

NEW YORK STATE PARASITOLOGY PROFICIENCY TESTING PROGRAM

BLOOD BORNE PARASITES

05 JUNE 2007

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.

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 checked to confirm their 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.

SAMPLE 08B-A

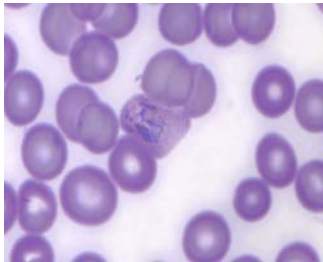
RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
<i>Plasmodium vivax</i>	17/17	100	Correct

QUALITY CONTROL:

Participating laboratories agreed that *Plasmodium vivax* was the correct response (100%). Quality control examination of 4% of this sample showed parasites in every 3-4 100X oil emersion fields. The predominant stage seen was the mature trophozoite. Infected cells are enlarged and exhibit Schüffner's stippling.

DIAGNOSTIC CHARACTERISTICS:



P. vivax trophozoite

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 in both the trophozoites and gametocytes.

SAMPLE 08B-B

RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
NO PARASITES SEEN	17/17	100	Correct

QUALITY CONTROL:

Participating 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. No inclusions are present.

SAMPLE 08B-C

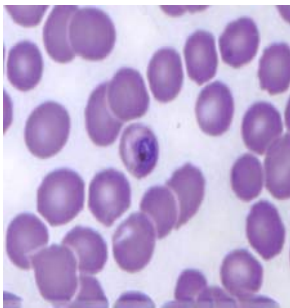
RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
<i>Plasmodium falciparum</i>	16/17	94	Correct
<i>Plasmodium malariae</i>	1	6	Incorrect
<i>Plasmodium ovale</i>	1	6	Incorrect

QUALITY CONTROL:

Participating laboratories agreed that *Plasmodium falciparum* was the correct response (94%). Quality control examination of 4% of this sample showed parasites in every 6-8 100X oil emersion fields. Infected cells are not enlarged and no stippling was noted. The only stages seen were the early (ring stage) and mature trophozoites.

DIAGNOSTIC CHARACTERISTICS:



P. falciparum
mature trophozoite

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 RBC's 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. The mature trophozoites (as shown in the image on the left) are compact with a mass or a few grains of coarse pigment. Gametocytes are rounded to banana-shaped and contain a single well defined chromatin and coarse rice-grain like pigment.

SAMPLE 08B-D

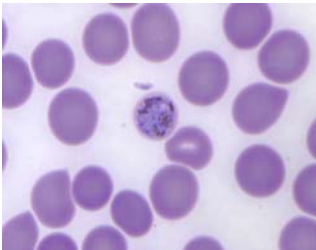
RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
<i>Plasmodium malariae</i>	16/17	94	Correct
<i>Plasmodium falciparum</i>	1	6	Incorrect

QUALITY CONTROL:

Participating laboratories agreed that *Plasmodium malariae* was the correct response (94%). Quality control examination of 4% of this sample showed parasites in every 10-12 100X oil emersion fields. The infected erythrocytes are not enlarged and no stippling was observed. The predominant stage seen was the mature trophozoite with compact cytoplasm and coarse pigment. Band and basket forms were present.

DIAGNOSTIC CHARACTERISTICS:



P. malariae mature trophozoite

Plasmodium malariae is the least common species of plasmodium 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 are not amoeboid and often appear as compact rounded or band forms with coarse, scattered pigment. The gametocytes are round and compact with a single, well defined chromatin. The pigment is scattered and coarse and may appear to be peripherally distributed. The schizonts contain 6-12 merozoites usually arranged in a rosette although they may be in an irregular cluster. The pigment, in the schizont, is in a concentrated mass.

SAMPLE 08B-E

RESULTS OF PARTICIPATING LABS:

ORGANISM	NUMBER REPORTED	PERCENT REPORTED	STATUS
NO PARASITES SEEN	17/17	100	Correct

QUALITY CONTROL:

Participating 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 although the staining quality was sub optimal. No inclusions are present.

DISTRIBUTION OF SCORES

SCORE	NUMBER OF LABS	PERCENT
100	14/17	82
90	1	6
80	2	12

ANSWER KEY

<u>SAMPLE</u>	<u>CORRECT ANSWER</u>	<u>POINTS</u>
08B-A	<i>Plasmodium vivax</i>	20
08B-B	NO PARASITES SEEN	20
08B-C	<i>Plasmodium falciparum</i>	20
08B-D	<i>Plasmodium malariae</i>	20
08B-E	NO PARASITES SEEN	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. These regulations state that 80% or more of participating laboratories **or** referee laboratories must identify the parasite for it to be correct. Similarly, less than 20% of the participating laboratories **or** referees finding parasites or ova is an incorrect response. Organisms reported by 20-80% 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 2, 2007**. You are responsible for notifying us **before October 9, 2007** if you do not receive your test. Proficiency test results must be electronically submitted through EPTRS by **October 16, 2007** 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 or can be accessed via the internet at <http://www.wadsworth.org/labcert/clep/ProgramGuide/WebGuide.pdf>

NEWS AND NOTES

The Clinical Parasitology Lab of the NYSDOH offers two mailing kits for the submission of specimens. One kit contains vials of PVA and Formalin and the other does not. These kits can be ordered by calling 518-474-4175 and requesting kit DOH-2117. Please be sure to specify whether you need preservatives or not. **Remember that the NYS Parasitology Lab only accepts specimens preserved in appropriate fixatives for the test requested.**