Supplemental Table S1: Mass spectrometry elution gradient.

HPLC gradient							
Time (min)	0	2.5	9	11	12	12.5	18
% B mobile phase	0	0	20	98	98	0	0

Supplemental Table S2: MS conditions.

MS parameters	
Mode	positive
Spray voltage	3,500 V
Nebulizer gas	Nitrogen
Desolvation (nitrogen) sheath gas	18 Arb
Aux gas	7 Arb
Ion transfer tube temperature	297°C
Vaporizer temperature	131°C
Q1 and Q3 resolutions	0.7 FWHM
Collision gas (CID, argon) pressure	2 mTorr

Supplemental Table S3: MS ionization, selection, fragmentation and identification parameters

Compounds	**Polarity**	**Precursor (m/z)**	**Product (m/z)**	**Collision Energy (V)**	**RF Lens (V)**
Dopamine	positive	324.14	116.11 145.11 171.05	54.24 33.36 23.90	206
D4-Dopamine	positive	328.14	116.11 128.05 171	55.00 48.67 20.76	206

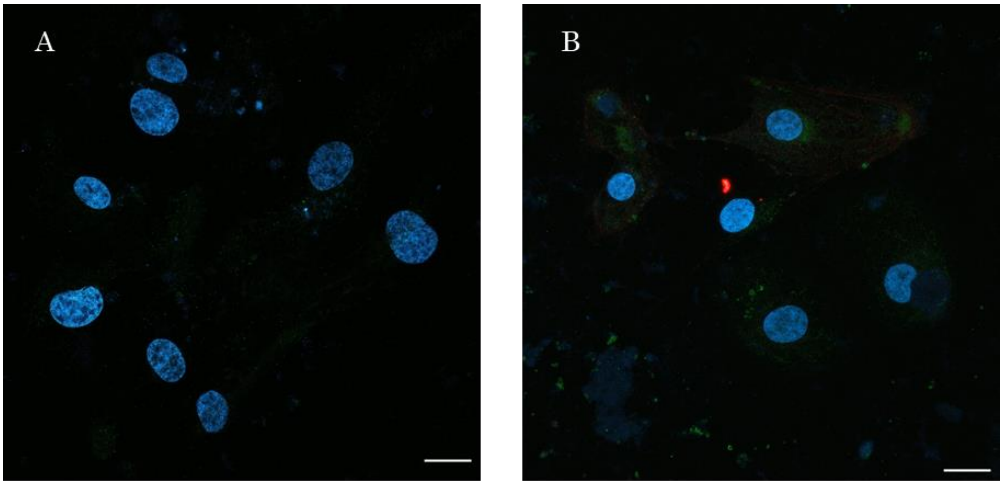
Adrenalin	positive	354.11	166.04 171.06 184.04	18.09 27.69 14.60	179
D6-Adrenaline	positive	360.17	171.06 172.04 190.04	27.19 18.65 14.35	184
Noradrenalin	positive	340.15	116.11 145.11 171.06	55.00 36.19 24.61	215
C6-Noradrenaline	positive	346.15	145.11 158.11 171.06	36.04 18.34 25.62	226

Supplemental Table S4: Listing of antibodies used

	Species	***Epitope***	***Concentration***	***Reference***	***Supplier***
Cardiac troponin I	*Mouse*	IgG2b	1/500	4T21	Hytest
alpha actinin	*Mouse*	IgG1	1/1000	A7732	Sigma
Beta3 tubulin	*Mouse*	IgG2b	1/1000	T8660	Sigma
Tyrosine Hydroxylase	*Rabbit*		1/500	AB152	Merck
Synapsin 1	*Rabbit*		1/200	ab64581	Abcam
ChAT	*Mouse*	IgG2b	1/500	Mab_31384	Invitrogen
DBH	*Rabbit*		1/200	22806	Immunostar Inc.

Supplemental Figures:

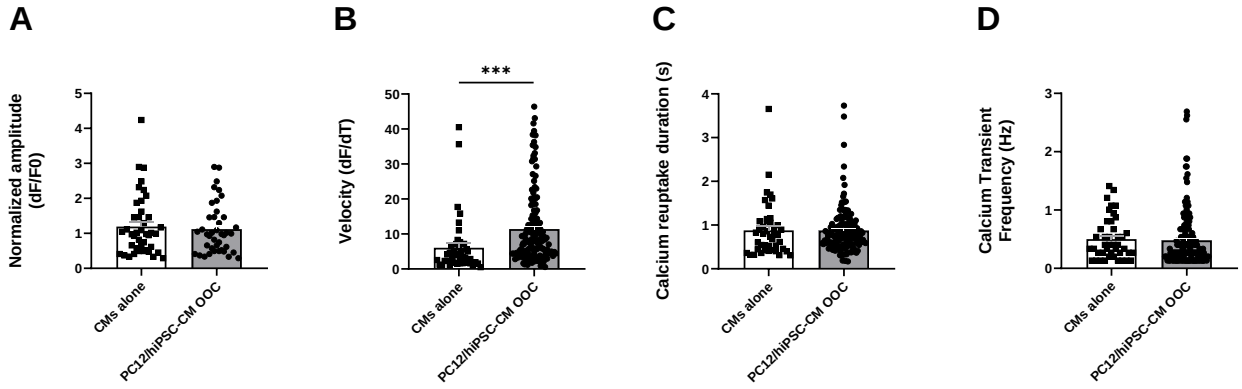
Supplemental figure S1.



Supplemental figure S1: hiPSC-CMs alone in OOC do not express synapsin-1a and tyrosine hydroxylase.

Immunocytochemistry of 30-days-old hiPSC-CMs cultivated alone in OOC. DNA (DAPI) is stained in blue with (A) synapsin-1a in green or (B) tyrosine hydroxylase in green and choline acetyltransferase in red. Scale bar: 20 µm

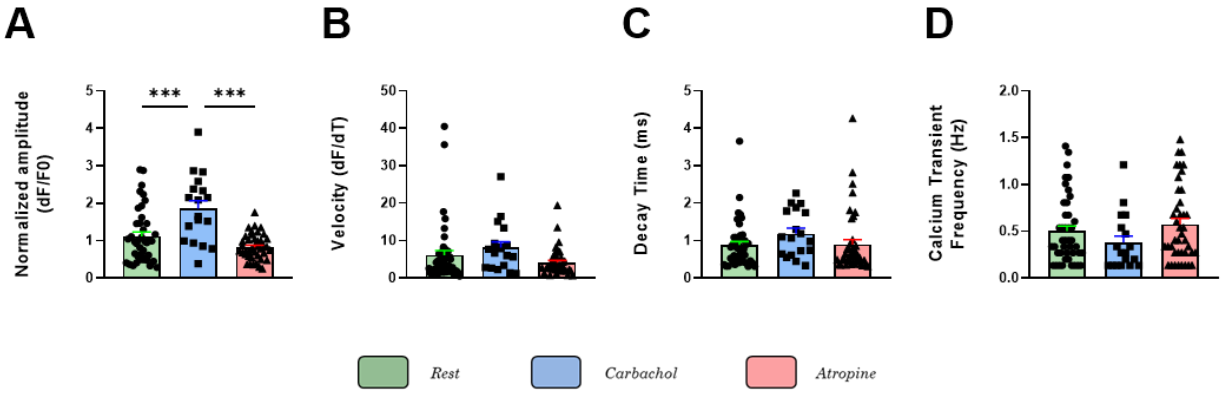
Supplemental figure S2.



Supplemental Figure S2: SR calcium handling properties in hiPSC-CMs with or without PC12.

Monitoring of the intracellular calcium cycling properties in hiPSC-CMs cultivated on microfluidic devices alone or in presence of PC12 for 14 days. (A) Normalized amplitude of CaT, (B) calcium release velocity, (C) calcium reuptake duration and (D) CaT frequency. Mann Witney test, ***, $p<0.001$.

Supplemental figure 3.



Supplemental figure 3 : Effect of carbachol and atropine on SR calcium handling of hiPSC-CMs cultivated in absence of PC12 in microfluidic devices.

Carbachol (1.5 mM) were applied in hiPSC-CMs while atropine (1µM) was applied in neuronal compartment in absence of PC12. (A) Normalized amplitude, (B) calcium release velocity, (C) calcium reuptake duration and (D) CaT frequency. The hiPSC-CMs were cultivated alone on microfluidic devices for 14 days. Tukey's multiple comparisons test, ***, $p<0.001$.