



## NEW YORK STATE

*Parasitology Proficiency Testing Program*

### Blood Borne Parasites 02 February 2010

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 February 2010 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.

### 10B-A

Correct diagnosis: *Babesia* sp.

#### *Results of Participating Laboratories*

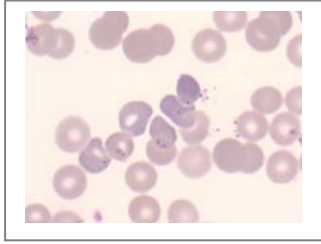
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Babesia</i> sp.	17/19	90	10/10	Correct
<i>Plasmodium malariae</i>	1	5	0	Incorrect
No Parasites Seen	1	5	0	Incorrect

#### *Quality Control and Referee Information*

Participating and referee laboratories agreed that *Babesia* sp. was the correct response (90 and 100%). Quality control examination of 4% of this sample showed numerous parasites in every 100 X oil immersion field. Both intracellular and extracellular parasites were observed. The presence of many extracellular parasites and the absence of pigment confirm the diagnosis of *Babesia* sp. Infected cells are not enlarged and no Schüffner's stippling is present. The overall staining quality is fair.

## Diagnostic Characteristics

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**Babesia sp.** has a widespread distribution which includes several counties in New York State. Parasites are transmitted by several species of ticks. Like malaria, the parasites infect red blood cells. They appear as small, pleomorphic rings which can be confused with the early stage of *Plasmodium falciparum*. Infected cells are not enlarged and do not exhibit stippling or Mauer's dots. No other stages are ever seen and no pigment is ever present. Occasionally tetrads may be seen and parasites are often seen outside the red blood cells.

## 10B-B

Correct diagnosis: *Trypanosoma cruzi*.

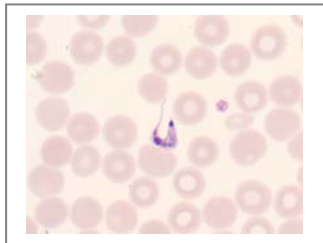
## Results of Participating Laboratories

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Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Trypanosoma cruzi</i>	19/19	100	10/10	Correct

## Quality Control and Referee Information

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Participating and referee laboratories agreed that ***Trypanosoma cruzi*** was the correct response (100%). Quality control examination of 4% of this sample showed parasites in every 25-30 100 X oil immersion fields. The parasites have a large centrally located nucleus and a large posterior kinetoplast. They often are comma shaped. The staining quality is good.

***Trypanosoma cruzi*** is the causative agent of the zoonosis Chagas' disease. It is a major health problem in Latin America. The organism is transmitted through the feces of the reduviid bug when it takes a blood meal. Trypomastigotes are detected in the blood on thin and thick smears. They measure approximately 20µm and usually are C or U shaped. The nucleus is located in the middle of the organism and a large kinetoplast is located at the posterior end. A flagellum arises from the kinetoplast and follows the undulating membrane to the anterior end where it projects as a free flagellum. On Giemsa stained smears the cytoplasm stains blueish while the nucleus and kinetoplast stain purple or red.

## 10B-C

Correct diagnosis: *Plasmodium falciparum*.

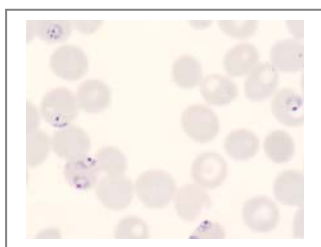
### Results of Participating Laboratories

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium falciparum</i>	18/19	95	10/10	Correct
<i>Plasmodium malariae</i>	1	5	0	Incorrect

### Quality Control and Referee Information

Participating and referee laboratories agreed that *Plasmodium falciparum* was the correct response (95 and 100%). Quality control examination of 4% of this sample showed parasites in every 100 X oil immersion field. The infected cells are not enlarged and no Schüffner's stippling is present. The only stage seen was the ring stage trophozoite. Appliqué forms are present. The overall staining quality is fair.

### Diagnostic Characteristics



*Plasmodium falciparum* is one of the four species of *Plasmodium* known to infect humans. It 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. *P. falciparum* invades all ages of RBC's and so the parasitemia can exceed 50%. The usual stages seen in the peripheral blood are rings and gametocytes. Schizogony occurs in the internal organs so it is rare to see other stages although they may be present in cases of severe malaria. The infected RBCs are not enlarged nor do they contain Schüffner's dots. The rings are generally small, and may have one or two chromatin dots. Appliqué forms are also characteristic. Gametocytes are rounded to banana-shaped and contain a single well defined chromatin and coarse rice-grain like pigment.

## 10B-D

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	19/19	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.

## 10B-E

Correct diagnosis: *Plasmodium vivax*.

### *Results of Participating Laboratories*

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Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
<i>Plasmodium vivax</i>	7/19	37	7/10	Unauthenticated
<i>Plasmodium ovale</i>	8	42	3	No Penalty
<i>Plasmodium malariae</i>	3	16	0	No Penalty
<i>Plasmodium falciparum</i>	1	5	0	No Penalty

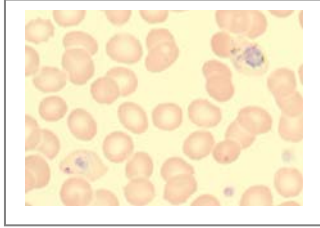
### *Quality Control and Referee Information*

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Participating and referee laboratories failed to agree that ***Plasmodium vivax*** was the correct response so all answers were given credit. Quality control examination of 4% of this sample showed parasites in every 10-15 100 X oil immersion fields. The infected cells are enlarged, pale staining, and some show schüffner's stippling. The cytoplasm is fragmented and the pigment is scattered and fine. The staining quality is good.

## Diagnostic Characteristics

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***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. 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.

## Scoring Information

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### Distribution of Scores

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Score	# of labs	% of labs
100	17/19	90
80	1	5
60	1	5

### Answer Key

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Sample	Correct Answer	Points
10B-A	<i>Babesia</i> sp.	20
10B-B	<i>Trypanosoma cruzi</i>	20
10B-C	<i>Plasmodium falciparum</i>	20
10B-D	No parasites seen	20
10B-E	<i>Plasmodium vivax</i>	20

**TOTAL POSSIBLE POINTS 100**

## Grading

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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 **June 1, 2010**. You are responsible for notifying the New York State Parasitology Unit **before June 8, 2010** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **June 15, 2010** 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 is in effect. Under the new scoring system, grades will be based only on the specimen or organism types processed by your laboratory. Laboratories that process all of the types of samples included in the exam will not observe any changes in scoring method.