

Supplementary Figure 9.

A

	Bone-related		Category								
	Bone (Figure 3E)	ECM organisation (Figure 3E)	DNA replication	Glycolysis	Lysosomal/autophagic	Mitochondrial metabolism	Oxidative stress	PI3K/Akt/mTOR	Proteasome	Telomere maintenance	TNF regulation
	Articular cartilage development	Cell adhesion mediated by integrin	DNA replication	Canonical glycolysis	Autophagic cell death	ATP synthesis coupled electron transport	Glutathione metabolic process	Insulin receptor signaling pathway	Negative regulation of ubiquitin-dependent protein catabolic process	Establishment of protein localization to telomere	Cellular response to tumor necrosis factor
Biomaterial tissue development	Collagen biosynthetic process	DNA replication initiation	Glucose catabolic process to pyruvate	Chaperone-mediated autophagy	Aerobic electron transport chain	Reactive oxygen species metabolic process	Phosphatidylinositol 3-kinase/protein kinase B signal transduction	Proteasomal protein catabolic process	Positive regulation of establishment of protein localization to telomere	Negative regulation of tumor necrosis factor production	
Bone development	Collagen fibril organization	DNA replication-dependent chromatin assembly	Glycolytic process	Lysosomal lumen acidification	Electron transport chain	Regulation of reactive oxygen species metabolic process	Positive regulation of phosphatidylinositol 3-kinase/protein kinase B signal transduction	Proteasome-mediated ubiquitin-dependent protein catabolic process	Positive regulation of telomere maintenance	Negative regulation of tumor necrosis factor superfamily cytokine production	
Bone mineralization	Collagen-activated signaling pathway	DNA strand elongation involved in DNA replication	Glycolytic process through fructose-6-phosphate	Lysosomal protein catabolic process	Mitochondrial ATP synthesis coupled electron transport	Regulation of superoxide metabolic process	Regulation of phosphatidylinositol 3-kinase/protein kinase B signal transduction	Positive regulation of telomere maintenance via telomerase	Negative regulation of tumor necrosis factor-mediated signaling pathway	Negative regulation of tumor necrosis factor superfamily cytokine production	
Canonical wnt signaling pathway	Collagen-activated tyrosine kinase receptor signaling pathway	Dna-templated DNA replication	Glycolytic process through glucose-6-phosphate	Lysosome organization	Mitochondrial electron transport, NADH to ubiquinone			Positive regulation of telomere maintenance via telomere lengthening	Regulation of tumor necrosis factor production	Regulation of tumor necrosis factor superfamily cytokine production	
Cartilage development	External encapsulating structure organization	G1/S transition of mitotic cell cycle	Hexose catabolic process	Regulation of lysosomal lumen pH	Mitochondrial electron transport, cytochrome c to oxygen			Regulation of establishment of protein localization to telomere	Regulation of tumor necrosis factor superfamily cytokine production	Regulation of tumor necrosis factor superfamily cytokine production	
Chondrocyte differentiation	Extracellular matrix assembly	Cell cycle DNA replication		Vacuolar acidification	Mitochondrial electron transport, ubiquinol to cytochrome c			Regulation of telomere maintenance	Response to tumor necrosis factor		
Cranial skeletal system development	Extracellular matrix disassembly	Cell cycle DNA replication initiation			Mitochondrial respiratory chain complex I assembly			Regulation of telomere maintenance via telomerase	Tumor necrosis factor production		
Embryonic skeletal system development	Extracellular matrix organization	Cell cycle phase transition			Mitochondrial respiratory chain complex assembly			Regulation of telomere maintenance via telomere lengthening	Tumor necrosis factor superfamily cytokine production		
Negative regulation of biomaterial tissue development	Extracellular structure organization	Mitotic DNA replication			Oxidative phosphorylation			Telomere maintenance			
Negative regulation of bone mineralization	Glomerular basement membrane development	Mitotic DNA replication initiation			Proton motive force-driven mitochondrial ATP synthesis			Telomere maintenance via telomerase			
Negative regulation of cartilage development	Integrin-mediated signaling pathway	Mitotic cell cycle			Regulation of mitochondrial membrane potential			Telomere maintenance via telomere lengthening			
Negative regulation of chondrocyte differentiation	Positive regulation of cell adhesion mediated by integrin	Mitotic cell cycle phase transition			Respiratory electron transport chain			Telomere organization			
Negative regulation of ossification	Positive regulation of collagen biosynthetic process	Mitotic cell cycle process			Tricarboxylic acid cycle						
Ossification	Positive regulation of collagen metabolic process	Nuclear DNA replication			Tricarboxylic acid metabolic process						
Osteoblast differentiation	Positive regulation of extracellular matrix disassembly	Nuclear cell cycle DNA replication initiation									
Positive regulation of wnt signaling pathway	Positive regulation of extracellular matrix organization	Positive regulation of dna-templated DNA replication									
Positive regulation of canonical wnt signaling pathway	Regulation of cell adhesion mediated by integrin	Positive regulation of cell cycle									
Regulation of wnt signaling pathway	Regulation of collagen biosynthetic process	Positive regulation of cell cycle phase transition									
Regulation of biomaterial tissue development	Regulation of collagen metabolic process	Positive regulation of cell cycle process									
Regulation of bone mineralization	Regulation of extracellular matrix disassembly	Positive regulation of metaphase/anaphase transition of cell cycle									
Regulation of canonical wnt signaling pathway	Regulation of extracellular matrix organization	Positive regulation of mitotic cell cycle									
Regulation of cartilage development	Supramolecular fiber organization	Premiotic DNA replication									
Regulation of ossification		Regulation of cell cycle									
Skeletal system development		Regulation of cell cycle phase transition									
		Regulation of cell cycle process									
		Regulation of nuclear cell cycle DNA replication									

GO terms

B

Pathway Changes: Temporal + Cross-Condition (W1 & W4)

Red = Upregulated | Blue = Downregulated | White = Not enriched

