

Supplementary Data

SUPPLEMENTARY TABLE S1. FIFTY TWO GENES SIGNIFICANTLY DIFFERENTIALLY EXPRESSED DURING hPDLSCs OSTEOGENIC DIFFERENTIATION ACROSS SECOND AND THIRD WEEKS VERSUS FIRST WEEK

<i>ID</i>	<i>Second week diff. relative fold change</i>	<i>Third week diff. relative fold change</i>	<i>Entrez gene name</i>	<i>Location</i>	<i>Type</i>
<i>ARSE</i>	0.9866	1.7289	Arylsulfatase E (chondrodysplasia punctata 1)	Cytoplasm	Enzyme
<i>BMP2</i>	2.4948	2.7955	Bone morphogenetic protein 2	Extracellular space	Growth factor
<i>BMP4</i>	0.9928	4.4727	Bone morphogenetic protein 4	Extracellular space	Growth factor
<i>BMP6</i>	1.2787	2.8487	Bone morphogenetic protein 6	Extracellular space	Growth factor
<i>CDH11</i>	1.2693	1.754	Cadherin 11, type 2, OB-cadherin (osteoblast)	Plasma membrane	Other
<i>COL10A1</i>	4.1194	7.2766	Collagen, type X, alpha 1	Extracellular space	Other
<i>COL11A1</i>	1.0541	2.3169	Collagen, type XI, alpha 1	Extracellular space	Other
<i>COL16A1</i>	2.0394	1.7852	Collagen, type XVI, alpha 1	Extracellular space	Other
<i>COL18A1</i>	1.0079	1.7891	Collagen, type XVIII, alpha 1	Extracellular space	Other
<i>COL1A2</i>	1.0293	1.7793	Collagen, type I, alpha 2	Extracellular Space	Other
<i>COL4A5</i>	2.5319	10.9185	Collagen, type IV, alpha 5	Extracellular space	Other
<i>COL7A1</i>	1.0041	1.7584	Collagen, type VII, alpha 1	Extracellular space	Other
<i>CSF2</i>	6.5024	3.5881	Colony-stimulating factor 2 (granulocyte macrophage)	Extracellular space	Cytokine
<i>EGFR</i>	2.073	2.2444	Epidermal growth factor receptor	Plasma membrane	KINASE
<i>FGF1</i>	2.02	2.2116	Fibroblast growth factor 1 (acidic)	Extracellular space	Growth factor
<i>FGF2</i>	2.0607	2.2405	Fibroblast growth factor 2 (basic)	Extracellular space	Growth factor
<i>FGFR1</i>	0.9946	1.7529	Fibroblast growth factor receptor 1	Plasma membrane	Kinase
<i>IGF1R</i>	2.027	2.2405	Insulin-like growth factor 1 receptor	Plasma membrane	Transmembrane receptor
<i>MGP</i>	0.3129	3.4692	Matrix Gla protein	Extracellular space	Other
<i>MINPP1</i>	1.5975	1.7593	Multiple inositol-polyphosphate phosphatase 1	Cytoplasm	phosphatase
<i>MMP2</i>	0.9768	2.1963	Matrix metalloproteinase 2 (gelatinase A, 72 kDa gelatinase, 72 kDa type IV collagenase)	Extracellular space	Peptidase
<i>MSX2</i>	1.6212	1.782	Msh homeobox 2	Nucleus	Transcription regulator
<i>PHEX</i>	2.0832	1.8093	Phosphate-regulating endopeptidase homolog, X-linked	Cytoplasm	Peptidase
<i>RUNX2</i>	2.0809	2.2704	Runt-related transcription factor 2	Nucleus	Transcription regulator
<i>SMAD1</i>	1.6078	1.7603	SMAD family member 1	Nucleus	Transcription regulator
<i>SMAD3</i>	0.9938	2.2232	SMAD family member 3	Nucleus	Transcription regulator
<i>SMAD4</i>	2.0546	1.7857	SMAD family member 4	Nucleus	Transcription regulator
<i>SMAD5</i>	2.0278	2.2448	SMAD family member 5	Nucleus	Transcription regulator
<i>SMAD7</i>	2.0351	2.2521	SMAD family member 7	Nucleus	Transcription regulator
<i>SOX9</i>	1.0118	1.8277	SRY (sex-determining region Y)-box 9	Nucleus	Transcription regulator
<i>SPARC</i>	1.2671	1.7671	Secreted protein, acidic, cysteine-rich (osteonectin)	Extracellular space	Other
<i>TFIP11</i>	2.0258	1.773	Tuftelin-interacting protein 11	Extracellular space	Other
<i>TGFβ2</i>	1.6429	1.7789	Transforming growth factor, beta 2	Extracellular space	Growth factor
<i>TGFβ3</i>	0.9974	1.7379	Transforming growth factor, beta 3	Extracellular space	Growth factor
<i>TGFβR2</i>	4.0929	4.5329	Transforming growth factor, beta receptor II (70/80 kDa)	Plasma membrane	Kinase
<i>TUFT1</i>	3.1675	3.4885	Tuftelin 1	Unknown	Other
<i>TWIST2</i>	4.0667	4.4251	Twist basic helix-loop-helix transcription factor 2	Nucleus	Transcription regulator
<i>VDR</i>	2.0417	1.7435	Vitamin D (1,25-dihydroxyvitamin D3) receptor	Nucleus	Transcription regulator
<i>VEGFA</i>	2.026	1.103	Vascular endothelial growth factor A	Extracellular space	Growth factor

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SUPPLEMENTARY TABLE S1. (CONTINUED)

<i>ID</i>	<i>Second week diff. relative fold change</i>	<i>Third week diff. relative fold change</i>	<i>Entrez gene name</i>	<i>Location</i>	<i>Type</i>
<i>COL15A1</i>	0.5101	0.4546	Collagen, type XV, alpha 1	Extracellular space	Other
<i>COL3A1</i>	0.5126	0.7036	Collagen, type III, alpha 1	Extracellular space	Other
<i>COL5A1</i>	0.6375	1.1102	Collagen, type V, alpha 1	Extracellular space	Other
<i>COL9A2</i>	0.6386	1.1058	Collagen, type IX, alpha 2	Extracellular space	Other
<i>GUSB</i>	0.4955	0.8772	Glucuronidase, beta	Cytoplasm	Enzyme
<i>IGF2</i>	0.5119	0.5661	Insulin-like growth factor 2 (somatomedin A)	Extracellular space	Growth factor
<i>SMAD9</i>	0.5047	1.1211	SMAD family member 9	Nucleus	Transcription regulator
<i>TGFβ1</i>	0.5138	0.8721	Transforming growth factor, beta 1	Extracellular space	Growth factor
<i>TGFβR1</i>	0.6201	0.6964	Transforming growth factor, beta receptor 1	Plasma membrane	Kinase
<i>TWIST1</i>	0.4623	0.8625	Twist basic helix-loop-helix transcription factor 1	Nucleus	Transcription regulator
<i>MSX1</i>	0.6545	1.8571	Msh homeobox 1	Nucleus	Transcription regulator
<i>SMAD6</i>	0.6339	1.3978	SMAD family member 6	Nucleus	Transcription regulator
<i>VEGFC</i>	2.0305	0.1379	Vascular endothelial growth factor C	Extracellular space	Growth factor

Expression values are the relative fold changes calculated as $2^{-\Delta\Delta C_t}$. Genes showing fold changes <0.7 were considered significantly down-expressed; genes showing fold changes >1.4 were considered significantly up-expressed.
hPDLSCs, human periodontal ligament stem cells.

SUPPLEMENTARY TABLE S2. RELATIVE FOLD CHANGES OF THE 52 GENES AT SECOND AND THIRD WEEKS VERSUS FIRST WEEK IN UNDIFFERENTIATED hPDLSCs, SIGNIFICANTLY EXPRESSED IN DIFFERENTIATED hPDLSCs

<i>ID</i>	<i>Second week undiff. relative fold change</i>	<i>Third week undifferentiated expression</i>	<i>Entrez gene name</i>	<i>Location</i>	<i>Type</i>
<i>ARSE</i>	1.2657	0.7689	Arylsulfatase E (chondrodysplasia punctata 1)	Cytoplasm	Enzyme
<i>BMP2</i>	0.6221	0.6084	Bone morphogenetic protein 2	Extracellular space	Growth factor
<i>BMP4</i>	1.0046	1.2438	Bone morphogenetic protein 4	Extracellular space	Growth factor
<i>BMP6</i>	1.014	1.2512	Bone morphogenetic protein 6	Extracellular space	Growth factor
<i>CDH11</i>	0.3963	0.7763	Cadherin 11, type 2, OB-cadherin (osteoblast)	Plasma membrane	Other
<i>COL10A1</i>	0.1537	0.295	Collagen, type X, alpha 1	Extracellular space	Other
<i>COL11A1</i>	0.4865	0.9957	Collagen, type XI, alpha 1	Extracellular space	Other
<i>COL16A1</i>	0.6233	0.7728	Collagen, type XVI, alpha 1	Extracellular space	Other
<i>COL18A1</i>	0.6154	0.7705	Collagen, type XVIII, alpha 1	Extracellular space	Other
<i>COL1A2</i>	0.967	1.2292	Collagen, type I, alpha 2	Extracellular space	Other
<i>COL4A5</i>	0.9996	0.6236	Collagen, type IV, alpha 5	Extracellular space	Other
<i>COL7A1</i>	0.4893	0.9699	Collagen, type VII, alpha 1	Extracellular space	Other
<i>CSF2</i>	NS	NS	Colony stimulating factor 2 (granulocyte-macrophage)	Extracellular Space	Cytokine
<i>EGFR</i>	0.9935	0.9758	Epidermal growth factor receptor	Plasma membrane	Kinase
<i>FGF1</i>	1.0007	0.6194	Fibroblast growth factor 1 (acidic)	Extracellular space	Growth factor
<i>FGF2</i>	1.2462	0.9724	Fibroblast growth factor 2 (basic)	Extracellular space	Growth factor
<i>FGF1R1</i>	1.0051	1.2308	Fibroblast growth factor receptor 1	Plasma membrane	Kinase
<i>IGF1R</i>	0.9946	0.7747	Insulin-like growth factor 1 receptor	Plasma membrane	Transmembrane receptor
<i>MGP</i>	0.3077	0.7787	Matrix Gla protein	Extracellular space	Other
<i>MINPP1</i>	0.6145	0.7686	Multiple inositol-polyphosphate phosphatase 1	Cytoplasm	Phosphatase
<i>MMP2</i>	0.6196	0.7715	Matrix metalloproteinase 2 (gelatinase A, 72 kDa gelatinase, 72 kDa type IV collagenase)	Extracellular space	Peptidase
<i>MSX2</i>	1.0113	0.6146	Msh homeobox 2	Nucleus	Transcription regulator
<i>PHEX</i>	1.9827	0.9921	Phosphate-regulating endopeptidase homolog, X-linked	Cytoplasm	Peptidase
<i>RUNX2</i>	0.9953	1.2278	Runt-related transcription factor 2	Nucleus	Transcription regulator
<i>SMAD1</i>	1.5994	1.2318	SMAD family member 1	Nucleus	Transcription regulator
<i>SMAD3</i>	0.6249	0.7793	SMAD family member 3	Nucleus	Transcription regulator
<i>SMAD4</i>	1.2582	1.2259	SMAD family member 4	Nucleus	Transcription regulator
<i>SMAD5</i>	0.9958	0.6098	SMAD family member 5	Nucleus	Transcription regulator
<i>SMAD7</i>	0.6148	0.6039	SMAD family member 7	Nucleus	Transcription regulator
<i>SOX9</i>	0.6301	1.2157	SRY (sex-determining region Y)-box 9	Nucleus	Transcription regulator
<i>SPARC</i>	1.0079	0.5977	Secreted protein, acidic, cysteine-rich (osteonectin)	Extracellular space	Other
<i>TFIP11</i>	1.2618	0.7667	Tuftelin-interacting protein 11	Extracellular space	Other
<i>TGFβ2</i>	1.0038	0.7836	Transforming growth factor, beta 2	Extracellular space	Growth factor
<i>TGFβ3</i>	0.7903	0.769	Transforming growth factor, beta 3	Extracellular space	Growth factor
<i>TGFβR2</i>	1.0029	0.7704	Transforming growth factor, beta receptor II (70/80 kDa)	Plasma membrane	Kinase
<i>TUFT1</i>	0.99	0.6138	Tuftelin 1	Unknown	Other
<i>TWIST2</i>	0.6324	0.7831	Twist basic helix-loop-helix transcription factor 2	Nucleus	Transcription regulator

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SUPPLEMENTARY TABLE S2. (CONTINUED)

<i>ID</i>	<i>Second week undiff. relative fold change</i>	<i>Third week undifferentiated expression</i>	<i>Entrez gene name</i>	<i>Location</i>	<i>Type</i>
<i>VDR</i>	0.9982	0.9868	Vitamin D (1,25-dihydroxyvitamin D3) receptor	Nucleus	Transcription regulator
<i>VEGFA</i>	1.2647	0.6127	Vascular endothelial growth factor A	Extracellular space	Growth factor
<i>COL15A1</i>	0.5066	0.6227	Collagen, type XV, alpha 1	Extracellular space	Other
<i>COL3A1</i>	1.0116	1.5838	Collagen, type III, alpha 1	Extracellular space	Other
<i>COL5A1</i>	0.6255	1.2205	Collagen, type V, alpha 1	Extracellular space	Other
<i>COL9A2</i>	0.784	0.9677	collagen, type IX, alpha 2	Extracellular space	Other
<i>GUSB</i>	1.5802	1.2419	Glucuronidase, beta	Cytoplasm	Enzyme
<i>IGF2</i>	0.6312	0.6016	Insulin-like growth factor 2 (somatomedin A)	Extracellular space	Growth factor
<i>SMAD9</i>	1.2359	1.9674	SMAD family member 9	Nucleus	Transcription regulator
<i>TGFβ1</i>	12.1185	6.1893	Transforming growth factor, beta 1	Extracellular space	Growth factor
<i>TGFβR1</i>	1.0213	1.2443	Transforming growth factor, beta receptor 1	Plasma membrane	Kinase
<i>TWIST1</i>	0.9602	1.2251	Twist basic helix-loop-helix transcription factor 1	Nucleus	Transcription regulator
<i>MSX1</i>	0.2885	0.5788	Msh homeobox 1	Nucleus	Transcription regulator
<i>SMAD6</i>	1.0003	1.2398	SMAD family member 6	Nucleus	Transcription regulator
<i>VEGFC</i>	2.5196	0.9752	Vascular endothelial growth factor C	Extracellular space	Growth factor

Expression values are the relative fold changes calculated as $2^{-\Delta\Delta Ct}$. Genes showing fold changes < 0.7 were considered significantly down-expressed; genes showing fold changes > 1.4 were considered significantly up-expressed.

NS, not significant.

SUPPLEMENTARY TABLE S3. EARLY UP-EXPRESSED
GENES AT SECOND WEEK OF DIFFERENTIATION
VERSUS FIRST WEEK

<i>ID</i>	<i>Second week diff. relative fold change</i>	<i>Third week diff. relative fold change</i>
<i>BMP2</i>	2.4948	2.7955
<i>COL10A1</i>	4.1194	7.2766
<i>COL16A1</i>	2.0394	1.7852
<i>COL4A5</i>	2.5319	10.9185
<i>CSF2</i>	6.5024	3.5881
<i>EGFR</i>	2.073	2.2444
<i>FGF1</i>	2.02	2.2116
<i>FGF2</i>	2.0607	2.2405
<i>IGF1R</i>	2.027	2.2405
<i>MINPP1</i>	1.5975	1.7593
<i>MSX2</i>	1.6212	1.782
<i>PHEX</i>	2.0832	1.8093
<i>RUNX2</i>	2.0809	2.2704
<i>SMAD1</i>	1.6078	1.7603
<i>SMAD4</i>	2.0546	1.7857
<i>SMAD5</i>	2.0278	2.2448
<i>SMAD7</i>	2.0351	2.2521
<i>TFIP11</i>	2.0258	1.773
<i>TGFβ2</i>	1.6429	1.7789
<i>TGFβR2</i>	4.0929	4.5329
<i>TUFT1</i>	3.1675	3.4885
<i>TWIST2</i>	4.0667	4.4251
<i>VDR</i>	2.0417	1.7435

Expression values are the relative fold changes calculated as $2^{-\Delta\Delta C_t}$. Genes showing fold changes <0.7 were considered significantly down-expressed; genes showing fold changes >1.4 were considered significantly up-expressed.

SUPPLEMENTARY TABLE S4. UP-EXPRESSED GENES ONLY AT THE THIRD WEEK OF DIFFERENTIATION VERSUS FIRST WEEK

<i>ID</i>	<i>Second week diff. relative fold change</i>	<i>Third week diff. relative fold change</i>
<i>ARSE</i>	0.9866	1.7289
<i>BMP4</i>	0.9928	4.4727
<i>BMP6</i>	1.2787	2.8487
<i>CDH11</i>	1.2693	1.754
<i>COL11A1</i>	1.0541	2.3169
<i>COL18A1</i>	1.0079	1.7891
<i>COL1A2</i>	1.0293	1.7793
<i>COL7A1</i>	1.0041	1.7584
<i>FGFR1</i>	0.9946	1.7529
<i>MGP</i>	0.3129	3.4692
<i>MMP2</i>	0.9768	2.1963
<i>SMAD3</i>	0.9938	2.2232
<i>SOX9</i>	1.0118	1.8277
<i>SPARC</i>	1.2671	1.7671
<i>TGFβ3</i>	0.9974	1.7379

Expression values are the relative fold changes calculated as $2^{-\Delta\Delta C_t}$. Genes showing fold changes <0.7 were considered significantly down-expressed; genes showing fold changes >1.4 were considered significantly up-expressed.