SUPPORTING INFORMATION

Smart Controlled-Release Delivery of Pennisetum purpureum Embedded Supramolecular Nanoparticles to Reduce Atherosclerotic Plaque

Fasih Bintang Ilhami[a*], Mufidatul Khasanah[a], Wahyu Satriyo Wibowo[a], Sapti Puspitarini[a], Sari Edi Cahyaningrum[b], Jindrayani Nyoo Putro[c, d], Astrid Rahmawati[e], and Huynh-Quang-Dieu Nguyen[f]

a. Department of Natural Science, Faculty of Mathematics and Natural Science, Universitas Negeri Surabaya, Surabaya 60231, Indonesia. Email: fasihilhami@unesa.ac.id

b. Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Negeri Surabaya, Surabaya 60231, Indonesia.

c. Chemical Engineering Master Program, Faculty of Engineering, Widya Mandala Surabaya Catholic University, Kalijudan 37, Surabaya 60114, Indonesia.

d. Collaborative Research Center for Sustainable and Zero Waste Industries, Jl. Kalijudan 37, Surabaya 60114, East Java, Indonesia.

e. Department of Applied Chemistry, Osaka Institute of Technology, 5-16-1 Omiya, Ashahi-ku, Osaka, 535-8585, Japan.

f. University of Colorado Denver · Anschutz Medical Campus, 2115 N Scranton Street, Aurora, CO 80045, USA.

* Corresponding author

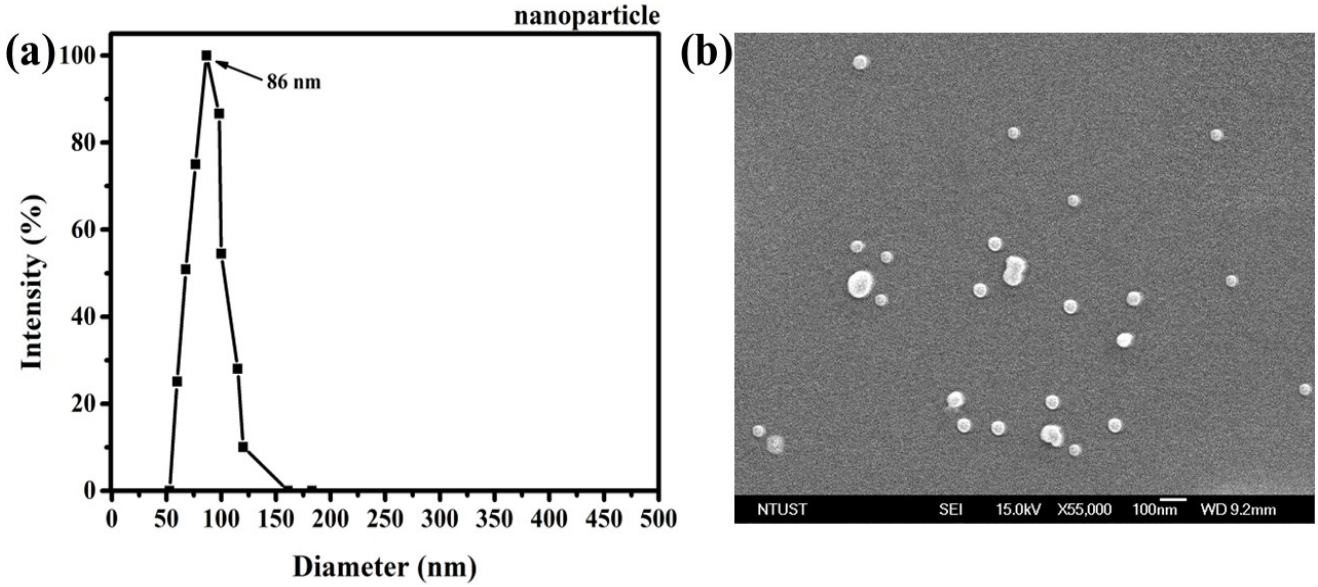

Figure S1. (a) DLS of supramolecular nanoparticles. **(b)** Morphology of supramolecular nanoparticles.

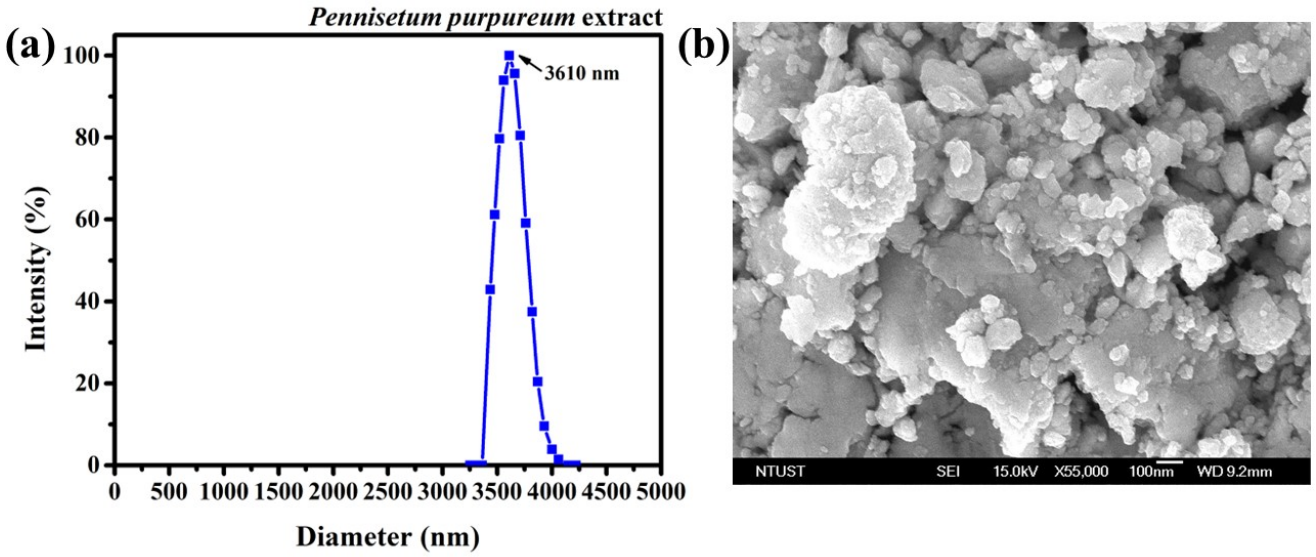

Figure S2. (a) DLS of *Pennisetum purpureum*. **(b)** Morphology of *Pennisetum purpureum*.

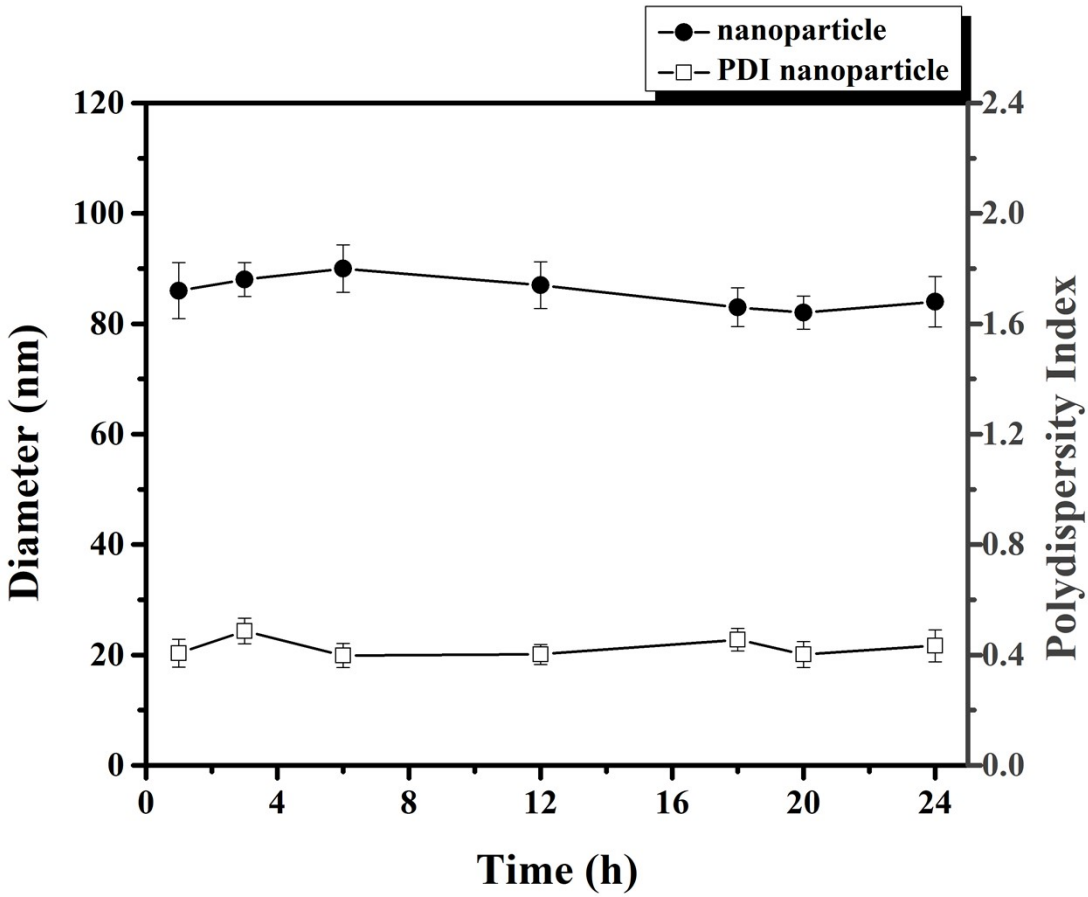

Figure S3. Kinetic stability of supramolecular nanoparticles.

Table S1. Particles size, zeta potential, drug loading content (DLC) and drug loading efficiency (DLE)

***Pennisetum purpureum*-loaded sample**	***Pennisetum purpureum*: nanoparticles (weight ratio)**	**Particle Size**	**Zeta Potential (mV)**	**DLC ± SD (%)**	**DLE ± SD (%)**
nanoparticles	-	86 ± 3.87	15.11 ± 1.62	-	-
***Pennisetum purpureum* extract**	-	3610 ± 5.08	-2.01 ± 4.99	-	-
***Pennisetum purpureum* /nanoparticles**	1 : 1	139 ± 1.6	14.66 ± 5.44	9.89 ± 1.56	47.23 ± 3.33
	1.5 : 1	151 ± 3.02	19.55 ± 2.93	14.32 ± 2.32	34.44 ± 1.2
	2 : 1	189 ± 6.13	21.21 ± 1.11	18.03 ± 1.89	27.13 ± 3.07

Table S2. Parameters of fitting model of drug release

Model	25°C	37°C	42°C
Higuchi	k_H = 5.42 R^2 =0.83	k_H = 6.81 R^2 = 0.85	k_H = 15.80 R^2 = 0.89
Korsmeyer Peppas	k_{KP} = 9.19 n = 0.33 R^2 = 0.96	k_{KP} = 11.05 n = 0.34 R^2 = 0.95	k_{KP} = 24.43 n = 0.36 R^2 = 0.97
Hill	R_m = 38.11% a = 0.71 $t_{1/2}$ = 7.15 h R^2 = 0.99	R_m = 46.36% a = 0.79 $t_{1/2}$ = 6.76 h R^2 =0.99	R_m = 100% a = 0.89 $t_{1/2}$ = 5.74 R^2 = 0.99

Table S3. Mean, median, and standard deviation values of abdominal aorta thickness after induced with atherogenic diet.

Groups	**The thickness of abdominals aorta (μ)**		
	Mean	***Median***	***SD***
G1	68.55	69.58	2.501
G2	66,62	66,61	4.363
G3	61.91	60.61	4.045

Table S4. Normality test of abdominal aorta thickness after induced with atherogenic diet.

Groups	**Shapiro-Wilk**		
	Statistic	***df***	***Sig***
G1	0.891	5	0.362
G2	0.977	6	0.937
G3	0.871	5	0.269

Table S5. *One Way Annova* test of abdominal aorta thickness after induced with atherogenic diet.

Groups	**The thickness of abdominals aorta**				
	Sum of squares	***df***	***Mean Square***	**F**	**Sig**
Between groups	117.487	2	58.743	4.113	0.041
Within groups	185.669	13	14.282		
Total	303.155	15	4.045		

Table S6. *PostHoc Tukey-HSD* test of abdominal aorta thickness after induced with atherogenic diet.

Groups	**The thickness of abdominals aorta**	
	Mean Differences	**Sig**
G1 and G2	1.928	0.648
G1 and G3	6.640	0.039
G2 and G3	4.712	0.137
PostHoc Tukey-HSD	$\alpha = 0.05$	