

Frequencies of Cell Types in Human Peripheral Blood

Cell Type	Frequencies ¹ (x10 ⁶ cells/mL)	Percent	Source ²	STEMCELL Technologies Products				
				Cell Isolation Kits by Platform				Human Primary Cells
				EasySep™	EasySep™ Release	EasySep™ Direct	RosetteSep™	
Erythrocytes	3800 – 6200	93 – 96% of blood cells	Whole Blood	✓ ³	–	–	–	–
Platelets	140 – 450	4 – 7% of blood cells	Whole Blood	–	–	–	–	–
Leukocytes ⁴	4.1 – 10.9	0.1 – 0.2% of blood cells	Whole Blood	–	–	–	–	–
Lymphocytes	1.1 – 3.5	14 – 47% of leukocytes	Whole Blood	✓	–	✓	✓	–
T Cells	0.54 – 1.79	7 – 24% of leukocytes	Whole Blood	✓	–	✓	✓	✓
			PBMC	✓	✓	–	–	
CD4 ⁺ T Cells	0.30 – 1.50	4 – 20% of leukocytes	Whole Blood	✓	–	✓	✓	✓
			PBMC	✓	✓	–	–	
Naïve CD4 ⁺ T Cells	0.08 – 0.76	1 – 10% of leukocytes	PBMC	✓	–	–	–	✓
Memory CD4 ⁺ T Cells	0.25 – 0.81	3 – 11% of leukocytes	PBMC	✓	–	–	–	✓
Regulatory CD4 ⁺ T Cells	0.007 – 0.052	0.1 – 0.7% of leukocytes	Whole Blood	✓	–	–	–	✓
			PBMC	✓	–	–	–	
CD8 ⁺ T Cells	0.14 – 0.82	2 – 11% of leukocytes	Whole Blood	✓	–	✓	✓	✓
			PBMC	✓	–	–	–	
Naïve CD8 ⁺ T cells	0.03 – 0.21	0.4 – 2.6% of leukocytes	PBMC	✓	–	–	–	✓
Memory CD8 ⁺ T Cells	– ⁵	1 – 7% of leukocytes	PBMC	✓	–	–	–	–
B Cells	0.07 – 0.53	1 – 7% of leukocytes	Whole Blood	✓	–	✓	✓	✓
			PBMC	✓	✓	–	–	
Naïve B cells	0.05 – 0.37	0.7 – 4.9% of leukocytes	Whole Blood	–	–	✓	–	✓
Memory B cells	– ⁵	0.2 – 1.7% of leukocytes	PBMC	✓	–	–	–	–
Plasma Cells	– ⁵	0.2 – 2.0% of leukocytes in bone marrow	Whole Blood	✓	–	–	–	–
			Bone Marrow	✓	–	–	✓	
			PBMC	✓	–	–	–	
NK Cells	0.08 – 0.43	1 – 6% of leukocytes	Whole Blood	–	–	✓	✓	✓
			Buffy Coat	✓	–	–	–	
			PBMC	✓	–	–	–	
Innate Lymphoid Cells	0.0006 – 0.005	0.05 – 0.07% of mononuclear cells	Whole Blood	–	–	–	✓	–
			PBMC	✓	–	–	–	
Myeloid Cells	3.9 – 6.5	53 – 86% of leukocytes	Whole Blood	✓	–	–	✓	–
			Lysed Whole Blood	✓	–	–	–	
Dendritic Cells	0.02 – 0.06	0.3 – 0.9% of leukocytes	PBMC	✓	–	–	–	✓
Myeloid Dendritic Cells	0.01 – 0.03	0.3 – 0.5% of leukocytes	PBMC	✓	–	–	–	✓
Plasmacytoid Dendritic Cells	0.01 – 0.04	0.2 – 0.6% of leukocytes	PBMC	✓	–	–	–	✓
Monocytes	0.20 – 0.90	2 – 12% of leukocytes	Whole Blood	–	–	✓	✓	✓
			Buffy Coat	✓	–	–	–	
			PBMC	✓	–	–	–	
Granulocytes	2.13 – 6.35	35 – 80% of leukocytes	Whole Blood	–	–	✓	–	–
			PMNC	✓	–	–	–	
Neutrophils	2.09 – 5.97	30 – 80% of leukocytes	Whole Blood	✓	–	✓	–	–
			PMNC	✓	–	–	–	
Eosinophils	0.03 – 0.30	0 – 7% of leukocytes	Whole Blood	–	–	✓	–	–
			PMNC	✓	–	–	–	
Basophils	0.01 – 0.08	0 – 2% of leukocytes	Whole Blood	–	–	✓	–	–
			PMNC	✓	–	–	–	
Hematopoietic Stem and Progenitor Cells (CD34 ⁺)	0.001 – 0.007	0.03 – 0.09% of leukocytes	Mobilized PBMC or BMMC	✓	–	–	–	✓
			Whole Blood	✓ ⁶	–	–	–	
			Cord Blood	✓	–	–	✓	
			Bone Marrow	–	–	–	✓	

1. Cell type frequencies will vary from donor to donor. 2. PBMC - Peripheral Blood Mononuclear Cells; BMMC - Bone Marrow Mononuclear Cells; PMNC - Polymorphonuclear Cells. 3. Remove erythrocytes from whole blood samples with EasySep™ RBC Depletion Reagent or EasySep™ Red Blood Cell Lysis Buffer. 4. Use HetaSep™ or Ammonium Chloride Solution to obtain nucleated cells from blood samples. HetaSep™ is an erythrocyte aggregation agent used to quickly separate nucleated cells from red blood cells (RBCs) in whole blood. Aggregated erythrocytes settle much faster than dispersed cells. Ammonium Chloride Solution is recommended for the lysis of RBCs in preparations of human peripheral blood and is optimized for gentle lysis of erythrocytes, with minimal effect on leukocytes. 5. Data not available. 6. Two-step cell isolation method that consists of RosetteSep™ pre-enrichment followed by positive selection using EasySep™.

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EasySep™ Direct immunomagnetically depletes red blood cells and unwanted cells directly from whole blood without density gradient centrifugation, sedimentation, lysis, or other pre-processing steps.

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RoboSep™ instruments allow for fully automated cell isolation of up to 16 samples using EasySep™ reagents.

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RosetteSep™ offers one-step enrichment of cells directly from whole blood during density gradient centrifugation. RosetteSep™ can be easily combined with SepMate™ for fast and reproducible cell isolation.

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