

## Supporting Information

### **Jellyfish Gel and Its Hybrid Hydrogels with High Mechanical Strength**

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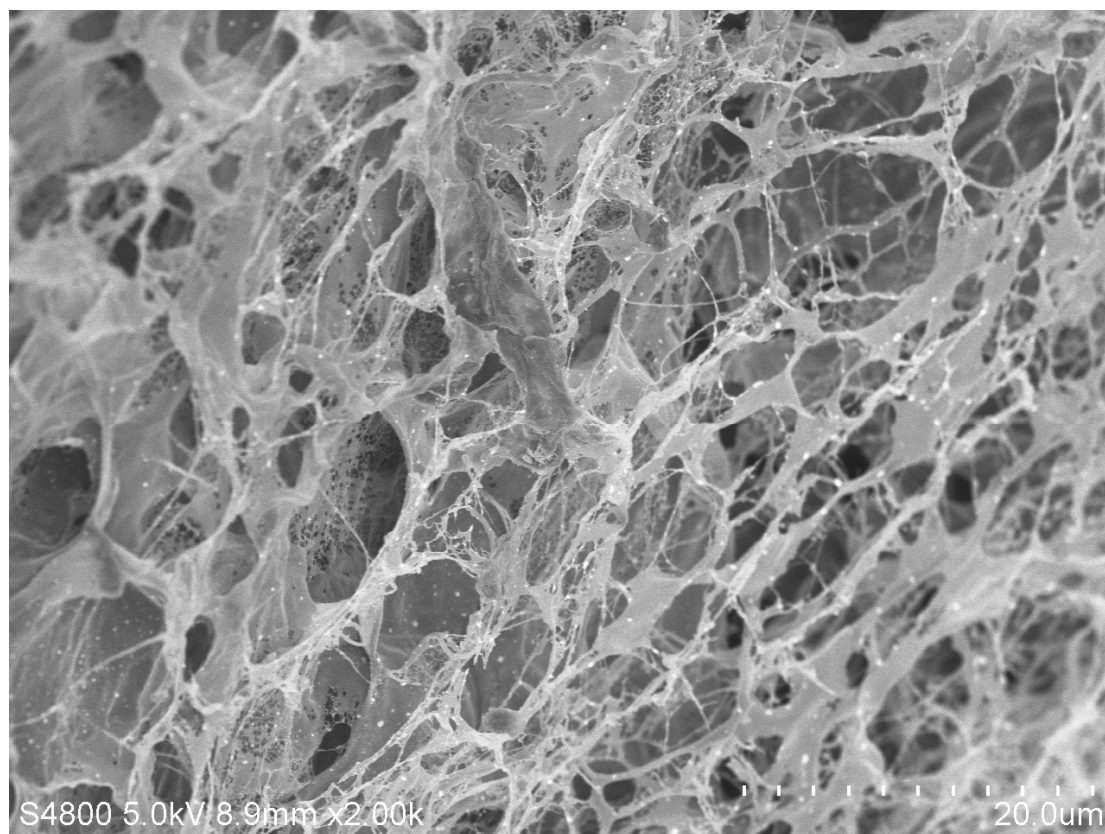
**Table S1.** The synthesis conditions and the mechanical properties of the hydrogels.

Hydrogel	Synthesis			Water [wt.-%]	Compression test	Tensile test
	$t$ (h)	$C_M$ (M)	$C_C$ (%) <sup>[a]</sup>		$\varepsilon_c$ [%] <sup>[b]</sup>	$\varepsilon_t$ [%]
JF gel				99.0	79.7	160
PAA gel (A1)	2	2	0	86.2	80.0	970
PAA gel (A2)	2	3	0	79.3	90.3	1200
PAA gel (A3)	2	4	0	72.5	81.2	830
PAA gel (B1)	2	2	0.05	86.9	77.5	320
PAA gel (B2)	2	2	0.10	86.4	83.8	340
PAA gel (B3)	2	2	0.20	85.5	88.5	365
PAA gel (B4)	2	2	0.30	85.0	92.3	280
JF-AA gel (A1)	2	2	0	85.8	95.0	370
JF-AA gel (A2)	2	3	0	78.3	95.0	310
JF-AA gel (A3)	2	4	0	71.5	95.0	300
JF-AA gel (B1)	2	2	0.05	84.9	95.0	310
JF-AA gel (B2)	2	2	0.10	84.6	95.0	210
JF-AA gel (B3)	2	2	0.20	84.4	92.9	250
JF-AA gel (B4)	2	2	0.30	82.7	90.0	200
PAAm gel (A1)	2	2	0	88.3	95.0	1640 <sup>[c]</sup>
PAAm gel (A2)	2	3	0	85.7	95.0	1700 <sup>[c]</sup>
PAAm gel (A3)	2	4	0	78.3	95.0	1480 <sup>[c]</sup>
PAAm gel (B1)	2	2	0.05	87.6	92.8	99
PAAm gel (B2)	2	2	0.10	87.5	88.8	61
PAAm gel (B3)	2	2	0.20	87.0	78.8	45
PAAm gel (B4)	2	2	0.30	86.8	70.3	37
JF-AAm gel (A1)	2	2	0	85.5	95.0	75
JF-AAm gel (A2)	2	3	0	84.5	95.0	170
JF-AAm gel (A3)	2	4	0	77.0	95.0	145
JF-AAm gel (B1)	2	2	0.05	84.5	95.0	150
JF-AAm gel (B2)	2	2	0.10	87.0	75.5	55
JF-AAm gel (B3)	2	2	0.20	85.2	73.3	80
JF-AAm gel (B4)	2	2	0.30	86.7	72.6	160

[a]: crosslinker concentration ( $C_C$ )/ monomer concentration ( $C_M$ ), mol/mol.

[b]: The strain 95.0% is not the fracture strain, and the corresponding stresses are the stresses at 95% strain.

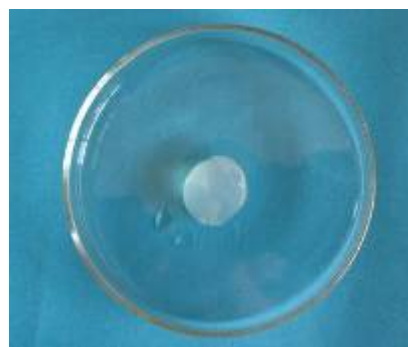
[c]: The gels did not break but slipped from the clamping apparatus.



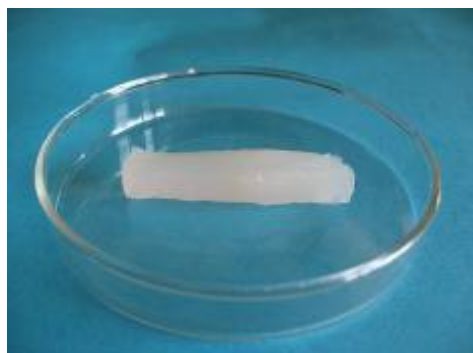
**Figure S1.** SEM micrograms of the jellyfish mesogloea after being immersed in 2 M AA solution for 18 h.



PAA gel



Jellyfish gel



JF-AA gel



JF-AAm gel

**Figure S2.** Photos of AA gel, jellyfish gel, JF-AA gel and JF-AAm gel.

## Supplementary Movies

**Movie S1.** The torsion of the JF-AA gel (B4) by hand. It could be twisted for several turns and it totally recovered its original shape immediately after the release of torsional forces.

**Movie S2.** The torsion of the AA gel (B4) by hand. It broke after only about 180° torsion.

**Movie S3.** The torsion of a jellyfish gel by hand. It broke after only about 180° torsion. Water leaked from jellyfish gel under torsional stress.