

Table S1: Nomenclature of monomers

Acronym	Full name
Am	Acrylamide
A2AGA	N-Acryloyl 2-glycine
A4ABA	N-Acryloyl 4-aminobutyric acid
A6ACA	N-Acryloyl 6-aminocaproic acid
A8ACA	N-Acryloyl 8-aminocaprylic acid
SS	Sodium 4-vinylbenzenesulfonate
SPA	3-Sulfopropyl acrylate potassium salt
MEDSAH	[2-(Methacryloyloxy)ethyl]dimethyl-(3-sulfopropyl) ammonium hydroxide
BisAm	N,N'-Methylenebisacrylamide

Table S2: Composition, nomenclature, and characterization of the hydrogels

Sample code	Comonomer (B)	Mole ratio of Am _x :B _y (BisAm)	Elastic modulus (kPa)	Water contact angle (°)
PAm ₆ -co-PA2AGA ₂	A2AGA (2.5mmol)	6:2 (0.26)	353.0±13.9	20.9±1.4
PAm ₆ -co-PA4ABA ₂	A4ABA (2.5mmol)	6:2 (0.26)	N/A	36.1±1.9
PAm ₆ -co-PA6ACA ₂	A6ACA (2.5mmol)	6:2 (0.26)	N/A	53.8±2.7
PAm ₆ -co-PA8ACA ₂	A8ACA (2.5mmol)	6:2 (0.26)	N/A	67.3±1.6
PAm ₆ -co-PSPA ₂	SPA (2.5mmol)	6:2 (0.26)	342.5±19.7	32.6±1.2
PAm ₆ -co-PMEDSAH ₂	MEDSAH (2.5mmol)	6:2 (0.26)	378.8±36.6	66.3±2.3
PAm ₆ -co-PSS _{0.5}	SS (0.625mmol)	6:0.5 (0.26)	327.8±7.1	14.3±1.7
PAm ₆ -co-PSS ₁	SS (1.25mmol)	6:1 (0.26)	382.9±5.1	17.4±0.3
PAm ₆ -co-PSS ₂	SS (2.5mmol)	6:2 (0.26)	343.7±5.1	23.0±2.0
PAm ₆ -co-PSS ₂ -M*	SS (2.5mmol)	6:2 (0.19)	137.6±6.9	20.8±0.5
PAm ₆ -co-PSS ₂ -L*	SS (2.5mmol)	6:2 (0.10)	53.5±2.8	17.5±1.5

*PAm₆-co-PSS₂-M and PAm₆-co-PSS₂-L represent PAm₆-co-PSS₂ hydrogels with an elastic modulus of 137.6±6.9kPa and 53.5±2.8 kPa, respectively.

Table S3: List of primers used for qRT-PCR

Gene Symbol	Assay ID
SOX17	Hs00751752_s1
FOXA2	Hs0023764_m1
CXCR4	Hs00607978_s1
SOX2	Hs01053049_s1
Nestin	Hs00707120_s1
SOX1	Hs01057642_s1
SMA	Hs00426835_g1
ACTC	Hs01109515_m1
NANOG	Hs04260366_g1
OCT4	Hs00999634_gH