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Supplemental Data

Malignant Transformation Initiated by *Mll-AF9*:

Gene Dosage and Critical Target Cells

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Supplemental Experimental Procedures

Microarray Analysis

For gene expression profiling experiments, sorted cells were collected directly into RNA lysis buffer (Buffer RLT, Qiagen Inc.) and total RNA was extracted using the Micro RNeasy kit (Qiagen). Quality of the RNA was assessed using the RNA 6000 Pico LabChip kit (Agilent Technologies Inc., Palo Alto, CA) and the RNA was amplified using the Two Cycle Labeling kit (Affymetrix, Santa Clara, CA). Labeled cRNA was hybridized to Mouse 430 2.0 GeneChip arrays. Expression measures were estimated using the robust multi-array averaging (RMA) (Irizarry et al., 2003) algorithm using Genedata Expressionist Refiner (Epro 1.0.32, GeneData Inc.). Condensed measures were imported into GeneData Expressionist Analyst where the arrays were normalized by the LOESS method using all experiments in generating the reference experiment. The Affymetrix murine 430 2.0 genechip array has 45,101 probe sets. For analysis, based on current annotations, we first filtered-out the probes without Unigene annotations, leaving us with 41,628 probe sets. To determine the differentially expressed genes in *Mll-AF9* samples compared to wild type samples, the following method was used:

For the expression values of gene j: $\{x_{1j},\ldots, x_{nj}\}$, we fitted the following additive effects model

$$x_{ij} = \alpha_j + \beta_j t_i + \sum_{k=1}^{3} \theta_{kj} z_{ki},\ i = 1, ..., n.$$

where t_i is the indicator for the *Mll-AF9* versus the wild type effect and z_{1i}, z_{2i}, z_{3i} are three indicator variables for the cell type effects. The parameter β_j summarized the *Mll-AF9* effect, and was used to identify differentially expressed genes. To make a comparison across genes, we need to identify the standard error of β_j, and to avoid small gene variations, a positive variation regularization term was added, which had been selected based on a numerical algorithm fitted to all the gene expression data. For significance estimation, we performed a stratified permutation test. Specifically, we permuted the *Mll-AF9* effect within each cell type, and then calculated the overall proportion of differentially expressed genes and the false discovery rate (FDR). The graph in Supplemantary Figure 4 is a plot of FDR on the Y-axis against the number of probe sets on the X-axis. 548 probe sets corresponding to 446 non-redundant genes met the FDR of <0.1.

Of the 446 genes selected in the two-way ANOVA, those that are over-expressed in all 4 *Mll-AF9* cell populations and those that are under-expressed compared to the corresponding wild type populations are listed in Supplementary Table 1 and 2. Heat maps were generated using Cluster and Treeview available at http://rana.lbl.gov/EisenSoftware.htm.

Real time RT-PCR for *MLL-AF9*.

For comparing *MLL-AF9* expression in retrovirally transduced and knockin GMPs, RNA was extracted using Trizol (Invitrogen) and subjected to DNase I digestion. Reverse transcription was performed using the Superscript First Strand cDNA Synthesis kit

(Invitrogen) and the cDNA was used as template in real-time PCR with SYBR green (ABI). Removal of genomic DNA was verified by using RNA as template in the PCR. The primers used were:

Gapdh: CGTCCCGTAGACAAAATGGT and CTCCTGAAAGATGGTGATGG

MLL-AF9: TGTGAAGCAGAAATGTGTGG and TGCCTTGTCACATTCACCAT

Supplemental References

Irizarry, R.A., Hobbs,B., Collin,F., Beazer-Barclay, Y.D., Antonellis, K.J., Scherf,U. and Speed,T.P. (2003). Exploration, normalization, and summaries of high density oligonucleotide array probe level data. Biostatistics *6*, 249.

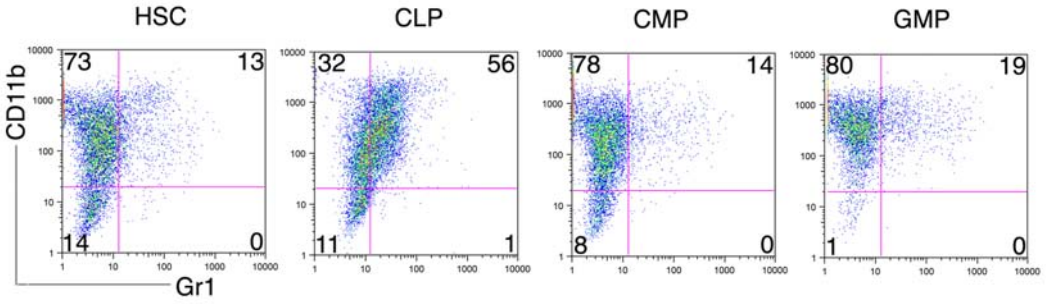

Figure S1 | FACS analysis of CD11b and Gr1 expression in myeloid culture from different *Mll-AF9* sorted populations. The experiment was repeated in 3-6 mice for each cell type. A representative of each group is shown here.

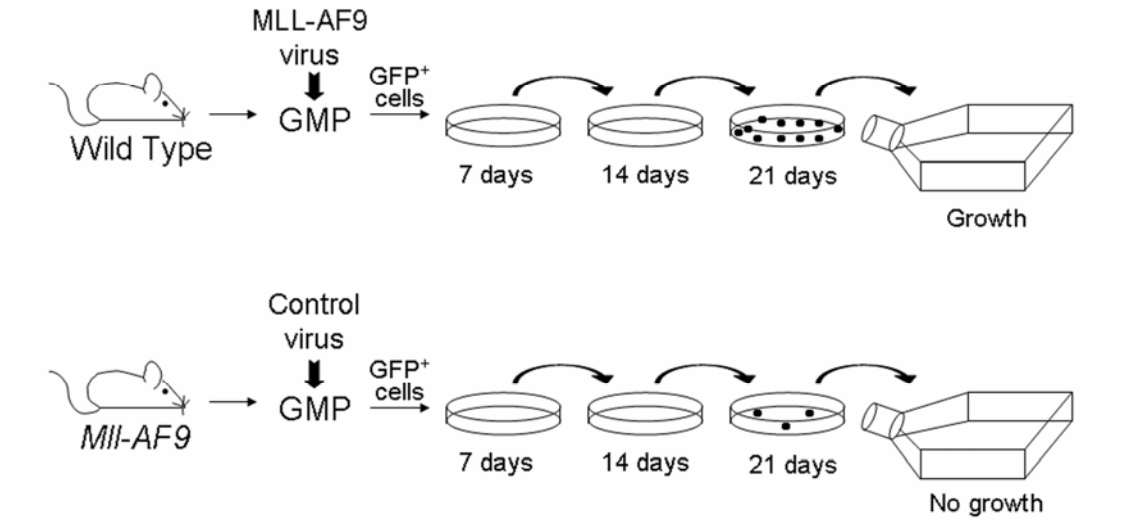

Figure S2: Long term self renewing cells were established in vitro from retroviral *MLL-AF9* transduced GMPs but not from knockin *Mll-AF9* GMPs.

The experimental design is shown in the figure. Colonies in methylcellulose cultures were examined at days 7, 14 and 21. At day 21, retroviral *MLL-AF9* transduced GMPs resulted in a mean of 183 compact colonies (per 1000 cells plated) compared to 13 compact colonies from knockin *Mll-AF9* GMPs. (See Figure 3C for details). Subsequently, well-isolated compact colonies were picked individually and transferred into liquid medium. Ten of ten retroviral *MLL-AF9* cultures resulted in long term growth, while none of ten knockin *Mll-AF9* cultures grew long term.

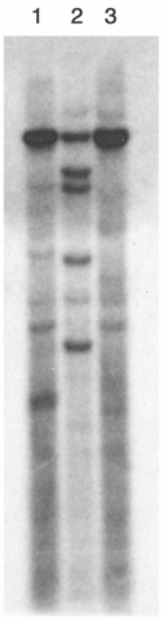

Figure S3 | Southern blotting on the genomic DNA from *MLL-AF9* retrovirally transduced GMP cell cultures by a probe for GFP. The result indicates the cultures from *MLL-AF9* transduced GMPs are oligoclonal. Sample 1, 2 and 3 came from 3 individual GMP transduction experiments.

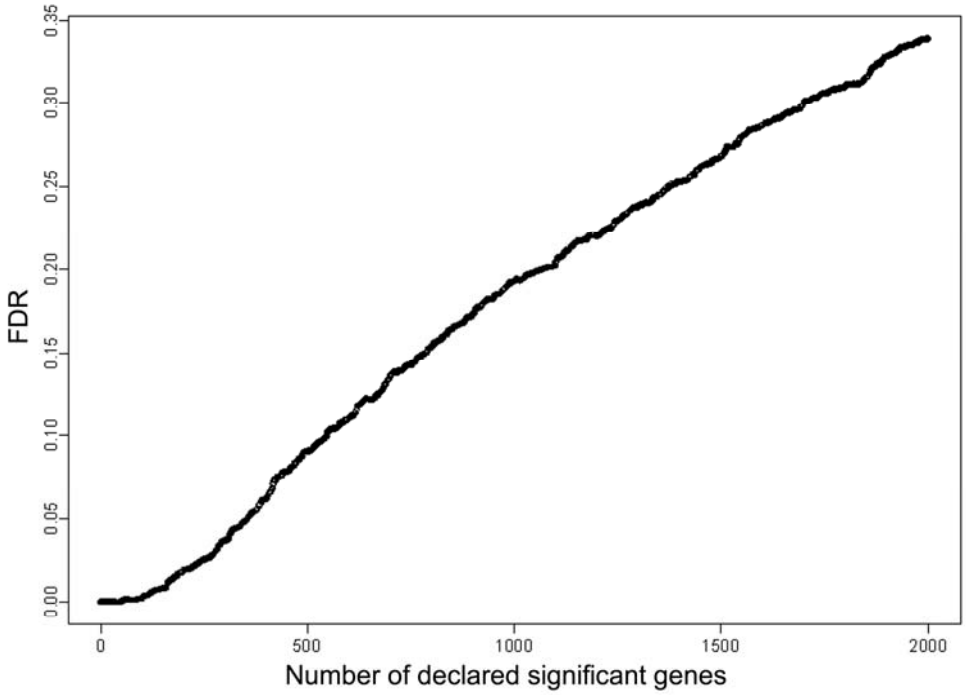

Figure S4: Genes with differential expression in *Mll-AF9* cells compared to wild type cells were identified in a 2-way ANOVA using a stratified permutation test. The graph shown is a plot of FDR on the Y-axis against the number of probe sets on the X-axis. 548 probe sets corresponding to 446 non-redundant genes met the FDR of <0.1.

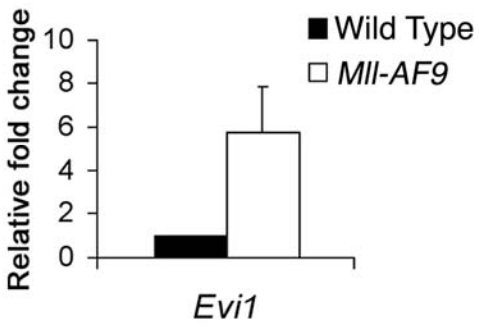

Figure S5 | Quantitative RT-PCR showing increased expression of *Evi1* in *Mll-AF9* CMPs compared to wild type (N=3 for each group). Error bars represent standard error of the means.

Supplementary Tables

Table S1. Genes over-expressed in all *Mll-AF9* populations

Probe ID	Gene Description
1457642_at	RIKEN cDNA 5730507N06 gene
1448926_at	homeo box A5
1438325_at	ecotropic viral integration site 1
1439514_at	CDC28 protein kinase 1b
1437232_at	bactericidal/permeability-increasing protein-like 2
1419226_at	CD96 antigen
1416904_at	Muscleblind-like 1 (Drosophila)
1420558_at	selectin, platelet
1455626_at	homeo box A9
1455435_s_at	Choline dehydrogenase
1421628_at	interleukin 18 receptor 1
1430387_at	RIKEN cDNA 1810073O08 gene
1420805_at	myosin light chain 2, precursor lymphocyte-specific
1417749_a_at	RIKEN cDNA D130061D10 gene
1431475_a_at	homeo box A10
1451310_a_at	cathepsin L
1419605_at	macrophage galactose N-acetyl-galactosamine specific lectin 1
1457102_at	RIKEN cDNA A030001D16 gene
1448470_at	Fructose bisphosphatase 3
1426953_at	high mobility group box 2-like 1
1443534_at	Muscleblind-like 1 (Drosophila) [BLAST]
1449937_at	placental protein 11 related
1428792_at	breast carcinoma amplified sequence 1
1452855_at	RIKEN cDNA 2410015A16 gene
1443260_at	myeloid ecotropic viral integration site 1
1429398_at	RIKEN cDNA 5730446D14 gene [BLAST]
1439066_at	angiopoietin 1
1431008_at	RIKEN cDNA 0610037M15 gene
1416768_at	RIKEN cDNA 1110003E01 gene
1430580_at	RIKEN cDNA 2810030E01 gene
1418536_at	Histocompatibility 2, Q region locus 7
1425525_a_at	purinergic receptor P2X, ligand-gated ion channel 4
1437012_x_at	Rap guanine nucleotide exchange factor (GEF) 3
1416635_at	sphingomyelin phosphodiesterase, acid-like 3A
1416408_at	RIKEN cDNA D130055E20 gene
1451535_at	interleukin 31 receptor A
1429274_at	RIKEN cDNA 2310010M24 gene
1425891_a_at	GH regulated TBC protein 1
1419602_at	homeo box A2
1422188_s_at	T-cell receptor gamma, variable 4

1449499_at	homeo box A7
1429184_at	RIKEN cDNA 9130002C22 gene
1447923_at	RIKEN cDNA 1810026B05 gene [BLAST]
1420842_at	protein tyrosine phosphatase, receptor type, F
1418993_s_at	Coagulation factor X
1460515_at	RIKEN cDNA 8430419K02 gene
1425570_at	signaling lymphocytic activation molecule family member 1
1418149_at	chromogranin A
1455053_a_at	Testis derived transcript 3 [BLAST]
1428651_at	RIKEN cDNA 4930429H24 gene
1426387_x_at	RIKEN cDNA 9030221M09 gene
1438968_x_at	serine protease inhibitor, Kunitz type 2
1441206_at	synaptopodin 2
1455796_x_at	olfactomedin 1
1418884_x_at	tubulin, alpha 1
1439825_at	cDNA sequence BC023741
1434140_at	mcf.2 transforming sequence-like
1418778_at	RIKEN cDNA 9030408N13 gene
1422103_a_at	signal transducer and activator of transcription 5B
1424108_at	glyoxalase 1
1420678_a_at	interleukin 17 receptor B
1431255_at	calreticulin 3
1451564_at	Poly (ADP-ribose) polymerase family, member 14
1449009_at	Transcribed locus
1446307_at	poly(A) polymerase gamma [BLAST]
1460319_at	Fucosyltransferase 8
1417235_at	EH-domain containing 3
1435510_at	Protein phosphatase 1H (PP2C domain containing)
1434670_at	kinesin family member 5A [BLAST]
1415971_at	myristoylated alanine rich protein kinase C substrate
1435458_at	proviral integration site 1
1452982_at	RIKEN cDNA A330103N21 gene
1459327_at	Mus musculus transcribed sequences
1432950_at	Solute carrier family 24 (sodium/potassium/calcium exchanger), member 2
1455220_at	frequently rearranged in advanced T-cell lymphomas 2
1451112_s_at	death-associated protein
1451814_a_at	HIV-1 tat interactive protein 2, homolog (human)
1433563_s_at	Der1-like domain family, member 1
1424857_a_at	Tripartite motif protein 34
1439163_at	Transcribed locus
1426642_at	fibronectin 1
1453119_at	RIKEN cDNA 4933428L19 gene
1437470_at	Pbx/knotted 1 homeobox
1439085_at	RIKEN cDNA C130039O16 gene
1451999_at	LIM domain binding 3
1438568_at	MAS-related GPR, member E

1454858_x_at	RIKEN cDNA 3300001H21 gene
1426302_at	transmembrane protease, serine 4
1423135_at	thymus cell antigen 1, theta
1435066_at	Phosphatidylinositol transfer protein, cytoplasmic 1
1424438_a_at	leptin receptor overlapping transcript
1421375_a_at	S100 calcium binding protein A6 (calcyclin)
1428496_at	SECIS binding protein 2
1424852_at	myocyte enhancer factor 2C [BLAST]
1460365_a_at	dynamin 1
1447089_at	ADP-ribosylation factor-like 1
1417101_at	heat shock protein 2
1425396_a_at	lymphocyte protein tyrosine kinase
1425099_a_at	aryl hydrocarbon receptor nuclear translocator-like
1427271_at	RIKEN cDNA 6030404E16 gene
1424008_a_at	RNA binding protein with multiple splicing 2
1434853_x_at	makorin, ring finger protein, 1
1451449_at	RIKEN cDNA 4933407N01 gene
1448237_x_at	lactate dehydrogenase 2, B chain
1429352_at	molybdenum cofactor sulfurase
1434329_s_at	adiponectin receptor 2
1440217_at	Similar to hypothetical protein FLJ39743
1427433_s_at	Homeo box A3
1428840_s_at	RIKEN cDNA 1500002B03 gene
1439448_x_at	RIKEN cDNA 2400003B06 gene
1424936_a_at	Similar to axonemal dynein heavy chain 8 Dnahc8
1421345_at	lecithin-retinol acyltransferase (phosphatidylcholine-retinol-O-acyltransferase)
1418490_at	serine dehydratase-like
1446309_at	Mus musculus transcribed sequences
1433593_at	yippee-like 5 (Drosophila)
1445260_at	Testis derived transcript 3
1427038_at	preproenkephalin 1
1437119_at	Endoplasmic reticulum (ER) to nucleus signalling 1
1433832_at	RIKEN cDNA B230369L08 gene
1450421_at	transforming growth factor alpha
1418825_at	interferon inducible protein 1
1434999_at	suppressor of variegation 4-20 homolog 1 (Drosophila)
1424031_at	sorting nexin 11
1417834_at	synaptojanin 2 binding protein
1435312_at	Transcribed locus [BLAST]
1457321_at	RIKEN cDNA D130037M23 gene
1422420_at	myoglobin
1430168_at	CSA-conditional, T cell activation-dependent protein
1434082_at	ELK3, member of ETS oncogene family
1436180_at	DnaJ (Hsp40) homolog, subfamily C, member 5
1425129_a_at	transaldolase 1
1426799_at	RAB8B, member RAS oncogene family

1448260_at	ubiquitin carboxy-terminal hydrolase L1
1418553_at	rho/rac guanine nucleotide exchange factor (GEF) 18
1456335_at	gene model 106, (NCBI)
1425594_at	laminin gamma 3
1442267_at	syntaxin binding protein 4 [BLAST]
1457162_at	expressed sequence AA691260
1418433_at	RIKEN cDNA C230066K19 gene
1447927_at	expressed sequence AI595338
1451114_at	CKLF-like MARVEL transmembrane domain containing 6
1426355_a_at	RIKEN cDNA 6330578E17 gene
1453154_at	RIKEN cDNA 1700029M20 gene
1424888_at	RIKEN cDNA 9530046H09 gene
1437887_at	RIKEN cDNA E130306M17 gene
1438752_at	Mus musculus adult male hypothalamus cDNA, RIKEN full-length enriched library, clone:A230058F20 product:hypothetical protein, full insert sequence
1449932_at	casein kinase 1, delta
1423144_at	RIKEN cDNA 6330412C24 gene
1435445_at	Cyclin T2
1456064_at	expressed sequence AI504432
1440831_at	RIKEN cDNA 6230421P05 gene [BLAST]
1460723_at	melanocortin 5 receptor
1445532_at	RIKEN cDNA C230040D10 gene
1451446_at	RIKEN cDNA 9530013L04 gene
1454853_s_at	expressed sequence AW146154
1417999_at	Integral membrane protein 2B
1456510_x_at	RIKEN cDNA 3300001H21 gene
1449108_at	ferredoxin 1
1427532_at	T-cell receptor interacting molecule
1416891_at	numb gene homolog (Drosophila)
1452864_at	Hypothetical protein A130035F20
1439427_at	claudin 9
1446239_at	RNA binding site for Dazl protein, clone be2
1456142_x_at	LIM domain containing preferred translocation partner in lipoma
1434283_at	AT rich interactive domain 5B (Mrf1 like) [BLAST]
1434683_at	RIKEN cDNA 2600010L24 gene
1417335_at	sulfotransferase family, cytosolic, 2B, member 1
1420870_at	Myeloid/lymphoid or mixed lineage-leukemia translocation to 10 homolog (Drosophila)
1436419_a_at	RIKEN cDNA 1700097N02 gene
1437624_x_at	RIKEN cDNA 1110001K21 gene
1442693_at	Tripartite motif protein 34
1441779_at	RIKEN cDNA 9530006C21 gene
1428871_at	RIKEN cDNA 4121402D02 gene
1452844_at	POU domain, class 6, transcription factor 1
1440626_at	homeo box D13 [BLAST]
1421003_at	glucocorticoid modulatory element binding protein 1
1418956_at	Serine/threonine protein kinase SSTK

1447151_at	RIKEN cDNA 4930519N13 gene
1424646_at	uridine-cytidine kinase 1-like 1
1449814_at	frequently rearranged in advanced T-cell lymphomas
1424821_at	Nedd4 family interacting protein 1
1438452_at	RIKEN cDNA A630080F05 gene
1435240_at	bromodomain adjacent to zinc finger domain, 2B
1426504_a_at	Ring finger protein 121
1449875_s_at	histocompatibility 2, T region locus 10
1420915_at	signal transducer and activator of transcription 1
1448418_s_at	RIKEN cDNA A730061H03 gene
1433471_at	Transcription factor 7, T-cell specific
1449815_a_at	Single-stranded DNA binding protein 2
1443635_at	BCL2/adenovirus E1B 19kD interacting protein like
1455231_s_at	RIKEN cDNA 2310011J03 gene
1424759_at	Expressed sequence AV216361

Supplementary Table 2. Genes under-expressed in all *Mll-AF9* populations

Probe ID	Gene Description
1450344_a_at	Prostaglandin E receptor 3 (subtype EP3)
1416168_at	serine (or cysteine) proteinase inhibitor, clade F, member 1
1422851_at	High mobility group AT-hook 2
1433908_a_at	cortactin
1416529_at	epithelial membrane protein 1
1447640_s_at	pre B-cell leukemia transcription factor 3
1445546_at	Prostaglandin E receptor 3 (subtype EP3)
1443394_at	High mobility group AT-hook 2 [BLAST]
1448918_at	Solute carrier organic anion transporter family, member 3a1
1419202_at	cystatin F (leukocystatin)
1437424_at	RIKEN cDNA C430017H16 gene
1428642_at	solute carrier family 35, member D3
1449404_at	Phosphatidylinositol-4-phosphate 5-kinase, type II, alpha
1457424_at	Eyes absent 1 homolog (Drosophila)
1424254_at	interferon induced transmembrane protein 1
1425062_at	RIKEN cDNA A230020G22 gene
1436907_at	neuron navigator 1
1448942_at	guanine nucleotide binding protein (G protein), gamma 11
1426566_s_at	interleukin 17 receptor E
1436970_a_at	platelet derived growth factor receptor, beta polypeptide
1432057_a_at	EST AI197291
1426389_at	calcium/calmodulin-dependent protein kinase ID
1425536_at	syntaxin 3
1459665_s_at	MRV integration site 1
1421457_a_at	SAM domain, SH3 domain and nuclear localisation signals, 1
1440179_x_at	Similar to hypothetical protein MGC26996; chromosome 6 open reading frame 172
1436759_x_at	calponin 3, acidic
1437217_at	ankyrin repeat domain 6
1433891_at	G protein-coupled receptor 48
1429589_at	Transcribed locus
1451791_at	tissue factor pathway inhibitor
1438306_at	RIKEN cDNA 3110001E11 gene
1430978_at	ribosomal protein S25
1417404_at	ELOVL family member 6, elongation of long chain fatty acids (yeast)
1455656_at	B and T lymphocyte associated
1437008_x_at	RIKEN cDNA 1110006I15 gene
1419722_at	protease, serine, 19 (neuropsin)
1438936_s_at	Ribonuclease, RNase A family 4
1423835_at	zinc finger protein 503
1417323_at	RIKEN cDNA 5430413I02 gene
1418351_a_at	DNA methyltransferase 3B
1428572_at	brain abundant, membrane attached signal protein 1
1426755_at	cytoskeleton-associated protein 4

1438571_at	budding uninhibited by benzimidazoles 1 homolog (S. cerevisiae)
1438160_x_at	solute carrier organic anion transporter family, member 4a1
1454795_at	Cobl-like 1
1455452_x_at	Mus musculus transcribed sequences
1451780_at	B-cell linker
1451332_at	zinc finger protein 521
1426628_at	Transmembrane protein 34
1460578_at	FYVE, RhoGEF and PH domain containing 5
1421144_at	retinitis pigmentosa GTPase regulator interacting protein 1
1447965_at	Mus musculus transcribed sequence with moderate similarity to protein prf:1614337A (M.musculus) 1614337A formin [Mus musculus]
1448892_at	dedicator of cytokinesis 7
1452119_at	RIKEN cDNA 2600005C20 gene
1456383_at	RIKEN cDNA 2410005K20 gene
1423760_at	CD44 antigen
1418355_at	nucleobindin 2
1457582_at	Ubiquitously transcribed tetratricopeptide repeat gene, Y chromosome
1451985_at	Leucine-rich repeat kinase 1
1457743_at	DNA segment, Chr 13, Brigham & Women's Genetics 1146 expressed
1427283_at	myeloid/lymphoid or mixed-lineage leukemia
1435149_at	phospholipase C, gamma 1
1451089_a_at	archain 1
1416996_at	TBC1 domain family, member 8
1439664_at	RIKEN cDNA 1700012F10 gene
1449591_at	caspase 4, apoptosis-related cysteine protease
1456584_x_at	3-phosphoglycerate dehydrogenase
1447851_x_at	ATPase, class V, type 10A
1423596_at	Proteasome (prosome, macropain) subunit, beta type 7
1436867_at	sarcalumenin
1420928_at	beta galactoside alpha 2,6 sialyltransferase 1
1416469_at	leucine zipper protein 1
1456195_x_at	integrin beta 5
1448985_at	dual specificity phosphatase 22
1450718_at	Adaptor protein with pleckstrin homology and src
1456795_at	RIKEN cDNA D330027G24 gene
1437621_x_at	3-phosphoglycerate dehydrogenase
1437861_s_at	Protein kinase C, epsilon
1457510_at	Mus musculus transcribed sequence with weak similarity to protein pir:I49130 (M.musculus) I49130 reverse transcriptase - mouse
1417849_at	Glucocorticoid induced gene 1
1429846_at	RIKEN cDNA 9030411K21 gene [BLAST]
1428373_at	RIKEN cDNA 1500005N04 gene
1441242_at	dipeptidylpeptidase 4
1441089_at	Transcribed locus
1424065_at	ER degradation enhancer, mannosidase alpha-like 1
1452073_at	RIKEN cDNA 6720460F02 gene

1422751_at	transducin-like enhancer of split 1, homolog of Drosophila E(spl)
1419872_at	colony stimulating factor 1 receptor
1435560_at	integrin alpha L
1422948_s_at	histone 1, H4a
1444248_at	reticulocalbin 2
1431256_at	RIKEN cDNA 5033423O07 gene
1435993_at	Mus musculus adult male diencephalon cDNA, RIKEN full-length enriched library, clone:9330168G06 product:SCAN-KRAB-zinc finger gene 1, full insert sequence
1417301_at	frizzled homolog 6 (Drosophila)
1423059_at	PTK2 protein tyrosine kinase 2
1445360_at	gb:BF318215 /DB_XREF=gi:11266785 /DB_XREF=ux08a07.x1 /CLONE=IMAGE:3470 FEA=EST /CNT=3 /TID=Mm.157542.1 /TIER=ConsEnd /STK=2 /UG=Mm.157542 / UG_TITLE=ESTs
1433625_at	RIKEN cDNA 5830434P21 gene
1441891_x_at	ELOVL family member 7, elongation of long chain fatty acids (yeast)
1434600_at	tight junction protein 2
1420804_s_at	C-type (calcium dependent, carbohydrate recognition domain) lectin, superfamily member
1437279_x_at	syndecan 1
1453285_at	RIKEN cDNA 2600017H02 gene
1436395_at	caspase recruitment domain family, member 6
1442754_at	RIKEN cDNA C030013G03 gene
1431931_a_at	RAB, member of RAS oncogene family-like 2A
1427284_a_at	tocopherol (alpha) transfer protein
1437811_x_at	LOC434352
1423194_at	Rho GTPase activating protein 5 [BLAST]
1456844_at	Calcium/calmodulin-dependent protein kinase II, delta
1456072_at	Protein phosphatase 1, regulatory (inhibitor) subunit 9A
1429612_at	RIKEN cDNA F830004D09 gene
1460314_s_at	Histone1, H3d
1452092_at	RIKEN cDNA 4631426J05 gene
1418981_at	caspase 12
1428795_at	Similar to chromosome 6 open reading frame 192; dJ55C23.6 gene
1434406_at	SLIT-ROBO Rho GTPase activating protein 2
1427682_a_at	early growth response 2
1425383_a_at	Pre B-cell leukemia transcription factor 1
1447935_at	RIKEN cDNA C730036B14 gene
1434945_at	Hypothetical protein A330042H22
1452013_at	ATPase, class V, type 10A
1456789_at	Zinc finger protein 462
1454919_at	N-myristoyltransferase 2
1450955_s_at	sortilin 1
1444350_at	RIKEN cDNA 9830137M10 gene
1435580_at	RIKEN cDNA C230081A13 gene [BLAST]
1441656_at	RIKEN cDNA B930068K11 gene [BLAST]
1455786_at	RIKEN cDNA 2610036F08 gene
1454655_at	Diacylglycerol kinase, delta

1438561_x_at	RIKEN cDNA 4930538D17 gene
1448754_at	retinol binding protein 1, cellular
1433051_at	RIKEN cDNA C030027H14 gene
1416498_at	peptidylprolyl isomerase C
1455970_at	Transcribed sequence with moderate similarity to protein sp:P00722 (E. coli) BGAL_ECOLI Beta-galactosidase
1433716_x_at	Transcribed locus
1456250_x_at	transforming growth factor, beta induced
1416301_a_at	Early B-cell factor 1
1429360_at	Kruppel-like factor 3 (basic)
1439754_at	SRY-box containing gene 12
1459916_at	RIKEN cDNA 5730488B01 gene
1447852_x_at	RIKEN cDNA 2900002H16 gene
1426994_at	RIKEN cDNA 9430090L19 gene
1440068_at	RIKEN cDNA 9930116O05 gene [BLAST]
1429459_at	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3D
1441001_at	Expressed sequence AI225934 [BLAST]
1449504_at	karyopherin (importin) alpha 1
1419538_at	FMS-like tyrosine kinase 3
1436132_at	RIKEN cDNA 9830001H06 gene [BLAST]
1429301_at	casein kinase II, alpha 2, polypeptide
1455946_x_at	thymosin, beta 10
1421385_a_at	myosin VIIa
1436209_at	RIKEN cDNA 4732437J24 gene
1457278_at	RIKEN cDNA 6720489N17 gene
1420444_at	solute carrier family 22 (organic cation transporter), member 3
1437343_x_at	ATPase family, AAA domain containing 3A
1457707_at	LOC434199
1452654_at	zinc finger, DHHC domain containing 2
1453360_a_at	testis expressed gene 9
1434990_at	Protein phosphatase 1E (PP2C domain containing) [BLAST]
1434773_a_at	solute carrier family 2 (facilitated glucose transporter), member 1
1452878_at	Protein kinase C, epsilon
1430481_at	RIKEN cDNA 4930545L23 gene
1452459_at	Calmodulin binding protein 1
1424042_at	transmembrane protein 5
1428626_at	RIKEN cDNA 2210402C18 gene
1440637_at	Intersectin 1 (SH3 domain protein 1A) [BLAST]
1455321_at	DDHD domain containing 1
1428263_a_at	Transcription elongation factor B (SIII), polypeptide 2
1454892_at	Phosphatidylinositol transfer protein, beta
1416359_at	sorting nexin associated golgi protein 1
1424336_at	RIKEN cDNA 8430432M10 gene
1419152_at	RIKEN cDNA 2810417H13 gene
1424095_at	RNA terminal phosphate cyclase domain 1
1434936_at	expressed sequence C86302

1428661_at	RIKEN cDNA 2810439M11 gene
1452463_x_at	Immunoglobulin kappa chain variable 8 (V8)
1424863_a_at	RIKEN cDNA B230339E18 gene
1448316_at	chemokine-like factor super family 3

Supplementary Table 3: Genes up-regulated in common in the present analysis of knockin *Mll-AF9* mice and in the analysis of leukemic GMPs generated by *MLL-AF9* retrovirus transduction (Krivtsov et al., Nature 2006)

Probe ID	**Gene Description**
1416768_at	RIKEN cDNA 1110003E01 gene
1436419_a_at	RIKEN cDNA 1700097N02 gene
1435240_at	bromodomain adjacent to zinc finger domain, 2B
1451114_at	CKLF-like MARVEL transmembrane domain containing 6
1424936_a_at	dynein, axonemal, heavy chain 8
1418993_s_at	coagulation factor X
1431475_a_at	homeo box A10
1427433_s_at	homeo box A3
1448926_at	homeo box A5
1449499_at	homeo box A7
1455626_at	homeo box A9
1451814_a_at	HIV-1 tat interactive protein 2, homolog (human)
1451535_at	interleukin 31 receptor A
1424852_at	myocyte enhancer factor 2C
1443260_at	myeloid ecotropic viral integration site 1
1455796_x_at	olfactomedin 1
1435312_at	Progestin and adipoQ receptor family member VII
1427038_at	preproenkephalin 1
1416635_at	sphingomyelin phosphodiesterase, acid-like 3A
1433593_at	yippee-like 5 (Drosophila)