

***Schistosoma mansoni*, Strain NMRI, Liver from Exposed Swiss Webster Mice**

Catalog No. NR-59453

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Contributor and Manufacturer:

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Product Description:

Flatworm Classification: *Schistosomatidae*, *Schistosoma*

Species: *Schistosoma mansoni*

Strain: NMRI

Host: *Mus musculus* (mouse)

Original Source: *Schistosoma mansoni* (*S. mansoni*), strain NMRI was isolated in the 1940s from *S. mansoni* eggs obtained from infected school children in Puerto Rico.

Comments: Strain NMRI was brought to the Naval Medical Research Institute (NMRI) in 1945, where it was maintained until 1971, at which time it was transferred to the Biomedical Research Institute.^{1,2}

S. mansoni is a species of trematode worm that causes the chronic parasitic disease schistosomiasis. Worldwide, more than 200 million people are infected, and nearly 700 million are at risk, primarily in areas with poor sanitation that lack access to safe drinking water.³

Infection occurs through contact with larval-stage schistosomes (cercariae) that are released by freshwater snails. Upon exposure to infested water, these larvae penetrate human skin and travel through blood vessels to the liver where they mature and deposit eggs. Some of these eggs are then passed through human feces into the 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, *Biomphalaria glabrata* (*B. glabrata*), strain NMRI were exposed to *S. mansoni*, strain NMRI miracidia. After at least 4 weeks of infection, cercariae were harvested. Mice were percutaneously exposed to the cercariae and housed at the Biomedical Research Institute (Rockville, MD) until 7 weeks post-infection. Thereafter, mice were euthanized, and their livers were removed for axenic egg isolation.

Material Provided:

NR-59453 consists of liver(s) from female Swiss Webster mice (Taconic Biosciences, Inc.) from mice that were exposed to ~ 200 cercariae of *S. mansoni*, strain NMRI and euthanized at 7 weeks post-infection. Livers are collected following mouse 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.^{4,5}

Collection of *Schistosoma* Eggs:⁶

1. Place the livers in cold 1.2% NaCl.
2. Homogenize in a laboratory blender for 30 seconds until 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 (45 µm) 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.
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 mansoni*, Strain NMRI, Liver from Exposed Swiss Webster Mice, NR-59453."

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:

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3. Verjee, M. A. "Schistosomiasis: Still a Cause of Significant Morbidity and Mortality." *Res. Rep. Trop. Med.* 10 (2019): 153-163. PubMed: 32099508.
4. Marquez, J., et al. "Molecular Characterization of Thioester-Containing Proteins in *Biomphalaria glabrata* and Their Differential Gene Expression upon *Schistosoma mansoni* Exposure." *Front. Immunol.* 13 (2022): 903158. PubMed: 35967434.
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6. Tucker, M. S., et al. "Schistosomiasis." *Curr. Protoc. Immunol.* 103 (2013): 19.1.1-19.1.58. PubMed: 24510597.

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