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Supplementary Materials for

Mechanical model for super-anisotropic swelling of the multi-cylindrical PDGI/PAAm gels

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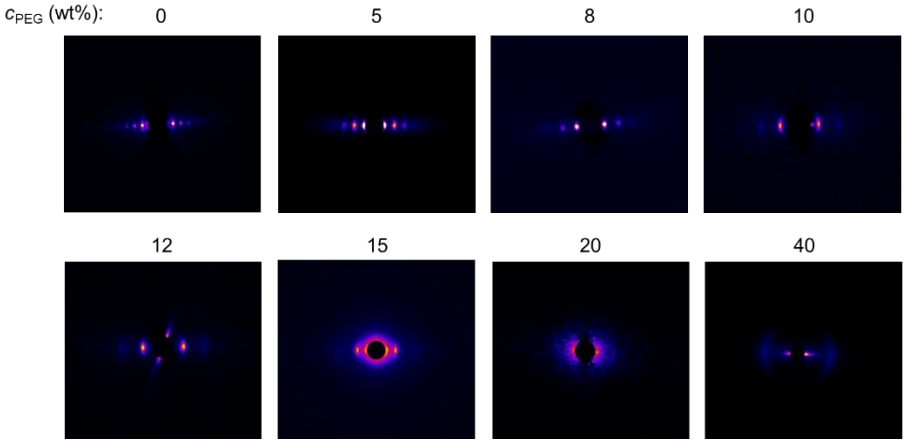


Figure S1. 2-D X-ray diffraction image of the MC-PDGI/PAAm(0.1) gel swollen in PEG aqueous solutions.

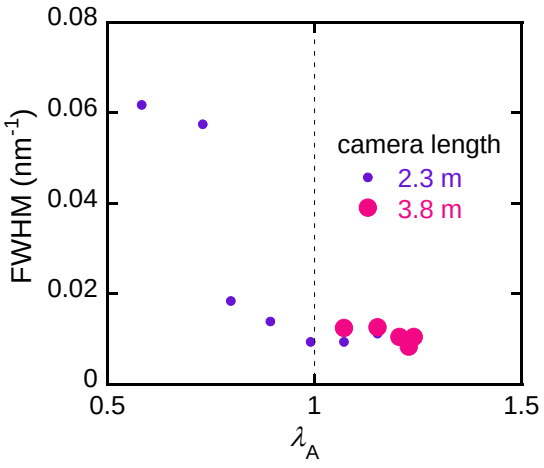


Figure S2. FWHM of the first-order X-ray diffraction peak of the MC-PDGI/PAAm(0.1) gel in the swelling regime, measured with longer camera length.

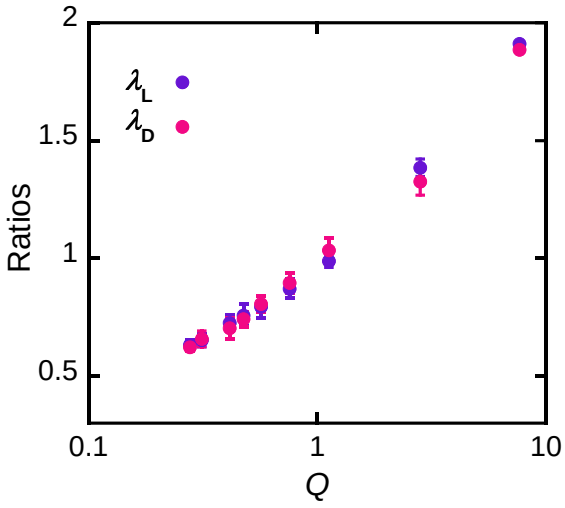


Figure S3. λ_L and λ_D of the string PAAm(0.1) gels as functions of Q. Reproduced from the data shown in ref. 18 (K. Mito *et al.*, *Polymer* 2017, 128, 373–378), Copyright 2017, with permission from Elsevier.

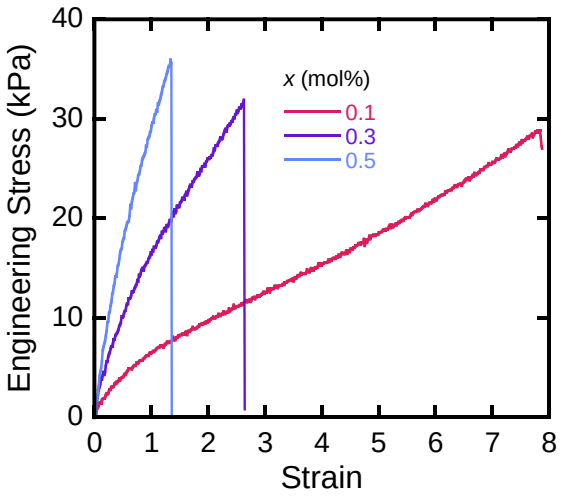


Figure S4. Uniaxial stress-strain curves of the rectangular PAAm(x) gels at their reference state, where x=0.1, 0.3 and 0.5. The gels were cut into the dumbbell shape (gauge length: 12 mm, width: 2 mm) and tested. Strain rate was 0.14 s^{-1}. Young's modulus of the gel was determined as initial slope of the curve. $G_{net}(x)$ was calculated by dividing the Young's modulus by 3.

	Supplier	Assay
Acrylamide	Junsei Chemicals	98%+
N,*N*'-Methylenebisacrylamide	Wako Pure Chemical Industries	99%+
Irgacure 2959	BASF SE	99%
Sodium dodecyl sulfate	MP Biomedicals	99%+
Polyethylene glycol (Mn: 21,170)	Wako Pure Chemical Industries	~100%
Itaconic acid anhydride	Sigma Aldrich	95%+
Dodecanol	Wako Pure Chemical Industries	95%+
Glycidol	Wako Pure Chemical Industries	90%+
Pyridinium *p*–toluenesulfonate	Wako Pure Chemical Industries	97-102% (by titration)

Table S1. List of the chemicals used in this study with their supplier and standard assay.