Supplementary Information

Generation of Functional Cardiomyocytes from the Synoviocytes of Patients with Rheumatoid Arthritis via Induced Pluripotent Stem Cells

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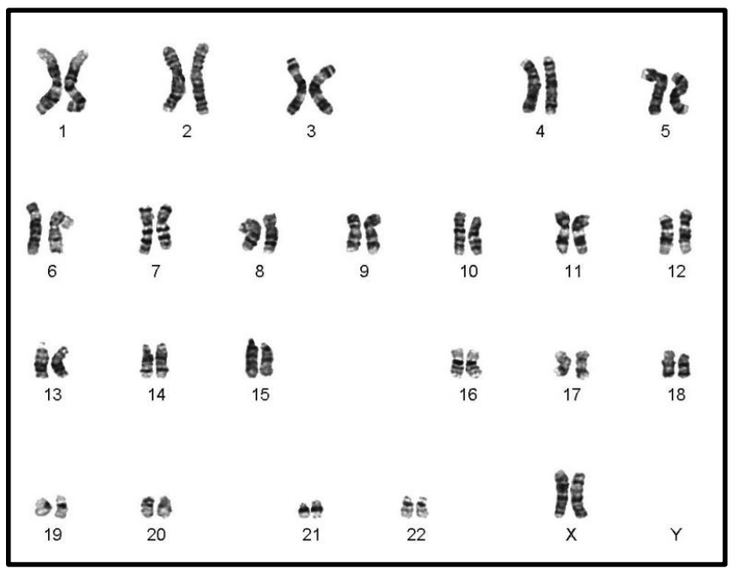
RA iPSC 1



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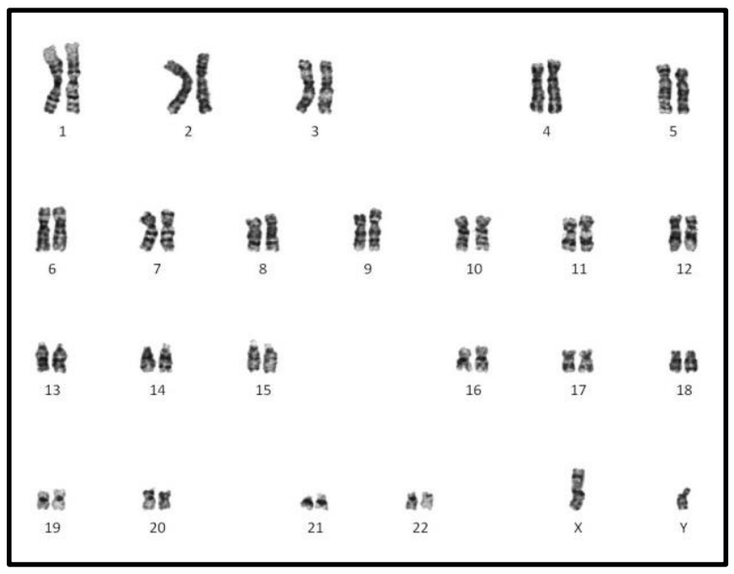

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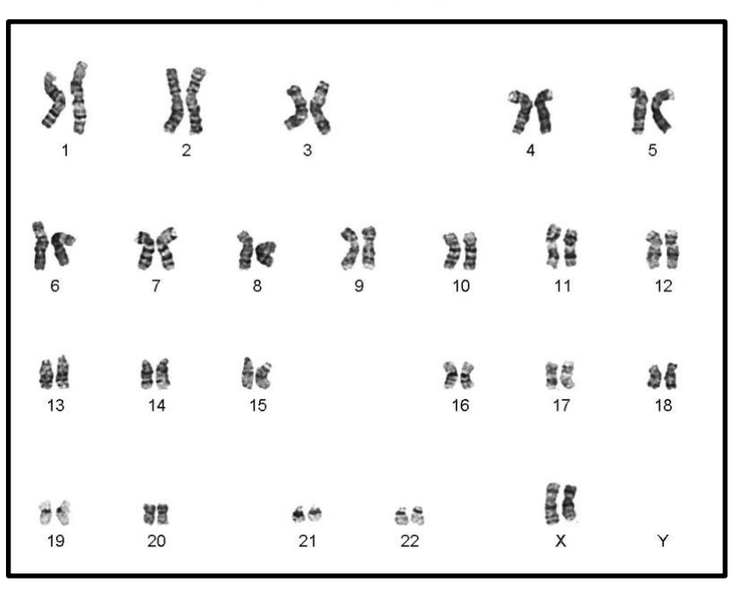

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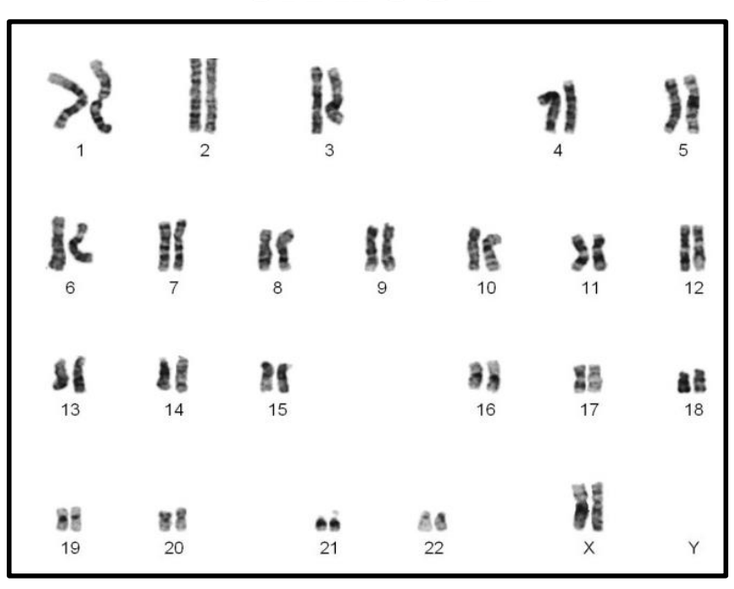

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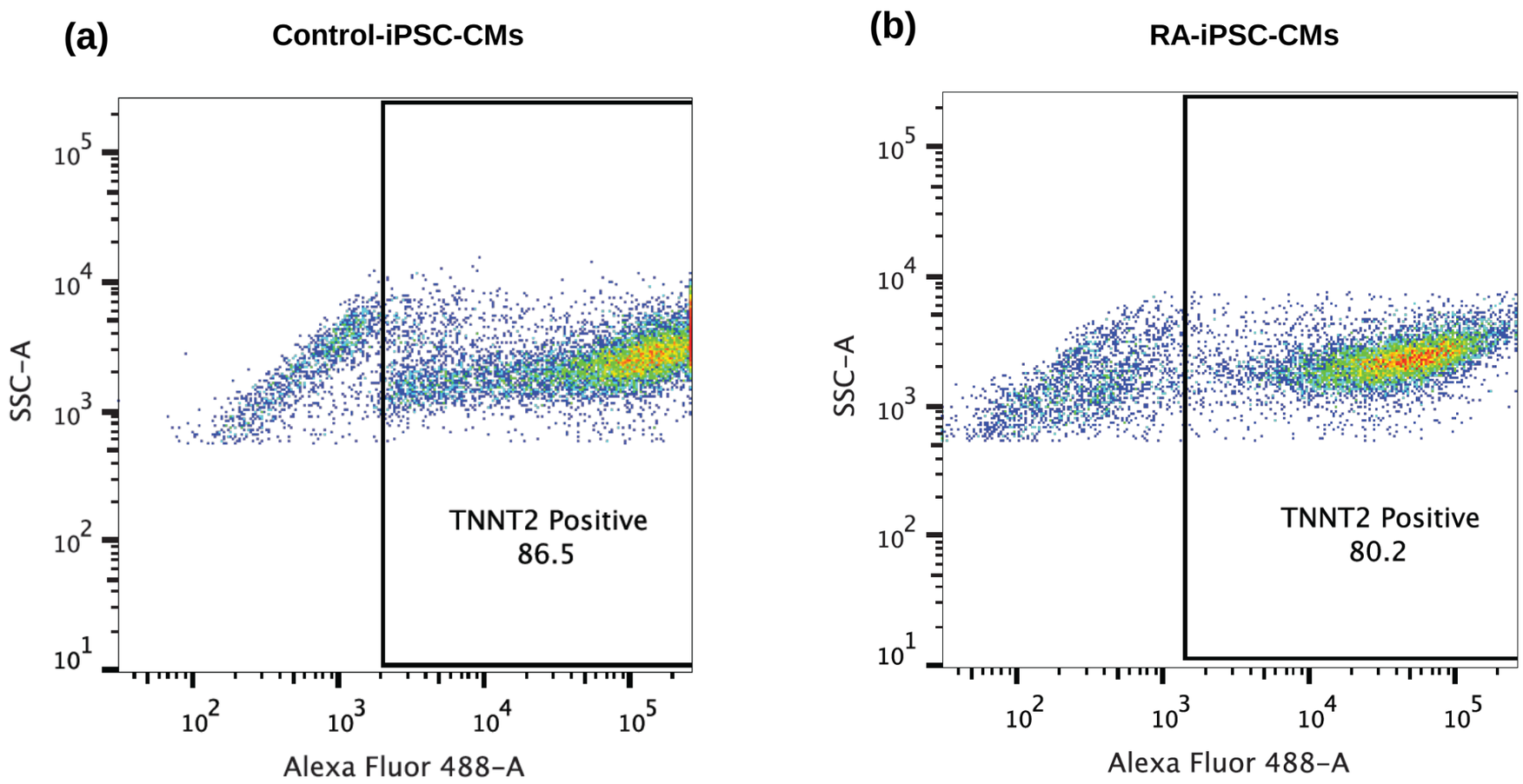
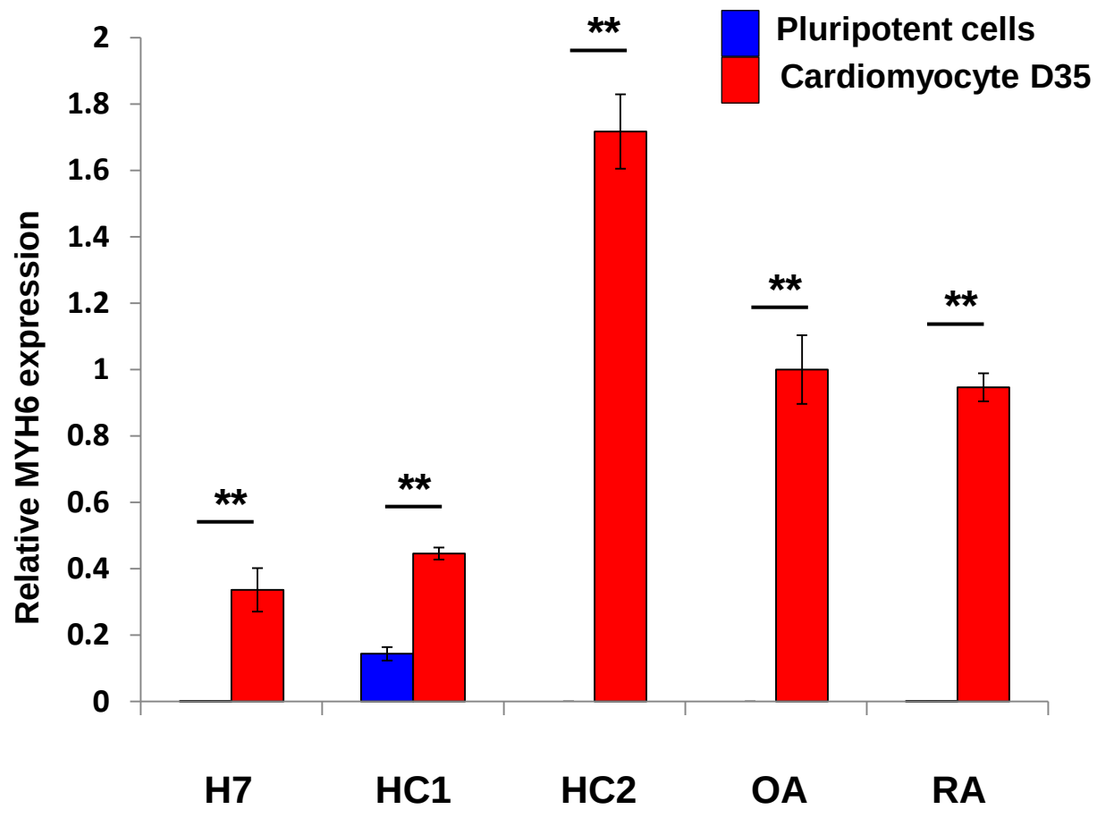
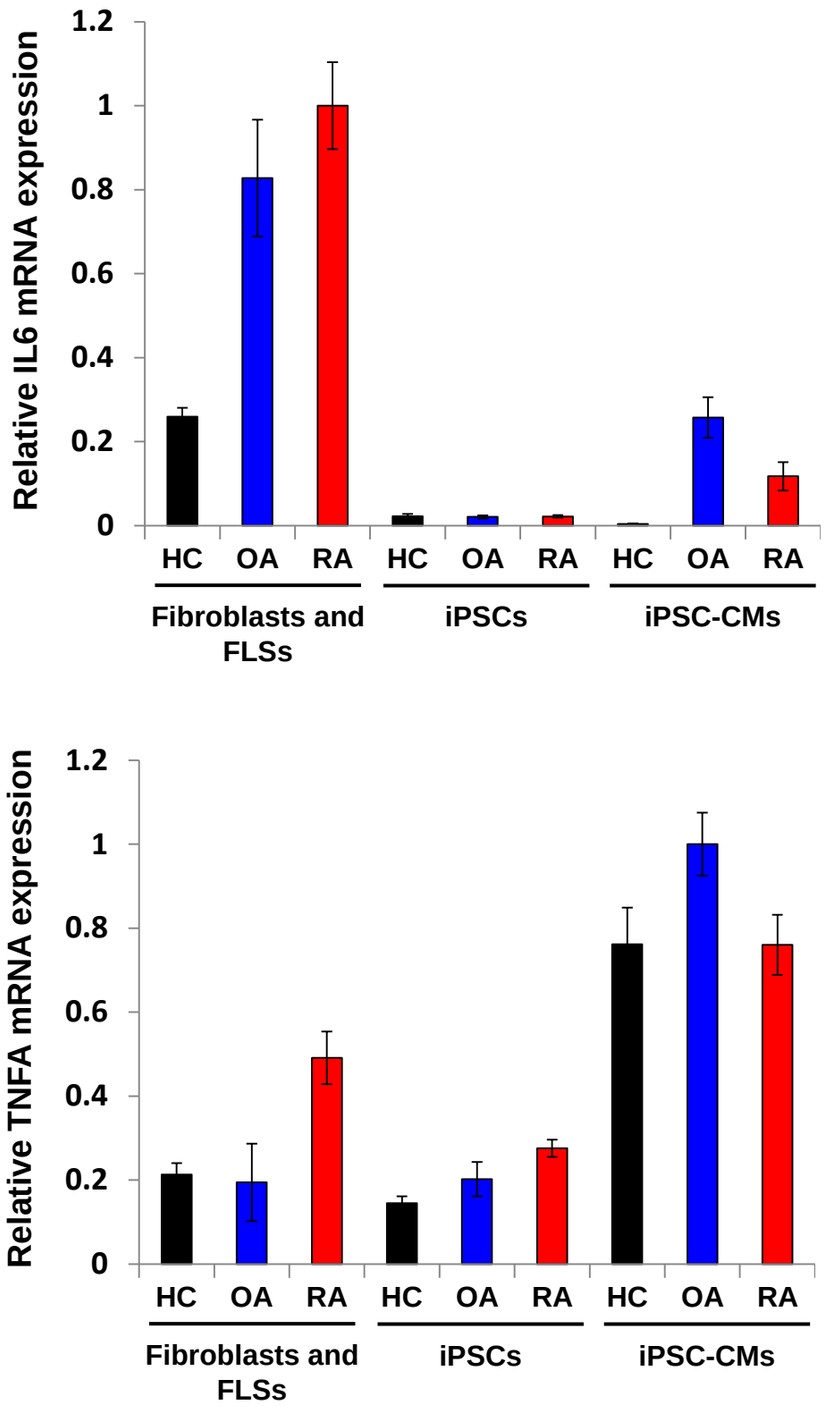
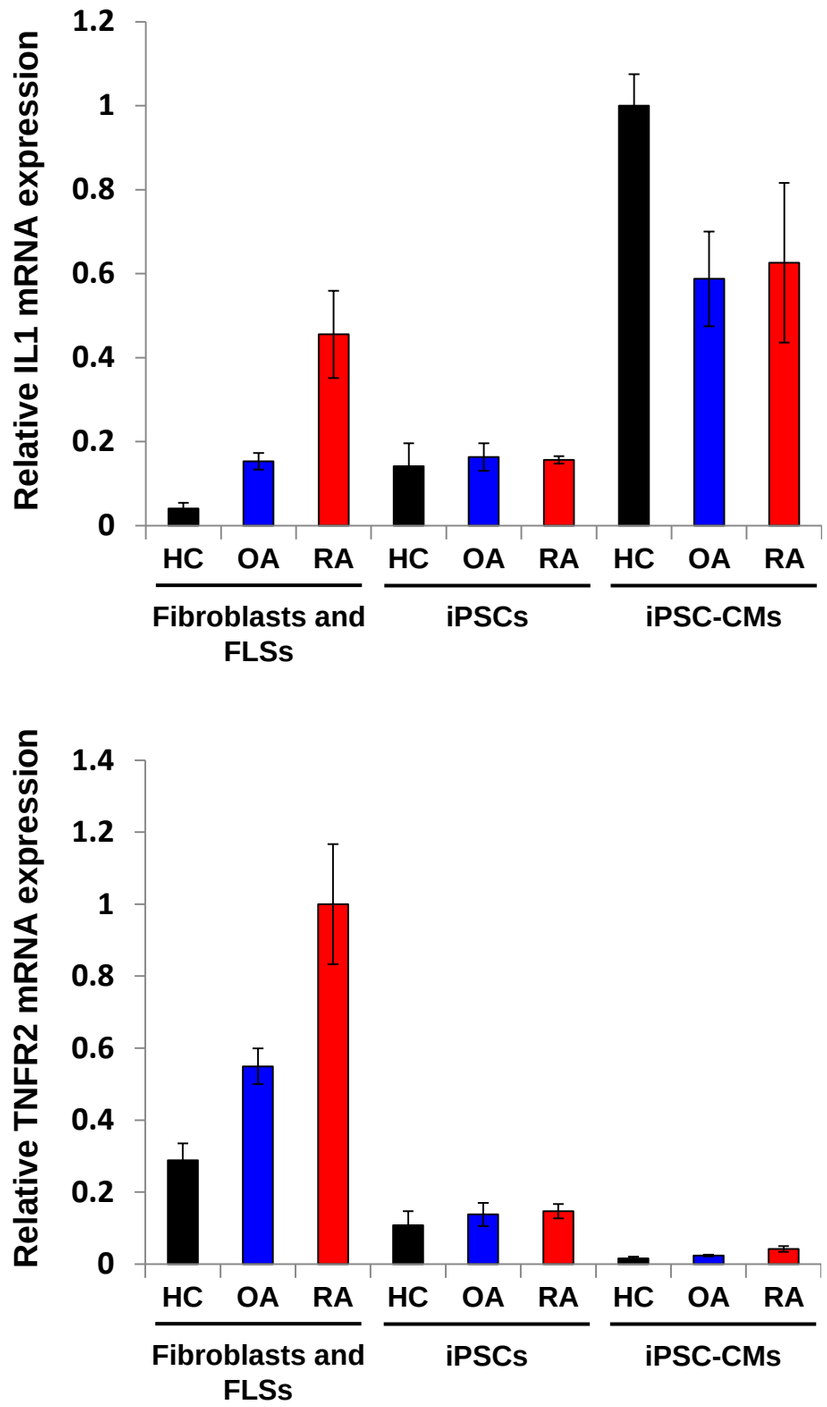


Lee *et al*. **Supplementary figure S2**



Lee *et al*. **Supplementary figure S3.**





Lee *et al*. **Supplementary figure S4**

Gene name	NCBI number	Direction	Sequences
POU5F1	NM_002701	Forward	CCATGCATTCAAACTGAGGTG
		Reverse	CCTTTGTGTTCCCAATTCCTTC
NANOG	NM_024865.2	Forward	TTCACTGTGTTAGCCAGGATG
		Reverse	ATGTCTTTTCTAGGCAGGGC
SOX2	NM_003106	Forward	GAGAAGTTTGAGCCCCAGG
		Reverse	AGAGGCAAACTGGAATCAGG
ZFP42	NM_174900.3	Forward	TTCTCCTTTGTTTTACGTTTGGG
		Reverse	AGATCACACCATTGCACTCC
KFL4	NM_004235.4	Forward	ACCTACACAAAGAGTTCCCATC
		Reverse	TGTGTTTACGGTAGTGCCTG
IL1 alpha	NM_000575.3	Forward	CAGGAGCTGCCAAGTATTC
		Reverse	TCTAGGAGGAAGGGAGAAATC
IL6	NM_000600.3	Forward	CCCAGGAGAAGATTCCAAAG
		Reverse	GCTGCTTTCACACATGTTAC
TNF alpha	NM_000594.3	Forward	CTGGTATGAGCCCATCTATCT
		Reverse	GGGCAATGATCCCAAAGTAG
TNFRSF1B	NM_001066.2	Forward	CAATGGGAGACACAGATTCC
		Reverse	CTGGTTAACTGGGCTTCATC

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Supplemental Information

Supplementary Figure 1. Karyotypes of patient-specific induced pluripotent stem cells (iPSCs). Representative karyotypes of iPSCs derived from patients with rheumatoid arthritis (RA) and osteoarthritis (OA) were visualised by Giemsa staining.

Supplementary Figure 2. Purity of induced pluripotent stem cell (iPSC)-derived cardiomyocytes. Flow cytometry showed that 87% and 80% of cardiomyocytes derived from control-iPSCs and rheumatoid arthritis (RA)-iPSCs were positive for the cardiac-specific marker cardiac troponin T type 2 (TNNT2), respectively.
Control-iPSC-CMs, cardiomyocytes derived from control-iPSCs; RA-iPSC-CMs, cardiomyocytes derived from RA-iPSCs.

Supplementary Figure 3. Relative expression of myosin heavy chain in cardiomyocytes derived from induced pluripotent stem cells (iPSCs) and H7 cells. Expression of a cardiac-specific gene, myosin heavy chain, α-isoform (MYH6), was evaluated in various cells by quantitative reverse transcription-polymerase chain reaction. Data represent mean values determined in three independent experiments ± SEM. NS, not significant; $^{**}P < 0.01$.
HC, healthy control; OA, osteoarthritis; RA, rheumatoid arthritis.

Supplementary Figure 4. Inflammatory signatures of primary cells, iPSCs and iPSC-CMs. Expression profiles of inflammatory genes were determined in primary cells, iPSCs and cardiomyocytes derived from iPSCs by quantitative reverse transcription-polymerase chain

reaction. The inflammatory signatures of FLSs from RA patients were eliminated after reprogramming into iPSCs.

HC, healthy control; OA, osteoarthritis; RA, rheumatoid arthritis; iPSCs, induced pluripotent stem cells; FLSs, fibroblast-like synoviocytes; IL-1, interleukin-1; IL-6, interleukin-6; TNF-α, tumour necrosis factor-alpha; TNFR2, TNF receptor 2.

Supplementary Table. Primers of endogenous genes used for qRT-PCR. The sequences presented in the table were used to amplify endogenous genes in iPSCs. The primers targeted the 3' or 5' UTR of the respective mRNAs.

Video legends

Supplementary movie 1

Established induced pluripotent stem cells were successfully differentiated into cardiomyocytes. Beating cells began to be observed on day 12 of cardiomyocyte differentiation.