NEW YORK STATE

Parasitology Proficiency Testing Program

Blood Smears Only
20 May 2014

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 smears. Below please find the results for the May 2014 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 genus or species level on patient reports. **Parasite Screen** is intended for labs that report "Parasites Seen" but do not identify organisms 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, please 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 at 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

14B-F

Correct Identification: *Trypanosoma brucei*

Results of Participating Laboratories Who Perform Parasite Identification

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

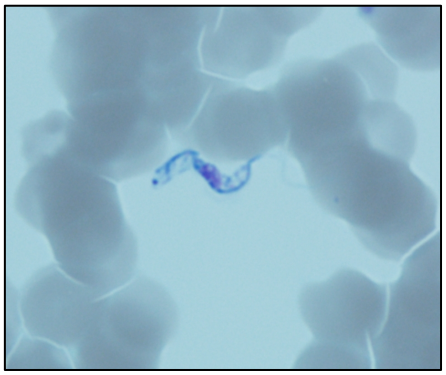
Results of Participating Laboratories Who Perform Parasite Screen

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

Quality Control and Referee Information

All participating and referee laboratories agreed that ***Trypanosoma brucei*** was the correct response. Quality control examination of 4% of the slides showed an average of 2 organisms per 40X oil immersion field. Staining quality was fair.

Diagnostic Characteristics



Trypanosoma brucei is the causative agent of African sleeping sickness; also know as human African trypanosomiasis (HAT). HAT is limited to the tse-tse fly endemic area of Sub-Saharan Africa, where it has caused serious economic and social problems.

Trypomastigotes are detected in the blood on thick and thin Giemsa-stained smears. The parasites measure 15-30 μm long. The nucleus is located in the middle of the organism and the kinetoplast (mitochondrial DNA) is located at the posterior end. Cytoplasm stains blue while the nucleus and kinetoplast will stain red or purple. Organisms seen in this specimen were long and had a small, less prominent kinetoplast. Trypomastigotes of *T. cruzi* are similar but are generally shorter, have a larger, more prominent kinetoplast and often form a C or U shape. 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.

14B-G

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	16/21	76	7/10	**Correct***
Loa loa	1	5	1	**Correct***
Wuchereria bancrofti	3	14	2	**Correct***
No Parasites Seen	1	5	0	**Incorrect**

* Credit was given for *Brugia malayi*, *Loa loa* and *Wucheraria bancrofti* as this sample was authenticated only as microfilaria.

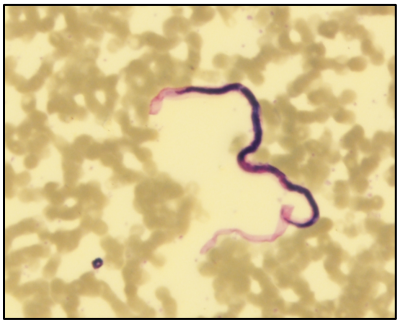
Results of Participating Laboratories Who Perform Parasite Screen

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

Quality Control and Referee Information

This sample contained microfilariae of *Brugia malayi*. Because participating and referee laboratories failed to reach consensus the specimen was authenticated as **microfilaria** (95% and 100% respectively). Quality control examination of 4% of the slides for this sample showed an average of 3 organisms per slide. The overall staining quality is good.

Diagnostic Characteristics



Brugia malayi is an arthropod-borne nematode. Adult females produce large numbers of sheathed larvae called microfilariae, which can be detected in the peripheral blood. These microfilariae have a clearly visible pink sheath when stained with Giemsa. The pink sheath is diagnostic for *Brugia malayi*. *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.

14B-H

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

All participating and referee laboratories agreed that **No Parasites Seen** was the correct response. Quality control examination of 4% of the slides for this sample showed erythrocytes of normal size and staining characteristics. Normal blood elements are present and exhibit typical staining characteristics. The overall staining quality is good.

14B-I

Correct Identification: *Babesia* species

Results of Participating Laboratories Who Perform Parasite Identification

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

Results of Participating Laboratories Who Perform Parasite Screen

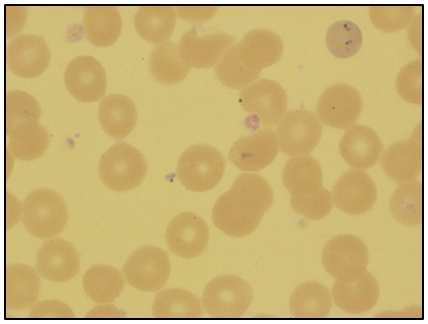
Organism reported	# of labs reporting	% of labs reporting	Referee results	Status
Parasites Seen	3/3	100	10/10	**Correct**

Quality Control and Referee Information

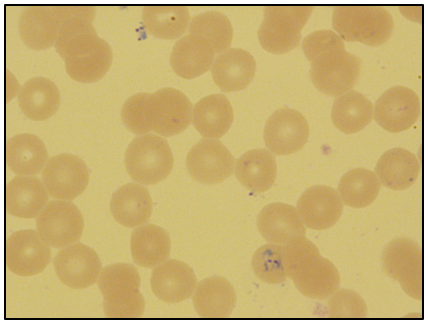
All participating and referee laboratories agreed that ***Babesia* species** was the correct response. Quality control examination of 4% of the slides for this sample demonstrated *Babesia* in every 100X oil immersion field. Both intracellular and extracellular parasites were observed and the staining quality was good.

Diagnostic Characteristics

***Babesia* microti** is endemic in the northeastern United States and is currently found in more than 20 counties of New York State. The parasite is transmitted by *Ixodes scapularis*, the deer tick, which can also carry *Borrelia burgdorferi*, *Anaplasma phagocytophilum* and in rare cases Powassan/deer tick virus. *Babesia microti* infects red blood cells and appears as small, pleomorphic rings, which could be confused with the early stage of *Plasmodium falciparum*. The presence of extracellular parasites distinguishes *B. microti* from *Plasmodium*. Infected cells are not enlarged and do not exhibit stippling or Maurer's dots. No other stages are seen and no pigment is present.



A



B

14B-J

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	21/22	95	9/10	**Correct**
Plasmodium ovale	1	5	1/10	**Incorrect**

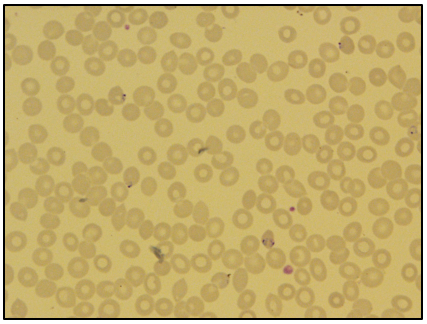
Results of Participating Laboratories Who Perform Parasite Screen

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 (95 and 90% respectively). Quality control examination of 4% of the slides for this sample showed numerous parasites in every 40X oil immersion field. Staining quality was fair.

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 30%. By contrast *P. vivax* and *P. ovale* infect new red blood cells (reticulocytes) and *P. malariae* infects mature red blood cells. For *P. falciparum*, the stage seen in peripheral blood is early trophozoites, or rings. Both cells with more than one ring and applique forms were present as is common in *P. falciparum* infections. The presence of only early trophozoites and a high parasitemia are also characteristic of this species.

Because high parasitemia is possible, infection with *P. falciparum* causes the most dangerous form of malaria and is always considered to be a medical emergency. Death may occur rapidly if proper treatment is not started immediately.

Scoring Information

Distribution of Scores

Score	# of labs	% of labs
100	22	92
90-99	0	0
80-89	2	8
70-79	0	0
60-69	0	0
0-59	0	0

Answer Key

Sample	Correct Answer
14B-F	*Trypanosoma brucei*
14B-G	*Brugia malayi* *
14B-H	No Parasites Seen
14B-I	*Babesia* sp.
14B-J	*Plasmodium falciparum*

* The sample was authenticated as microfilaria.

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 **September 30, 2014.** Participating labs will need to notify us **before October 7, 2014** if the samples are not received. Proficiency test results must be electronically submitted through EPTRS by **October 15, 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/WebGuide.pdf