Supporting Information

Polycyclic aromatic polymer nanoparticles show potent infectious particle adsorption capability

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Table S1

Table S1 Preparation conditions and characterization of ArP nano particles*

Name	Monomer 1		Monomer 2		Crosslinker		Solvent[b]	Reaction condition		Yield (%)	Size (nm)	CV (%)
	Type[a]	Conc. (mM)	Type[a]	Conc. (mM)	Type[a]	Conc. (mM)		Time (h)	Temp. (˚C)			
-	1,5-DHN	30	–		TMTA	30	EtOH/H_2O (1 : 1)	75	6	75.1	867	14.5
15D	1,5-DHN	30	–		TMTA	30	EtOH/EG (7 : 3)	75	6	80.1	448	7.9
-	2,6-DHN	30	–		TMTA	30	EtOH/H_2O (7 : 3)	75	24	13.6	331	29.9
26D	2,6-DHN	30	–		TMTA	30	EtOH/H_2O (7 : 3)	75	72	33.8	481	31.8
-	1,5-DHN	15	PhCOOH	15	TMTA	30	EtOH	75	24	35.6	1677	3.9
-	1,5-DHN	15	PhCOOH	15	TMTA	30	EtOH/EG (7 : 3)	75	24	32.2	~100	-
-	1,5-DHN	15	PhCOOH	15	TMTA	30	1-PrOH	90	24	37.1	840	7.9
15D-C	1,5-DHN	15	PhCOOH	15	TMTA	30	1-BuOH	110	24	33.3	617	4.6
-	1,5-DHN	15	$PhNH_2$	15	TMTA	30	EtOH	75	24	53.7	1395	9.7
-	1,5-DHN	15	$PhNH_2$	15	TMTA	30	EtOH/EG (7 : 3)	75	24	51.5	369	8.2
-	1,5-DHN	15	$PhNH_2$	15	TMTA	30	1-BuOH	110	24	66.6	695	5.1
15D-N	1,5-DHN	15	$PhNH_2$	15	TMTA	30	1-PrOH	90	24	57.1	667	5.0

[a]1,5-DHN: 1,5-dihydroxy naphthalene; 2,6-DHN: 2,6-dihydroxy naphthalene; PhCOOH: 3-hydroxybenzoic acid; PhNH2: 3-aminophenol; TMTA: 1,3,5-trimethyl-1,3,5-triazinane.
[b]EtOH: ethanol; EG: ethylene glycol; 1-BuOH: 1-butanol; 1-PrOH: 1-propanol. *Gray marker indicates the optimized preparation conditions for virus adsorption experiments.

Table S2

Table S2 The atomic percentage of C, N and O determined from XPS analysis

	C (%)	N (%)	O (%)
15D-h	78.4	6.2	15.2
26D-h	81.9	5.2	12.8
15D-C-h	79.7	7.8	12.1
15D-N-h	75.1	10.6	14.2

Table S3

Table S3 The atomic percentage of C, N and O determined from EDX analysis

	C (%)	N (%)	O (%)
15D-h	80.6	6.0	13.4
26D-h	82.1	3.4	14.6
15D-C-h	70.3	9.6	20.1
15D-N-h	66.9	12.1	21.0

Table S4

Table S4 Percentage composition of chemical bond from XPS N1s spectra

	Binding energy (eV)		
	399.7–399.9	400.9	401.3–401.9
	C-N-C (%)	NH_2 (%)	$(C)_3$-N (%)
15D-h	59.3	–	40.7
26D-h	60.9	–	39.1
15D-C-h	79.2	–	20.8
15D-N-h	73.0	13.2	13.8

Table S5

Table S5 Percentage composition of chemical bond from XPS O1s spectra

	Binding energy (eV)		
	530.6–531.2	532.5–532.9	535.0–535.3
	C=O (%)	C-O (%)	H-O-H (%)
15D-h	28.3	68.9	2.8
26D-h	26.6	72.0	1.4
15D-C-h	31.1	66.4	2.5
15D-N-h	35.8	61.7	2.5

Table S6

Table S6 Zeta potential (N=3) of ArP nanoparticles dispersed in 20 mM HEPES buffer (pH 7.5) at 25˚C.

	15D-h	26D-h	15D-C-h	15D-N-h
Zeta potential (mV)	-36.4	-31.6	-35.3	-35.0
Zeta deviation (mV)	4.13	5.71	4.34	4.47

Figure S1

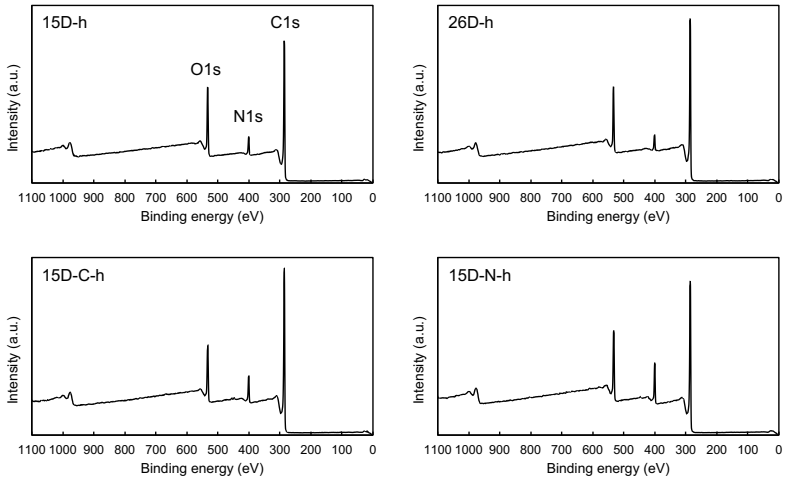

Fig. S1 XPS survey spectra of ArP nanoparticles.

Figure S2

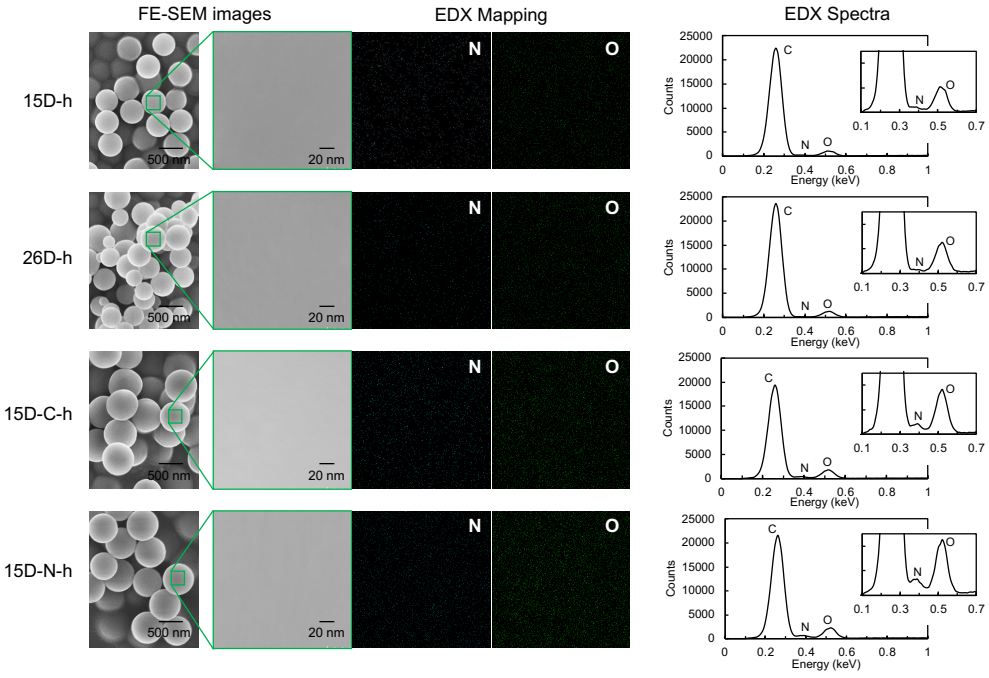

Fig. S2 EDX mapping and spectra of ArP nanoparticles.

Figure S3

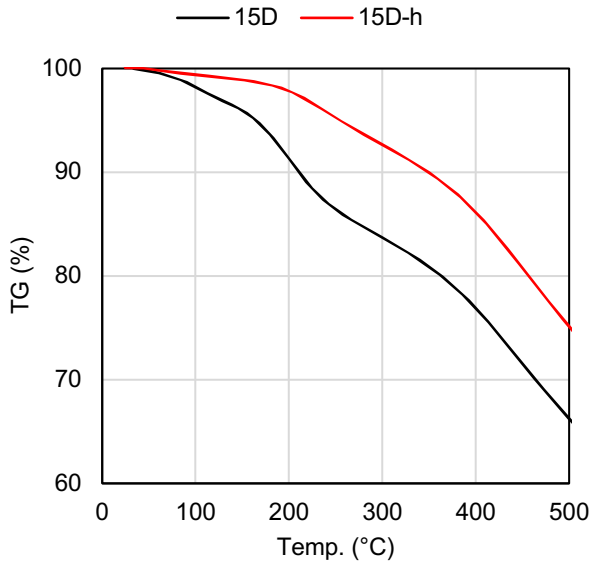

Fig. S3 TGA results of 15D and 15D-h. (Heating rate: 5˚C/min, under 200 mL/min N_2 gas flow)

Figure S4

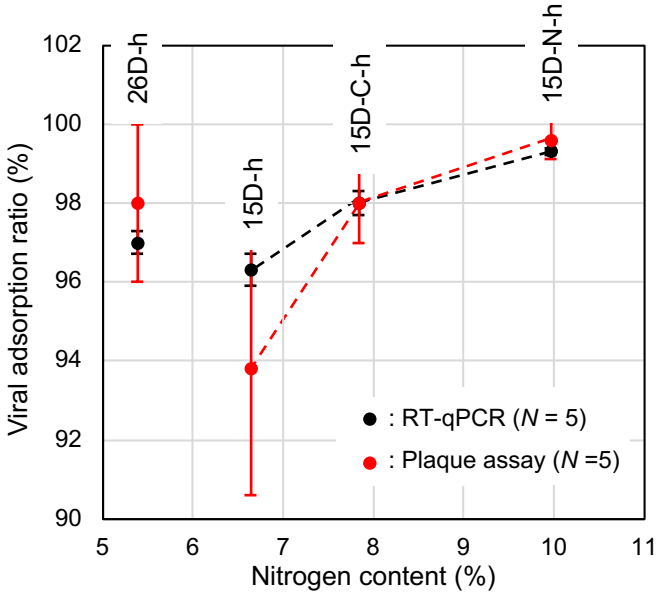

Fig. S4 Relationship between nitrogen contents and viral adsorption ratios determined by RT-qPCR ($N = 5$) and plaque assay ($N = 5$). The initial viral titre of viral adsorption experiment is 40,000 PFU/mL. The nitrogen content was determined by elemental analysis. The error bar represents standard deviation.