SUPPORTING INFORMATION FOR PUBLICATION

Impact of Polydimethylsiloxane Surface Modification with Conventional and Amino Acid Conjugated Self-Assembled Monolayers on the Differentiation of Induced Pluripotent Stem Cells into Cardiomyocytes

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Contents

1. Video recordings of beating cardiomyocytes

Following videos show beating cardiomyocytes on given substrates, on the 12th day of cardiac differentiation of iPSCs (Magnification: 10x). These videos are related to Fig. 6d.

Video S1: Beating cardiomyocytes on TCP on the 12th day of differentiation.

Video S2: Beating cardiomyocytes on PDMS-A on the 12th day of differentiation.

Video S3: Beating cardiomyocytes on PDMS-O on the 12th day of differentiation.

Video S4: Beating cardiomyocytes on PDMS-H on the 12th day of differentiation.

Video S5: Beating cardiomyocytes on PDMS-L on the 12th day of differentiation.

Video S6: Beating cardiomyocytes on native PDMS on the 12th day of differentiation.

TCP: Tissue Culture Polystyrene

PDMS: Polydimethylsiloxane

PDMS-A: [(3-Aminopropyl)triethoxysilane (APTES)] modified PDMS

PDMS-O: [Octadecyltrimethoxysilane (OTS)] modified PDMS

PDMS-H: His-SAM modified PDMS

PDMS-L: Leu-SAM modified PDMS

2. Spontaneous contractions of cardiomyocytes

Functional assessment of cardiomyocytes were done by their spontaneous contractions, using the video recordings. Figure S1a shows the frequency (beat/min) of beating cardiomyocytes on the 12th day of differentiation. We have observed the lowest beat rate of cardiomyocytes on PDMS-L, whereas the highest rate was on native PDMS. Beating area calculations were done on same video recordings and given in Figure S1b.

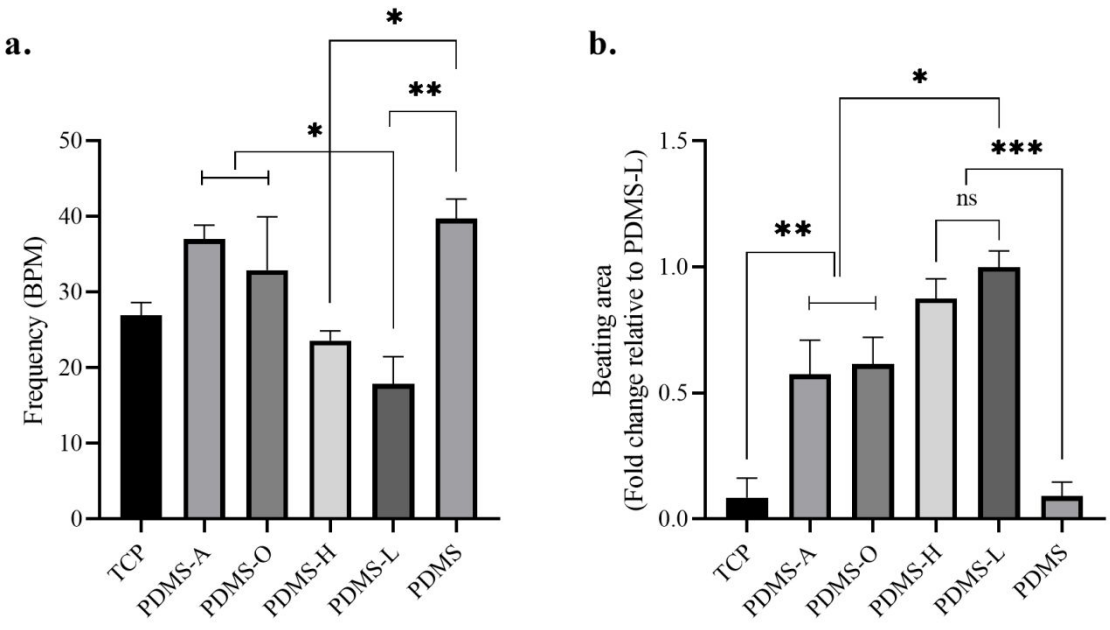

Figure S1. (a) Frequency and (b) areas of beating cardiomyocyes on the 12th day of differentiation. The data are presented as the mean ± SD (n = 3); *p <0.05, **p < 0.01 and ***p < 0.001.

3. Quantification of cTnT positive immunostaining

cTnT positive cell percentages and cTnT positive areas were analyzed after 12 days of cardiac differentiation. Cells were trypsinized and plated on fibronectin coated well plates. On the next day, cTnT immunostaining (with DAPI counterstain) was performed and images were analyzed on ImageJ software. cTnT positive and negative cell nuclei were counted and the percentage of cTnT positive cells were quantified as shown in Figure S2a. Then, cTnT positive fluorescence areas were quantified on ImageJ and given in Figure S2b. Supporting the western blot analysis, PDMS-L provided the highest number of cardiomyocytes and all conventional and amino acid conjugated SAMs-modification increased the number of cardiomyocytes, when compared to native PDMS and gelatin coated TCP. Furthermore, no significant differences were found between native PDMS and gelatin coated TCP, showing the predominant effect of healthy myocardium-like stiffness on the differentiation of iPSCs into cardiomyocytes.

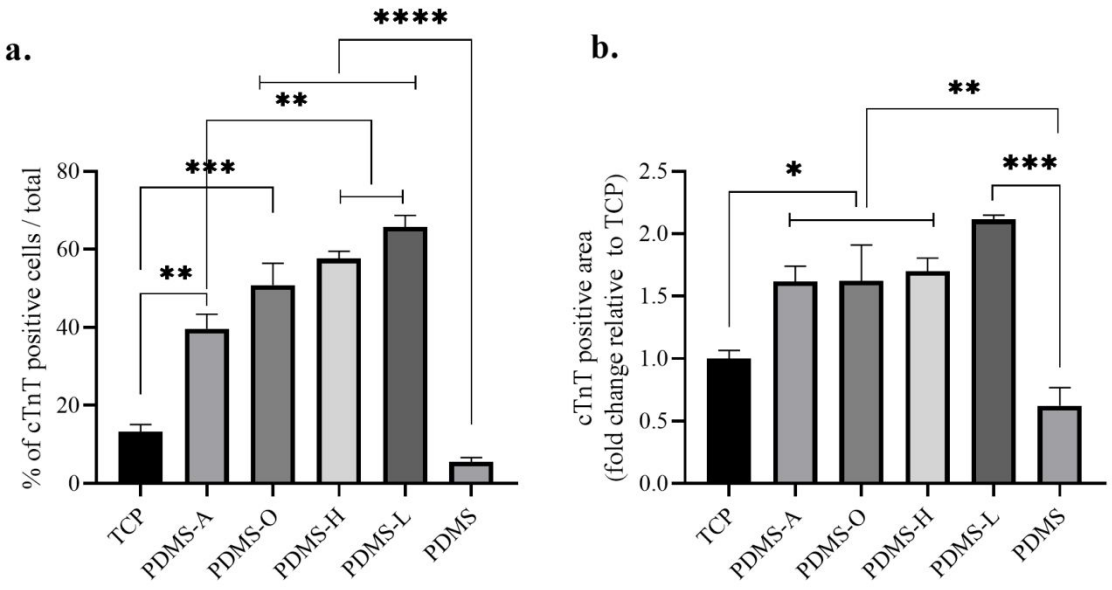

Figure S2. (a) Quantification of cTnT positive cells (%) and (b) area. The data are presented as the mean ± SD (n = 3); *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ and ****$p < 0.0001$.