gently swirl the dish over a light box (for better visibility). Mature eggs will concentrate in the center of the vortex. These can be withdrawn with a Pasteur pipette and placed in a 15 mL test tube on ice. Keeping the volume of the egg suspension in the petri dish constant by adding fresh cold 1.2% NaCl as needed, continue to swirl the dish and collect eggs from the center until no more can be seen concentrating in the center. After 3-4 complete cycles, the resulting egg population will be highly enriched in mature eggs.[4,5]
7. Centrifuge eggs for 5 minutes at 100 × g. If freezing the eggs, pour off supernatant and freeze eggs as a "dry" pellet.

Citation:

Acknowledgment for publications should read "The following reagent was provided by the Schistosomiasis Resource Center of the Biomedical Research Institute through NIH-NIAID Contract HHSN272201700014I for distribution through BEI Resources, NIAID, NIH: *Schistosoma haematobium*, Egyptian Strain, Liver from Exposed Golden Syrian LVG Hamsters, NR-59712."

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories (BMBL). 6th ed. Washington, DC: U.S. Government Printing Office, 2020.

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References:

1. Lewis, F.A. Personal Communication.
2. Roberts, L. and J. Janovy. Foundations of Parasitology. 5th ed. Dubuque, Iowa: Wm. C. Brown Publishers; 1996.
3. Osakunor D.N.M. et. al. “Host Tissue Proteomics Reveal Insights into the Molecular Basis of *Schistosoma haematobium* Induced Bladder Pathology.” PLoS Neglected Tropical Diseases 16(2) (2022): e0010176. PMID: 35167594.
4. Young, N.D. et. al. “Nuclear Genome of *Bulinus truncatus*, An Intermediate Host of the Carcinogenic Human Blood Fluke *Schistosoma haematobium*.” Nature Communications (2022): 13.1.977. PMID: 35190553.
5. Tucker, M.S. et. al. “Schistosomiasis.” Current Protocols in Immunology 103 (2013): 19.1.1-19.1.58. PMID: 24510597.

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