Electronic Supplementary Material (ESI) for Soft Matter.


Supporting information

# Elastoplastic behavior of anisotropic, physically crosslinked hydrogel networks comprising stiff, charged fibrils in an electrolyte

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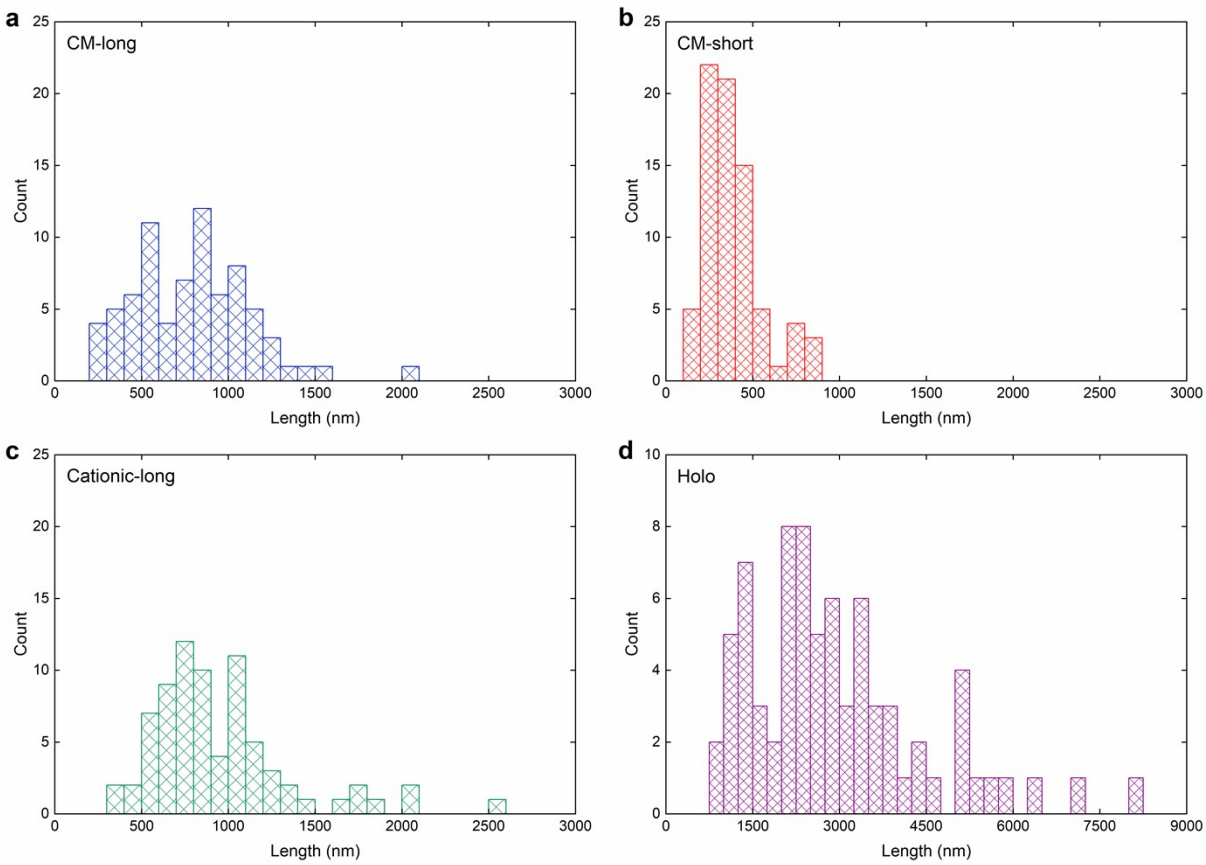


**Fig. S1.** Length distribution for a) CM-long, b) CM-short, c) Cat-long, and d) Holo CNFs.

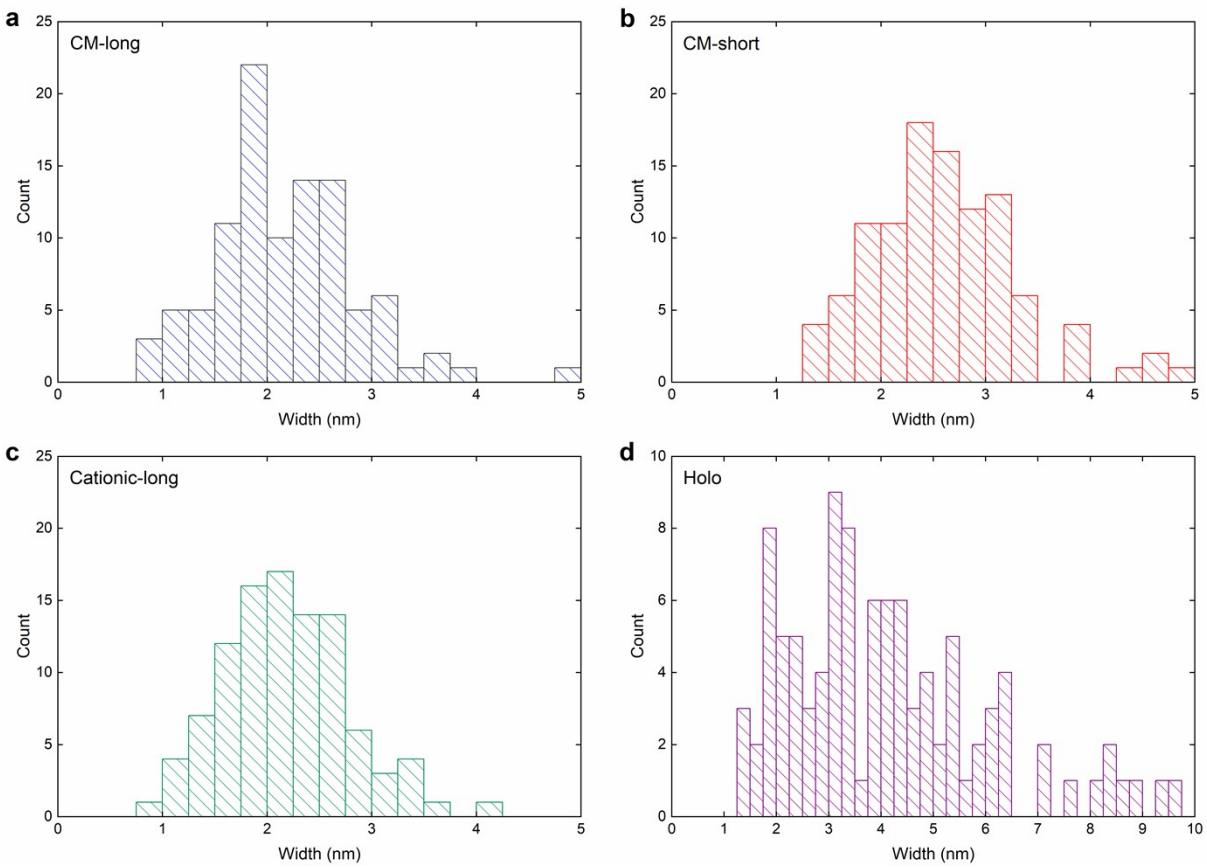


**Fig. S2.** Width distribution for a) CM-long, b) CM-short, c) Cat-long, and d) Holo CNFs.

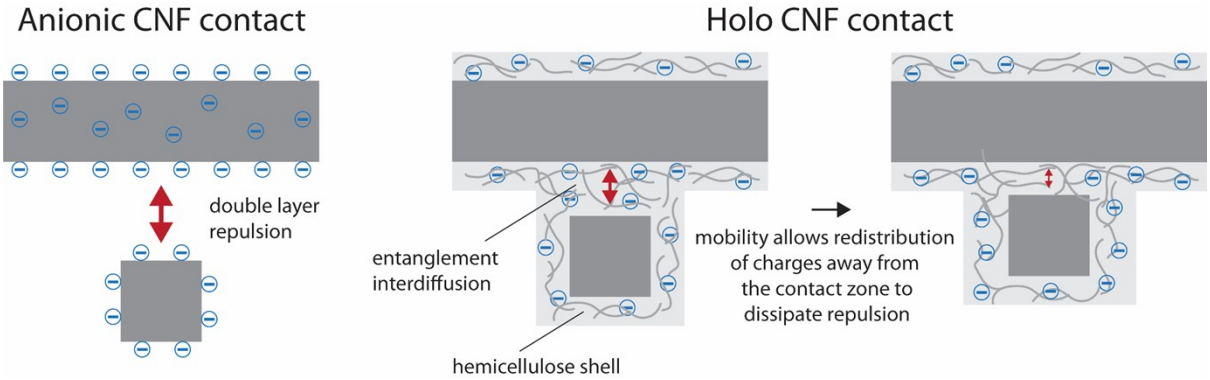


**Fig. S3.** Hypothetical mechanism for Holo-CNF interfaces by entanglement, interdiffusion, and redistribution of charges to dissipate repulsion.

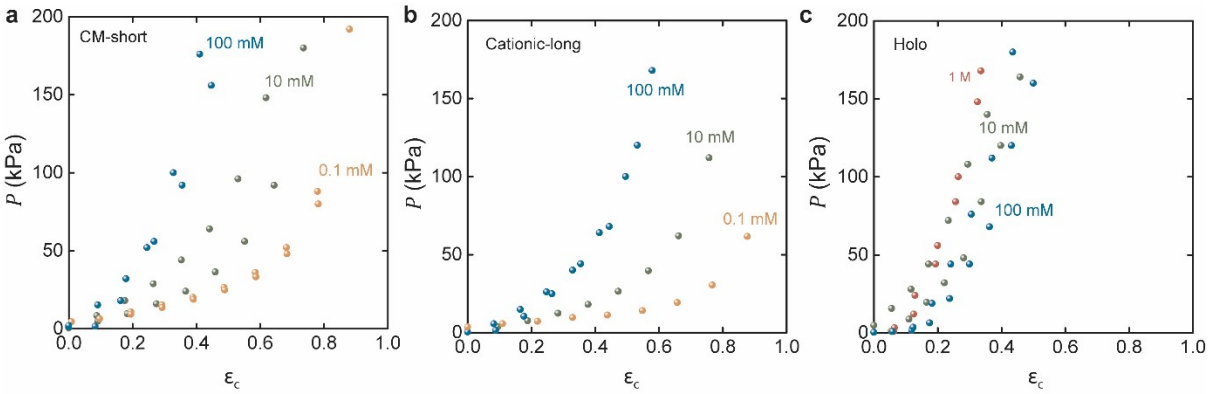


**Fig. S4.** Plate pressure (*P)* as a function of compressive strain for a) CM-short, b) Cat-long, and c) Holo CNFs.

**Table S1.** Steps and relaxation time during compression measurements.

| STEP | COMPRESSION RATE (μm/s) | RELAXATION TIME (min) |
|---|---|---|
| **1** | 0.3 | 20 |
| **2** | 0.3 | 20 |
| **3** | 0.3 | 20 |
| **4** | 0.3 | 20 |
| **5** | 0.2 | 20 |
| **6** | 0.2 | 20 |
| **7** | 0.2 | 40 |
| **8** | 0.1 | 40 |
| **9** | 0.1 | 60 |
| **10** | 0.1 | 60 |