Electronic Supplementary Information

The effect of blob size in polymer networks on the nanoparticle-mediated adhesion hydrogels

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	Water	DMA	MBA	KPS	TEMED
	(ml)	(ml)	(mg)	(mg)	(µl)
PDMA-1	15	6.176	9.2	164	90
PDMA-2	30	6.176	9.2	164	90
PDMA-3	45	6.176	9.2	164	90

Table S1. Amounts of water and reactants used for preparing PDMA hydrogels



Figure S1. Equilibrium swelling ratio of PDMA hydrogels depending on the time.



Figure S2. UTM adhesion test of PDMA hydrogel.



Figure S3. Schematic illustration of the mesh and blob size of PDMA hydrogel.



Figure S4. Storage modulus of the PDMA hydrogels as a function of frequency.

Table S2. Mesh sizes of PDMA hydrogels from rheological measurements assuming a cubic-shaped volume

 $\xi_{m-cube} = \left(\frac{RT}{GN_A}\right)^{\frac{1}{3}} \text{ and a spherical volume element}} \frac{4\pi}{3} (\xi_{m-sphere})^3 = \frac{RT}{GN_A} [J. Appl. Polym. Sci. 2018, 135, 46695.$

	G′	ξ_{m-cube}	$\xi_{m-sphere}$
	(Pa)	(nm)	(nm)
PDMA-1	28103	5.24	3.25
PDMA-2	4111	9.95	6.17
PDMA-3	1582	13.68	8.48



Figure S5. Schematic illustration of the hydrogel polymer chain interacting with the surface of the smooth silica and CMS-6 nanoparticles. (a) Smooth silica nanoparticle with PDMA-1, (b) CMS-6 with PDMA-1 and (c) CMS-6 with PDMA-2.



and (c) PDMA-3.