

Supplementary materials

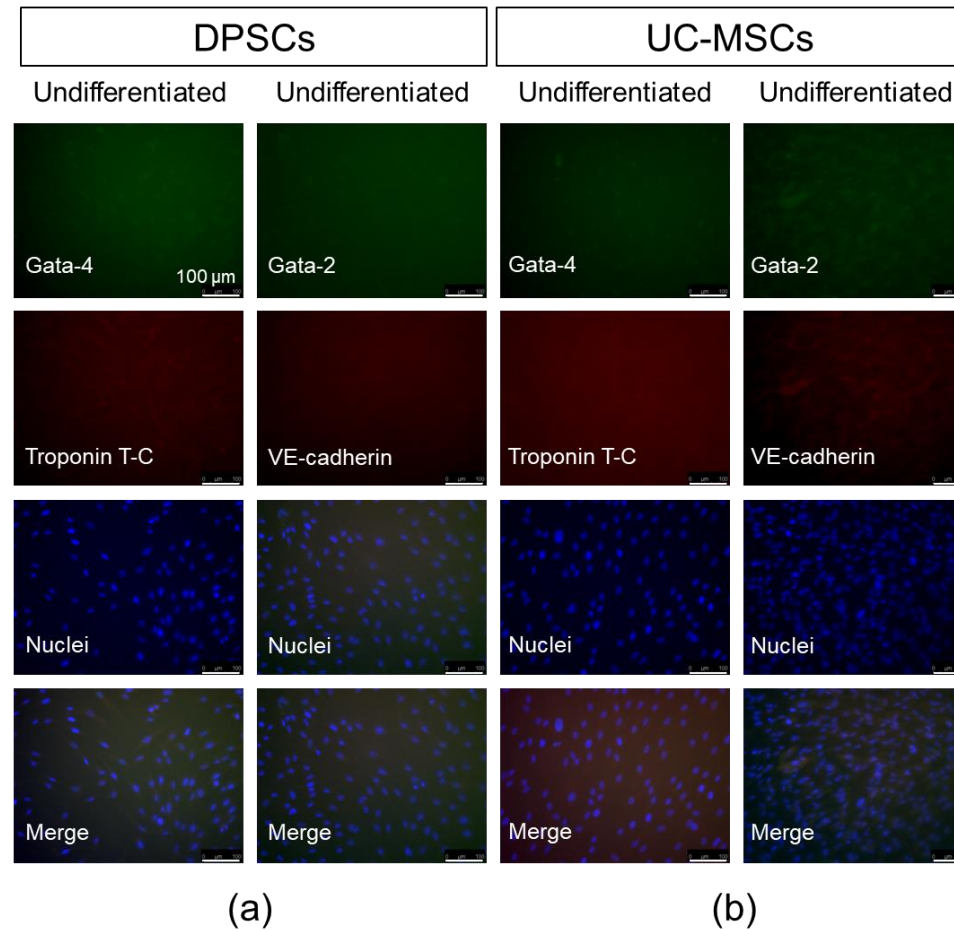


Figure S1. Immunocytochemical staining of DPSCs and UC-MSCs at 7 day of standard cell culture. (a) Representative images of cardiomyogenic and endothelial marker expression in undifferentiated (control) DPSCs. (b) Representative images of cardiomyogenic and endothelial marker expression in undifferentiated (control) UC-MSCs. Cells were cultured in DMEM/F12 supplemented with 10% FBS. At 7 day, cells were fixed, permeabilized and stained against intranuclear transcription factor Gata-4 (Alexa Fluor 488, green) and troponin T-C (Alexa Fluor 546, red) or against intranuclear transcription factor Gata-2 (Alexa Fluor 488, green) and VE-cadherin (Alexa Fluor 546, red). Nuclei were co-stained with DAPI (blue). Cells were analyzed with Leica DMI6000B ver. AF7000 fluorescent microscope. Scale bars: 100 μm.

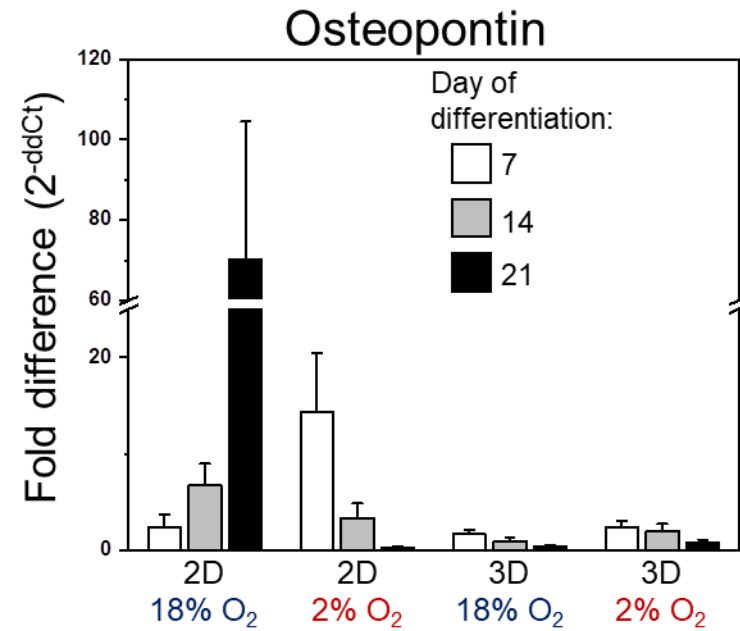


Figure S2. Expression of osteopontin during osteogenic differentiation of DPSCs encapsulated in hydrogel (3D) or seeded on the surface coated with gelatin (2D) cultured in hypoxic (2% O₂) or normoxic (18% O₂) environment. Quantitative analysis of mRNA expression for osteopontin in DPSCs at 7, 14 and 21 day of differentiation by Real-Time RT-PCR. Fold change in expression of analyzed gene in control cells before differentiation were calculated as 1.0. Results are presented as means±SEM. *n* = 3 (every sample w analyzed in duplicate). * *p* < 0.05 (*t*-test).

Table S1. Fold change in mRNA expression for osteogenesis related genes (osteocalcin, osteopontin, *Runx2*) in DPSCs and UC-MSCs by Real-Time RT-PCR. Grey color indicates value of change of fold change. The darker shades of gray correspond to a higher fold change in expression for tested gene.

DPSCs		Mean fold change			Mean from 3 experiments	SEM	UC-MSCs		Mean fold change			Mean from 3 experiments	SEM
Day	Gene	Sample 1	Sample 2	Sample 3			Day	Gene	Sample 1	Sample 2	Sample 3		
7	Osteocalcin	0,23	0,02	0,98	0,41	0,29	7	Osteocalcin	0,36	0,18	0,18	0,24	0,06
14		0,27	0,76	0,49	0,51	0,14	14		0,98	0,65	0,49	0,71	0,15
21		0,40	1,01	0,59	0,67	0,18	21		0,41	0,31	0,45	0,39	0,04
7	Osteopontin	0,64	0,03	2,18	0,95	0,64	7	Osteopontin	12,99	4,66	2,17	6,61	3,27
14		0,22	0,12	1,10	0,48	0,31	14		8,67	17,00	5,06	10,24	3,54
21		0,56	0,05	3,45	1,36	1,06	21		4,44	5,75	1,10	3,76	1,39
7	Runx2	1,63	1,02	0,98	1,21	0,21	7	Runx2	0,93	1,82	0,19	0,98	0,47
14		2,41	1,02	1,20	1,55	0,44	14		2,17	1,54	0,91	1,54	0,36
21		1,42	1,31	0,89	1,20	0,16	21		1,89	0,91	0,78	1,20	0,35

Table S2. Fold change in mRNA expression for chondrogenesis related genes (*Acan*, *Col10A1*, *Col2A1*, *Sox9*) in DPSCs and UC-MSCs by Real-Time RT-PCR. Grey color indicates value of change of fold change. The darker shades of gray correspond to a higher fold change in expression for tested gene.

DPSCs		Mean fold change			Mean from 3 experiments	SEM	UC-MSCs		Mean fold change			Mean from 3 experiments	SEM
Day	Gene	Sample 1	Sample 2	Sample 3			Day	Gene	Sample 1	Sample 2	Sample 3		
7	Acan	0,07	0,06	2,45	0,86	0,80	7	Acan	1,82	0,01	2,53	1,45	0,75
14		0,01	0,17	0,18	0,12	0,06	14		8,01	0,04	0,52	2,86	2,58
21		0,01	0,07	0,08	0,05	0,02	21		251,21	0,02	45,43	98,89	77,28
7	Sox9	6,20	5,24	1,63	4,36	1,39	7	Sox9	261,13	0,30	16,03	92,49	84,44
14		6,07	0,66	2,45	3,06	1,59	14		296,07	0,81	9,03	101,97	97,08
21		0,65	0,41	0,59	0,55	0,07	21		903,49	0,12	49,12	317,58	293,30
7	Col10A1	3,73	3,09	7,96	4,92	1,53	7	Col10A1	908,26	0,65	876,62	595,18	297,40
14		1,51	0,63	2,22	1,45	0,46	14		670,02	3,73	251,71	308,48	194,43
21		1,90	3,22	0,94	2,02	0,66	21		4011,96	1,13	3360,55	2457,88	1242,68
7	Col2A1	8,00	5,27	0,66	4,64	2,14	7	Col2A1	0,24	0,50	1,24	0,66	0,30
14		0,86	0,37	1,77	1,00	0,41	14		0,33	3,47	0,36	1,39	1,04
21		1,62	3,12	2,17	2,30	0,44	21		0,93	2,61	0,95	1,49	0,56

Table S3. Fold change in mRNA expression for adipogenesis related genes (*CEBP α* , *PPAR γ*) in DPSCs and UC-MSCs by Real-Time RT-PCR. Grey color indicates value of change of fold change. The darker shades of gray correspond to a higher fold change in expression for tested gene.

DPSCs		Mean fold change			Mean from 3 experiments	SEM	UC-MSCs		Mean fold change			Mean from 3 experiments	SEM
Day	Gene	Sample 1	Sample 2	Sample 3			Day	Gene	Sample 1	Sample 2	Sample 3		
7	PPAR γ	15,98	3,80	2,01	7,26	4,39	7,00	PPAR γ	16,52	11,14	17,04	14,90	1,88
14		29,05	10,81	3,20	14,35	7,67	14,00		15,28	23,11	32,72	23,70	5,04
21		34,30	10,66	2,61	15,86	9,51	21,00		80,85	68,38	67,08	72,11	4,39
7	CEBP α	30,99	0,54	3,00	11,51	9,77	7,00	CEBP α	1,21	1,68	1,81	1,57	0,18
14		3,35	0,65	3,75	2,58	0,97	14,00		6,81	8,05	5,53	6,80	0,73
21		7,20	1,02	10,74	6,32	2,84	21,00		52,02	22,38	19,43	31,28	10,41

Table S4. Fold change in mRNA expression for cardiomyogenesis related genes (*Gata-4*, *Nkx2.5*, *Myl2c*) in DPSCs and UC-MSCs by Real-Time RT-PCR. Grey color indicates value of change of fold change. The darker shades of gray correspond to a higher fold change in expression for tested gene.

DPSCs		Mean fold change			Mean from 3 experiments	SEM	UC-MSCs		Mean fold change			Mean from 3 experiments	SEM
Day	Gene	Sample 1	Sample 2	Sample 3			Day	Gene	Sample 1	Sample 2	Sample 3		
7	Gata-4	0,13	1,29	1,32	0,91	0,39	7	Gata-4	6,11	7,96	0,92	5,00	2,11
14		1,45	0,05	0,53	0,68	0,41	14		0,48	0,04	0,46	0,33	0,14
21		0,26	0,09	0,16	0,17	0,05	21		10,10	0,44	1,61	4,05	3,05
7	Nkx2.5	2,79	0,60	0,69	1,36	0,71	7	Nkx2.5	7,18	103,60	0,87	37,22	33,24
14		1,26	0,10	0,19	0,52	0,37	14		1,18	0,17	0,94	0,76	0,30
21		0,39	0,08	0,56	0,34	0,14	21		34,47	8,62	1,28	14,79	10,06
7	Myl2c	1,95	1,05	0,23	1,08	0,50	7	Myl2c	1,21	8,75	0,49	3,48	2,64
14		1,12	0,02	0,81	0,65	0,33	14		0,72	0,08	0,05	0,28	0,22
21		1,10	1,30	0,13	0,84	0,36	21		5,04	9,82	0,34	5,07	2,74

Table S5. Fold change in mRNA expression for endothelial related genes (*Gata-2*, *Tie-2*, VE-cadherin) in DPSCs and UC-MSCs by Real-Time RT-PCR. Grey color indicates value of change of fold change. The darker shades of gray correspond to a higher fold change in expression for tested gene.

DPSCs		Mean fold change			Mean from 3 experiments	SEM	UC-MSCs		Mean fold change			Mean from 3 experiments	SEM
Day	Gene	Sample 1	Sample 2	Sample 3			Day	Gene	Sample 1	Sample 2	Sample 3		
7	Gata-2	1,82	1,08	0,23	1,04	0,46	7	Gata-2	3,31	23,18	0,33	8,94	7,17
14		0,41	0,19	0,02	0,21	0,11	14		17,82	3,02	0,75	7,20	5,35
21		0,29	0,25	0,22	0,25	0,02	21		2,00	5,30	0,33	2,54	1,46
7	VE-cadherin	1,95	0,93	1,10	1,33	0,32	7	VE-cadherin	12,29	203,15	1,17	72,21	65,55
14		0,88	0,04	1,11	0,68	0,33	14		4,39	1,53	0,87	2,26	1,08
21		0,09	0,10	0,60	0,27	0,17	21		0,93	11,12	1,49	4,52	3,31
7	Tie-2	0,57	1,09	1,06	0,90	0,17	7	Tie-2	1,26	16,10	0,16	5,84	5,14
14		0,06	0,01	0,97	0,35	0,31	14		1,37	0,70	0,15	0,74	0,35
21		0,02	0,03	0,87	0,31	0,28	21		0,30	14,87	0,23	5,13	4,87