



Supplementary Table 1 The primers of selected mRNAs

Primer name	Sequence of primer(5'to3')	Size of production (bp)
GAPDH-F (endogenous control)	GGAGCGAGATCCCTCCAAAAT	197
GAPDH-R (endogenous control)	GGCTGTTGTCATACTTCTCATGG	
ATF, 2-F	TTTGACCCAGCAACATCCTCC	168
ATF2-R	TGGGTCTGTGGAGTTGTGTGA	
FBXW7-F	GTCCCGAGAAGCGGTTTGATA	100
FBXW7-R	TGCTCAGGCACGTCAGAAAAG	
RBBP4-F	TCAGTTTGATGCGTCACACTAC	150
RBBP4-R	GCGATGATACAAGGGTTCTGG	
RDX-F	GCCCAAGCCAGAGATGAAACC	166
RDX-R	ATGCATACAGTTTGGGTCCCC	

Supplementary table 2 The clinical features of the enrolled subjects

GSE7429			
GEO accession	Sample title	Sample characteristics 1	Sample characteristics 2
GSM179758	Bcell-highBMD-1	postmenopause, age=57	-
GSM179759	Bcell-highBMD-2	postmenopause, age=57	-
GSM179760	Bcell-highBMD-3	postmenopause, age=60	-
GSM179761	Bcell-highBMD-4	postmenopause, age=58	-
GSM179762	Bcell-highBMD-5	postmenopause, age=54	-
GSM179763	Bcell-highBMD-6	postmenopause, age=54	-
GSM179764	Bcell-highBMD-7	postmenopause, age=58	-
GSM179765	Bcell-highBMD-8	postmenopause, age=58	-
GSM179766	Bcell-highBMD-9	postmenopause, age=55	-
GSM179767	Bcell-highBMD-10	postmenopause, age=58	-
GSM179768	Bcell-lowBMD-1	postmenopause, age=58	-
GSM179769	Bcell-lowBMD-2	postmenopause, age=56	-
GSM179770	Bcell-lowBMD-3	postmenopause, age=58	-
GSM179771	Bcell-lowBMD-4	postmenopause, age=59	-
GSM179772	Bcell-lowBMD-5	postmenopause, age=58	-
GSM179773	Bcell-lowBMD-6	postmenopause, age=60	-
GSM179774	Bcell-lowBMD-7	postmenopause, age=59	-
GSM179775	Bcell-lowBMD-8	postmenopause, age=56	-
GSM179776	Bcell-lowBMD-9	postmenopause, age=59	-
GSM179777	Bcell-lowBMD-10	postmenopause, age=56	-

GSE13850

GEO accession	Sample title	Sample characteristics 1	Sample characteristics 2
GSM179758	Bcell-highBMD-1	postmenopause, age=57	-
GSM179759	Bcell-highBMD-2	postmenopause, age=57	-
GSM179760	Bcell-highBMD-3	postmenopause, age=60	-
GSM179761	Bcell-highBMD-4	postmenopause, age=58	-
GSM179762	Bcell-highBMD-5	postmenopause, age=54	-
GSM179763	Bcell-highBMD-6	postmenopause, age=54	-
GSM179764	Bcell-highBMD-7	postmenopause, age=58	-
GSM179765	Bcell-highBMD-8	postmenopause, age=58	-
GSM179766	Bcell-highBMD-9	postmenopause, age=55	-
GSM179767	Bcell-highBMD-10	postmenopause, age=58	-
GSM179768	Bcell-lowBMD-1	postmenopause, age=58	-
GSM179769	Bcell-lowBMD-2	postmenopause, age=56	-
GSM179770	Bcell-lowBMD-3	postmenopause, age=58	-
GSM179771	Bcell-lowBMD-4	postmenopause, age=59	-
GSM179772	Bcell-lowBMD-5	postmenopause, age=58	-
GSM179773	Bcell-lowBMD-6	postmenopause, age=60	-
GSM179774	Bcell-lowBMD-7	postmenopause, age=59	-
GSM179775	Bcell-lowBMD-8	postmenopause, age=56	-
GSM179776	Bcell-lowBMD-9	postmenopause, age=59	-
GSM179777	Bcell-lowBMD-10	postmenopause, age=56	-
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348199	BMD_rep1		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348200	BMD_rep2		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348201	BMD_rep3		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348202	BMD_rep4		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348203	BMD_rep5		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348204	BMD_rep6		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348205	BMD_rep7		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348206	BMD_rep8		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348207	BMD_rep9		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348208	BMD_rep10		
	B cells_Postmenopausal_Smoking_high	Postmenopause, smoking	-
GSM348209	BMD_rep1		

GSM348210	B cells_Postmenopausal_Smoking_high BMD_rep2	Postmenopause, smoking	-
GSM348211	B cells_Postmenopausal_Smoking_high BMD_rep3	Postmenopause, smoking	-
GSM348212	B cells_Postmenopausal_Smoking_high BMD_rep4	Postmenopause, smoking	-
GSM348213	B cells_Postmenopausal_Smoking_high BMD_rep5	Postmenopause, smoking	-
GSM348214	B cells_Postmenopausal_Smoking_high BMD_rep6	Postmenopause, smoking	-
GSM348215	B cells_Postmenopausal_Smoking_high BMD_rep7	Postmenopause, smoking	-
GSM348216	B cells_Postmenopausal_Smoking_high BMD_rep8	Postmenopause, smoking	-
GSM348217	B cells_Postmenopausal_Smoking_high BMD_rep9	Postmenopause, smoking	-
GSM348218	B cells_Postmenopausal_Smoking_high BMD_rep10	Postmenopause, smoking	-

GSE56815

GEO accession	Sample title	Sample characteristics 1	Sample characteristics 2
GSM1369756	Monocytes from a postmonopausal high BMD woman (H-GE-01M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369757	Monocytes from a postmonopausal high BMD woman (H-GE-04M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369758	Monocytes from a postmonopausal high BMD woman (H-GE-06M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369759	Monocytes from a postmonopausal high BMD woman (H-GE-07M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369760	Monocytes from a postmonopausal high BMD woman (H-GE-10M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369761	Monocytes from a postmonopausal high BMD woman (H-GE-11M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369762	Monocytes from a postmonopausal high BMD woman (H-GE-13M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369765	Monocytes from a postmonopausal high BMD woman (H-GE-18M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369767	Monocytes from a postmonopausal high BMD woman (H-GE-20M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369769	Monocytes from a postmonopausal high BMD woman (H-GE-23M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369771	Monocytes from a postmonopausal high BMD woman (H-GE-26M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369777	Monocytes from a postmonopausal high BMD woman (H-GE-34M.CEL)	gender: Female	bone mineral density: high BMD

GSM1369778	Monocytes from a postmenopausal high BMD woman (H-GE-42M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369779	Monocytes from a postmenopausal high BMD woman (H-GE-45M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369780	Monocytes from a postmenopausal high BMD woman (H-GE-47M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369781	Monocytes from a postmenopausal high BMD woman (H-GE-53M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369782	Monocytes from a postmenopausal high BMD woman (H-GE-55M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369783	Monocytes from a postmenopausal high BMD woman (H-GE-59M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369784	Monocytes from a postmenopausal high BMD woman (H-GE-65M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369792	Monocytes from a postmenopausal high BMD woman (H-GE-80M.CEL)	gender: Female	bone mineral density: high BMD
GSM1369797	Monocytes from a postmenopausal low BMD woman (L-GE-25M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369798	Monocytes from a postmenopausal low BMD woman (L-GE-31M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369799	Monocytes from a postmenopausal low BMD woman (L-GE-32M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369800	Monocytes from a postmenopausal low BMD woman (L-GE-35M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369802	Monocytes from a postmenopausal low BMD woman (L-GE-37M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369803	Monocytes from a postmenopausal low BMD woman (L-GE-38M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369805	Monocytes from a postmenopausal low BMD woman (L-GE-40M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369807	Monocytes from a postmenopausal low BMD woman (L-GE-43M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369810	Monocytes from a postmenopausal low BMD woman (L-GE-48M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369812	Monocytes from a postmenopausal low BMD woman (L-GE-50M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369813	Monocytes from a postmenopausal low BMD woman (L-GE-51M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369814	Monocytes from a postmenopausal low BMD woman (L-GE-52M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369816	Monocytes from a postmenopausal low BMD woman (L-GE-56M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369821	Monocytes from a postmenopausal low BMD woman (L-GE-62M.CEL)	gender: Female	bone mineral density: low BMD

GSM1369822	Monocytes from a postmonopausal low BMD woman (L-GE-63M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369823	Monocytes from a postmonopausal low BMD woman (L-GE-64M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369824	Monocytes from a postmonopausal low BMD woman (L-GE-66M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369825	Monocytes from a postmonopausal low BMD woman (L-GE-67M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369826	Monocytes from a postmonopausal low BMD woman (L-GE-69M.CEL)	gender: Female	bone mineral density: low BMD
GSM1369828	Monocytes from a postmonopausal low BMD woman (L-GE-72M.CEL)	gender: Female	bone mineral density: low BMD

GSE100609

GEO accession	Sample title	Sample characteristics 1	Sample characteristics 2
GSM179758	Bcell-highBMD-1	postmenopause, age=57	-
GSM179759	Bcell-highBMD-2	postmenopause, age=57	-
GSM179760	Bcell-highBMD-3	postmenopause, age=60	-
GSM179761	Bcell-highBMD-4	postmenopause, age=58	-
GSM179762	Bcell-highBMD-5	postmenopause, age=54	-
GSM179763	Bcell-highBMD-6	postmenopause, age=54	-
GSM179764	Bcell-highBMD-7	postmenopause, age=58	-
GSM179765	Bcell-highBMD-8	postmenopause, age=58	-

!Sample_geo_acc	!Sample_title	!Sample_characteristics_ch1
GSM179758	Bcell-highBMD-1	postmenopause, age=57,Spine Z-score=2.28,Hip Z-score=1.46
GSM179759	Bcell-highBMD-2	postmenopause, age=57,Spine Z-score=2.37,Hip Z-score=0.97
GSM179760	Bcell-highBMD-3	postmenopause, age=57,Spine Z-score=1.66,Hip Z-score=1.29
GSM179761	Bcell-highBMD-4	postmenopause, age=60,Spine Z-score=1.91,Hip Z-score=2.41
GSM179762	Bcell-highBMD-5	postmenopause, age=58,Spine Z-score=1.23,Hip Z-score=0.80
GSM179763	Bcell-highBMD-6	postmenopause, age=54,Spine Z-score=2.09,Hip Z-score=3.07
GSM179764	Bcell-highBMD-7	postmenopause, age=54,Spine Z-score=2.25,Hip Z-score=2.56
GSM179765	Bcell-highBMD-8	postmenopause, age=58,Spine Z-score=1.84,Hip Z-score=0.57
GSM179766	Bcell-highBMD-9	postmenopause, age=55,Spine Z-score=2.74,Hip Z-score=1.19
GSM179767	Bcell-highBMD-10	postmenopause, age=58,Spine Z-score=1.94,Hip Z-score=1.93
GSM179768	Bcell-lowBMD-1	postmenopause, age=58,Spine Z-score=-0.9,Hip Z-score=-0.77
GSM179769	Bcell-lowBMD-2	postmenopause, age=56,Spine Z-score=-1.62,Hip Z-score=-1.15
GSM179770	Bcell-lowBMD-3	postmenopause, age=58,Spine Z-score=-1.3,Hip Z-score=-1.16
GSM179771	Bcell-lowBMD-4	postmenopause, age=59,Spine Z-score=0.16,Hip Z-score=-0.9
GSM179772	Bcell-lowBMD-5	postmenopause, age=58,Spine Z-score=-0.7,Hip Z-score=-0.47
GSM179773	Bcell-lowBMD-6	postmenopause, age=60,Spine Z-score=-0.2,Hip Z-score=-0.88
GSM179774	Bcell-lowBMD-7	postmenopause, age=59,Spine Z-score=-0.52,Hip Z-score=-0.89
GSM179775	Bcell-lowBMD-8	postmenopause, age=56,Spine Z-score=0.3,Hip Z-score=-0.61
GSM179776	Bcell-lowBMD-9	postmenopause, age=59,Spine Z-score=-2.26,Hip Z-score=-1.31
GSM179777	Bcell-lowBMD-10	postmenopause, age=56,Spine Z-score=-0.73,Hip Z-score=-0.65