Electronic Supplementary Material (ESI) for Soft Matter.

Supporting Information

Tunable enzymatically degradable hydrogels for controlled cargo release with dynamic mechanical properties

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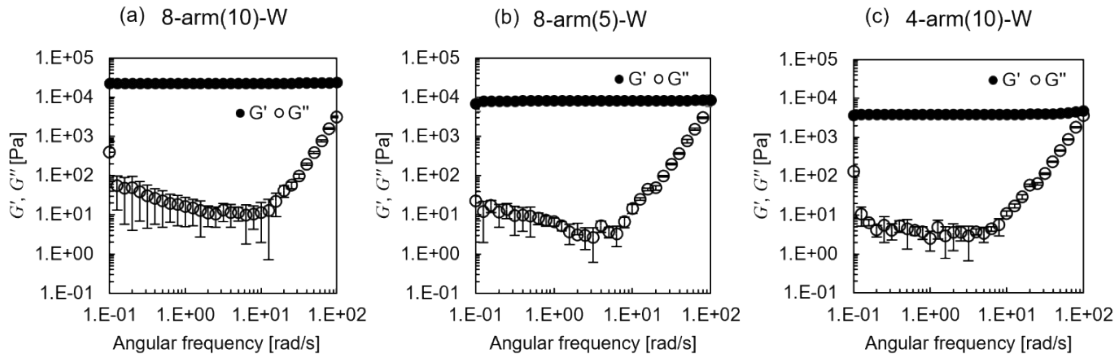

Figure S1 Frequency sweep conducted at 1% strain for swollen gels (before degradation) (n=3). Since *G″* was negligible relative to *G'* in the low frequency region, most of the mechanical structure of the hydrogel is supported by *G′*. The value of *G′* was almost constant independent of frequency.

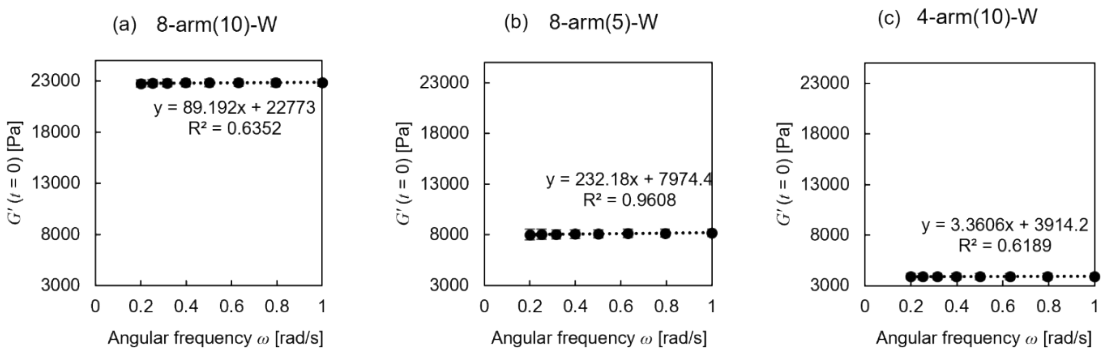

Figure S2 A linear fit of the storage modulus plateau (n = 3) was performed for each gel to calculate the zero-frequency storage modulus (G' (t = 0, ω = 0)). The equation from the linear fit is displayed on each graph. The y-intercept from the equation was used as the G' (t = 0, ω = 0) to estimate the hydrogel mesh size.

Table S1 Summery of mesh size for swollen initial hydrogels (ξ), and a kinetic constant of hydrogel's enzymatic degradation (k^*), and the kinetic constant (K_m) and diffusion or release exponent (n) of FD released because of hydrogel degradation.

	ξ (t = 0) estimated from G' (t = 0, ω = 0) [nm]	ξ (t = 0) estimated from Q_v [nm]	k^* [$M^{-1}*s^{-1}$]	K_m ($t \geq 0$)	n ($t \geq 0$)
8-arm (10)-W	5.73±0.03	11.27±0.57	1.76±0.14	0.02±0.02	1.78±0.18
8-arm (10)-A		12.17±0.89		0.13±0.08	1.97±0.27
8-arm (5)-W	8.13±0.18	13.94±0.54	4.04±0.68	0.05±0.02	1.67±0.18
8-arm (5)-A		14.08±0.14		0.13±0.07	2.07±0.16
4-arm (10)-W	10.31±0.25	17.39±1.20	23.32±3.38	0.77±1.00	1.20±0.39
4-arm (10)-A	10.25±0.23	18.23±0.22	151.71±52.55	0.73±0.30	1.38±0.16
$2r_H$ (a hydrodynamic diameter of FD (M_w = 150k))	13.09-21.08	13.09-21.08			
$2r_H$ (a hydrodynamic diameter of collagenase (M_r = 70–120 k))	6.0	6.0			

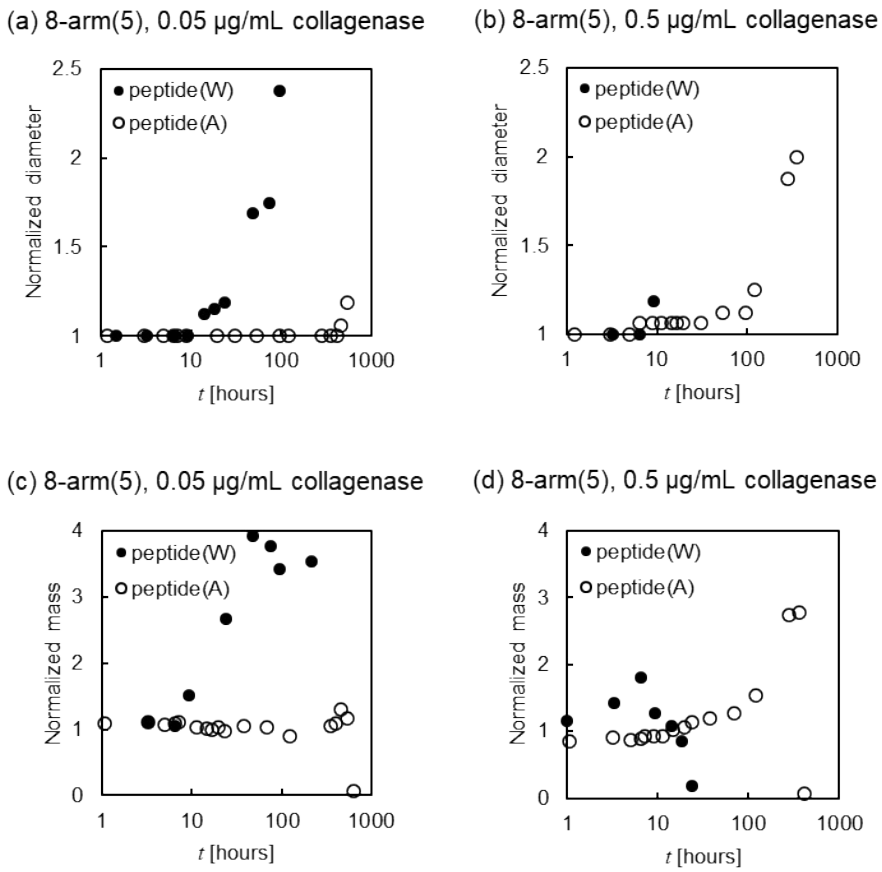

Figure S3. (a), (b) Mass change and (c), (d) diameter change of hydrogels in degradation process (n = 1).