

# NEW YORK STATE

## *Parasitology Proficiency Testing Program*

### News and Notes

Beginning with the May 2013 event a separate set of 3 samples were supplied for laboratories performing antigen detection. For the February event these were samples 14I-A, 14I-B, and 14I-C. These are distinct from samples 14-A, 14-B, and 14-C and cannot be used interchangeably.

As molecular methods become increasingly common in the clinical parasitology lab, so does the necessity of knowing what preservative was used with the specimen. Preservatives commonly used for parasitology are not ideal for DNA extraction, and newly developed tests may only be approved for use with specific preservatives. For example, the assay may be approved for use with specimens preserved in 10% formalin but not SAF. Please remember to include the preservative information by filling out that section of the Infectious Disease Requisition, whenever submitting specimens to Wadsworth.

Please note that an unpreserved specimen should also be submitted, whenever possible, to maximize the likelihood of extracting good quality DNA.

The image shows a screenshot of a web-based form titled "www.wadsworth.org/divisions/infdis/enceph/form.htm". The form includes several fields: "Submitting lab findings: Smear/Stain/Other results", "Specimen submitted on/in: Media", "Relevant Exposure: ☐ Contact known case", and "Preservative". The "Preservative" field is circled in red. To the right of the "Preservative" field is a "Comments" field. Below the "Relevant Exposure" field, there are three checkboxes: "Food/water" and "Nasco".

### Parasitology Comprehensive 4 February 2014

The purpose of the New York State Proficiency Testing Program in the category of Parasitology - Comprehensive is to monitor the performance of applicant laboratories that detect and identify parasites in fecal emulsions, fecal smears, and blood films. This document reports the results for the February 2014 proficiency test in Parasitology - Comprehensive and Antigen Detection.

### Sample Preparation and Quality Control

All emulsions and slides used in this test were prepared by a commercial source. The emulsions were dispensed into the vials from pools, which were continuously mixed during the loading process. Numerous samples of each test specimen were selected at random by the Wadsworth Center Parasitology Laboratory of the New York State Department of Health, and were assayed for quality and confirmation of organisms. The supplying vendor also conducted extensive quality control tests and a detailed quality control report was submitted for inspection and verification. Samples were authenticated by at least 80% of participating laboratories and/or referee laboratories.

## 14-A (Helminths Only)

Correct identification: *Ascaris lumbricoides*

### Results of Participating Laboratories

| Organism reported           | # of labs reporting | % of labs reporting | Referee results | Status  |
|-----------------------------|---------------------|---------------------|-----------------|---------|
| <i>Ascaris lumbricoides</i> | 95/95               | 100                 | 10/10           | Correct |

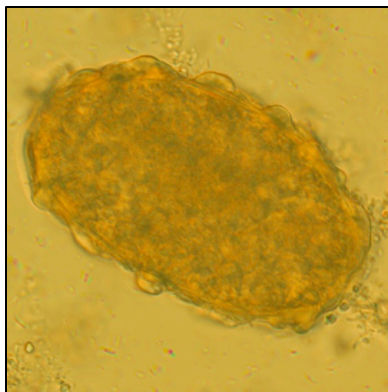
### Quality Control and Referee Information

All participating and referee laboratories reported that *Ascaris lumbricoides* was the correct response (100% respectively). Quality control examination of 4% of the vials for this sample showed an average of 5 organisms per coverslip.

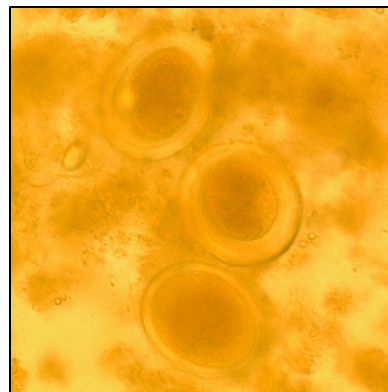
### Diagnostic Characteristics

*Ascaris lumbricoides* is one of the most common intestinal nematode infections of man. In this sample both fertile (typically 45-75µm by 35-50µm) and infertile (typically 85-90µm by 43-47µm) eggs were seen. Fertile eggs that were decorticated (had lost that outer mammilated layer) and infertile eggs with the mammilated layer were common.

Infections with *Ascaris* are most prevalent in warm moist climates, but can also be found in cooler areas. Infection is acquired when embryonated eggs are ingested from contaminated soil. The fertilized eggs are round to oval, mammilated, and golden brown in color.



Infertile egg



Fertile decorticated egg

## 14-B (Helminths Only)

Correct identification: *Clonorchis sinensis*

### Results of Participating Laboratories

| Organism reported                                    | # of labs reporting | % of labs reporting | Referee results | Status    |
|--|---------------------|---------------------|-----------------|-----------|
| <i>Clonorchis sinensis</i> / <i>Opisthorchis</i> sp. | 94/95               | 99                  | 10/10           | Correct   |
| No Parasites Seen                                    | 1                   | 1                   | 0               | Incorrect |

### Quality Control and Referee Information

Participating and referee laboratories agreed that *Clonorchis sinensis* was the correct response (99 and 100% respectively). Quality control examination of 4% of the vials for this sample showed 2-3 eggs per coverslip.

### Diagnostic Characteristics



*Clonorchis sinensis* is a trematode that parasitizes the biliary ducts of humans. Humans become infected when they eat uncooked freshwater fish that contain metacercariae. The metacercariae excyst and travel to the distal bile capillaries where the worms mature. Adult worms deposit eggs in the bile fluid and these are later discharged into the feces. The eggs measure 28-35µm. They are thick shelled, ovoid, have an operculum with distinct opercular shoulders, and a knob at the abopercular end. *Clonorchis* and *Opisthorchis* eggs are very similar in appearance and cannot be easily distinguished from each other. *Clonorchis sinensis* is endemic to the Far East whereas *Opisthorchis* spp. can be found from Germany and Poland to western Siberia as well as Northern Thailand and Laos.

## 14-C (Helminths Only)

Correct identification: *Schistosoma haematobium*

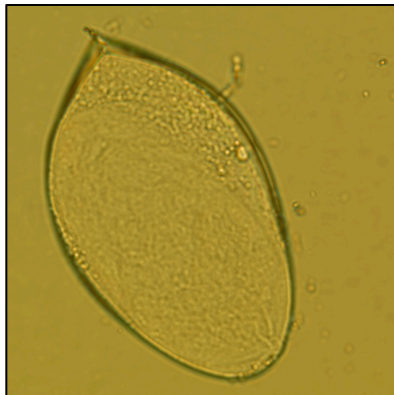
### Results of Participating Laboratories

| Organism reported              | # of labs reporting | % of labs reporting | Referee results | Status  |
|--------------------------------|---------------------|---------------------|-----------------|---------|
| <i>Schistosoma haematobium</i> | 95/95               | 100                 | 10/10           | Correct |

### Quality Control and Referee Information

All Participating and referee laboratories agreed that *Schistosoma haematobium* was the correct response (100% respectively). Quality control examination of 4% of the vials for this sample showed an average of 5-10 eggs per coverslip.

### Diagnostic Characteristics



*Schistosoma haematobium*, a blood trematode, is the causative agent of urinary schistosomiasis. The diagnostic stage is the fully embryonated egg which is released to the environment in the urine or, in heavy infections, in the stool. The specimen contained eggs at various stages of development; eggs measured approximately 50µm by 130-140µm. These eggs have no operculum, are light brown, and have a prominent terminal spine. Egg excretion is periodic so collection of samples should occur between 12:00pm and 3:00pm or a 24-hour urine should be obtained. Depending on worm burden hematuria (blood in urine) is the primary symptom in early stages of disease due to cystitis from deposited eggs.

Symptoms are usually not seen until 3-6 months after infection and may take a year or more to develop. Chronic disease may lead to more severe diseases, including bladder cancer. Tumors mainly involve the posterior wall of the bladder and occur more frequently in males than females.

## 14-D (All Parasites)

Correct identification: No Parasites Seen

### *Results of Participating Laboratories*

| Organism reported            | # of labs reporting | % of labs reporting | Referee results | Status    |
|------------------------------|---------------------|---------------------|-----------------|-----------|
| No Parasites Seen            | 92/95               | 97                  | 10/10           | Correct   |
| <i>Entamoeba hartmanni</i>   | 1                   | 1                   | 0               | Incorrect |
| <i>Iodamoeba butschlii</i>   | 1                   | 1                   | 0               | Incorrect |
| <i>Plasmodium falciparum</i> | 1                   | 1                   | 0               | Incorrect |

### *Quality Control and Referee Information*

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (97 and 100% respectively). Quality control examination of 4% of the slides for this sample showed normal fecal elements are present. Typical staining characteristics were observed with no organisms present. The overall staining quality was good.

## 14-E (All Parasites)

Correct identification: *Plasmodium falciparum*

### Results of Participating Laboratories

| Organism reported            | # of labs reporting | % of labs reporting | Referee results | Status    |
|------------------------------|---------------------|---------------------|-----------------|-----------|
| <i>Plasmodium falciparum</i> | 87/92               | 95                  | 10/10           | Correct   |
| <i>Babesia</i> sp.           | 2                   | 2                   | 0               | Incorrect |
| No Parasites Seen            | 1                   | 1                   | 0               | Incorrect |

### Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium falciparum* was the correct response (100% respectively). Quality control examination of 4% of the slides for this sample showed an average of 5 organisms per 100X oil immersion field. Staining quality was good.

### Diagnostic Characteristics



*Plasmodium falciparum* is one of the four species of *Plasmodium* commonly known to infect humans. *P. falciparum* invades all ages of red blood cells; thus the parasitemia can exceed 50%. The usual stages seen in peripheral blood are early trophozoites/ring form and gametocytes. In this specimen only ring forms were observed. Both cells with more than one ring and applique forms were present. Examples of each of these are shown in the accompanying image.

Infection with *P. falciparum* causes the most dangerous and severe form of malaria and is always considered to be a medical emergency. Death may occur rapidly if proper treatment is not started immediately. Its distribution is limited to the tropics, primarily Africa and Asia.

A separate set of samples (14I-A, 14I-B, and 14I-C) was sent for antigen detection. These results are reported below.

## Scoring Information

### *Immunoassay Results*

| <b><i>Cryptosporidium</i></b>                     | <b>14I-A</b> |    | <b>14I-B</b> |    | <b>14I-C</b> |   |
|---|--------------|----|--------------|----|--------------|---|
| <b>METHOD</b>                                     | -            | +  | -            | +  | -            | + |
| MCC Para-Tect Cryptosporidium/Giardia DFA         | 0            | 1  | 0            | 1  | 1            | 0 |
| Meridian ImmunoCard STAT Cryptosporidium/Giardia  | 0            | 24 | 0            | 24 | 24           | 0 |
| Meridian Merifluor Cryptosporidium/Giardia        | 0            | 16 | 0            | 16 | 16           | 0 |
| Meridian Premier Cryptosporidium                  | 0            | 1  | 0            | 1  | 1            | 0 |
| Remel ProSpecT Cryptosporidium EIA                | 0            | 13 | 0            | 13 | 13           | 0 |
| Remel Xpect Giardia/Cryptosporidium               | 0            | 6  | 0            | 6  | 6            | 0 |
| TechLab Cryptosporidium II ELISA                  | 0            | 2  | 0            | 2  | 2            | 0 |
| TechLab Giardia/Cryptosporidium Quik Chek (Alere) | 0            | 8  | 1            | 7  | 7            | 1 |
| TechLab/Wampole Test EIA                          | 0            | 4  | 0            | 4  | 4            | 0 |

| <b><i>Giardia</i></b>                             | <b>14I-A</b> |    | <b>14I-B</b> |   | <b>14I-C</b> |    |
|---|--------------|----|--------------|---|--------------|----|
| <b>METHOD</b>                                     | -            | +  | -            | + | -            | +  |
| MCC Para-Tect Cryptosporidium/Giardia DFA         | 0            | 1  | 1            | 0 | 0            | 1  |
| Meridian ImmunoCard STAT Cryptosporidium/Giardia  | 0            | 24 | 24           | 0 | 0            | 24 |
| Meridian Merifluor Cryptosporidium/Giardia        | 0            | 13 | 13           | 0 | 0            | 13 |
| Meridian Premier Giardia                          | 0            | 1  | 1            | 0 | 0            | 1  |
| Remel ProSpecT Giardia EIA                        | 0            | 19 | 19           | 0 | 0            | 19 |
| Remel ProSpecT Giardia EZ                         | 0            | 2  | 2            | 0 | 0            | 2  |
| Remel Xpect Giardia                               | 0            | 2  | 2            | 0 | 0            | 2  |
| Remel Xpect Giardia/Cryptosporidium               | 0            | 6  | 6            | 0 | 0            | 6  |
| TechLab Giardia II ELISA                          | 0            | 2  | 2            | 0 | 0            | 2  |
| TechLab Giardia/Cryptosporidium Quik Chek (Alere) | 0            | 8  | 7            | 1 | 1            | 7  |
| TechLab/Wampole Test EIA                          | 0            | 7  | 7            | 0 | 0            | 7  |

*Distribution of Scores      Parasitology - Comprehensive*

| Score | # of labs | % of labs |
|-------|-----------|-----------|
| 100   | 87        | 91        |
| 90-99 | 0         | 0         |
| 80-89 | 7         | 7         |
| 70-79 | 0         | 0         |
| 60-69 | 1         | 1         |
| 0-59  | 1         | 1         |

*Distribution of Scores      Parasitology - Antigen Detection*

| Score | # of labs | % of labs |
|-------|-----------|-----------|
| 100   | 84        | 99        |
| 90-99 | 0         | 0         |
| 80-89 | 0         | 0         |
| 70-79 | 0         | 0         |
| 60-69 | 0         | 0         |
| 0-59  | 1         | 1         |

*Answer Key      Parasitology - Comprehensive*

| Sample | Correct Answer                                       |
|--------|--|
| 14-A   | <i>Ascaris lumbricoides</i>                          |
| 14-B   | <i>Clonorchis sinensis</i> / <i>Opisthorchis</i> sp. |
| 14-C   | <i>Schistosoma haematobium</i>                       |
| 14-D   | No Parasites Seen                                    |
| 14-E   | <i>Plasmodium falciparum</i>                         |

*Answer Key      Parasitology - Antigen Detection*

| Sample | Correct Answer  |
|--------|---|
| 14I-A  | <i>Cryptosporidium</i> sp. and <i>Giardia lamblia</i> |
| 14I-B  | <i>Cryptosporidium</i> sp.                            |
| 14I-C  | <i>Giardia lamblia</i>                                |



## Grading

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The answer key was derived from the response of all participating laboratories as per **CLIA Regulations**, CFR Title 42, Part 493, Subpart I, Section 493.917. These regulations can be viewed at [www.cdc.gov/clia/Regulatory/default.aspx](http://www.cdc.gov/clia/Regulatory/default.aspx). These regulations state that 80% or more of participating laboratories **or** referee laboratories must identify the parasite for it to be authenticated as a correct answer. Similarly, reporting of a parasite identified by less than 10% of the participating laboratories **or** referees is an incorrect response. Organisms that are not authenticated, but which were reported by more than 10% of the participating laboratories **or** referees, are "Unauthenticated" and are not considered for grading.

Credit is given according to the formula:

$$[\# \text{ of Correct Responses} / (\# \text{ of Correct Responses} + \# \text{ of Incorrect Responses})] \times 100$$

For example, if a sample contained one principal parasite and the laboratory reported it correctly but reported the presence of an additional parasite, which was not present, the sample grade would be:

$$1/(1+1) \times 100 = 50 \text{ percent.}$$

## Important Reminders

The next Parasitology Proficiency Test is scheduled for **May 20, 2014**. Participating labs will need to notify us **before May 27, 2014** if the samples are not received. Proficiency test results must be electronically submitted through EPTRS by **June 3, 2014** or the laboratory will receive a score of zero. This and additional information can be found in the NYS Proficiency Testing Program Guide provided by the NYS Clinical Laboratory Evaluation Program, which can be accessed via the Internet at:

<http://www.wadsworth.org/labcert/clep/ProgramGuide/pg.htm>