K-means is not informative in the 2-cluster instance → it clusters incorrectly.

Filter 1: paired t test on normalized intensity changes between MPCs and MPCs induced to osteoblast differentiation at various time points
Filter 2: a simple data filter that selects genes for which the average change in intensity among all three donors was 2-fold relative to the data for MPCs.

Combining filter 1 and filter 2, they found that a total of 535 genes was differentially expressed at any time point. Among them, 24 genes were up-regulated and 52 down-regulated on day 1, 43 genes were up-regulated and 130 down-regulated on day 2, and 274 were up-regulated and 122 down-regulated on day 7 compared undifferentiated MPCs:

Cluster 1

Acc.No	Gene	Acc.No	Gene
AA045180	CA150	AA598526	HIF1A
AA055585	COPEB	AA630017	TCEB2
AA099534	PC4	AA669341	ZNF6
AA115186	GTF2IP1	AA894687	ILF2
AA136533	TCEB1L	H17943	RNF4
AA441930	CLTH	H73914	LDB2
AA454673	ZNF162	N28860	KHSRP
AA456147	GTF3A	N75581	FUBP1
AA464600	MYC	R83000	BTF3
AA479196	GTF2F2	T55801	GTF2A2
AA485427	CRIP2		

Cluster 2

Acc. No	Gene	Acc. No	Gene
AA482119	ID3	AA460838	GTF2H3
AA007444	HOX11	AA461304	CREB3
AA127096	ENIGMA	AA481758	HSPF1
AA227982	PSIP1	AA490538	ZFP161
AA282537	MEF2B	AA609982	NCYM
AA284693	TFAP4	AA683219	HIVEP2
AA455272	ITBA1	H69335	PIR
AA457034	MYBL2	N29376	MNDA
AA457153	ZNF282	N71628	SPIB
AA457155	ZNF212		

Cluster 3

Acc. No	Gene	Acc. No	Gene
AA022561	SATB1	AA699732	ONECUT1
AA026644	TCF3	AA704492	TLE4
AA035144	MEF2D	AA775091	DSIPI
AA055504	HT2A	AA775410	EMX1
AA056465	NONO	*AA775423	SOX3
AA057436	RFXAP	AA825491	IRF4
AA088434	ZNF38	AA858175	CBFA1
AA131585	JUND	AA873635	POU2F2
AA195036	RNF15	H12320	CREB1
AA195636	MSX2	H17048	ZNF133
AA211508	ZNF36	H38522	POU2F1
AA406269	NF1X	*H65734	KLF1
AA424950	E2F1	H72875	GATA3
AA425806	SPN	H90415	BRCA1
AA425823	SREBF1	H99588	LAF4
AA428551	SOX22	N20996	NFIC
AA443659	ZNF143	N49284	MYB
AA447515	MAD4	N63770	TFAP2A
AA448256	MTF1	N67778	RUNX3
AA453420	SOX4	N69908	ZNF273
AA454609	FOXJ1	R01991	ZNF200
AA455657	ZNF184	*R06446	GATA1
AA463452	DGSI	R18845	ZNF177
AA478480	TCEAL1	R26082	TCF17
AA479928	SHOX2	R39356	TP53
AA486533	EGR1	R44020	FOXG1B
AA488075	STAT1	R46202	IRX-2A
AA489785	NCOA1	R51865	RNF8
AA496576	NFE2L1	R69885	HCFC1
AA600217	ATF4	R83277	ORC1L
* AA610066	HOXB6	T57877	ZNF268
AA629686	EED	T95053	PER1
AA629838	ZNF74	W31899	ZNF165
AA633811	NFIL3	W86216	ERF
AA699573	TCF2	W88571	ABP/ZF

ADH2 (Acc. No. N93428) – alcohol dehydrogenase 2 (class I), beta polypeptide – is most upregulated in later stages with a 17 fold increase. According to the literature, ADH2 is known to respond to transcription factors that are active during late fetal and early postnatal liver development. It is likely that this late time point is the developmental time period during which the liver is most rapidly developing, and it is necessary for this gene to be upregulated to facilitate this development.