Category	Term	
BP	antigen processing and presentation of peptide or polysaccharide antigen via MHC class II	
BP	antigen processing and presentation	
BP	immune response	
BP	defense response	
BP	inflammatory response	
BP	immune effector process	
BP	response to wounding	
BP	immunoglobulin mediated immune response	
BP	mitosis	
BP	nuclear division	
BP	B cell mediated immunity	
BP	cell division	
KEGG	Asthma	
KEGG	Intestinal immune network for IgA production	
KEGG	Type I diabetes mellitus	
KEGG	Systemic lupus erythematosus	
KEGG	Allograft rejection	
KEGG	Graft-versus-host disease	
KEGG	Cell adhesion molecules (CAMs)	
KEGG	Viral myocarditis	
KEGG	Autoimmune thyroid disease	
KEGG	Antigen processing and presentation	

Table S1. GO and KEGG enrichment of up-regulated genes of osteosarcoma

## Gene function analysis of osteosarcoma

CategoryTermBPblood vessel developmentBPvasculature developmentBPcell adhesionBPbiological adhesionBPskeletal system developmentBPcell motionBPcell motionBPregulation of cell proliferationBPblood vessel morphogenesisBPcell migrationBPregulation of cell growthBPnegative regulation of cell proliferationBPcell motilityBPlocalization of cellBPregulation of cell migrationBPregulation of cell motionBPregulation of cell motionBPregulation of cell deathBPregulation of growthBPregulation of growthBPregulation of growthBPregulation of growthBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of growthBPregulation of growthBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosis<	genes of osteosarcoma			
BPvasculature developmentBPcell adhesionBPbiological adhesionBPskeletal system developmentBPcell motionBPcell motionBPcell motion of cell proliferationBPblood vessel morphogenesisBPcell migrationBPcell migrationBPregulation of cell growthBPnegative regulation of cell proliferationBPcell motilityBPlocalization of cellBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell motionBPregulation of cell motionBPregulation of cell motionBPregulation of cell deathBPregulation of growthBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPresponse to organic substance	Category	Term		
BPcell adhesionBPbiological adhesionBPskeletal system developmentBPcell motionBPregulation of cell proliferationBPblood vessel morphogenesisBPcell migrationBPregulation of cell growthBPnegative regulation of cell proliferationBPcell motilityBPlocalization of cellBPlocalization of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell motionBPregulation of cell migrationBPregulation of locomotionBPregulation of cell motionBPregulation of cell motionBPregulation of cell deathBPregulation of cell deathBPregulation of growthBPregulation of growthBPresponse to woundingBPnegative regulation of cell migrationBPresponse to woundingBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosis	BP	blood vessel development		
BPbiological adhesionBPskeletal system developmentBPcell motionBPregulation of cell proliferationBPblood vessel morphogenesisBPcell migrationBPcell migration of cell growthBPnegative regulation of cell proliferationBPcell motilityBPlocalization of cellBPregulation of cell migrationBPregulation of cell migrationBPgenetic end to be added to	BP	vasculature development		
BPskeletal system developmentBPcell motionBPregulation of cell proliferationBPblood vessel morphogenesisBPcell migrationBPregulation of cell growthBPnegative regulation of cell proliferationBPcell motilityBPlocalization of cellBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell motionBPregulation of cell motionBPregulation of cell motionBPregulation of cell deathBPregulation of cell deathBPregulation of cell deathBPregulation of cell deathBPregulation of growthBPregulation of growthBPregulation of growthBPregulation of cell migrationBPregulation of cell migrationBPregulation of cell migrationBPregulation of growthBPresponse to woundingBPregulation of apoptosisBPregulation of apoptosisBPregulation of apoptosisBPresponse to organic substance	BP	cell adhesion		
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BPangiogenesisBPregulation of growthBPresponse to woundingBPnegative regulation of cell migrationBPregulation of apoptosisBPresponse to organic substance	BP	regulation of programmed cell death		
BPregulation of growthBPresponse to woundingBPnegative regulation of cell migrationBPregulation of apoptosisBPresponse to organic substance	BP	regulation of cell death		
BPresponse to woundingBPnegative regulation of cell migrationBPregulation of apoptosisBPresponse to organic substance	BP	angiogenesis		
BPnegative regulation of cell migrationBPregulation of apoptosisBPresponse to organic substance	BP	regulation of growth		
BPregulation of apoptosisBPresponse to organic substance	BP	response to wounding		
BP response to organic substance	BP	negative regulation of cell migration		
	BP	regulation of apoptosis		
RP negative regulation of locomotion	BP	response to organic substance		
	BP	negative regulation of locomotion		
BP negative regulation of cell motion	BP	negative regulation of cell motion		
BP regulation of endothelial cell proliferation	BP	regulation of endothelial cell proliferation		
BP circulatory system process	BP	circulatory system process		
BP blood circulation	BP	blood circulation		
BP response to endogenous stimulus	BP	response to endogenous stimulus		
BP response to hormone stimulus	BP	response to hormone stimulus		
BP extracellular structure organization	BP	extracellular structure organization		
BP positive regulation of cell proliferation	BP	positive regulation of cell proliferation		
BP regulation of cellular component size	BP	regulation of cellular component size		
BP steroid metabolic process	BP	steroid metabolic process		
KEGG Bladder cancer	KEGG	Bladder cancer		
KEGG Focal adhesion	KEGG	Focal adhesion		

 Table S2. GO and KEGG enrichment of down-regulated genes of osteosarcoma