

SUPPLEMENTAL INFORMATION AVAILABLE

SUPPLEMENTAL METHODS

Live cell microscopy

Colocalization analyses- Colocalization analysis of raw data image stacks was performed using MetaMorph (Correlation Plot plugin). The correlation coefficient (r) measures the correlation between intensities of corresponding pixels in two images (the red and green channels). The correlation coefficient calculation can return a range of values from -1.0 to +1.0 where a value of +1.0 shows the data are perfectly correlated and a value of -1.0 shows an inverse relationship of the pixel values between the two images.

SUPPLEMENTAL TABLES

A. Chlorpromazine inhibits THIO-QD and cell membrane association at concentrations as high as 250 nM.

THIO-QD concentration (nM)	% Fluorescent cells	
	- Chlorpromazine	+ Chlorpromazine
0	1.0 ± 0.2	1.4 ± 0.3
31.2	65.6 ± 2.4	2.8 ± 0.5
62.5	85.1 ± 1.6	9.9 ± 1.4
125	91.5 ± 1.5	26.8 ± 3.6
250	93.6 ± 1.3	34.9 ± 2.1

B. MPA-QDs utilize scavenger receptors as a mechanisms for cellular entry at low concentrations, while THIO-QDs do not.

MPA-QD concentration (nM)	% Fluorescent cells					
	RPMI		RPMI + FBS		X-Vivo	
	- Poly I	+ Poly I	- Poly I	+ Poly I	- Poly I	+ Poly I
0	0.7 ± 0.1	0.5 ± 0.2	0.7 ± 0.3	1.0 ± 0.3	0.7 ± 0.3	1.1 ± 0.3
31.2	79.4 ± 2.5	54.0 ± 4.0	15.4 ± 0.5	5.6 ± 0.4	78.1 ± 3.4	7.5 ± 1.5
62.5	92.0 ± 1.6	75.9 ± 2.4	29.8 ± 4.0	17.3 ± 2.0	87.4 ± 3.8	27.3 ± 2.6
125	95.2 ± 1.8	96.4 ± 1.6	82.8 ± 5.6	42.2 ± 3.4	96.5 ± 0.5	70.0 ± 7.0
250	96.6 ± 0.5	98.3 ± 0.9	95.1 ± 1.0	72.1 ± 6.1	96.6 ± 0.4	92.7 ± 2.4

THIO-QD concentration (nM)	% Fluorescent cells					
	RPMI		RPMI + FBS		X-Vivo	
	- Poly I	+ Poly I	- Poly I	+ Poly I	- Poly I	+ Poly I
0	1.6 ± 0.2	1.3 ± 0.5	0.7 ± 0.1	0.7 ± 0.3	2.4 ± 0.9	1.7 ± 0.2
31.2	27.7 ± 6.5	33.8 ± 8.2	9.8 ± 1.7	23.3 ± 5.3	32.1 ± 0.6	50.2 ± 4.0
62.5	67.1 ± 0.7	60.9 ± 12.7	24.3 ± 6.2	49.6 ± 5.8	40.1 ± 11.5	66.8 ± 6.3
125	81.0 ± 3.5	82.6 ± 2.4	57.6 ± 14.3	69.1 ± 5.1	65.7 ± 6.4	85.6 ± 2.5
250	86.0 ± 3.5	86.6 ± 5.2	89.3 ± 1.9	81.0 ± 4.1	86.8 ± 1.5	89.2 ± 2.1

SUPPLEMENTAL FIGURES

- A. Dynamic light scattering and Zeta potential for QDs in all media (see Figures 1-33)
- B. Necrosis of macrophages after 24, 48 or 72 hours of exposure (Figure 34)
- C. Apoptosis of macrophages after 24 hours of exposure to 500 nM of MPA-QDs or THIO-QDs (Figure 35).
- D. Movie of cell – MPA-QD interactions in real time
- E. Movie of MPA-QD/lysosome compartmentalization

SUPPLEMENTAL FIGURES

Water

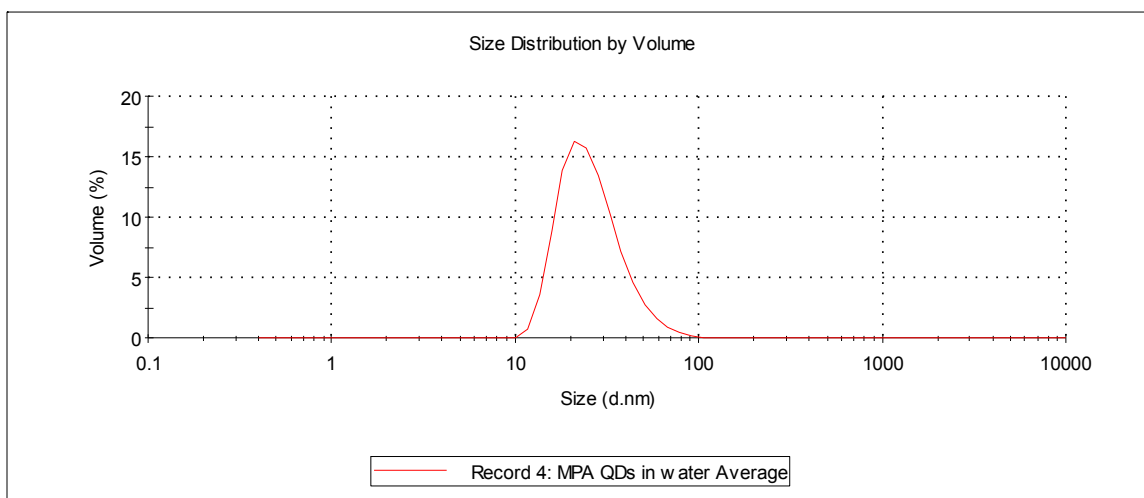


Figure 1: MPA Quantum Dots in Water - Volume Distribution

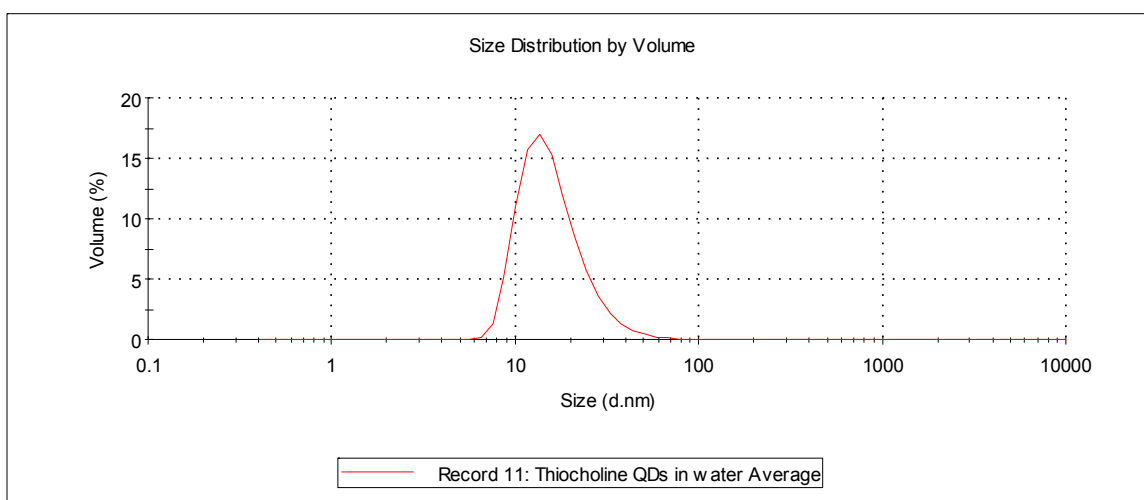


Figure 2: Thiocholine Quantum Dots in Water - Volume Distribution

RPMI Media

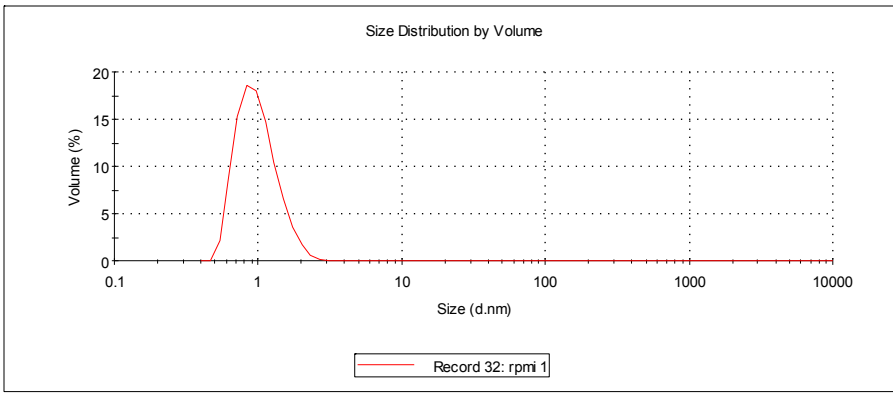


Figure 3: RPMI Media - Volume Distribution

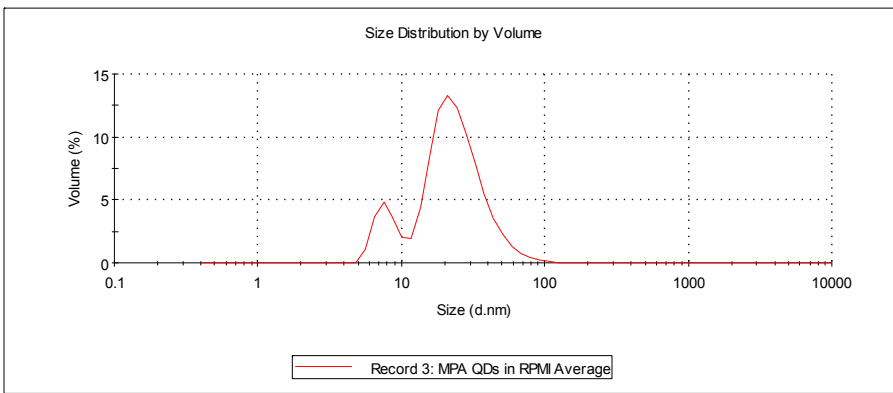


Figure 4: MPA Quantum Dots in RPMI - Volume Distribution

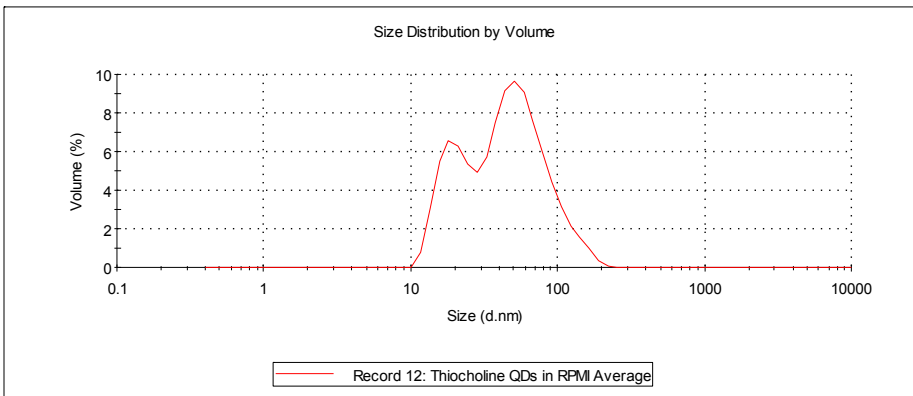


Figure 5: Thiocholine Quantum Dots in RPMI - Volume Distribution

Fetal Bovine Serum 10% in RPMI

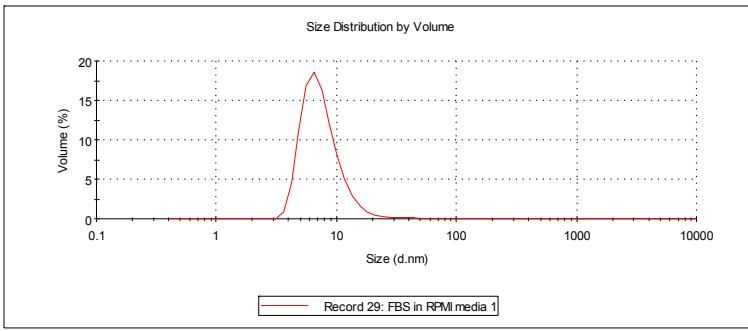


Figure 6: FBS 10% Media - Volume Distribution

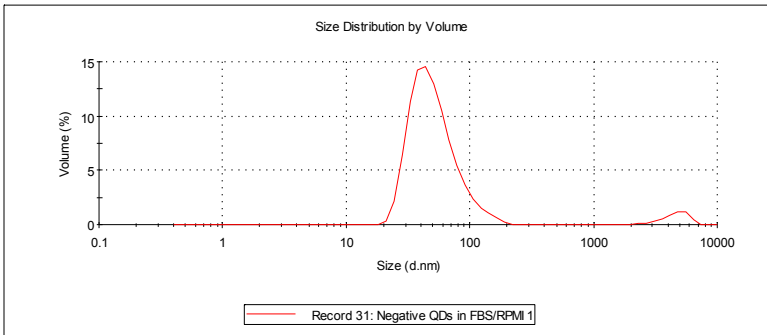


Figure 7: MPA Quantum Dots in FBS 10% Media - Volume Distribution

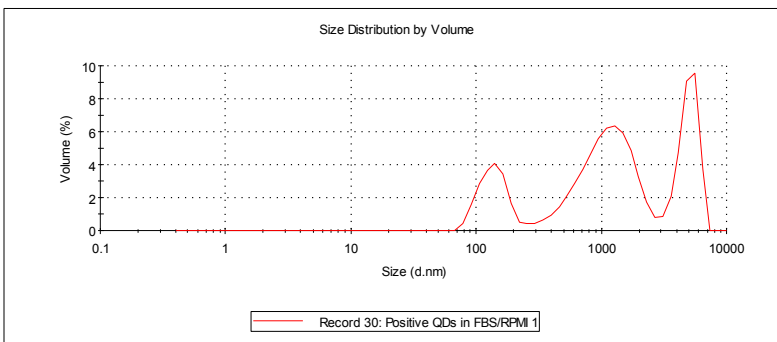


Figure 8: Thiocholine Quantum Dots in FBS 10% Media - Volume Distribution

Serum Free Media

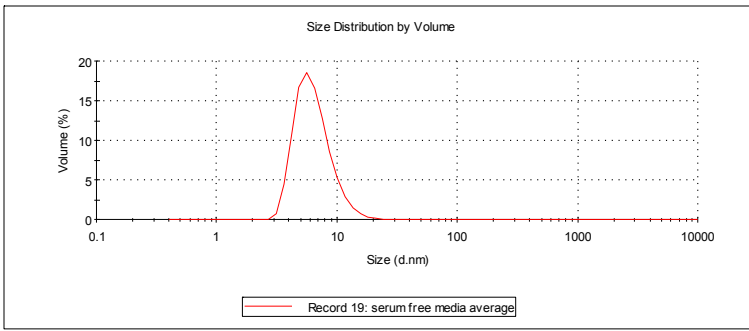


Figure 9: Serum Free Media - Volume Distribution

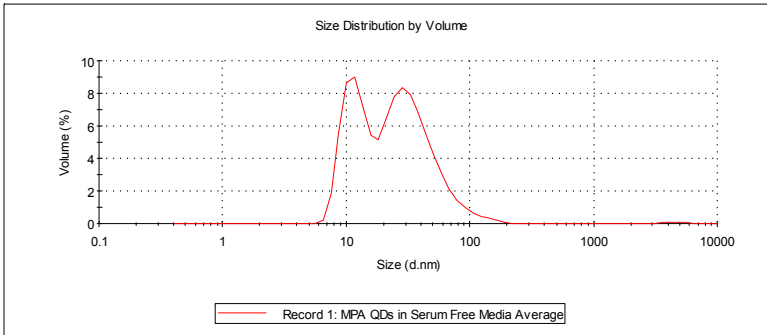


Figure 10: MPA Quantum Dots in Serum Free Media - Volume Distribution

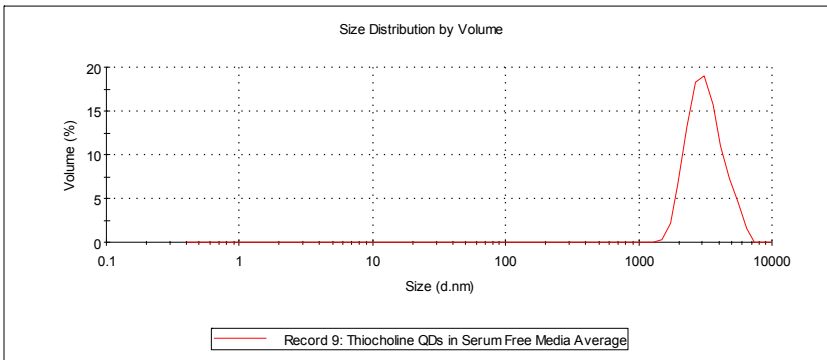


Figure 11: Thiocholine Quantum Dots in Serum Free Media - Volume Distribution

Zeta Potential
Water

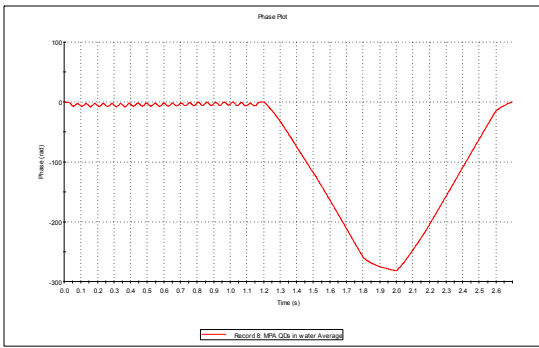


Figure 12: MPA Quantum Dots in Water - Phase Plot

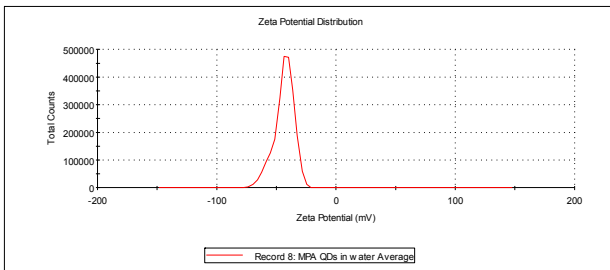


Figure 13: MPA Quantum Dots in Water - Zeta Potential Distribution

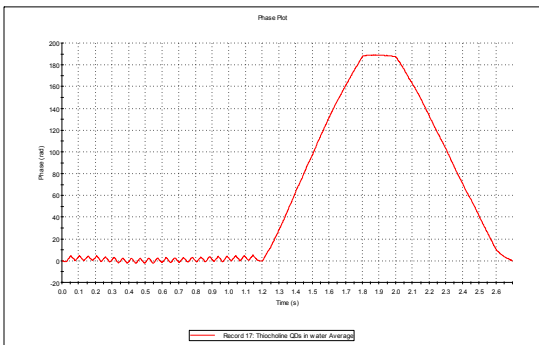


Figure 14: Thiocholine QDs in Water - Phase Plot

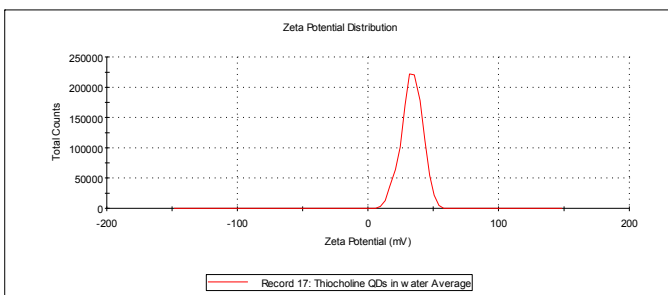


Figure 15: Thiocholine QDs in Water - Zeta Potential Distribution

RPMI Media

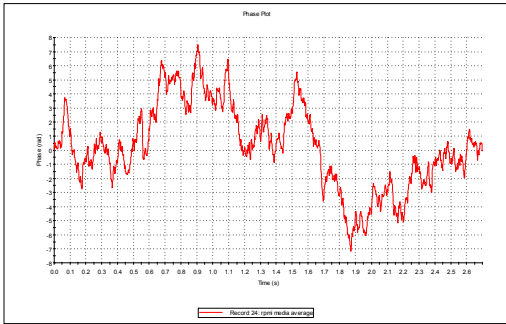


Figure 16: RPMI Media Phase Plot

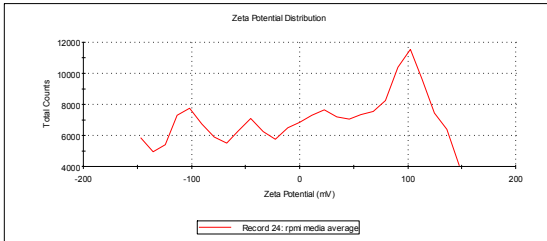


Figure 17: RPMI Media Zeta Potential Distribution

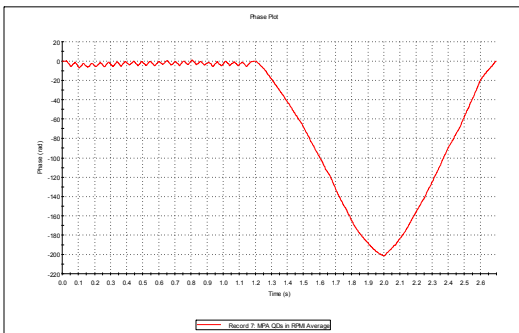


Figure 18: MPA Quantum Dots in RPMI - Phase Plot

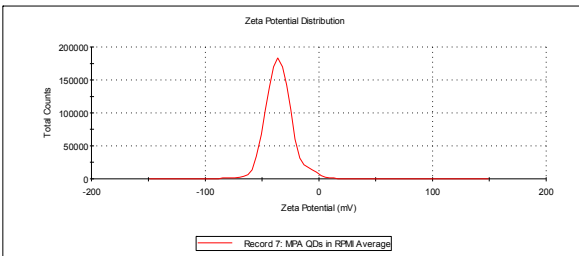


Figure 19: MPA Quantum Dots in RPMI - Zeta Potential Distribution

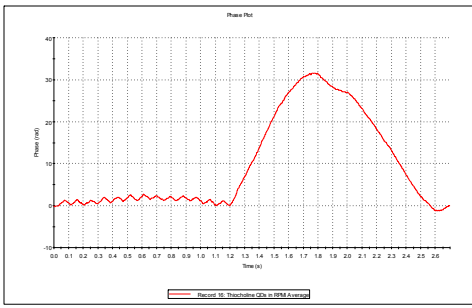


Figure 20: Thiocoline Quantum Dots in RPMI - Phase Plot

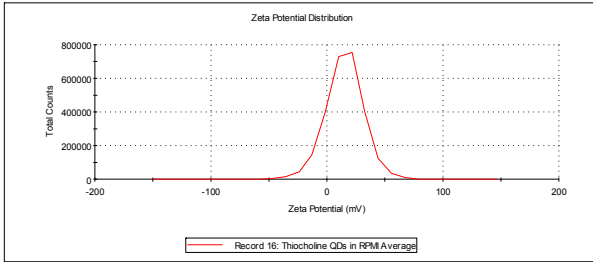


Figure 21: Thiocoline Quantum Dots in RPMI - Zeta Potential Distribution

Fetal Bovine Serum 10% in RPMI

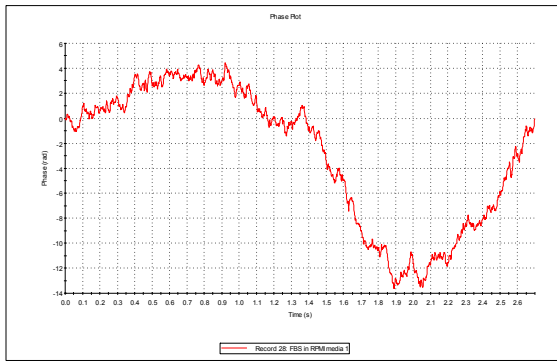


Figure 22: FBS 10% Media - Phase Plot

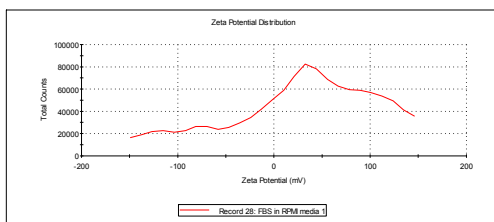


Figure 23: FBS 10% Media - Zeta Potential Distribution

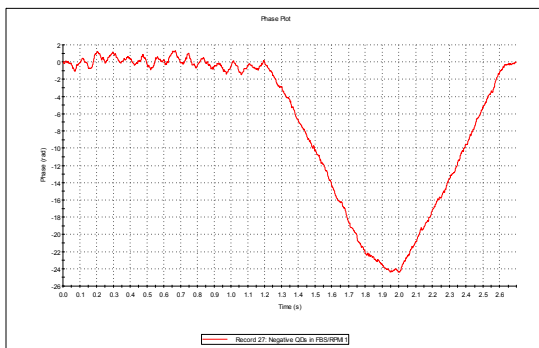


Figure 24: MPA Quantum Dots in FBS 10% Media - Phase Plot

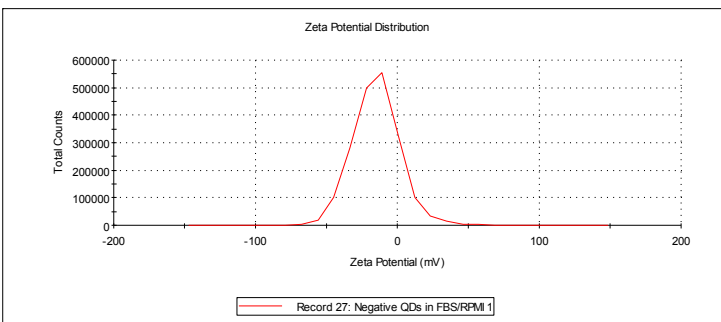


Figure 25: MPA Quantum Dots in FBS 10% Media - Zeta Potential Distribution

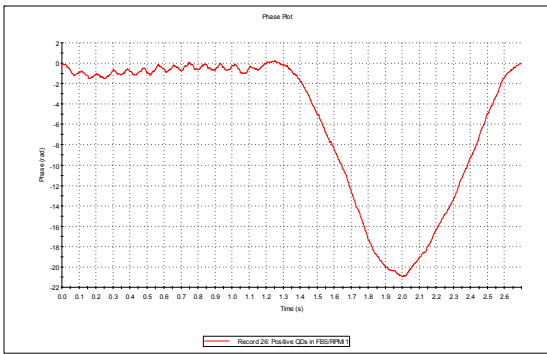


Figure 26: Thiocholine Quantum Dots in FBS 10% Media - Phase Plot

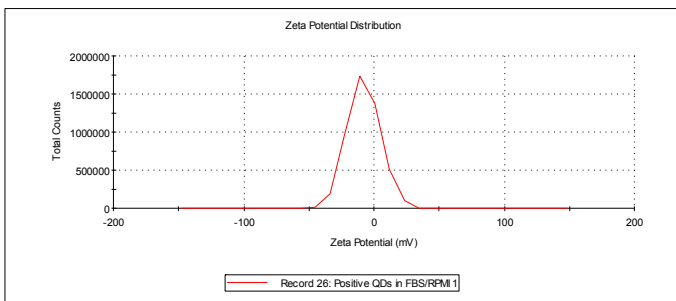


Figure 27: Thiocholine Quantum Dots in FBS 10% Media - Zeta Potential Distribution

Serum Free Media

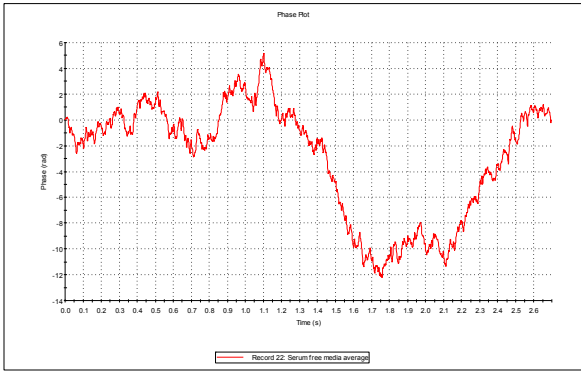


Figure 28: Serum Free Media - Phase Plot

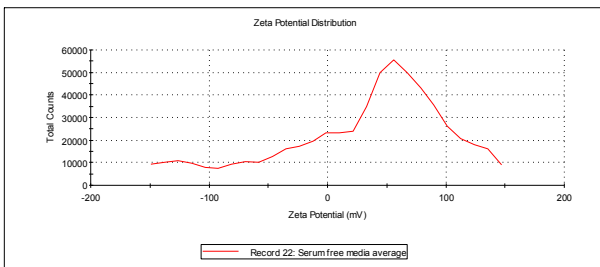


Figure 29: Serum Free Media - Zeta Potential Distribution

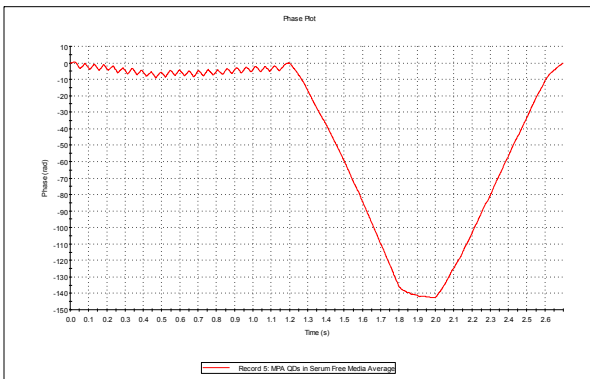


Figure 30: MPA Quantum Dots in Serum Free Media - Phase Plot

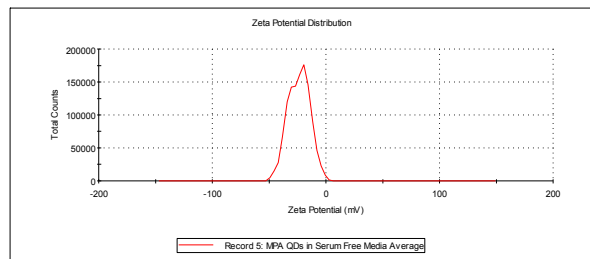


Figure 31: MPA Quantum Dots in Serum Free Media - Zeta Potential Distribution

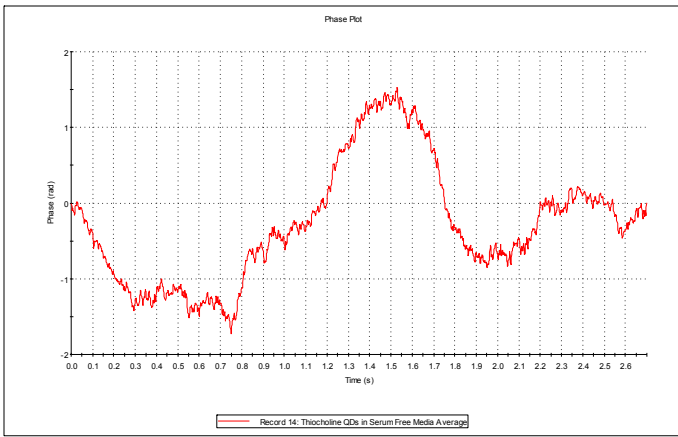


Figure 32: Thiocholine Quantum Dots in Serum Free Media - Phase Plot

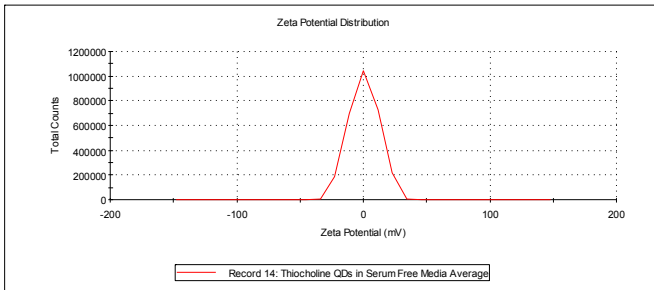


Figure 33: Thiocholine Quantum Dots in Serum Free Media - Zeta Potential Distribution

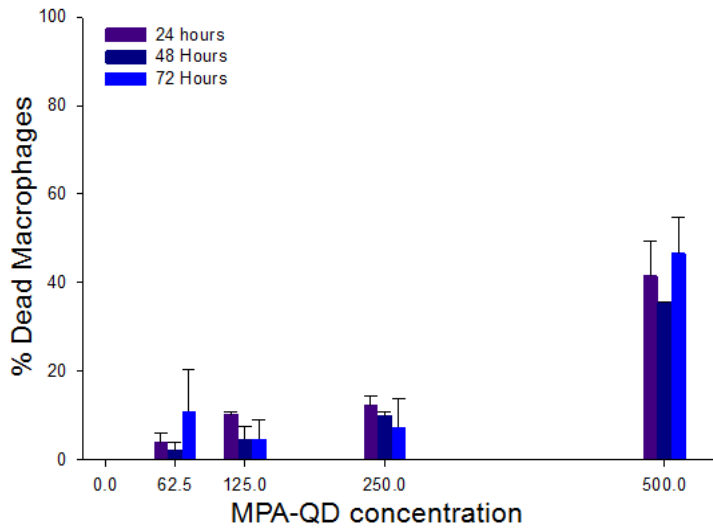


Figure 34: Cytotoxicity caused by MPA-QDs

Macrophages were exposed to MPA-QDs for 24, 48 or 72 hours and assessed for necrosis using LDH activity as an indicator of cell membrane integrity.

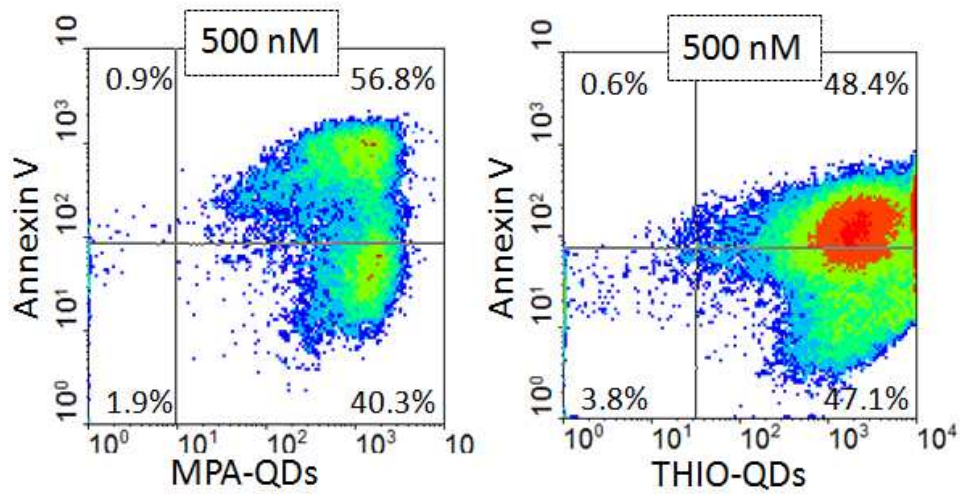


Figure 35: QDs induce apoptosis in macrophages at high concentrations after 24 hours of exposure.