

# Supplementary Materials: Physicochemical and Stability Evaluation of Topical Niosomal Encapsulating Fosinopril/ $\gamma$ -Cyclodextrin Complex for Ocular Delivery

Hay Marn Hnin, Einar Stefánsson, Thorsteinn Loftsson, Rathapon Asasutjarit, Dusadee Charnvanich and Phatsawee Jansook

**Table S1.** pH and zeta potential values of FOS niosomal preparation and FOS/ $\gamma$ CD complex storage at 4 °C, 30  $\pm$  2 °C (75  $\pm$  5% RH) and 40  $\pm$  2 °C (75  $\pm$  5% RH) for 0, 1,3 and 6 months ( $n$  = 3, mean  $\pm$  SD).

Time (month)	Formulation					
	pH			zeta potential (mV)		
	Sp-DCP	Sp-DCP+ $\gamma$ CD	FOS/ $\gamma$ CD complex	Sp-DCP	Sp-DCP+ $\gamma$ CD	FOS/ $\gamma$ CD complex
4 °C						
Initial	6.82 $\pm$ 0.02	6.72 $\pm$ 0.02	7.41 $\pm$ 0.01	-35.15 $\pm$ 1.48	-25.83 $\pm$ 0.87	-11.13 $\pm$ 0.62
1 Month	6.76 $\pm$ 0.02	6.68 $\pm$ 0.01	7.32 $\pm$ 0.02	-35.14 $\pm$ 1.89	-25.35 $\pm$ 0.06	-10.87 $\pm$ 0.46
3 Months	6.71 $\pm$ 0.04	6.63 $\pm$ 0.02	7.10 $\pm$ 0.02	-35.09 $\pm$ 0.09	-25.22 $\pm$ 1.65	-10.74 $\pm$ 0.47
6 Months	6.63 $\pm$ 0.02	6.52 $\pm$ 0.04	6.78 $\pm$ 0.05	-34.92 $\pm$ 2.15	-25.12 $\pm$ 1.65	-10.45 $\pm$ 0.47
30 $\pm$ 2 °C (75 $\pm$ 5% RH)						
Initial	6.82 $\pm$ 0.02	6.72 $\pm$ 0.02	7.41 $\pm$ 0.01	-35.15 $\pm$ 1.48	-25.83 $\pm$ 0.87	-11.13 $\pm$ 0.62
1 Month	6.57 $\pm$ 0.03	6.53 $\pm$ 0.03	5.60 $\pm$ 0.02	-35.10 $\pm$ 1.75	-25.23 $\pm$ 0.89	-10.97 $\pm$ 0.66
3 Months	6.32 $\pm$ 0.11	5.53 $\pm$ 0.03	5.34 $\pm$ 0.06	-35.07 $\pm$ 1.11	-25.17 $\pm$ 1.34	-10.73 $\pm$ 0.14
6 Months	4.39 $\pm$ 0.03	4.58 $\pm$ 0.03	4.70 $\pm$ 0.01	-32.63 $\pm$ 1.19	-21.53 $\pm$ 0.88	-9.53 $\pm$ 0.14
40 $\pm$ 2 °C (75 $\pm$ 5% RH)						
Initial	6.82 $\pm$ 0.02	6.72 $\pm$ 0.02	7.41 $\pm$ 0.01	-35.15 $\pm$ 1.48	-25.83 $\pm$ 0.87	-11.13 $\pm$ 0.62
1 Month	5.88 $\pm$ 0.04	5.56 $\pm$ 0.03	5.11 $\pm$ 0.04	-27.77 $\pm$ 0.85	-23.80 $\pm$ 1.56	-9.50 $\pm$ 0.56
3 Months	4.42 $\pm$ 0.09	4.64 $\pm$ 0.01	4.89 $\pm$ 0.01	-25.97 $\pm$ 1.30	-22.45 $\pm$ 0.52	-8.35 $\pm$ 0.50
6 Months	4.23 $\pm$ 0.10	4.39 $\pm$ 0.04	4.49 $\pm$ 0.04	-23.87 $\pm$ 1.89	-19.95 $\pm$ 0.71	-8.02 $\pm$ 0.86

**Table S2.** Average particle size and size distribution (PDI) of FOS niosomal preparation and FOS/ $\gamma$ CD complex storage at 4 °C, 30  $\pm$  2 °C (75  $\pm$  5% RH) and 40  $\pm$  2 °C (75  $\pm$  5% RH) for 0, 1,3 and 6 months ( $n$  = 3, mean  $\pm$  SD).

Time (month)	Formulation					
	Average particle size (nm)			Size distribution (PDI)		
	Sp-DCP	Sp-DCP+ $\gamma$ CD	FOS/ $\gamma$ CD complex	Sp-DCP	Sp-DCP+ $\gamma$ CD	FOS/ $\gamma$ CD complex
4°C						
Initial	275.10 $\pm$ 48.20	241.70 $\pm$ 34.40	243.60 $\pm$ 45.60	0.44 $\pm$ 0.02	0.18 $\pm$ 0.01	0.51 $\pm$ 0.01
1 Month	281.20 $\pm$ 7.40	258.03 $\pm$ 8.80	282.00 $\pm$ 26.20	0.44 $\pm$ 0.01	0.24 $\pm$ 0.03	0.51 $\pm$ 0.07
3 Months	306.80 $\pm$ 8.85	266.45 $\pm$ 22.86	768.35 $\pm$ 134.22	0.55 $\pm$ 0.07	0.42 $\pm$ 0.05	0.53 $\pm$ 0.06
6 Months	435.67 $\pm$ 19.48	421.47 $\pm$ 10.34	2330.75 $\pm$ 296.58	0.64 $\pm$ 0.03	0.59 $\pm$ 0.02	0.55 $\pm$ 0.01
30 $\pm$ 2 °C (75 $\pm$ 5% RH)						
Initial	275.10 $\pm$ 48.20	241.70 $\pm$ 34.40	243.60 $\pm$ 45.60	0.44 $\pm$ 0.02	0.18 $\pm$ 0.01	0.51 $\pm$ 0.01
1 Month	293.30 $\pm$ 27.10	254.70 $\pm$ 10.10	1019.40 $\pm$ 179.3	0.45 $\pm$ 0.10	0.29 $\pm$ 0.10	0.59 $\pm$ 0.01
3 Months	391.40 $\pm$ 7.69	309.57 $\pm$ 13.63	1023.20 $\pm$ 65.15	0.52 $\pm$ 0.02	0.53 $\pm$ 0.07	0.75 $\pm$ 0.05
6 Months	911.85 $\pm$ 43.73	452.27 $\pm$ 26.40	3244.75 $\pm$ 216.10	0.71 $\pm$ 0.08	0.74 $\pm$ 0.10	0.78 $\pm$ 0.16
40 $\pm$ 2 °C (75 $\pm$ 5% RH)						
Initial	275.10 $\pm$ 48.20	241.70 $\pm$ 34.40	243.60 $\pm$ 45.60	0.44 $\pm$ 0.02	0.18 $\pm$ 0.01	0.51 $\pm$ 0.01
1 Month	296.20 $\pm$ 7.40	277.80 $\pm$ 10.40	1607.20 $\pm$ 285.10	0.48 $\pm$ 0.10	0.33 $\pm$ 0.10	0.79 $\pm$ 0.10
3 Months	380.80 $\pm$ 14.07	360.10 $\pm$ 47.86	1846.70 $\pm$ 91.79	0.73 $\pm$ 0.01	0.53 $\pm$ 0.09	0.88 $\pm$ 0.08
6 Months	1895.00 $\pm$ 511.53	1071.10 $\pm$ 140.27	3942.70 $\pm$ 420.90	1.00 $\pm$ 0.00	0.95 $\pm$ 0.05	0.97 $\pm$ 0.24