

## SUPPLEMENTARY INFORMATION

# **Oriented collagen films with high Young's modulus by self-assembly on micrometer grooved polydimethylsiloxane**

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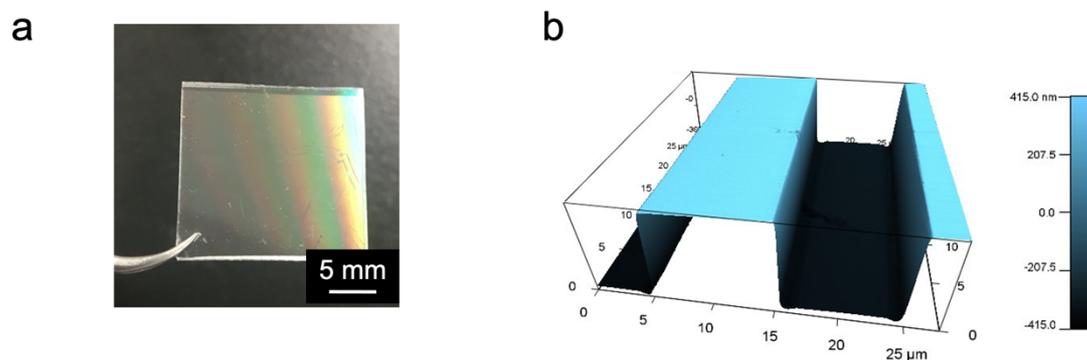
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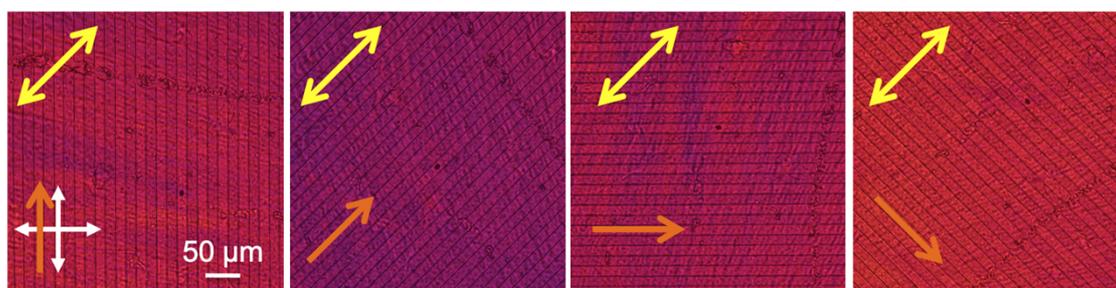
**S1.** Supplementary Figures

**S2.** Description of the Supplementary Movies

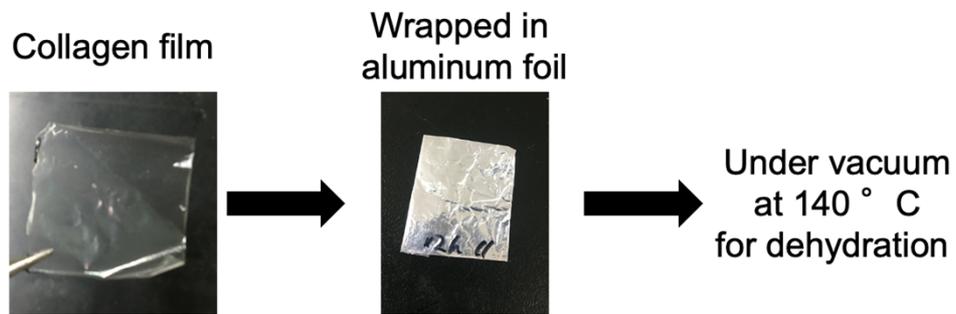
## S1. Supplementary Figures



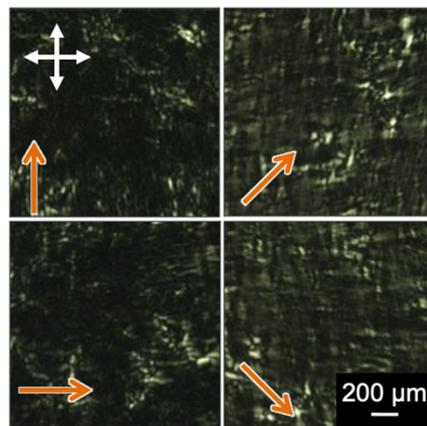
**Fig. S1** (a) Photograph and (b) AFM image of a PDMS film with a micrometer groove. Using atomic force microscopy (AFM) (Cypher S, Oxford Instruments), we confirmed that the PDMS groove had a period of 20  $\mu\text{m}$  and depth of 800 nm.



**Fig. S2** Polarized optical micrographs of the collagen film fabricated on the micrometer grooved PDMS substrate. The orange arrows indicate the groove direction in the film. The yellow arrows show the optical axis of the test plate with a retardation of 530 nm. The white arrows denote the direction of the polarizers.



**Fig. S3** Scheme of DHT treatment process for collagen films.



**Fig. S4** Polarized optical micrographs of the collagen film prepared on the micrometer grooved PDMS substrate after heating for 48 h. The orange arrows indicate the groove direction in the film. The white arrows denote the direction of the polarizers.

## **S2. Description of the Supplementary Movies**

**Supplementary Movie 1.** POM observation of the collagen solution concentrated to approximately 60 mg/ml between a glass substrate. The optical anisotropy was observed by adding a shear stress. The white arrows denote the direction of the polarizers.

**Supplementary Movie 2.** Observation of the solubility to water of collagen films with and without DHT treatment.