<u>**Electronic Supplementary Information (ESI)**</u>

Polymeric micelles in porous and nanotubular implants as a new system for extended delivery of poorly soluble drugs

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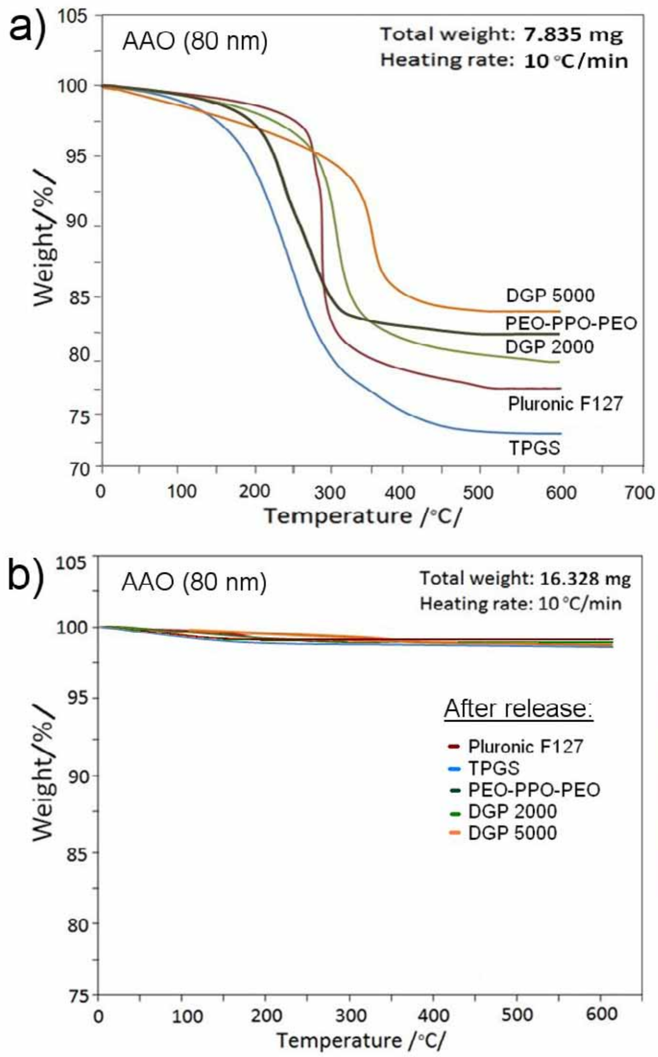
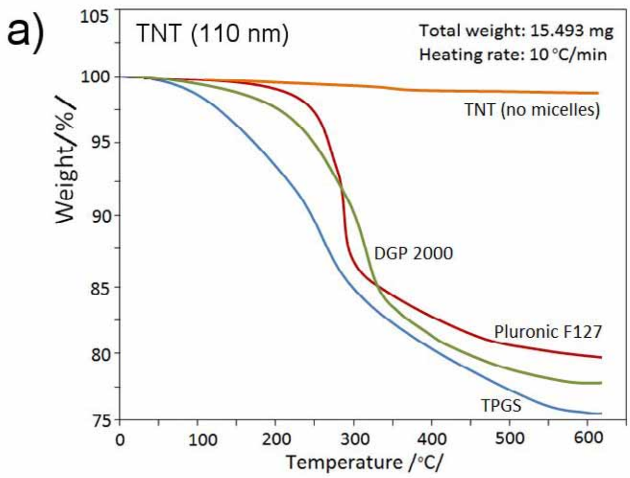


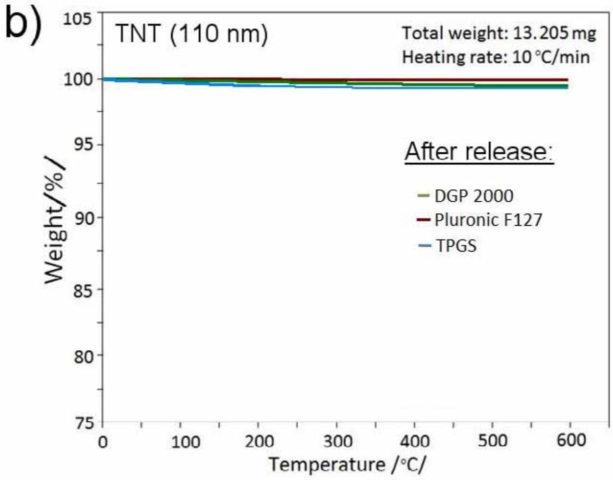
Micelle type	Loading (wt %)
TPGS	20.1
Pluronic	18.9
PEO-PPO-PEO	15.4
DGP 2000	21.7
DGP 5000	25.4

Micelle type	Release/days
TPGS	> 20
Pluronic	> 18
PEO-PPO-PEO	> 10
DGP 2000	> 20
DGP 5000	> 20

Figure S1. a) TGA graphs showing weight loss of five different types of micelles from AAO substrate to measure loading capacity of AAO. b) TGA graphs on the end of release process showing that micelles were released from nanopore structures.



Micelle type	Loading (wt %)
TPGS	26.6
Pluronic	22.3
PEO-PPO-PEO	17.6
DGP 2000	20.1
DGP 5000	15.8



Micelle type	Release/days
TPGS	> 22
Pluronic	> 22
PEO-PPO-PEO	> 22
DGP 2000	> 20
DGP 5000	> 20

Figure S2. a) TGA graphs showing weight loss of selected types of micelles from TNT substrate to measure loading capacity of AAO. b) TGA graphs on the end of release process, showing that micelles were released from nanotube structures.

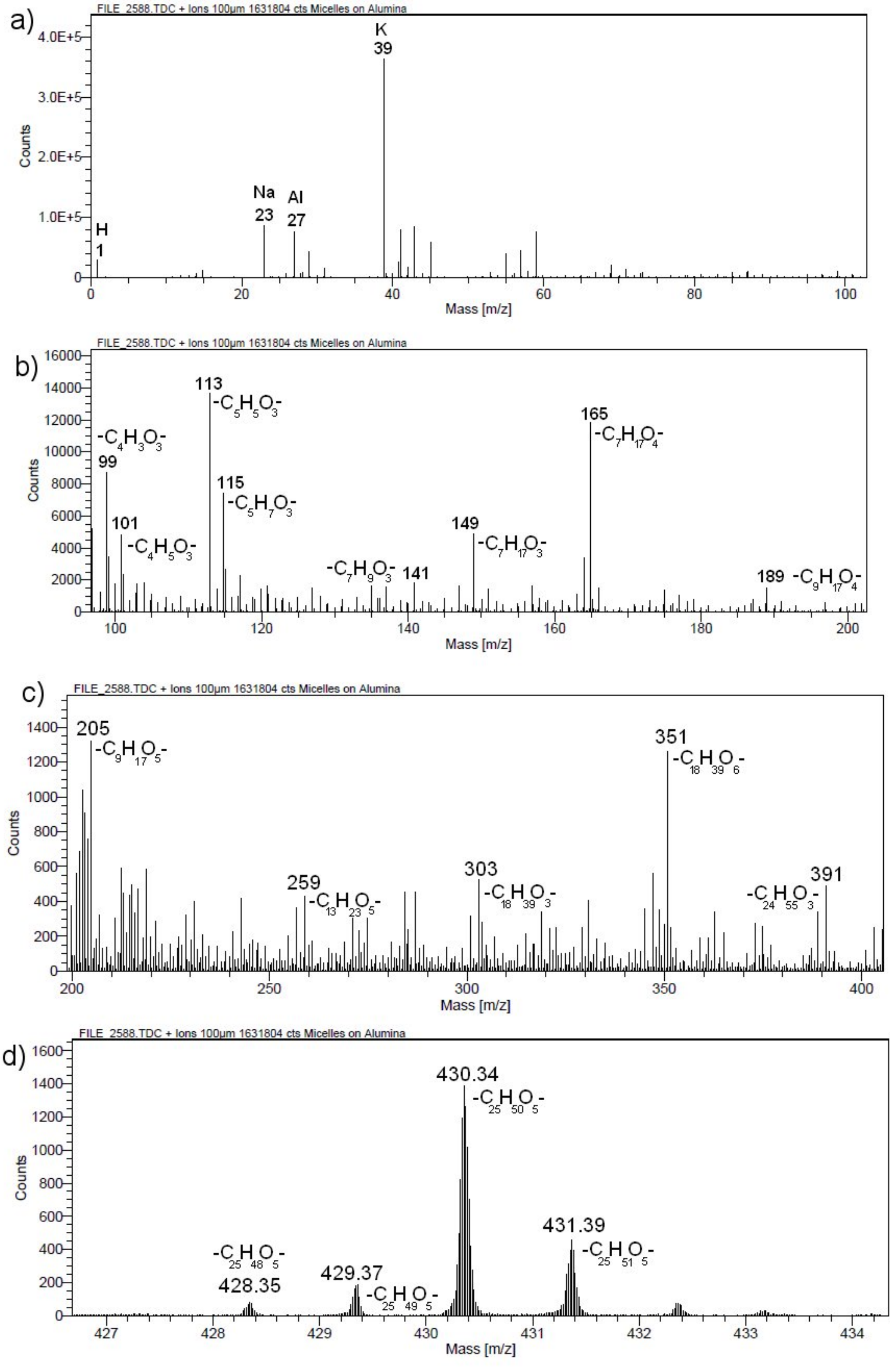


Figure S3. a) Tof-SIMS mass spectra of TPGS nanocarrier in AAO. cross-sectional analysis were performed for 5 min. to the 20 µm depth b) Obtained mass spectra with assigned peaks in atomic mass number.

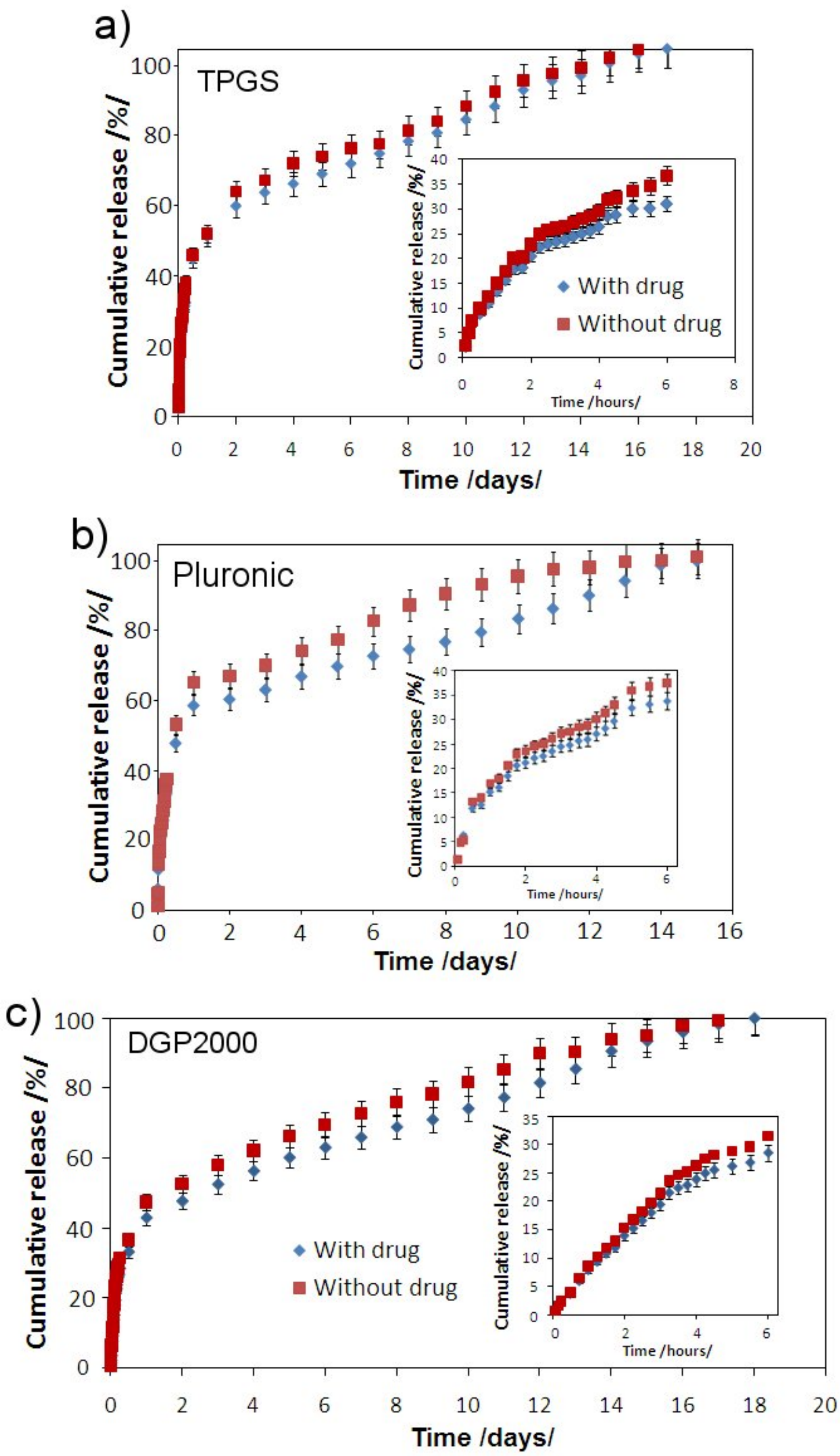


Figure S4. Comparative release graphs of different micelles on AAO a) TPG, b) Pluronic and c) DGP2000 without and with loaded drug (indomethacin). Insets show the burst release for the firs 6 hours.

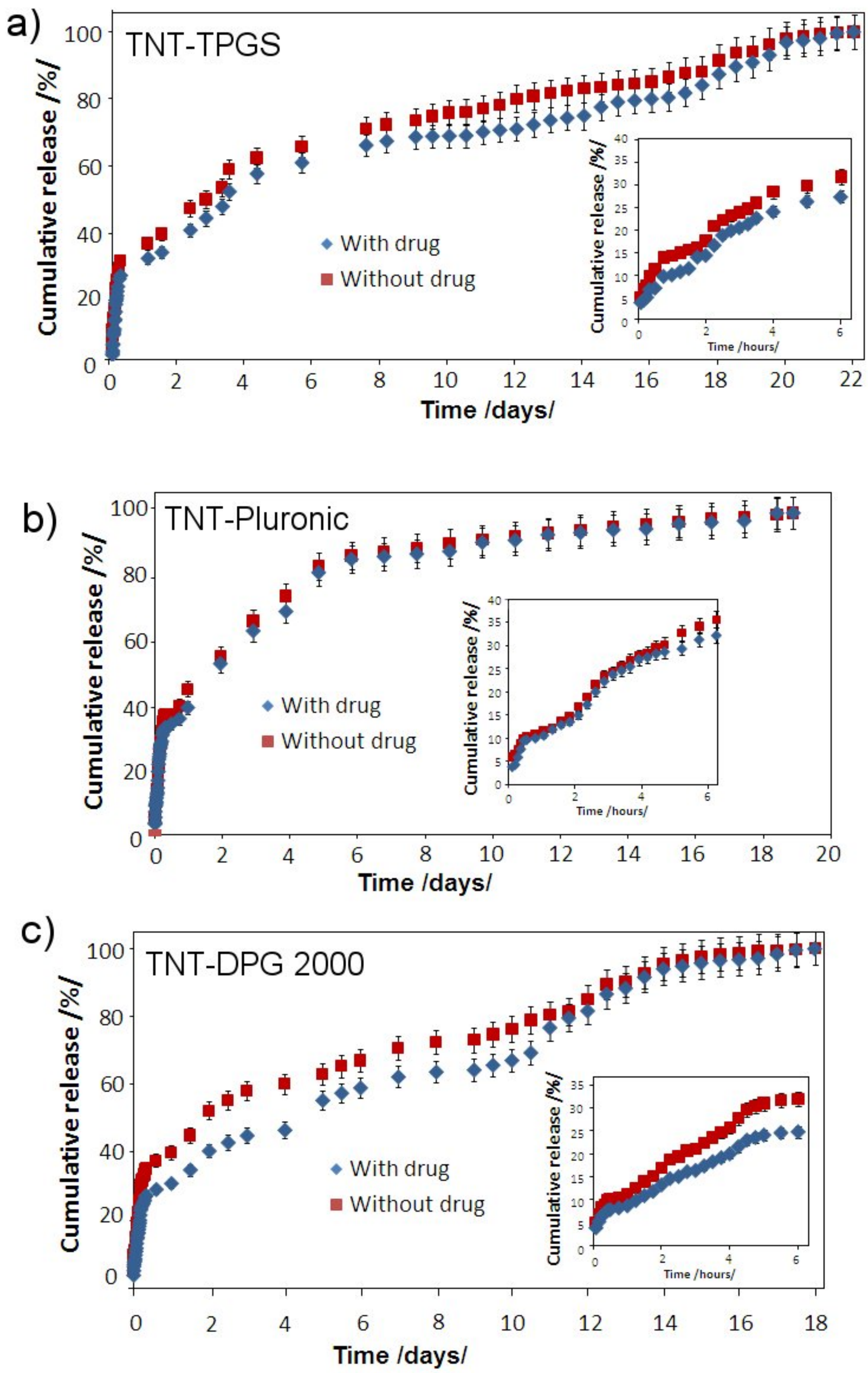


Figure S5. Comparative release graphs of different micelles on TNT a) TPG, b) Pluronic and c) DGP2000 without and with loaded drug (indomethacin). Insets show the burst release for the firs 6 hours.

Table S1. Drug loading of selected micelles on AAO with different pore diameters

	Loading Wt. (%)			
AAO Pore size	65 nm	100 nm	130 nm	160 nm
Micelle type				
Pluronic F127	13.5	20.1	22.7	24.0
TPGS	14.9	23.2	23.8	24.5
DGP 2000	17.8	25.9	28.0	28.4

Table S2: Summary of fitting different models for the drug-micelle-nanotubes/pores system

Model type	*Equation*	*Least square regression line, R^2* AAO					TNT
		80 nm	65nm	100nm	130nm	160nm	110 nm
Higuchi	$Q_t = [2DS\varepsilon(A - 0.5S\varepsilon)]^{0.5} \times t^{0.5} = k_H t^{0.5}$	0.95	0.90	0.97	0.88	0.81	096
Hixson-Crowell	$Q_t = 100\left[1 - \left(1 - \left(kt/4.6416\right)\right)^3\right]$	0.67	0.66	0.67	0.71	0.73	0.70
First order	$Q_t = 100(1 - e^{-kt})$	0.81	0.82	0.74	0.77	0.75	0.79
Zero order	$Q_t = k_t$	0.97	0.98	0.97	0.95	0.97	0.97
Weibull	$Q_t = 100[1 - e^{-(t/T_d)^{\beta}}]$	0.59	0.68	0.65	0.67	0.70	0.62
Korsmeyer-Peppas	$Q_t/Q_\infty = k_t n$	0.77	0.74	0.77	0.73	0.69	0.81