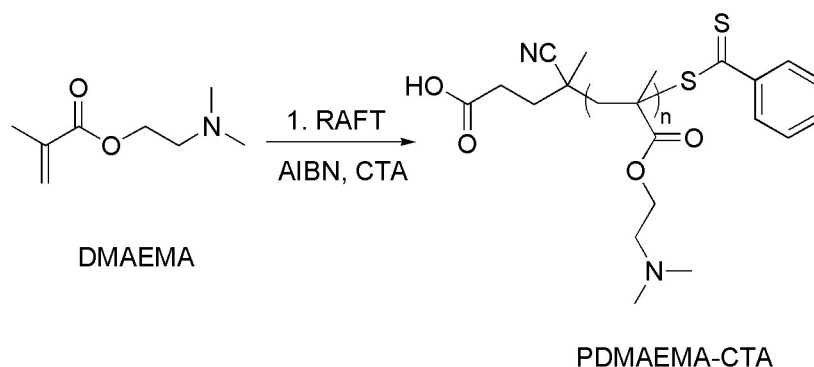


## Supporting information

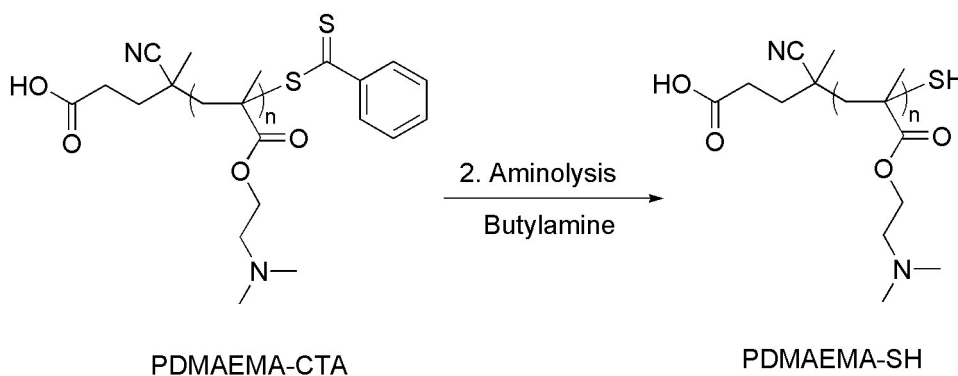
### Comb-like Temperature-responsive Polyhydroxyalkanoate-graft-Poly(2-Dimethylamino-ethylmethacrylate) for Controllable Protein Adsorption

Hui Yao<sup>a</sup>, Daixu Wei<sup>a</sup>, Xuemei Che<sup>a</sup>, Longwei Cai<sup>a</sup>, Lei Tao<sup>b</sup>, Lei Liu<sup>c</sup>, Linping Wu<sup>d</sup>,  
Guo-Qiang Chen<sup>\*,a,e</sup>



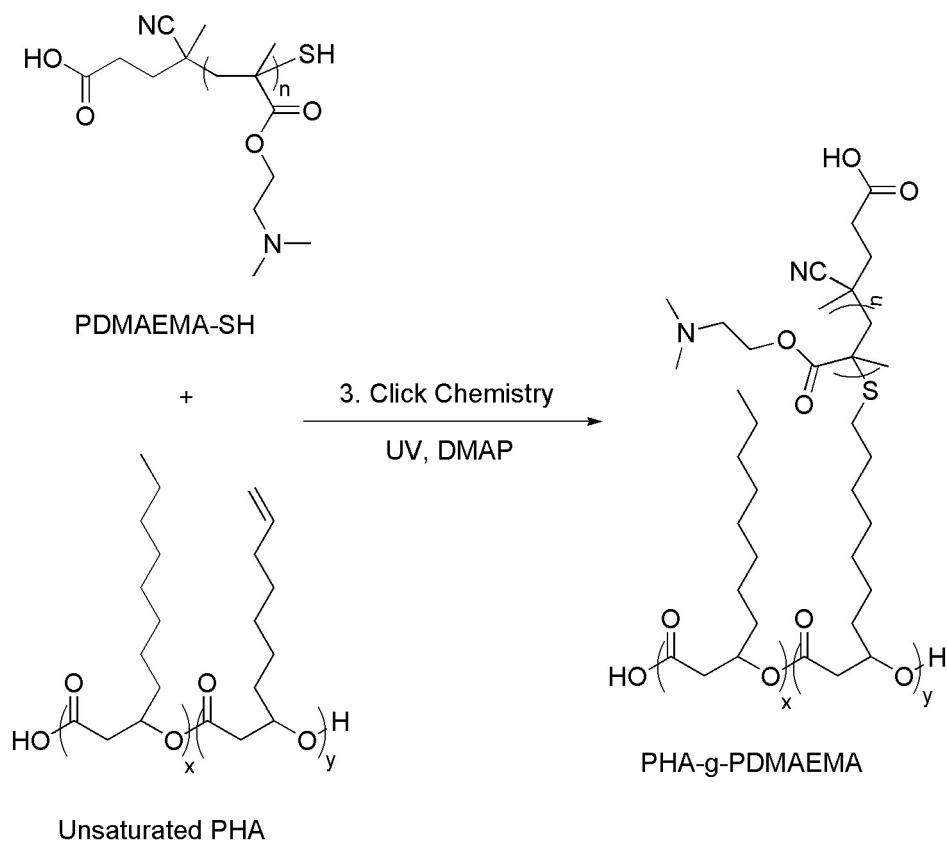
**Scheme S1** RAFT polymerization of PDMAEMA oligomer.

Reagents and reaction conditions: CTA, AIBN (20% molar ratio of CTA), Ar, toluene, 75°C, 9 h.



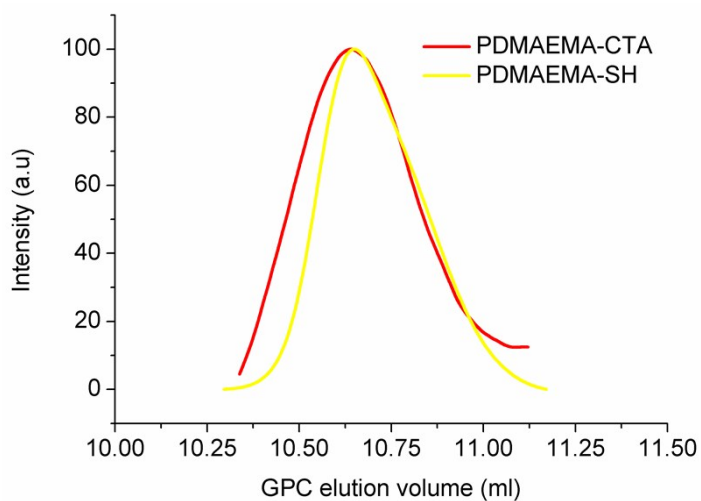
**Scheme S2** Aminolysis of PDMAEMA-CTA.

Reagents and conditions: Excess n-butylamine, Ar, THF, room temperature, 0.5-2 h.

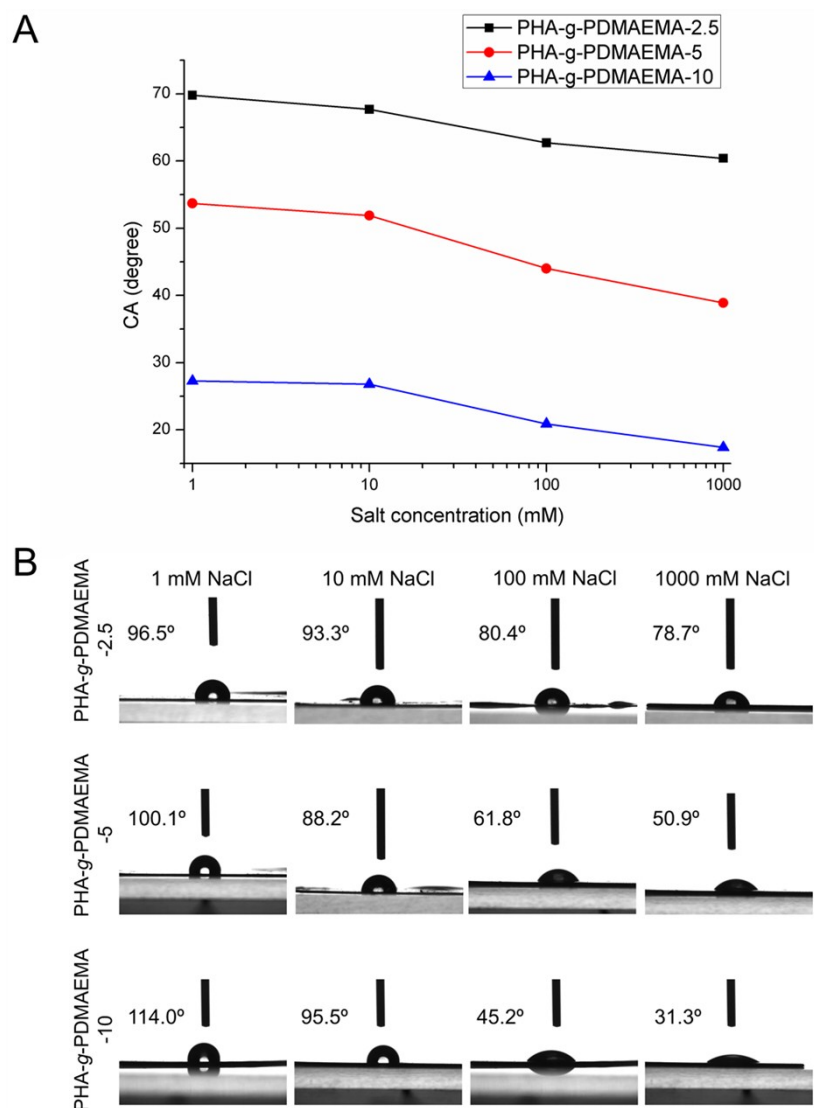


**Scheme S3** Preparation of graft polymer PHA-g-PDMAAEMA via thiol-ene click chemistry.

Reagents and conditions: 5-20mol% DMAP with UV, Ar, toluene, 20-38 h.



**Fig. S1** GPC chromatograms of PDMAEMA-CTA and PDMAEMA-SH.



**Fig. S2** Step-wise responses of PHA-g-PDMAEMA films to a varying salt concentration. **(A)** Contact angle changes of PHA-g-PDMAEMA films under different NaCl concentrations at room temperature. **(B)** Images of contact angles of PHA-g-PDMAEMA films responding to different NaCl concentrations at 50°C.

**Table S1** Water adsorption of P(3HDD-co-3H9D) and PDMAEMA-g-PHA.

°C	P(3HDD-co-3H9D)	PHA-g-PDMAEMA-2.5	PHA-g-PDMAEMA-5	PHA-g-PDMAEMA-10
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25	$6.31 \pm 3.86$	$6.59 \pm 1.98$	$10.38 \pm 6.24$	$33.30 \pm 9.11$
50	$7.72 \pm 2.75$	$7.89 \pm 3.32$	$6.28 \pm 2.56$	$6.13 \pm 3.40$

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*Water uptake experiment.* 3 cm×3 cm PHA based films were immersed in deionized water at constant temperature. 24 hours later, they were removed from water. Each film was quickly weighted after the removal of excess surface water with cellulose filter paper. Three measurements were taken for each sample.

At room temperature, graft copolymer films showed enhanced water uptake ability than that of P(3HDD-co-3H9D) due to the improved hydrophilicity (Table S1). And along with increasing grafting yield, water absorption of graft copolymer PHA-g-PDMAEMA showed an obvious tendency to increase. While at 50°C, water uptake trend was not clear. Water absorption of P(3HDD-co-3H9D) and PHA-g-PDMAEMA-2.5 were similar while PHA-g-PDMAEMA-5 and PHA-g-PDMAEMA-10 showed weaker water uptake ability than that of P(3HDD-co-3H9D).