NEW YORK STATE

Parasitology Proficiency Testing Program

Blood Smears Only
5 November 2013

The purpose of the New York State Proficiency Testing Program in the category of Parasitology - Blood Smears Only is to monitor the performance of applicant laboratories that detect and identify parasites on blood films. This document reports the results for the Nov 2013 proficiency test in Blood Smears Only.

This category is divided into two sub-categories. **Parasite Identification** is intended for labs that identify parasites and report them to the species level on patient reports. **Parasite Screen** is intended for labs that report "Parasites Seen" and never report organisms to the species level on patient reports. Participants in both sub-categories examine the same samples, however the scoring criteria for the two sub-categories are different. When reading this critique, ensure that you are comparing your performance to other laboratories in your sub-category.

Sample Preparation and Quality Control

All slides used in this test were prepared and stained by a commercial source. Samples of each test specimen were selected at random by the Parasitology Laboratory of the Wadsworth Center, NYS DOH, and were assayed for quality and confirmation of contents. The supplying vendor also conducted extensive quality control tests and a detailed quality control report was submitted to the Parasitology Laboratory for inspection and verification. Samples were authenticated by 80% of participating laboratories and/or referee laboratories.

13B-K

Correct identification: *Plasmodium ovale*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
*Plasmodium ovale**	3/22	14	2/10	**Unauthenticated**
Plasmodium malariae	10	45	5	**No Penalty**
Plasmodium vivax	2	9	0	**No Penalty**
No Parasites Seen	7	32	3	**No Penalty**

* Sample contained *Plasmodium ovale* but was not authenticated.

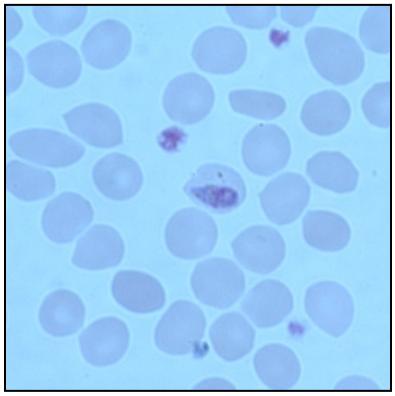
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	1/2	50	7/10	**Unauthenticated**
No Parasites Seen	1	50	3	**No Penalty**

Quality Control and Referee Information

Neither the majority of participating nor referee laboratories were able to agree that ***Plasmodium ovale*** was the correct response (14 and 20% respectively). Therefore this sample was not authenticated by 80% of the participating or referee laboratories. As there was also no majority agreement to the genus this sample was graded as No Penalty. However, quality control examination of 4% of the slides for this sample showed an average of 1 organism per 30-50 100X oil immersion fields. The overall staining quality is fair.

Diagnostic Characteristics



Plasmodium ovale infections occur primarily in Central West Africa and some South Pacific Islands and account for fewer than 5% of all malaria cases. *P. ovale* malaria is usually less severe than other malarias and often ends in spontaneous recovery. The infected cells are usually enlarged, fimbriate, and have Schüffner's stippling. The cytoplasm of the trophozoites is usually less amoeboid than then that of *P. vivax* and the schizonts have 4-12 merozoites compared to 12-24 for *P. vivax*. The chromatin is usually very pronounced and the pigment is coarse.

13B-L

Correct identification: *Trypanosoma cruzi*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Trypanosoma cruzi	21/21	100	10/10	**Correct**

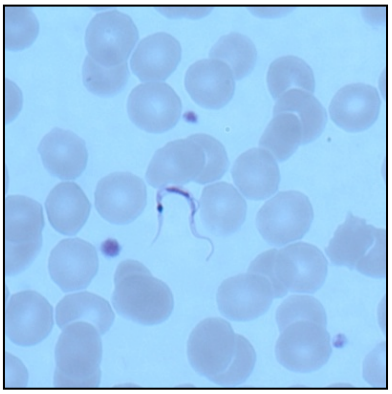
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	3/3	100	10/10	**Correct**

Quality Control and Referee Information

Participating and Referee laboratories agreed that ***Trypanosoma cruzi*** was the correct response (100 and 100% respectively). Quality control examination of 4% of the slides for this sample showed an average of 1 organism per 100X oil immersion field. Organisms have a central nucleus and a large posterior kinetoplast.

Diagnostic Characteristics



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 20 µm long and usually are C or U shaped. The nucleus is located in the middle of the organism and a large kinetoplast (mitochondrial DNA) is located at the posterior end. A flagellum arises from the flagellar pocket near 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. *Trypanosoma cruzi* is distinguished from *Trypanosoma brucei* primarily by the prominence of the kinetoplast, which is much larger in *Trypanosoma cruzi.*

13B-M

Correct identification: *Brugia malayi*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Brugia malayi	18/21	86	9/10	**Correct**
Loa loa	2	9	0	**Incorrect**
Wuchereria bancrofti	1	5	1	**Incorrect**

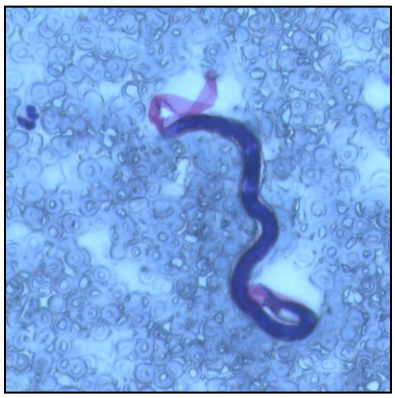
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	1/3	33	9/10	**Correct**
No Parasites Seen	2	67	0	**Incorrect**

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Brugia malayi*** was the correct response (86 and 90% respectively). Quality control examination of 4% of the slides for this sample showed an average of 1 organism per 10 10X fields. The overall staining quality is good.

Diagnostic Characteristics



Brugia malayi is an arthropod-borne worm that resides in the lymphatic system of humans. Infection is spread by the arthropod intermediate host, in this case the mosquito. Adult female worms produce large numbers of sheathed larvae called microfilariae, which can be detected, in the peripheral blood. These microfilariae range in size from 177-230 µm long and have a clearly visible pink sheath when stained with Giemsa stain. *Wuchereria bancrofti* and *Loa loa* also have sheaths but they are not well stained with Giemsa. *Brugia malayi* is also characterized by the presence of two terminal nuclei the second of which is located in the tip of the tail. *Wuchereria bancrofti* has no nuclei in the tip of the tail and *Loa loa* has a continuous row extending all the way to the tip.

13B-N

Correct identification: *Plasmodium falciparum*

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Plasmodium falciparum	18/22	82	9/10	**Correct**
Plasmodium ovale	1	5	1	**Incorrect**
Plasmodium vivax	1	5	0	**Incorrect**
Babesia sp.	2	9	0	**Incorrect**

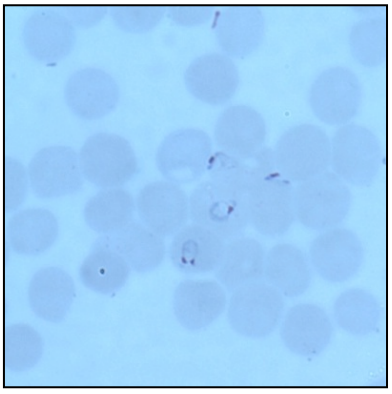
Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	2/2	100	10/10	**Correct**

Quality Control and Referee Information

Participating and referee laboratories agreed that ***Plasmodium falciparum*** was the correct response (82 and 90% respectively). Quality control examination of 4% of the slides for this sample showed an average of 2-3 organisms per 100X oil immersion field. The staining quality is fair.

Diagnostic Characteristics



Plasmodium falciparum is one of the four species of *Plasmodium* know 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 seen 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. Gametocytes are rounded to banana-shaped and contain a single well-defined chromatin and coarse rice-grain like pigment.

13B-O

Correct identification: No Parasites Seen

Results of Participating Laboratories Who Perform Parasite Identification

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	21/21	100	10/10	**Correct**

Results of Participating Laboratories Who Perform Parasite Screen

Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
No Parasites Seen	3/3	100	10/10	**Correct**

Quality Control and Referee Information

Participating and referee laboratories agreed that **No Parasites Seen** was the correct response (100 and 100% respectively). Quality control examination of 4% of the slides for this sample showed erythrocytes of normal size and staining characteristics in 100X oil immersion field. Normal blood elements are present and exhibit typical staining characteristics. The overall staining quality is good.

Scoring Information

Distribution of Scores

Score	# of labs	% of labs
100	16	67
90-99	0	0
80-89	7	29
70-79	0	0
60-69	1	4
0-59	0	0

Answer Key

Sample	Correct Answer
13B-K*	*Plasmodium ovale**
13B-L	*Trypanosoma cruzi*
13B-M	*Brugia malayi*
13B-N	*Plasmodium falciparum*
13B-O	No Parasites Seen

* Sample contained *Plasmodium ovale* but was not authenticated. Therefore this sample was graded as No Penalty.

Grading

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. 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% but less than 80% of the participating laboratories **or** referees are "Unauthenticated", and are not considered for grading.

Credit is given according to the formula:

[# of Correct Responses / (# of Correct Responses + # of Incorrect Responses)] X 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:

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

Important Reminders

The next Parasitology Proficiency Test is scheduled for **February 4, 2014.** You are responsible for notifying us **before February 11, 2014** if you do not receive your samples. Proficiency test results must be electronically submitted through EPTRS by **February 19, 2014** or the laboratory will receive a score of zero. These requirements are stated 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/WebGuide.pdf