



## NEW YORK STATE

### Parasitology Proficiency Testing Program

## Blood Borne Parasites 02 June 2009

The purpose of the New York State Proficiency Testing Program in the category of Blood Borne Parasites is to monitor the performance of applicant laboratories in detecting and identifying parasites on blood films. This document reports the results for the June 2009 proficiency test in Blood Borne Parasites.

### Sample Preparation and Quality Control

All slides used in this test were prepared and stained by a commercial source. Numerous samples of each test specimen were selected at random by the Parasitology Unit of the David Axelrod Institute for Public Health, and were assayed for quality and confirmation of contents. Extensive quality control tests were also conducted by the supplying vendor and a detailed quality control report was submitted to the New York State Parasitology Laboratory for inspection and verification. Samples were authenticated by 80% of participating laboratories and/or referee laboratories.

### 09B-F

Correct diagnosis: *Plasmodium vivax*.

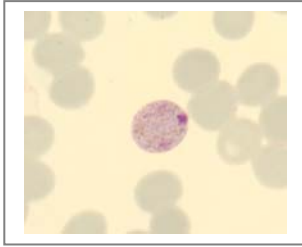
#### Results of Participating Laboratories

| Organism reported       | # of labs reporting | % of labs reporting | Referee results | Status          |
|-------------------------|---------------------|---------------------|-----------------|-----------------|
| <i>Plasmodium vivax</i> | 11/17               | 65                  | 7/10            | Unauthenticated |
| <i>Plasmodium ovale</i> | 6                   | 35                  | 3               | No Penalty      |

#### Quality Control and Referee Information

Participating and referee laboratories failed to agree that *Plasmodium vivax* was the correct response (65% and 70% respectively). Quality control examination of 4% of this sample showed parasites in every 100X oil immersion field. Infected cells are enlarged and Schüffner's stippling is present. The pigment is fine and scattered. The predominant stages seen are the amoeboid trophozoites and gametocytes. The heavy stippling made it difficult to see the cytoplasm and may have led some labs to incorrectly report *Plasmodium ovale*. *Plasmodium vivax* was confirmed as the correct response by using a conventional PCR assay.

## Diagnostic Characteristics



***Plasmodium vivax*** is the most common species of malaria to infect humans. It may account for as much as 80% of all malaria cases. It also has the widest distribution. Infected red cells are usually enlarged and stain paler than uninfected ones. They may also contain Schüffner's dots. The trophozoites are generally amoeboid and have a large chromatin dot. Occasionally cells will contain more than one parasite. Mature schizonts contain 12-24 merozoites and gametocytes are round and fill the entire cell. Pigment is fine and scattered.

## 09B-G

Correct diagnosis: No Parasites Seen.

### Results of Participating Laboratories

| Organism reported | # of labs reporting | % of labs reporting | Referee results | Status  |
|-------------------|---------------------|---------------------|-----------------|---------|
| No Parasites Seen | 17/17               | 100                 | 10/10           | Correct |

### Quality Control and Referee Information

Participating and referee laboratories agreed that No Parasites Seen was the correct response (100%). Quality control examination of 4% of this sample showed erythrocytes of normal size and staining characteristics. Normal blood elements are present and exhibit typical staining characteristics. Howell-Jolly bodies are also present.

## 09B-H

Correct diagnosis: *Loa loa*.

### Results of Participating Laboratories

| Organism reported     | # of labs reporting | % of labs reporting | Referee results | Status          |
|-----------------------|---------------------|---------------------|-----------------|-----------------|
| <i>Loa loa</i>        | 11/17               | 65                  | 6/10            | Unauthenticated |
| <i>Mansonella</i> sp. | 5                   | 29                  | 2               | No Penalty      |
| No Parasites Seen     | 1                   | 6                   | 1               | No Penalty      |

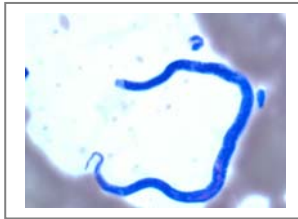
## Quality Control and Referee Information

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Participating and referee laboratories failed to agree that *Loa loa* was the correct response (65% and 60% respectively). Quality control examination of 4% of this sample showed an average of 10 organisms per slide. All organisms seen on quality control examination had lost their sheath, which made correct identification more challenging. The characteristics that distinguish *Loa loa* from *Mansonella* sp. are the presence of a sheath; size, with *Loa loa* being longer and wider; and a tapered tail with irregularly spaced nuclei extending all the way to the tip. In *Mansonella* sp. the tail is blunt and the nuclei are regularly spaced. *Loa loa* was confirmed as the correct response by PCR and sequencing.

## Diagnostic Characteristics

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***Loa loa***, also called the African eye worm, infects humans when they are bitten by infected deer or mango flies. The larvae are deposited into the bite wound and develop into adults within 6-12 months. Adults migrate beneath the conjunctiva or the skin, or through subcutaneous tissues. Years after the initial infection the adults give rise to microfilariae which can be detected in the blood. The microfilariae are sheathed and measure between 250-300 µm. They have nuclei that extend all the way to the tip of the tail.

## 09B-I

Correct diagnosis: No Parasites Seen.

## Results of Participating Laboratories

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| Organism reported | # of labs reporting | % of labs reporting | Referee results | Status  |
|-------------------|---------------------|---------------------|-----------------|---------|
| No Parasites Seen | 17/17               | 100                 | 10/10           | Correct |

## Quality Control and Referee Information

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Participating and referee laboratories agreed that No Parasites Seen was the correct response (100%). Quality control examination of 4% of this sample showed erythrocytes of normal size and staining characteristics. Normal blood elements are present and exhibit typical staining characteristics. Howell-Jolly bodies are also present.

## 09B-J

Correct diagnosis: *Plasmodium malariae*.

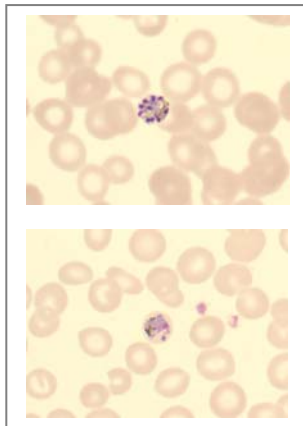
### Results of Participating Laboratories

| Organism reported          | # of labs reporting | % of labs reporting | Referee results | Status  |
|----------------------------|---------------------|---------------------|-----------------|---------|
| <i>Plasmodium malariae</i> | 17/17               | 100                 | 10/10           | Correct |

### Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium malariae* was the correct response (100%). Quality control examination of 4% of this sample showed parasites in every 3 to 4 100X oil immersion fields. Infected cells are small and show no stippling. All stages are seen with organisms containing coarse pigment and compact cytoplasm.

### Diagnostic Characteristics



*Plasmodium malariae* is the least common species of malaria to infect humans, and is sporadic in distribution. It tends to infect older red blood cells and so the parasitemia is often low. The ring stage is short lived so it is not usually seen. The most common stages seen are mature trophozoites and schizonts. The infected cells are not enlarged and may actually be smaller than uninfected cells. There is no stippling. The trophozoites (bottom image) are not amoeboid and often appear as compact rounded or band forms. The schizonts (top image) contain 6-12 merozoites usually arranged in a rosette although they may be in an irregular cluster.

# Scoring Information

## Distribution of Scores

| Score | # of labs | % of labs |
|-------|-----------|-----------|
| 100   | 17/18     | 94        |
| 0     | 1/18      | 6         |

## Answer Key

| Sample | Correct Answer             | Points |
|--------|----------------------------|--------|
| 09B-F  | <i>Plasmodium vivax</i>    | 20     |
| 09B-G  | No parasites seen          | 20     |
| 09B-H  | <i>Loa loa</i>             | 20     |
| 09B-I  | No parasites seen          | 20     |
| 09B-J  | <i>Plasmodium malariae</i> | 20     |

**TOTAL POSSIBLE POINTS 100**

## Grading

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

Each sample has a maximum value of 20 points. Credit is given according to the formula:

$$\frac{\text{Number of correct responses by lab}}{\text{\# Correct Parasites Present} + \text{\# Lab's Incorrect Answers}} \times 100$$

## Important Reminders

The mailout dates for Parasitology have been changed from the first Monday of February, June, and October to the first Tuesday.

The next Parasitology Proficiency Test is scheduled for **October 6, 2009**. You are responsible for notifying the New York State Parasitology Unit **before October 13, 2009** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **October 20, 2009** or you will receive a zero. These requirements are clearly stated in your NYS Proficiency Testing Handbook provided by the NYS Clinical Laboratory Evaluation Program, and can be accessed via the Internet at:  
<http://www.wadsworth.org/labcert/clep/ProgramGuide/WebGuide.pdf>

## News and Notes

Beginning with the February 2009 proficiency exam, the **grading policy has changed**. In order to make the score on the NYS Parasitology PT exam more accurately reflect laboratory performance, and be more consistent across categories, a new scoring system will be in effect. Under the new scoring system, grades will be based only on the specimen or organism types processed by your laboratory. For example, if your laboratory does not diagnose microfilarian infections, your score on this test would have been based on the four other specimens, each of which will be worth 25% of the total. Laboratories that process all of the types of samples included in the exam will not observe any changes in scoring method.