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BIOMEDICAL RESEARCH INST ROCKVILLE MD
SCHISTOSOME MATERIALS FOR VACCINE DEVELOPMENT. (U)
SEP 80 M A STIREWALT, F A LEWIS

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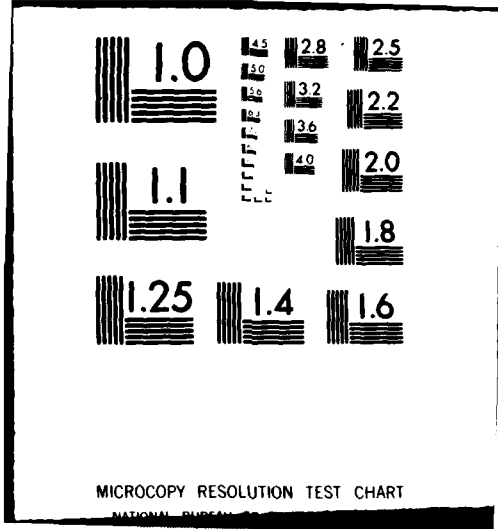
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MICROCOPY RESOLUTION TEST CHART

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OFFICE OF NAVAL RESEARCH

Contract No. N00014-76-C-0146

Task No. NR 204-005

9 Annual Report No. 5

6 Schistosome Materials for Vaccine Development

by

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BACKGROUND

The Immunoparasitology Department at the Naval Medical Research Institute (NMRI) is involved in research centered primarily on the development of effective vaccines against several parasitic diseases. Immunological research in one such disease, schistosomiasis, is particularly difficult due to the limited quantity of schistosomal materials available to most laboratories. It has been the objective of this contract to supply large quantities of schistosomal materials to investigators at NMRI and the Biomedical Research Institute (BRI) to help realize the goal for the development of an effective vaccine against schistosomiasis. The various materials provided included adult schistosomes, eggs, cercariae, schistosomules, cercarial penetration enzymes, and vertebrate and invertebrate host serum and tissues.

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METHODOLOGY

A Puerto Rican strain of Schistosoma mansoni was maintained in Biomphalaria glabrata snails and Swiss albino mice. Uninfected snails were raised in six 20-gallon aquaria. Approximately 200 snails (5-7mm dia.) were collected each week and exposed individually with 6-8 miracidia. When requested, snails were exposed to 1 miracidium each for development of single-sex schistosomal infections. Miracidia were derived from livers of 8-week infected mice. A constant supply of approximately 400 infected snails was maintained for production of cercariae. Weekly yields of from 1 to 3 million cercariae were processed as needed or used for experimental work.


Adult parasites were perfused from 30 mice per week and used for production of adult worm antigens. Due to reduction in funds, compared to previous years, no schistosome eggs, schistosomules, or cercarial secretion enzymes were collected on a regular basis for investigators at NMRI.



RESULTS AND DISCUSSION

This list of investigators at NMRI and BRI for whom schistosomal materials were supplied by the contract is given in Appendix 1. Materials supplied each week consisted of 1 to 3 million cercariae, and approximately 3000 adult worms. Populations of cercariae of a single-sex were supplied as requested.

Due to the aforementioned reduction in funding for FY 80 research involving the nature of fluctuations encountered in cercarial harvests and infectivity was not supported. Basic investigations into the details of life cycle maintenance and the problems encountered were supported by separate funding.



REPORTS AND PUBLICATIONS

Supported in part by N00014-76-C-0146

1. Murrell, K. D., Clark, S. S., Dean, D. A., and Vannier, W. E. Schistosoma mansoni: Immunization of cynomolgus monkeys by injection of irradiated schistosomula. *Exp. Parasitol.* **48**: 415-420, 1979.
2. Murrell, K. D., Clark, S. S., Dean, D. A., and Vannier, W. E. Influence of mouse strain on induction of resistance with Schistosoma mansoni cercariae. *J. Parasitol.* **65**: 829-831, 1979.
3. Murrell, K. D., Stirewalt, M. A., and Lewis, F. A. Schistosoma mansoni: Vaccination of mice with cryopreserved irradiated schistosomules. *Exp. Parasitol.* **48**: 265-271, 1979.
4. Stirewalt, M. A., Lewis, F. A., and Murrell, K. D. Schistosoma mansoni: Cryopreservation of schistosomules. *Exp. Parasit.* **48**: 272-281, 1979.
5. Vannier, W. E., Hussain, R., Murrell, K. D., Dean, D. A. and Attallah, A. M. Immediate hypersensitivity and protective immunity in schistosomiasis. United States-Japan Cooperative Medical Science Program, New Orleans, Louisiana, August 1979.
6. Cousin, D. Stirewalt, M. and Dorsey, C. H. in press. Schistosoma mansoni: Comparative early transformation of skin- and shear pressure-derived schistosomules. *Experimental Parasitology*.
7. Beaudoin, R. L., Armstrong, J. C., and Vannier, W. E. Production of radiation-attenuated vaccines against malaria and schistosomiasis. *Int'l. J. Nuclear Med. and Biol.* (In Press). 1980-81.
8. Lewis, F. A., and Wilson, E. M. Schistosoma mansoni: Splenic lymphocyte responses of mice following an initial exposure to highly irradiated cercariae. *Experimental Parasitology*. (In Press).
9. Catto, B. A., Lewis, F. A., and Ottesen, E. A. Cercarial induced histamine release: a factor in the pathogenesis of schistosomal dermatitis? *American Journal of Tropical Medicine and Hygiene*. (In Press).
10. Attallah, A. M., Lewis, F. A., Urrutia-Shaw, A., Folks, T., and Yeatman, T. J.: Natural killer cells and antibody-dependent cell-mediated cytotoxicity components of Schistosoma mansoni infection. *International Archives of Allergy and Applied Immunology*. (In Press).
11. Cousin, C., Cunningham, K. and Solano, L. Schistosoma mansoni: tegumental changes in cercariae as they develop into adult worms. 8th Annual Minority Biomedical Support Symposium, Georgetown University, Washington, D. C. April, 1980.
12. Cousin, C., Solano, L. and Cunningham, K. Schistosoma mansoni: early morphological changes in *in vivo* schistosomules following penetration. 8th Annual Minority Biomedical Support Symposium, Georgetown University, Washington, D. C. April, 1980.

Appendix 1.

List of Investigators Supplied with Schistosomal materials on Contract ONR N00014-76-C-0146.

NAVAL MEDICAL RESEARCH INSTITUTE

**Dr. W. E. Vannier
Dr. K. D. Murrell
Dr. D. A. Dean
Dr. A. H. Smith
Dr. P. Minard
Dr. D. W. Taylor
Dr. P. Coulis
Dr. V. Schinski
Dr. M. Stek
Dr. C. H. Dorsey
Dr. I. Barsoum**

BIOMEDICAL RESEARCH INSTITUTE

**Dr. M. A. Stirewalt
Dr. F. A. Lewis
Dr. E. Hayunga
Dr. C. Cousin**