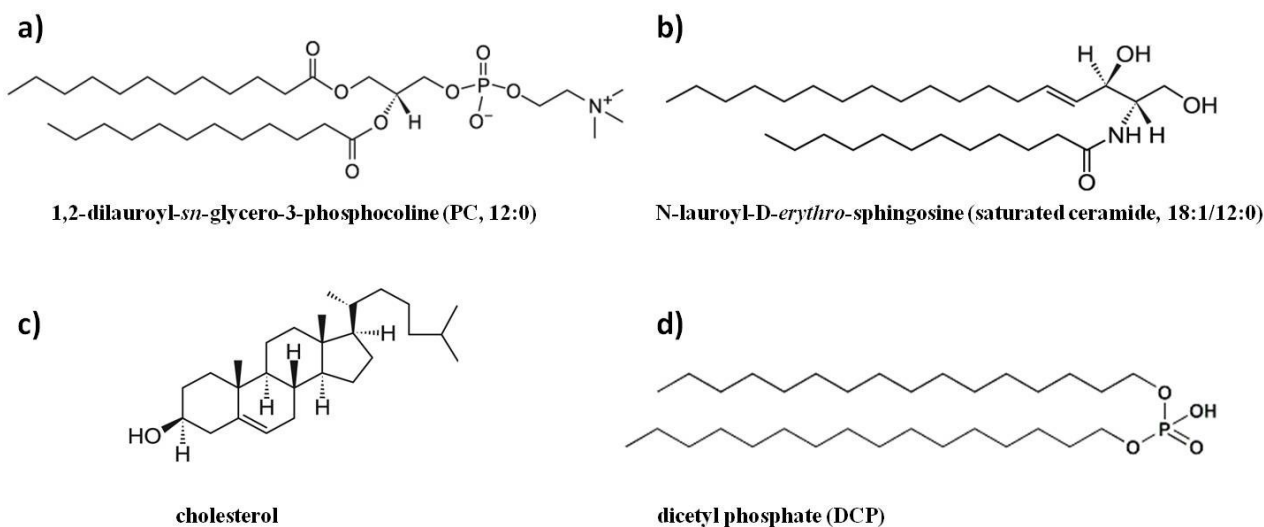


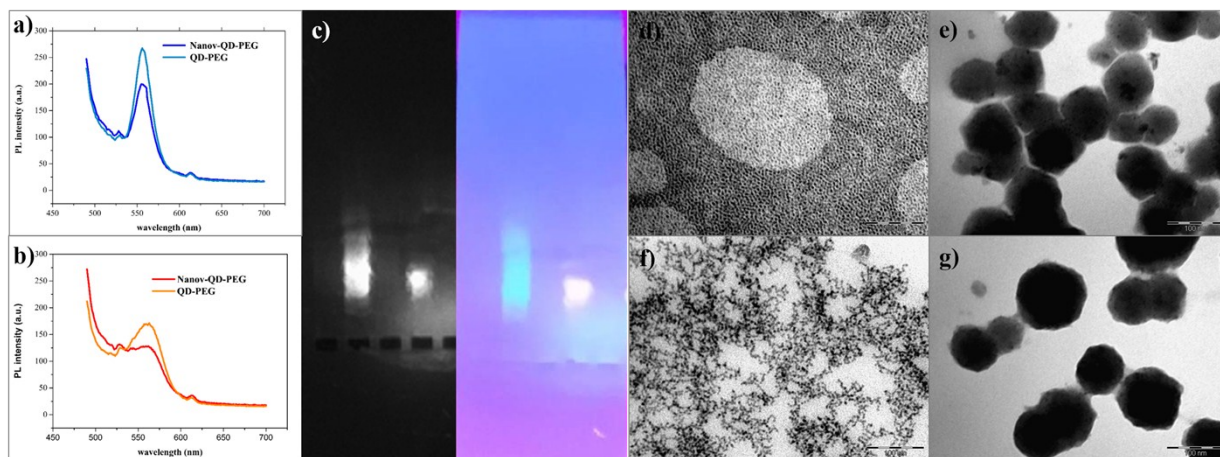
# Electronic Supplementary Information

## One step preparation of quantum dot-embedded lipid nanovesicles by a microfluidic device

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**Table S1** Structure of **a)** phosphatidylcholines (PC), **b)** ceramide (Cer), **c)** cholesterol (Chol) and **d)** dicetyl phosphate (DCP).



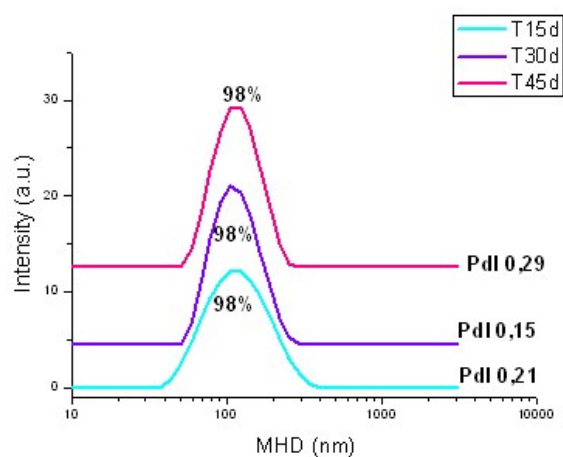
**Fig. S1:** a) and b) Absorption and emission spectra of green- and orange-emitting QDs, respectively. c) Gel electrophoresis migration of PEG-coated green- and orange-emitting QDs. The left panel refers to the gel picture acquired with the black/white camera of the Gel analyzer, while the right panel with a colored camera. d) and e) TEM images of the green-emitting QDs and of the vesicles embedded with the green-emitting QDs, respectively; f) and g) TEM images of the orange-emitting QDs and of the vesicles embedded with the orange-emitting QDs, respectively.

Vesicles/ $Q_t$	MHD (nm) 0d	pdi 0d	MHD (nm) 3d	pdi 3d	MHD (nm) 5d	pdi 5d	MHD (nm) 7d	pdi 7d
PC at $Q_t$ of 37 $\mu\text{l}/\text{min}$	44 $\pm$ 0.9	0.26 $\pm$ 0.03	44 $\pm$ 0.9	0.4 $\pm$ 0.1	43 $\pm$ 0.9	0.4 $\pm$ 0.01	42 $\pm$ 1.6	0.4 $\pm$ 0.01
PC at $Q_t$ of 74 $\mu\text{l}/\text{min}$	44 $\pm$ 1	0.28 $\pm$ 0.04	46 $\pm$ 0.1	0.3 $\pm$ 0.01	45 $\pm$ 1.3	0.4 $\pm$ 0.1	44 $\pm$ 1.2	0.4 $\pm$ 0.01

**Table S2** Size distribution of PC vesicles formed at total volumetric flow rate ( $Q_t$ ) of 37  $\mu\text{l}/\text{min}$  and 74  $\mu\text{l}/\text{min}$ , for a constant FRR (18:1) and their stability over time (up to 7 days). As expected the vesicles size distribution remain nearly unaffected by the  $Q_t$ .

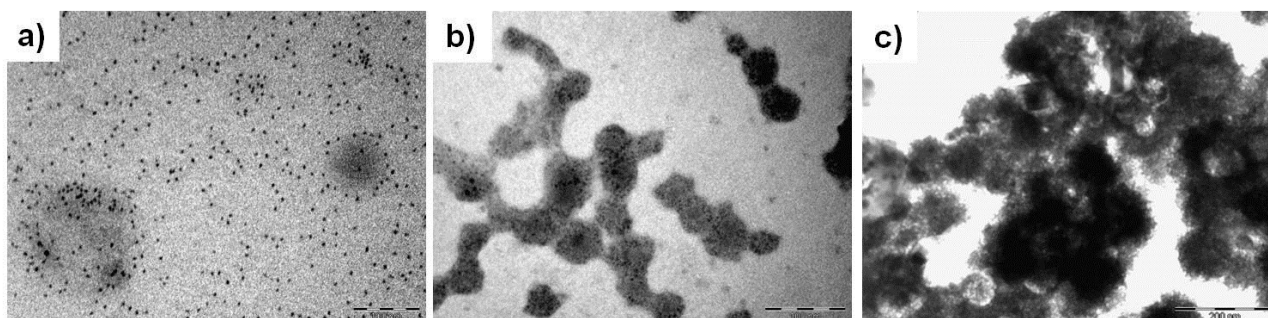
Vesicles	MHD(nm) 0d	%Area Intensity	pdi 0d	MHD(nm) 7d	%Area Intensity	pdi 7d
PC	44 $\pm$ 1	93	0.28 $\pm$ 0.04	44 $\pm$ 1	77	0.39 $\pm$ 0.09
PC/Chol/DCP	146 $\pm$ 5	100	0.16 $\pm$ 0.02	159 $\pm$ 9	98	0.29 $\pm$ 0.04
PC/Chol/Cer	112 $\pm$ 2	100	0.08 $\pm$ 0.01	121 $\pm$ 3	98	0.25 $\pm$ 0.03

**Table S3** Size distribution of vesicle formed with pure PC, PC/Chol/DCP and PC/Chol/Cer at  $Q_t=74 \mu\text{l}/\text{min}$  (FRR 18:1), soon after the preparation and after 7 days.



vesicles	MHD (nm) 15d	pdi 15d	MHD (nm) 30d	pdi 30d	MHD (nm) 45d	pdi 45d
PC/Chol/Cer	125 $\pm$ 2 (cyan curve)	0.24 $\pm$ 0.04	125 $\pm$ 5 (violet curve)	0.14 $\pm$ 0.02	121 $\pm$ 3 (pink curve)	0.29 $\pm$ 0.02

**Fig. S2:** Size distribution and pdi evolution of PC/Chol/Cer vesicles formed at  $Q_t$  74  $\mu\text{l}/\text{min}$ , FRR 18:1, and monitored over 45 days. Experimental results show low polydispersity and high stability during the observation time. Curves were shifted vertically for better graphic representation.



**Fig. S3:** TEM images of PC/Chol/Cer vesicles. **a)** vesicles prepared with TOPO-coated QDs dissolved in chloroform: in this experimental condition, QDs were observed outside the vesicles (darker dots); **b, c)** PC/Chol/Cer vesicles produced with 0.6  $\mu\text{M}$  PEG-modified QDs at **b)**  $Q_t = 6.33 \mu\text{l}/\text{min}$ , and **c)**  $Q_t = 171 \mu\text{l}/\text{min}$ , for a constant FRR =9:1. Nanovesicles exhibit a spherical structure. Electron-dense QDs appear as darker dots in the vesicles.

	MHD (nm) <b>0d</b>	pdi <b>0d</b>	MHD (nm) <b>3d</b>	pdi <b>3d</b>	MHD (nm) <b>7d</b>	pdi <b>7d</b>
PC/Chol/Cer	225±13	0.23±0.01	225±0.56	0.3±0.02	225±47	0.3±0.03
PC/Chol/Cer/QDs	295±4	0.19±0.02	294±20	0.17±0.01	294±15	0.17±0.02

**Table S4** Size distribution and stability of PC/Chol/Cer/QDs vesicles formed at  $Q_t = 57 \mu\text{l}/\text{ml}$  using 0.6  $\mu\text{M}$  QDs concentration. DLS measurements confirmed their stability and low polydispersity up to 7 days.