

Supplementary Table 14: Index Sort Antibodies

Antibody	Clone	Manufacturer
CD45 APC-H7	2D1	BD Bioscience
HLA-DR BV785	L243	Biolegend

Supplementary Table 15: Cytospin/Mini Bulk Sort Antibodies

	Antibody	Clone	Manufacturer
Panel 1	CD14 APC-Cy7	MφP9	BD Bioscience
	CD34 APC	581	BD Bioscience
	CD45 BUV395	HI30	BD Bioscience
	CD56 PE	NCAM16.2	BD Bioscience
	CD106 FITC	51-10C9	BD Bioscience
	GYPA BV605	GA-R2	BD Bioscience
	HLA-DR BV785	L243	Biolegend
Panel 2	CD14 PE CF594	MφP9	BD Bioscience
	CD34 APC-Cy7	581	Biolegend
	CD41 AF700	HIP8	Biolegend
	CD45 BUV395	HI30	BD Bioscience
	CD56 PE	NCAM16.2	BD Bioscience
	CD94 APC	REA113	Miltenyi
	CD117 PE-Cy7	104D2	Biolegend
	CD161 PerCP-Cy5.5	HP-3G10	Biolegend
	GYPA BV605	GA-R2	BD Bioscience
HLA-DR BV785	L243	Biolegend	
Panel 3	CD1c AF700	L161	Biolegend
	CD14 PE CF594	MφP9	BD Bioscience
	CD45RA BV510	HI100	Biolegend
	CD20 FITC	L27	BD Bioscience
	CD34 APC	581	BD Bioscience
	CD45 APC-H7	2D1	BD Bioscience
	CD38 PerCP-Cy5.5	HB7	Biolegend
	CD117 PE-Cy7	104D2	Biolegend
	CD123 BUV395	7G3	BD Bioscience
	GYPA BV605	GA-R2	BD Bioscience
	CLEC9A PE	8F9	Biolegend
	HLA-DR BV785	L243	Biolegend

Supplementary Table 16: HSC Culture with stroma Antibodies

	Antibody	Clone	Manufacturer
Sort	CD3 FITC	SK7	BD Bioscience
	CD11c BV421	B-Ly6	BD Bioscience
	CD14 PE Dazzle	HCD14	Biolegend
	CD16 FITC	NKP15	BD Bioscience
	CD19 FITC	4G7	BD Bioscience
	CD34 APC-Cy7	581	Biolegend
	CD38 PerCP-Cy5.5	HB-7	Biolegend
	CD45 BUV395	HI30	BD Bioscience
	CD45RA BV510	HI100	BD Bioscience
	CD49f PE-Cy7	GoH3	eBioscience
	CD56 FITC	NCAM16.2	BD Bioscience
	CD90 APC	5E10	Biolegend
	Culture readout	CD11b APC	ICRF44
CD14 APC-Cy7		HCD14	Biolegend
CD15 BUV395		HI98	BD Bioscience
CD41 FITC		HIP8	Biolegend
CD45 V500		HI30	BD Bioscience
CD56 PE		NCAM16.2	BD Bioscience
GYPA BV605		GA-R2	BD Bioscience

Supplementary Table 17: HSC Culture without stroma and B cell assay Antibodies

	Antibody	Clone	Manufacturer
No stroma and B cell culture Sort	Lineage FITC	UCHT1, HCD14, HIB19,2H7 HCD56	Biolegend
	CD11c FITC	3.9	Biolegend
	CD370 PE	8F9	Biolegend
	CD49f PE-Cy5	GoH3	BD Bioscience
	CD38 PE-Cy7	HIT2	Biolegend
	CD90 APC	5E10	BD Bioscience
	CD45RA AF700	HI100	Biolegend
	CD34 APC-Cy7	581	Biolegend
	CD10 BV421	HI10a	BD Bioscience
	CD71BV650	CY1G4	Biolegend
	CD45 BV786	2D1	Biolegend
	Zombie Aqua	-	Biolegend
No stroma culture readout	CD45 PE-Cy5	HI30	Biolegend
	CD41 FITC	HIP8	Biolegend
	CD11b APC-Cy7	ICRF44	Biolegend
	CD14 PE-Cy7	M5E2	Biolegend
	CD15 BV421	MC-480	Biolegend
	GYPA PE	GA-R2	BD Bioscience
	CD56 APC	HCD56	Biolegend
B cell culture readout	CD45 PE-Cy5	HI30	Biolegend
	CD19 FITC	HIB19	Biolegend
	CD19 AF700	HIB19	Biolegend
	CD11b APC-Cy7	ICRF44	Biolegend
	CD14 PE-Cy7	B5E2	Biolegend
	CD15 BV421	MC-480	Biolegend
	CD56 APC	HCD56	Biolegend

Supplementary Table 18: Ki67 Assay Antibodies

	Antibody	Clone	Manufacturer
Ki67 Sort	Lineage FITC	UCHT1, HCD14, HIB19, 2H7, HCD56	Biolegend
		581	Biolegend
	CD11c FITC	3.9	Biolegend
	CD45RA PE	HI100	Biolegend
	CD38 PE-Cy7	HIT2	Biolegend
	CD90 APC	5E10	BD Bioscience
	CD34 APC-Cy7	581	Biolegend
	Zombie Aqua	-	Biolegend
Ki67 readout	DAPI	-	Biolegend
	Ki67 FITC	B56	BD Bioscience

Supplementary Table 19: ImageStream Antibodies

Antigen	Clone	Manufacturer	Amount ($\mu\text{L}/10 \times 10^6$ cells)
CD14 APC-Cy7	M ϕ P9	BD Bioscience	5
CD34 PE	8G12	BD Bioscience	20
CD45 PerCP-Cy5.5	2D1	BD Bioscience	20
CD106 FITC	51-10C9	BD Bioscience	5
CD117 PE-Cy7	104D2	Biolegend	5
GYPA BV605	GA-R2	BD Bioscience	3
HLA-DR APC	L243	BD Bioscience	3

Supplementary Table 20: IHC Antibodies

Antigen	Clone	Host	Manufacturer	Concentration
CD68	KP1	Mouse	Biolegend	1:750
GYPA	R10	Mouse	R&D Systems	1:100
CD49d	polyclonal	Rabbit	LSBio	1:200
VCAM1	1.43C	Mouse	ThermoFisher	1:100

Supplementary Table 21: Hyperion Antibodies

Antigen	Clone	Metal Tag	Manufacturer	Amount ($\mu\text{g}/\text{section}$)
CD1c	2A7C11	170 Er	Novus Bio	0.4
CD20	L26	141 Pr	eBioscience	0.17
CD34	Qbend/10	172 Yb	Biorad	0.8
CD68	KP1	153 Eu	Biolegend	0.27
CD79A	JCB117 + HM47/A9	161 Dy	Abcam	0.33
CK19	polyclonal	159 Tb	Abcam	1.0
CSP1/Heppar	OCH1E5	167 Er	Abcam	0.8
GYPA	R10	142 Nd	R&D Systems	2.0

Supplementary Table 22: Light sheet fluorescence microscopy Antibodies

Antigen	Clone	Host	Manufacturer	Concentration
CD34	Qbend/10	Mouse	Agilent	1:100
CD34	EP373Y	Rabbit	Abcam	1:100
GYPA	R10	Mouse	R&D Systems	1:100
GYPA	EPR8200	Rabbit	Abcam	1:100