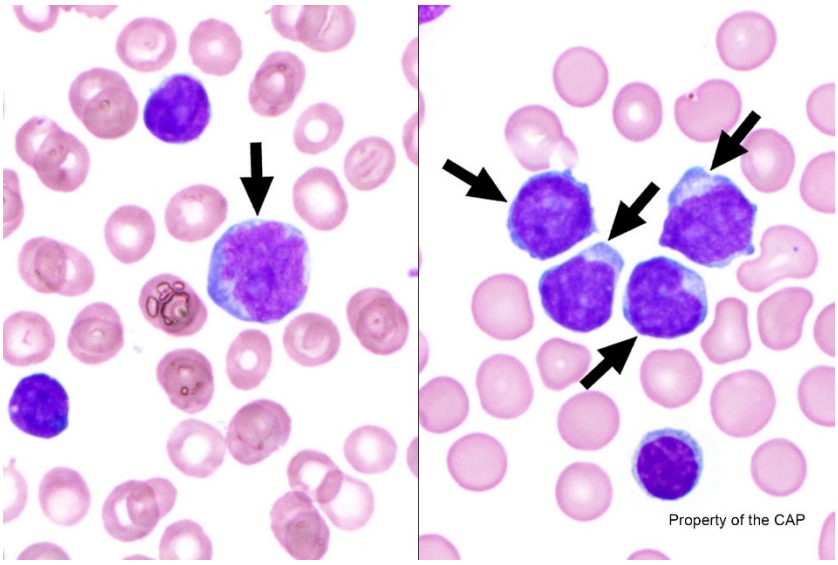
Blood Cell Identification – Ungraded

BCP-28

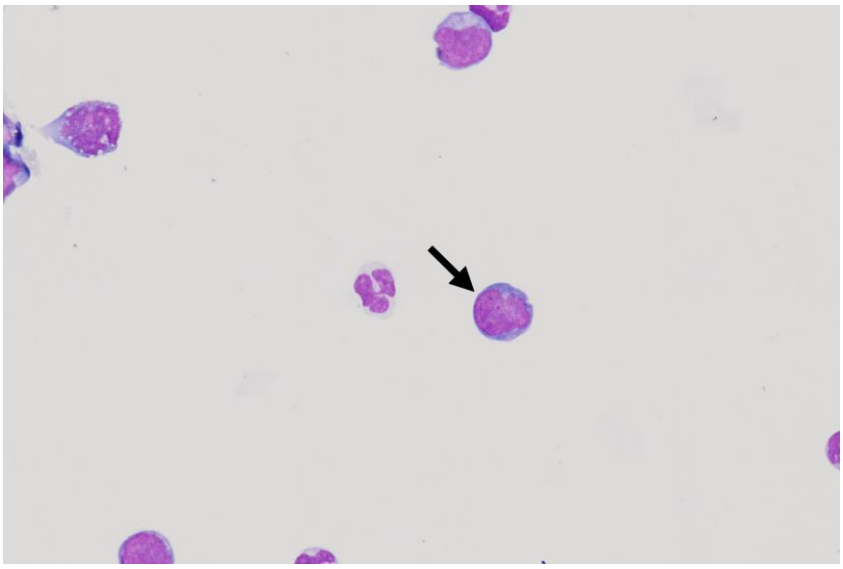


Identification	Referees Freq	Referees %	Participants Freq	Participants %	Evaluation
Malignant lymphoid cell (other than blast)	71	35.1	1850	36.9	Educational
Lymphocyte, reactive (includes plasmacytoid and immunoblastic forms)	48	23.8	1372	27.4	Educational
Lymphocyte	43	21.3	927	18.5	Educational
Blast cell	28	13.9	591	11.8	Educational
Immature or abnormal cell, would refer for identification	10	5.0	212	4.2	Educational
Lymphocyte, large granular	1	0.5	39	0.8	Educational
Neutrophil necrobiosis (degenerated neutrophil)	1	0.5	1	0.0	Educational

The arrowed cells are malignant lymphoid cells (other than blasts), as correctly identified by 35.1% of referees and 36.9% of participants. Lymphoma cells can exhibit a variety of appearances depending on the lymphoma subtype, and definitive diagnosis can be difficult. Cell size ranges from 8 to 30 µm, and the N:C ratio varies from 7:1 to 3:1. It is critical to obtain an accurate clinical history, since knowledge of a previous diagnosis of lymphoma greatly aids in the identification of these cells. Large lymphoma cells may exhibit some highly abnormal morphologic appearances. They are large (20 to 30 µm) and have scant to moderate amounts of basophilic cytoplasm. The nuclei are generally round to oval, but they may be angulated, folded, indented, or convoluted. Nucleoli are prominent, and they may be single or multiple. Vacuoles can occasionally be seen in the cytoplasm. These cells can be easily confused with blasts, and additional studies such as immunophenotyping (flow cytometry) are often necessary to make the correct diagnosis.

5.0% of referees and 4.2% of participants selected the response of immature/abnormal cell, would refer for identification. This is considered an acceptable answer if your laboratory routinely sends the cells in question to an outside laboratory with another CLIA number.

VBF-24



Identification	Participants Freq	%	Evaluation
Blast cell	400	63.4	Educational
Lymphocyte, reactive	78	12.4	Educational
Monocyte/macrophage	43	6.8	Educational
Immature or abnormal cell, would refer for identification	37	5.9	Educational
Lymphoma cell	37	5.9	Educational
Lymphocyte	23	3.6	Educational
Malignant cell (non-hematopoietic)	4	0.6	Educational
Neutrophil, immature (metamyelocyte, myelocyte, promyelocyte)	4	0.6	Educational
Neutrophil, segmented or band	2	0.3	Educational
Germinal matrix cell	1	0.2	Educational
Neutrophil/macrophage containing fungi	1	0.2	Educational
Plasma cell, normal/abnormal	1	0.2	Educational

The arrowed cell is a blast, as correctly identified by 63.4% of participants. A blast is a large (10 to 20 µm) round-to-oval cell with a high N:C ration (7:1 to 5:1) with a round-to-oval to indented or folded nucleus. Blasts have fine, lacy or reticular chromatin and often one or more prominent nucleoli. The cytoplasm may be scant or abundant with or without granules. The morphologic features of do not typically permit determination of the cell lineage (ie, myeloblast versus lymphoblast) except when Auer rods are present as these are diagnostic of myeloid lineage (ie, myeloblast). In the absence of Auer rods, immunophenotyping by flow cytometry, immunohistochemistry on tissue sections, or, cytochemical staining (eg, peroxidase or Sudan black) is required to determine the lineage of a blast. Notably, blasts may be morphologically indistinguishable from lymphoma cells. For identification purposes, one should classify cells exhibiting blast morphology as a “blast” when additional confirmatory information is unavailable.

VBF-24, cont'd

5.9% of participants selected the response of immature/abnormal cell, would refer for identification. This is considered an acceptable answer if your laboratory routinely sends the cells in question to an outside laboratory with another CLIA number.

12.2% of participants incorrectly identified the arrowed cell as a reactive lymphocyte. Reactive lymphocytes are usually larger than resting lymphocytes, with more abundant cytoplasm; however, the N:C ratio is lower than blasts and the nuclear chromatin is more condensed. The arrowed cell has a high N:C ratio and fine/open chromatin characteristic of a blast.

6.8% of participants incorrectly identified the arrowed cell as a monocyte/macrophage. Monocytes are large (12 to 20 µm) with abundant blue-gray cytoplasm and relatively low N:C ratio. The arrowed cell is also large but has fine chromatin and a high N:C ratio characteristic of a blast.

5.9% of participants incorrectly identified the arrowed cell as a lymphoma cell. Lymphoma cells can exhibit a variety of appearances depending on the lymphoma subtype, and definitive diagnosis can be difficult. It is critical to obtain an accurate clinical history, since knowledge of a previous diagnosis of lymphoma greatly aids in the identification of these cells. For identification purposes, one should classify cells exhibiting blast morphology as a “blast” when additional confirmatory information is unavailable. Note: although not present in the arrowed cell cytoplasm, other cells on the slide contain cytoplasmic Auer rods diagnostic of a myeloid blast.

3.6% of participants incorrectly identified the arrowed cell as a lymphocyte. Lymphocytes are smaller than a neutrophil (7 to 15 µm) have round nuclei with smooth contours, and highly condensed chromatin without nucleoli. The arrowed cell is large (compare to the adjacent non-arrowed neutrophil within the same field) with fine/open chromatin and irregular nuclear contours, features characteristic of a blast.