Release of Paclitaxel Nanoparticles from pH Sensitive

and Biodegradable Dextran based Hydrogels

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Methods of preparing dextran precursors

- Briefly, 1 g of dextran was dissolved in 40 mL of LiCl/DMF (10 wt %) solvent at 90 °C under nitrogen. Then the temperature was cooled to 60 °C and triethylamine (6% mol to MA) was then added and stirred for 15 min. 2:1 molar ratio of maleic anhydride to the hydroxyl group of dextran was injected to obtain the dextran derivative and reacted for 20 hr.¹⁵
- 2. In short, 5 g of dextran was dissolved in 40 mL of DMSO at 60 °C under nitrogen for 2 hr. After dissolving 1 g of DMAP catalyst and stirring for 20 min at room temperature, the proper amount of glycidyl methacrylate was added (DS= 6.2) and reacted for 48 hr. The reaction was stopped by injecting equimolar amount of concentrated HCl to neutralize DMAP. The reaction mixture was then transferred to a dialysis membrane (MWCO=14,000) and dialyzed for 2 weeks against deionized water at 4 °C.¹⁷



¹H-NMR for dextran-maleic acid precursor



¹H-NMR spectra for precursor methacrylated dextran Figure S1 ¹H-NMR spectra of dextran based precursors for synthesis of pH sensitive hydrogels

	Dextran-GMA (mg)	Acrylic acid	UV time
	(DS=6.2)	(µl)	(min)
1	10	20	30
2	10	30	30
3	10	50	25
4	10	60	15
5	10	70	10
6	10	87	60
7	30	25	20
8	30	50	20
9	40	25	20
10	40	50	20
11	50	25	20
12	50	50	20
13	80	30	20

Table S1. Different compositions of Dex-GMA based copolymers



Figure.S2. pH sensitive Swelling of Dex-MA hydrogel in SGF v.s. SIF (hydrogels were loaded with 300 μ L of 1.6 mg/mL F-NPs; polymerization time 30 min; data obtained from triplicate of three independent experiments)



Figure.S3. pH sensitive swelling of Dex-GMA-co-AA hydrogel in SGF v.s. SIF (composition of Dex-GMA-co-AA hydrogel at Dex-GMA 10 mg/mL, AA 87 μ L/mL,

UV irradiation time 1 hr; 300 μ L of 1.6 mg/mL F-NPs loaded within the hydrogels; data obtained from triplicate of three independent experiments)