

# Supporting Information

## **Unraveling In Vivo Potential of Curcumin-loaded Graphene Quantum Dots on Drug Delivery and Release Kinetics Aspects of Cancer Treatment**

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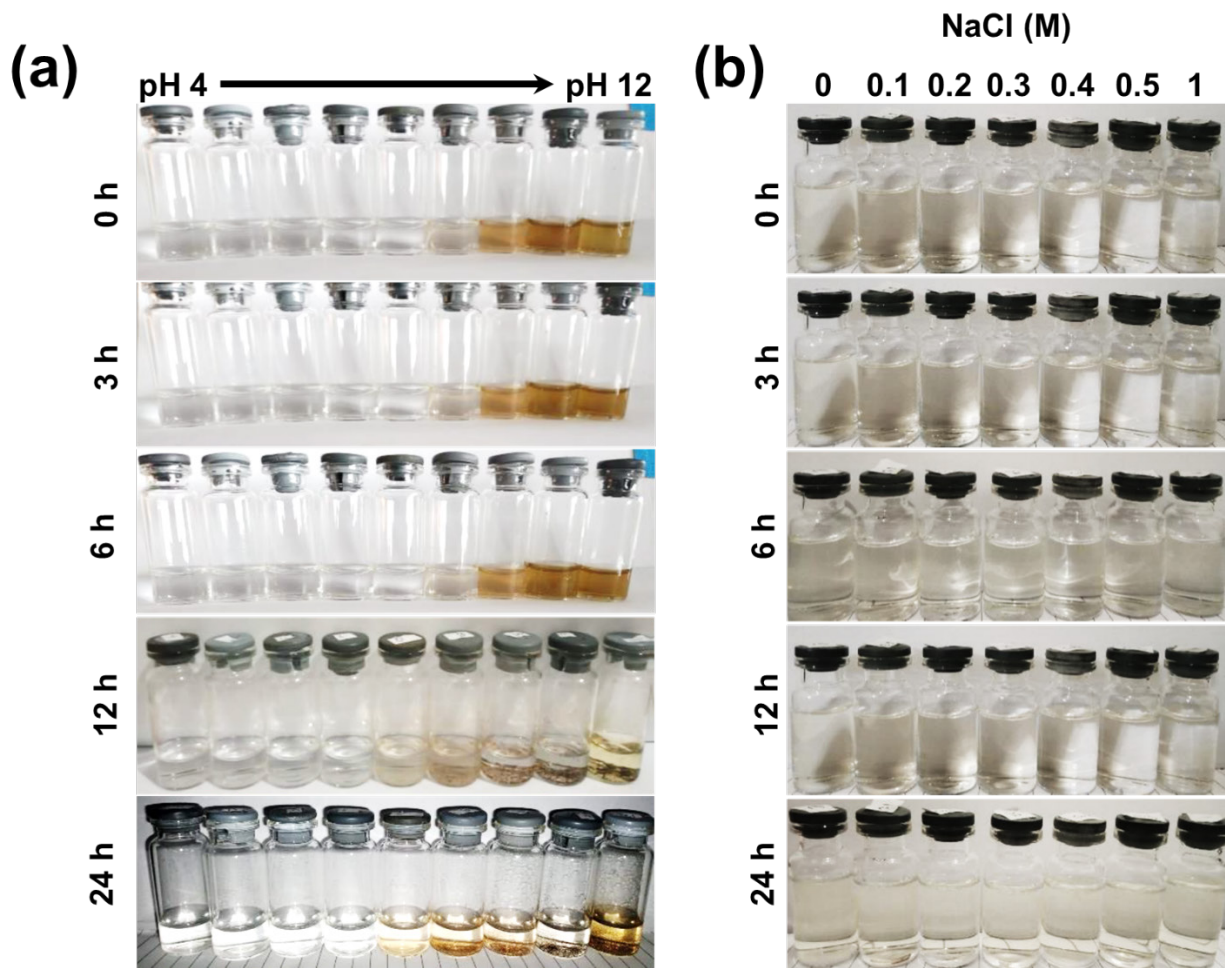
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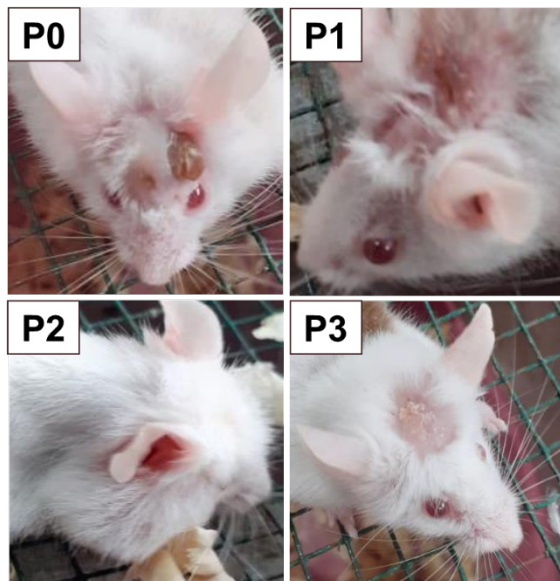
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**Figure S1.** Photograph of GQDs colloidal stability under varying pH (1-12) and NaCl concentration (0-0.5 M) for 24 h incubation.



**Figure S2.** Visual image of tumor to mice under different treatments after 29 days observation (P0, negative control; P1, curcumin; P2, GQDs; P3, GQDs/cur).

**Table S1.** The parameters of several mathematical models that influence the drug release in GQDs/cur.

<b>Formula</b>	<b>Parameter</b>	<b>Zero-order</b>	<b>First-order</b>	<b>Peppas-Sahlin</b>	<b>Higuchi</b>	<b>Hixson-Crowell</b>	<b>Korsmeyer-Peppas</b>
GQDs/cur pH 4	M <sub>0</sub> (g)	0,02	0,02	0,02	0,02	0,02	0,02
	$\chi^2$	58,6621	54,008	2,2365	3,4206	55,8641	7,8389
	R <sup>2</sup>	0,6039	0,6516	0,9514	0,8482	0,6448	0,7642
	K <sub>1</sub>	6,6039	0,0001	0,5377	0,3449	0,000,	0,1204
	K <sub>2</sub>	-	-	0,0068	-	-	-
	n	-	-	-	-	-	0,6974
GQDs/cur pH 7	M <sub>0</sub> (g)	0,02	0,02	0,02	0,02	0,02	0,02
	$\chi^2$	92,4467	90,6594	0,0529	5,5092	91,2762	1,1844
	R <sup>2</sup>	0,3167	0,3234	0,9948	0,5883	0,3212	0,7237
	K <sub>1</sub>	0,0035	0,0001	0,2958	0,1311	0,0001	0,6066
	K <sub>2</sub>	-	-	-0,0052	-	-	-
	n	-	-	-	-	-	0,2842
GQDs/cur pH 9	M <sub>0</sub> (g)	0,02	0,02	0,02	0,02	0,02	0,02
	$\chi^2$	209,153	204,1898	0,9448	10,9181	205,8312	0,7109
	R <sup>2</sup>	0,4236	0,424	0,9619	0,6853	0,4295	0,8258
	K <sub>1</sub>	0,0048	0,0001	0,3763	0,1733	0,0001	0,9712
	K <sub>2</sub>	-	-	-0,0073	-	-	-
	n	-	-	-	-	-	0,2368

**Table S2.** Blood parameter evaluation of GQDs/cur.

<b>Blood parameter</b>	<b>Normal doses</b>	<b>P0</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P-value<sup>1</sup></b>	<b>P-value<sup>2</sup></b>	<b>P-value<sup>3</sup></b>
Hemoglobin (g/dL)	11.6 – 16.1	11.7 5 ± 1.91	11.2 ± 1.70	11.9 5 ± 0.21	12.1 ± 2.12	0.39475	0.45347	0.43914
Leukocytes (10 <sup>3</sup> µL)	2.0 – 10.0	4.4 ± 1.27	7.3 ± 5.23	6.6 ± 0.14	11.5 ± 6.51	0.29282	0.12429	0.18573
Thrombocytes (10 <sup>3</sup> µL)	150.0 – 450.0	1002. 5 ± 113.8 4	1593. 5 ± 61.52	1096 ± 295.5 7	893.5 ± 304.7 6	0.01157	0.37412	0.35915
Basophils (%)	0.5 – 1.0	12.5 ± 4.95	11.5 ± 6.36	17 ± 18.38	9.5 ± 0.71	0.43845	0.39732	0.27602
Neutrophils (%)	12.0 – 38.0	0.5 ± 0.71	9 ± 2.83	4 ± 0	4 ± 4.24	0.07574	0.04517	0.22772
Lymphocytes (%)	60.0 – 75.0	85.5 ± 4.95	78 ± 9.90	74.5 ± 14.85	76.5 ± 14.85	0.25677	0.25098	0.28269
Monocytes (%)	1.0 – 6.0	1.5 ± 0.71	1.5 ± 0.71	4 ± 4.24	10 ± 11.31	0.50000	0.28100	0.24067
Erythrocyte sedimentation rate (ESR) (mm)	0 – 2	2 ± 0	2 ± 0	2 ± 0	–	–	–	–

P-value<sup>1</sup>: P-value of P0 and P1; P-value<sup>2</sup>: P-value of P0 and P2; P-value<sup>3</sup>: P-value of P0 and P3

**Table S3.** Blood parameter evaluation of GQDs/cur.

<b>Blood parameter</b>	<b>Normal doses</b>	<b>P0</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P-value<sup>1</sup></b>	<b>P-value<sup>2</sup></b>	<b>P-value<sup>3</sup></b>
Albumin (g/dL)	3.0 – 5.0	2.8±0.14 1	2.9±0.14 20.51	3±0 6	2.7±0.14 6.36	0.276	0.148	0.276
SGOT (U/L)	23.2 – 48.4	160.5±0.7 1	121.5± 20.51	116.5±6 6	112.5±6.36 6.36	0.113	0.033	0.030
SGPT (U/L)	2.1 – 23.8	45.5±34.65 65	38.5±9.1 9	37.5±9.1 9	17.5±4.95 4.95	0.414	0.403	0.230
Gamma GT (U/L)	0 – 30	16±0	13.5±2.1 2	12±0	30.5±2.12 2.12	0.172	-	0.033
Total Bilirubin	0 – 0.55	0.210±0.03 3	0.29	0.16	0.22	0.213	0.121	0.450
BUN	8.92 – 17.89	14.75	21.25	30	15.25	0.225	0.194	0.429
Creatinine (mg/dL)	0.30 – 1.00	0.03	0.06 5	0.11 5	0.115	0.209	0.042	0.042

P-value<sup>1</sup>: P-value of P0 and P1; P-value<sup>2</sup>: P-value of P0 and P2; P-value<sup>3</sup>: P-value of P0 and P3