

Supplemental Tables

Supplementary Table 1. Leukemia cell lines.

| # | Cell line | Histological subtype | Gene fusion | Gender, Age |
|----|-----------|----------------------|----------------------------|-------------|
| 1 | K562 | CML | <i>BCR-ABL1</i> | f,53 |
| 2 | HL60/S4 | AML | -- | f, 35 |
| 3 | KASUMI6 | AML, M2 type | -- | m,64 |
| 4 | KASUMI1 | AML | <i>t(8;21) AML1-CBF2T1</i> | m,7 |
| 5 | SKNO1 | AML, M2 type | <i>t(8;21)AML1-CBF2T1</i> | m, 22 |
| 6 | SEM | pre B- ALL | <i>MLL-AF4</i> | f,5 |
| 7 | TANOUE | pre B- ALL | <i>IGH@-MYC</i> | m, 11 |
| 8 | REH | pre B- ALL | <i>ETV6-AML1</i> | f,15 |
| 9 | NALM6 | pre B- ALL | -- | m, 19 |
| 10 | 697(EU-3) | pre B- ALL | <i>TCF3(E2A)-PBX1, M7</i> | m,12 |
| 11 | CEM3 | T-cell ALL | -- | f,3 |
| 12 | MOLT4 | T-cell ALL | -- | m,19 |
| 13 | MOLT16 | T-cell ALL | <i>TRA@-MYC</i> | f,5 |

Supplementary Table 2. Antibodies.

| Gene Name | Company | Catalog # | IgG Type | Dilution, (technique#) |
|-------------------------------|-----------------------------|-----------------------------|----------------------------|-------------------------------|
| CD34-APC* | Miltenyi Biotech | 130-098-139/ 130-113-738 | Mouse IgG2a | 1:50 (FC) |
| CD38-PE* | Miltenyi Biotech | 130-110-344/ 130-117-829 | Recombinant human IgG1 | 1:50 (FC) |
| CD19-PE* | Miltenyi Biotech | 130-110-350/ 130-114-172 | Recombinant human IgG1 | 1:50 (FC) |
| CD3-PE* | Miltenyi Biotech | 130-109-540/ 130-113-701 | Recombinant human IgG1 | 1:50 (FC) |
| CD11b-PE | Miltenyi Biotech | 130-110-553 | Recombinant human IgG1 | 1:50 (FC) |
| CD11b-PE | BioLegend | 301306 | Mouse IgG1, κ | 1:20 (FC) |
| IgG1k-PE | BioLegend | 400112 | Mouse IgG, κ ctrl | 1:20 (FC) |
| REA Ctrl(S)-PE | Miltenyi Biotech | 130-113-438 | Recombinant human IgG1ctrl | 1:50 (FC) |
| IgG-APC* | Miltenyi Biotech | 130-091-835/ 130-113-272 | Mouse IgG2a ctrl | 1:50 (FC) |
| IGF2BP1 | Cell Signaling Technologies | 8482S | Rabbit | 1:1000 (WB) |
| IGF2BP2 | MBL | RN008P | Rabbit | 1:1000 (WB) |
| IGF2BP3 | MBL | RN009P | Rabbit | 1:1000 (WB) |
| ALDH1A1 | Cell Signaling Technologies | 12035S | Rabbit | 1:1000 (WB) |
| ALDH1A1 | Novus Biologicals | NBP2-15336 | Rabbit | 1:1000 (WB) |
| HOXB4 | Invitrogen | PA5-23366 | Rabbit | 1:1000 (WB) |
| HOXB4 | Novus Biologicals | NBP2-24561 | Rabbit | 1:1000 (WB) |
| MYB | Cell Signaling Technologies | 12319S | Rabbit | 1:1000 (WB) |
| beta-actin | Cell Signaling Technologies | 4970S | Rabbit | 1:2000 (WB) |
| HRP-linked anti-rabbit | Cell Signaling Technologies | 7074S | Goat | 1:2000 (WB) |

#FC- Flow cytometry, WB- Western blotting.

*Previous catalog number/Current catalog number

Supplementary Table 3. Short hairpin (sh) RNA-expressing vectors used for gene silencing.

| Construct Name | Insert (targeting site) | Plasmid Name | Catalog# | Company |
|------------------------|---|--|-------------------------|----------------|
| shIGF2BP1 (SH1) | ACGCTTAGAGATTGAACATTC (coding region of IGF2BP1) | MISSION® pLKO.1-puro | TRCN0000218079; | Sigma |
| shIGF2BP1 (SH2) | TTCCTTGCCAATGAGACGC (coding region of IGF2BP1) | SMARTvector Inducible TurboGFP shRNA | V3SH11252- 227953809 | Dharmacon |
| shIGF2BP1 (SH3) | AAAATACATCGTTCCTCT (3'UTR of IGF2BP1) | SMARTvector Inducible TurboGFP shRNA | V3SH11252- 228438084 | Dharmacon |
| shIGF2BP3 | CGGTGAATGAACTTCAGAATT (coding region of IGF2BP3) | MISSION® pLKO.1-puro TRCN0000074675 | TRCN0000074675 | Sigma |
| shControl | Targets no known mammalian genes | MISSION® pLKO.1-puro | SHC002 | Sigma |
| shControl | Non-targeting control | SMARTvector Inducible Non- targeting Control 1 | VSC11653 | Dharmacon |

Supplementary Table 4. Plasmids for genes' overexpression.

| Construct Name | Insert | Plasmid Name | Catalog# | Company |
|---|------------------------------|--------------------------|-------------------------------|---------------------------------------|
| <i>gfp</i> (nucleofection control) | YP_002302326.1 | pmaxGFP | included in the kit V4XP-3012 | Lonza |
| <i>gfp</i> (lentiviral control) | YP_002302326.1 | pLV-EF1a-IRES-Puro | #85132 | Addgene (Dr. Meyer lab) |
| <i>gfp</i> (inducible lentiviral control) | YP_002302326.1 | pINDUCER20 | #44012 | Addgene (Dr. Stephen Elledge, lab) |
| Empty vector control | n/a | pReceiver-Lv105 | EX-NEG-Lv105 | GeneCopoeia |
| <i>IGF2BP1</i> | NM_006546.4 | pLKO,hIMP1_3G | n/a | Dr. Joel Yisraeli lab |
| | NM_006546.4 | pINDUCER20 | #44012 | Addgene (Dr. Stephen Elledge, lab) |
| <i>ALDH1A1</i> | NM_000689.5 | pcDNA3-HA-ADH | 11610 | Addgene (Dr. Steven Johnson lab) |
| | NM_000689.4 | pReceiver-Lv105 | EX-U0011-Lv105 | GeneCopoeia |
| <i>HOXB4</i> | NM_024015.5 | MSCV-humanHoxB4-IRES-YFP | 91889 | Addgene (Dr. Brian Sorrentino lab) |
| | NM_024015.4 | pReceiver-Lv105 | EX-T1370-Lv105 | GeneCopoeia |
| <i>MYB</i> | NM_001130173.1 BC064955.1 | pReceiver-Lv105 | EX-H3756-Lv105 | GeneCopoeia |

Supplementary Table 5. Chemical compounds.

| Chemical Name | CAS # | Company | Catalog # | Solvent | Stock Concentration |
|--|--------------|--------------------|-----------------------|----------------|----------------------------|
| Doxycycline, Hyclate | 24390-14-5 | Stemgent Millipore | 04-0016 324385-1gm | water | 5mg/ml |
| All-trans retinoic acid (ATRA) | 302-79-4 | Sigma | R2625 | DMSO | 100 mM |
| BTYNB | 304456-62-0 | Cayman Chemical | 25623 | DMSO | 100 mM |
| Doxorubicin hydrochloride | 25316-40-9 | Tocris | 2252 | water | 50 mM |
| Cytarabine | 147-94-4 | Tocris | 4520 | water | 50 mM |
| 4-hydroperoxy-cyclophosphamide (4-OOH-CY) | 39800-16-3 | Cayman Chemical | 19527 | chloroform | 100 mM |

Supplementary Table 6. Primers for qPCR.

| Gene Name | Fwd | Rev |
|--------------------------|--------------------------|---------------------------|
| ABCA2 | AGATGGACAAGATGATCGAG | GCTTGTACTTCAGGATGAGG |
| ABCB1 | GAGGAAGACATGACCAGGTA | CTGTCCGATTATAGCATGAA |
| ABCG2 | ACCTGAAGGCATTTACTGAA | TCTTTCCTTGCAGCTAAGAC |
| ALDH1A1 | TGTTAGCTGATGCCGACTTG | TTCTTAGCCCCGCTCAACT |
| ALDH1A2 | TGATCCTGCAAACACTGCTC | CTGGAGCTGGGTGGTAAGAG |
| AML1-ETO (RUNX1- CBF2T1) | ATGACCTCAGGTTTGTCTGGTCCG | TGAACTGGTTCCTGGAGCCTCCT |
| AML1-ETO (RUNX1- CBF2T1) | GGCTGGCAATGATGAAAACCT | CGCCATTCAAGGCTGTAGGAG |
| CD34 | ACCAGAGCTATTCCCAAAAGACC | TGCGGCGATTTCATCAGGAAAT |
| DNMT3b | ACCTCGTGTGGGGAAAGATCA | CCATCGCAAACCACTGGA |
| HOXB4 | CGTGAGCACGGTAAACCCC | CGAGCGGATCTTGGTGTG |
| HOXB9 | CCATTTCTGGGACGCTTAGCA | TTGTAAGGGTGGTAGACGGACG |
| IGF2BP1 FL | TGAAGGCCATCGAACTTTCTC | GATTTGAATTTCCGGCTCCTTTG |
| IGF2BP1 total | GACCCCTGATGAGAACGAC | TGGTACTCTGTCCCTTCTGA |
| LAPTM4B | GCCCGGAGCGATGAAGATG | CAACAGTACCACAGCATTGATGA |
| MLL-AF4 | CACCTACTACAGGACCGCCAA | GGGGTTTGTTCCTGTCACTGTCC |
| MLL-AF4 | ACAGAAAAAGTGGCTCCCCG | GCAAACCACCCTGGGTGTTA |
| MMRN1 | GGCATTGGGCTTAACAACAGT | CGACATGACCCGAGTGGTT |
| RPL13A | CCTGGAGGAGAAGAGGAAAGAGA | TTGAGGACCTCTGTGTATTTGTCAA |
| RPL13A | CGGACCGTGCAGGTAT | CACCATCCGCTTTTTCTTGTCT |
| RPS18 | ATCACCATTATGCAGAATCCACG | GACCTGGCTGTATTTTCCATCC |
| TCF3-PBX1 | CACCAGCCTCATGCACAAC | TCGCAGGAGATTTCATCACG |
| TCF3-PBX1 | CAGCACCAGCCTCATGCACA | GTTGTCCAGCCGCATCAGCT |
| TBP | CCGAAACGCCGAATATAATCC | AATCAGTGCCGTGGTTCGTG |
| Gene Name | Bio-Rad ID | |
| ABCB1 | qHsaCEP0058075 | n/a |
| ABCC1 | qHsaCID0016624 | n/a |
| ALDH1A1 | qHsaCID0018574 | n/a |
| ALDH1A3 | qHsaCED0047656 | n/a |
| CEBPA | qHsaCED0048815 | n/a |
| HOXB4 | qHsaCED0047548 | n/a |
| HOXB9 | qHsaCID0008079 | n/a |
| IGF2BP1 | qHsaCID0010743 | n/a |
| IGF2BP2 | qHsaCED0036334 | n/a |
| IGF2BP3 | qHsaCED0004904 | n/a |
| MYB | qHsaCED0043781 | n/a |
| MYC | qHsaCID0012921 | n/a |
| RPS18 | qHsaCED0037454 | n/a |