

Supplemental Table S1: AES induces proliferation of primary human CD34+ cells in the presence of NUP98-HOXA9

Week 4	Control	AES	NUP98-HOXA9	NUP98-HOXA9 + AES
Primitive	0	0	22 ± 2	14 ± 4
Intermediate Myeloid	20 ± 9	13 ± 8	51 ± 3	52 ± 14
Mature Myeloid	80 ± 9	87 ± 8	27 ± 2	34 ± 14
Week 5				
Primitive	0	0	12 ± 3	14 ± 3
Intermediate Myeloid	4 ± 1	4 ± 3	43 ± 7	50 ± 4
Mature Myeloid	96 ± 1	96 ± 3	46 ± 10	37 ± 6
Week 6				
Primitive	0	-	3 ± 1 **	25 ± 3 **
Intermediate Myeloid	2 ± 1	-	26 ± 8	54 ± 4
Mature Myeloid	98 ± 1	-	72 ± 9 *	21 ± 4 *

* $P < 0.05$

** $P < 0.01$

Sorted primary human CD34+ cells from the liquid cultures were harvested at week 4, 5 and 6. Cytospin smears were prepared and stained with Giemsa. A 500 cell differential count was performed. Cells with blast and promyelocyte morphology were counted as primitive; those with myelocyte/metamyelocyte morphology as intermediate myeloid and those with band, segmented neutrophil, monocyte, and macrophage morphology as mature myeloid. Average percentages ± standard deviations from 3 independent experiments are shown. In week 6, the AES samples were not counted due to insufficient cells. The P value was obtained by comparing NUP98-HOXA9 with and without AES using a paired two-tailed t-test.

Supplemental Table S2: AES counteracts the erythroid hyperplasia and shift to immaturity caused by NUP98-HOXA9

	Red	White	Mixed /Branched
Control	16 ± 6	84 ± 6	0
AES	7 ± 4	91 ± 5	2 ± 2
NUP98-HOXA9	36 ± 6	66 ± 11	5 ± 2
NUP98-HOXA9 + AES	12 ± 4*	80 ± 7	8 ± 3

* $P=0.05$

Colonies from the CFC plates were counted under low magnification (40X). Red: Round erythroid colonies; White: Myeloid colonies; Mixed/Branched: Colonies with irregular contours with a mixed red/colorless and branched morphology. Average percentages ± standard deviations from 3 independent experiments are shown. The P value was obtained by comparing NUP98-HOXA9 with and without AES using a paired two-tailed t-test.

Supplemental Table S3: Non-specific and AES-specific shRNA sequences

Target	Company	Catalog no.	shRNA Sequence
Non-Specific	Origene	TR30015	GCACTACCAGAGCTAACTCAGATAGTACT
Human AES	Origene	TF306804 # FI327209	TACCACAGCCTCAAGCTCGAATGTGACAA
Human AES	Origene	TF306804 # FI327211	TCCTACGGCTTGAACATCGAGATGCACAA
Non-Specific	Open Biosystems	RHS4346	
Human AES	Open Biosystems	RHS4430- 100992629	ACGAATTCAGCTACTGCA
Human AES	Open Biosystems	RHS4430- 99614203	CTCAAGCTCGAATGTGACA