

## Supplementary Materials

**CD45<sup>dim</sup>CD34<sup>+</sup>CD38<sup>-</sup>CD133<sup>+</sup> cells have the potential as leukemic stem cells in acute myeloid leukemia.**

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**Supplementary Table 1. Baseline characteristics of AML patients.**

Clinical parameters	No. (Total = 40)	CD45 <sup>dim</sup> CD34 <sup>+</sup> CD38 <sup>-</sup> CD133 <sup>+</sup> cells, %			P-value
		< 10% (n=14)	10-<40% (n=19)	≥40% (n=7)	
Age, median (range), years	61.5 (28-84)	60.5 (31-82)	59.0 (28-84)	73 (62-76)	0.085 <sup>b</sup>
M/F, no.	20 (50%)/ 20 (50%)	7 (50.0%) /7 (50.0%)	9 (47.4%)/ 10 (52.6%)	4 (57.1%)/ 3(42.9%)	1.0 <sup>c</sup>
CD45 <sup>dim</sup> CD34 <sup>+</sup> CD38 <sup>-</sup> CD133 <sup>+</sup> cells, %, median (range)	13.0 (0-58)	5.0 (0-8.0)	14.0 (10.0-36.0)	49.0 (40-58)	<0.001
White blood cell, x 10 <sup>3</sup> /mm, median (range)	4.3 (0.6-268.8)	3.7 (0.65-268.8)	4.6 (0.64-128.3)	5.9 (2.56-200.8)	0.397 <sup>b</sup>
Hemoglobin, g/dL, median (range)	8.4 (3.7-11.1)	8.5 (5.1-11.1)	7.5 (3.7-11.1)	8.3 (6.6-10.9)	0.536 <sup>b</sup>
Platelet, x 10 <sup>3</sup> /mm, median (range)	53 (19.0-353.0)	77.5 (19.0-157.0)	50.0 (19.0-182.0)	49.0 (22.0-353.0)	0.737 <sup>b</sup>
Peripheral blast, %, median (range)	21.0 (0-94.0)	8.0 (0-94)	20.0 (0-87.0)	58 (3.0-91.0)	0.311 <sup>b</sup>

Bone marrow cellularity, % (range)	79.5 (10-100)	67.5 (10.0-95.0)	83.0 (20.0-100)	78.9 (41.3-99.0)	0.540 <sup>b</sup>
Bone marrow blast, % (range)	62.8 (8.5-93.5)	54.8 (23.5-86.5)	69.5 (8.5-93.0)	70.0 (25.5-91.5)	0.532 <sup>b</sup>
Cytogenetic risk classification <sup>a</sup>					
Favorable	10 (25.0%)	2 (14.3%)	5 (26.3%)	3 (42.9%)	0.738 <sup>c</sup>
Intermediate	20 (50.0%)	8 (57.1%)	9 (47.4%)	2 (28.6%)	
Poor	10 (25.0%)	4 (21.4%)	5 (10.5%)	2 (14.3%)	
NPM1 mutation (+), no. (%)	4 (10%)				
FLT3-ITD mutation (+), no. (%)	3 (7.5%)	3 (23.1%)	0 (0%)	0 (0%)	0.065 <sup>c</sup>
FLT3 D835Y mutation (+), no. (%)	1 (2.5%)	0 (0%)	1 (5.3%)	0 (0%)	1.0 <sup>c</sup>
CEBPA mutation (+), no. (%)	1 (2.5%)	1 (7.7%)	0 (0%)	0 (0%)	0.526 <sup>c</sup>

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(%)

Induction chemotherapy,

no. (%)

Intensive chemotherapy	30 (75.0%)	11(78.6%)	16 (84.2%)	3 (42.9%)	0.130 <sup>c</sup>
(AD or AI 7+3)					
Hypomethylating agents	10 (25.0%)	3 (21.4%)	3 (15.8%)	4 (57.1%)	

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<sup>a</sup>According to NCCN 2017 prognostic risk classification.; AD, cytarabine+daunorubicin; AI, cytarabine+ idarubicin. <sup>b</sup>P-value was calculated by one way

ANOVA test among three groups (CD45<sup>dim</sup>CD34<sup>+</sup>CD38<sup>-</sup>CD133<sup>+</sup> cells <10%, 10-<40% and ≥40%). <sup>c</sup> P-value was calculated by Fisher's exact test.

**Supplementary Table 2. Patient characteristics.**

<b>Clinical parameters</b>	<b>No. (Total = 49)</b>
Gender	
Male	32 (65.3%)
Female	17 (34.7%)
Median age (range; years)	60 (23-80)
Pathology	
Diffuse large B cell lymphoma	19 (38.8%)
→ Bone marrow involvement (+)	3/19 (15.8%)
Multiple myeloma	10 (20.5%)
→ Median percentage of plasma cells on bone marrow	17% (range, 10% - 45%)
Chronic myeloid leukemia	6 (12.2%)
Myelodysplastic syndrome	5 (10.2%)
Hodgkin lymphoma	4 (8.1%)
→ Bone marrow involvement (+)	0/4 (0%)
Acute lymphoblastic leukemia	3 (6.1%)
Chronic lymphocytic leukemia	2 (4.1%)

**Supplementary Table 3. Univariate analysis for AML patients.**

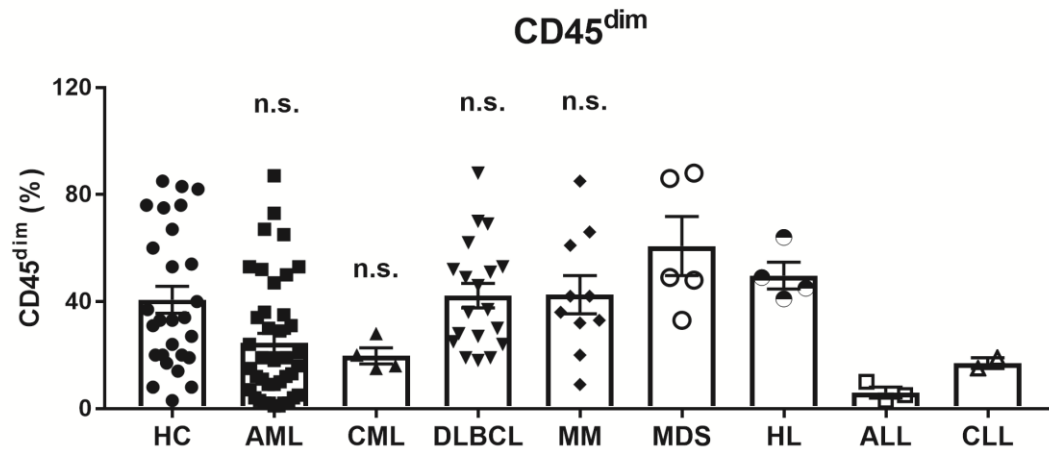
	<b>2y-OS</b>	<b>P-value</b>	<b>2y-EFS</b>	<b>P-value</b>
<b>CD45<sup>dim</sup>CD34<sup>+</sup>CD38<sup>-</sup>CD133<sup>+</sup></b>		<b>&lt;0.001</b>		<b>0.002</b>
<10%	64.3%		62.3%	
10-<40%	57.9%		37.2%	
≥40%	0%		0%	
<b>Age, years</b>		<b>0.041</b>		<b>0.077</b>
< 60	75%		61.1%	
> 60	32.8%		24.7%	
<b>WBC count, /mm<sup>3</sup></b>		0.412	0.412	0.332
< 40, x 10 <sup>3</sup>	53.6%		44.2%	
≥ 40, x 10 <sup>3</sup>	40.0%		30.0%	
<b>Platelet count, /mm<sup>3</sup></b>		0.128	0.412	0.332
< 40, x 10 <sup>3</sup>	37.5%		44.2%	
≥ 40, x 10 <sup>3</sup>	45.8%		30.0%	
<b>BM blast, %</b>		<b>0.038</b>		<b>0.084</b>
< 60	66.7%		51.8%	
≥ 60	36.7%		30.6%	
<b>Chromosome<sup>a</sup></b>		0.734		0.703
Favorable	68.6%		51.4%	
Intermediate	50.7%		36.5%	
Poor	36.4%		36.4%	
<b>Chemotherapy</b>		<b>0.012</b>		<b>0.175</b>
Intensive chemotherapy	57.8%		43.3%	
Hypomethylating agent	30.0%		40.0%	
<b>CD 33</b>		<b>&lt;0.001</b>		<b>0.001</b>
(+)	42.0%		42.0%	
(-)	0%		0%	
<b>CD 34</b>		0.426		0.969
(+)	46.8%		41.5%	
(-)	66.7%		33.3%	
<b>HLA-DR</b>		0.386		0.323
(+)	54.5%		44.3%	
(-)	42.9%		28.6%	

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<b>CD 7</b>		0.773	0.459
(+)	57.1%		28.6%
(-)	51.2%		44.3%

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<sup>a</sup>According to 2017 NCCN guideline ; BM, bone marrow.



**Supplementary Figure 1.** The expression of CD45<sup>dim</sup> population on bone marrow cells in the study. The CD45<sup>dim</sup> cells were examined by flow cytometry in diverse hematological malignancies including AML (n = 40), CML (n = 6), DLBCL (n = 19), MM (n = 10), MDS, (n = 5), HL (n = 4), ALL (n = 3), and CLL (n = 2). Data represent mean ± SEM from three independent experiments in different AML patients. Significantly different from the control (\*). HC, healthy controls; AML, acute myeloid leukemia; CML, chronic myeloid leukemia; DLBCL, diffuse large B-cell lymphoma; MM, multiple myeloma; MDS, myelodysplastic syndrome; HL, Hodgkin lymphoma; ALL, acute lymphocytic leukemia; CLL, chronic lymphocytic leukemia; n.s., no significance.