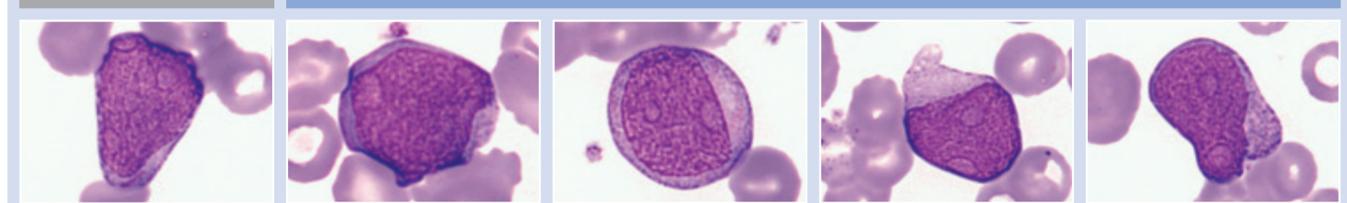


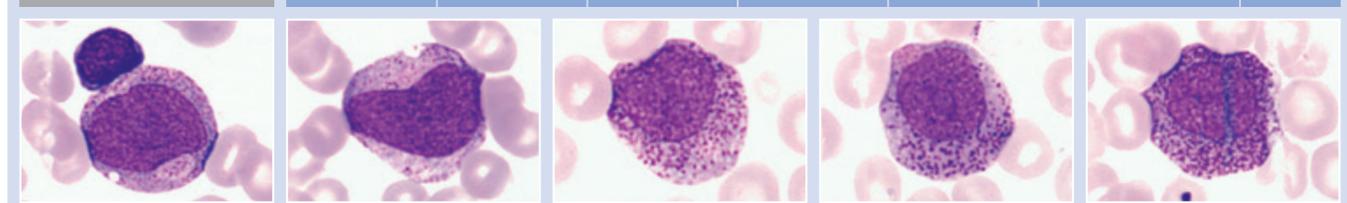
Classification of Neutrophilic Granulocytes

Neutrophilic Granulocytes (May Grünwald-Giemsa stain) Characteristics

Myeloblasts	cell size	nucleus shape	nuclear chromatin	N/C ratio	cytoplasm colour	granules	nucleoli
	~12–18 μm	round or oval	very fine	greater than 0.5 as a rule	strongly basophilic	none or a few azurophilic granules	1 or more
Classification of neoplastic myeloblasts: type I myeloblasts: no granules, type II myeloblasts: less than 20 granules, type III myeloblasts: more than 20 granules							

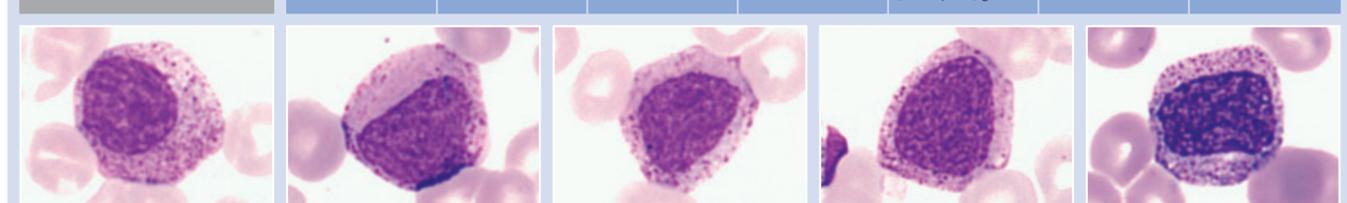


Promyelocytes	cell size	nucleus shape	nuclear chromatin	N/C ratio	cytoplasm colour	granules	nucleoli
	~14–24 μm	round or oval	fine with little or no clumping	less than 0.5 as a rule	less basophilic than myeloblasts	azurophilic granules few = promyelocytes I many = promyelocytes II	1 or more



Neutrophilic Granulocytes (May Grünwald-Giemsa stain) Characteristics

Myelocytes	cell size	nucleus shape	nuclear chromatin	cytoplasm colour	granules (immature)	granules (mature)	nucleoli
	~10–18 μm	oval or slightly indented	variable degree of chromatin clumping	acidophilic	primary (azurophilic) and secondary (neutrophilic) granules	many secondary granules	1 or more



Metamyelocytes	cell size	nucleus shape	nuclear chromatin	cytoplasm colour	granules	nucleoli
	~10–17 μm	thick horseshoe or indented	usually clumped	acidophilic	appearance of many secondary (neutrophilic) granules	none



Neutrophilic Granulocytes (May Grünwald-Giemsa stain) Characteristics

Band neutrophils	cell size	nucleus shape	nuclear chromatin	cytoplasm colour	granules	nucleoli
	~10–15 μm	band shaped or indented, beginning segmentation	coarse and clumpy	strongly acidophilic	specific (neutrophilic) granules	none



Segmented neutrophils	cell size	nucleus shape	nuclear chromatin	cytoplasm colour	granules	nucleoli
	~10–15 μm	~2–5 distinct lobes connected by thin filaments	clumped	acidophilic	fine, specific granules sometimes giving a ground glass appearance	none



Classification

Difference between myeloblasts and promyelocytes

	nuclear chromatin	granules	N/C ratio
Myeloblasts	very fine	none or few	greater than 0.5
Promyelocytes	fine with little or no clumping	primary azurophilic granules present	less than 0.5

Nucleus: oval shape
Cytoplasm: basophilic
N/C ratio: > 0.5

azurophilic granules

no: myeloblast
few: promyelocyte

Other criteria in determining promyelocytes:
1. Chromatin structure becomes more coarse.
2. Golgi body is more distinct.

Difference between promyelocytes and myelocytes

	nuclear chromatin	granules	basophilic cytoplasm
Promyelocytes	fine with little or no clumping	few or many primary	distribution over 50% of cytoplasm
Myelocytes	variable degree of chromatin clumping	primary (azurophilic) and secondary (neutrophilic)	distribution in less than 50% of cytoplasm*

*Note: classify using nuclear chromatin and presence of specific granules.

Difference between myelocytes and metamyelocytes* (clumped chromatin)

Nucleus shape	round to oval shape	indented	indented
Myelocytes	$a \geq 1/2b$		
Metamyelocytes	$a < 1/2b$	$b \geq 2 \mu m$	$b \geq 1 \mu m$ $a \geq 4 \mu m$

*Note: classification of nucleus shape

Difference between metamyelocytes and band neutrophils

Nucleus shape	
Metamyelocytes	$a > 4 \mu m$ $b > 2 \mu m$
Band neutrophils	$2 \leq a \leq 4 \mu m$

Difference between band neutrophils and segmented neutrophils*

Nucleus shape	
Band neutrophils	$2 \leq a \leq 4 \mu m$ $a \geq 1/3b$
Segmented neutrophils*	$a < 2 \mu m$ $a < 1/3b$

*Note: the following nucleus shapes are classified into segmented neutrophils:

- T- or Y-shaped lobes
- 3-dimensional overlapping of lobes
- knotted lobes