

# Microscale and macroscale deformation behavior of electrospun polymeric nanofiber membranes using in-situ SEM during mechanical testing

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## Supporting information

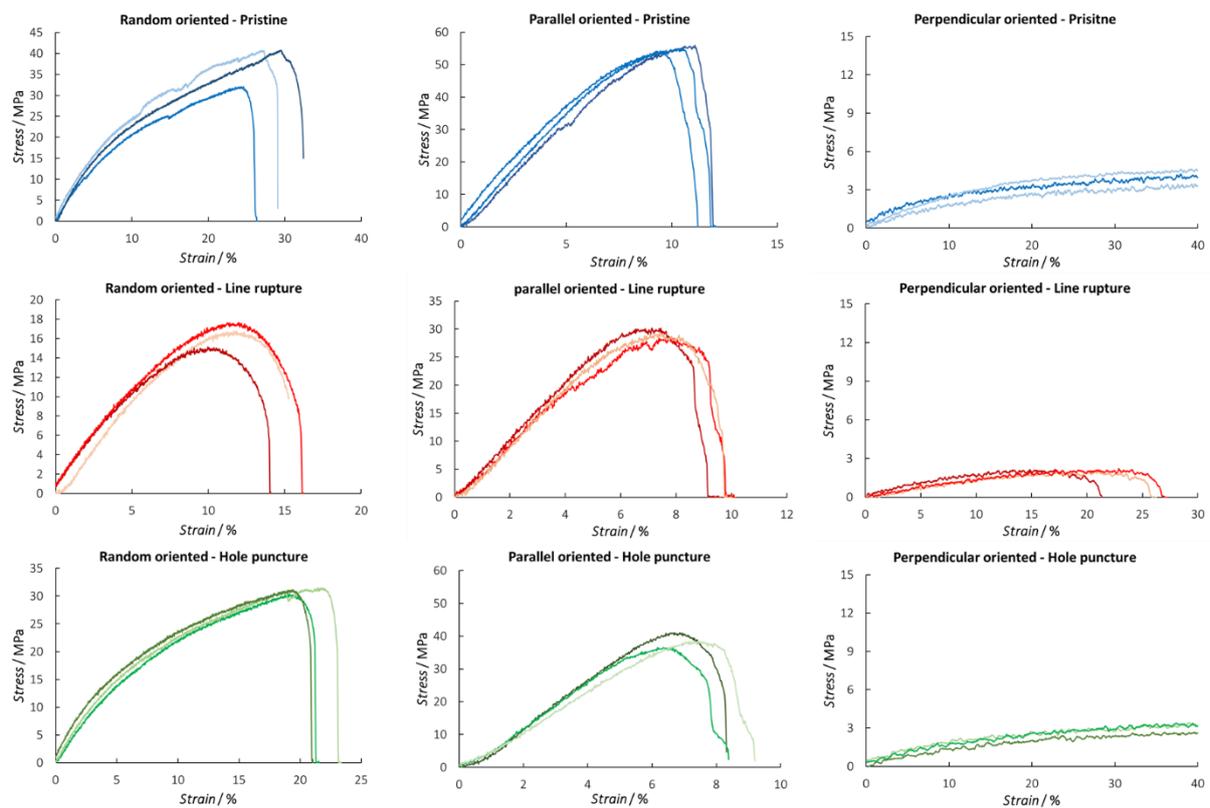
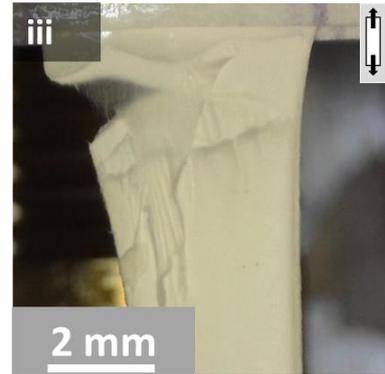
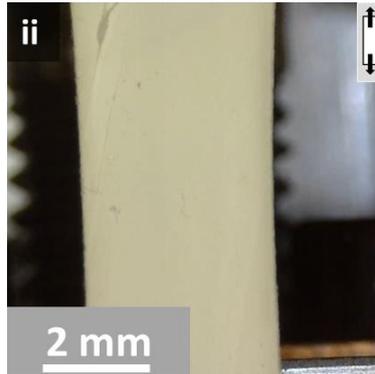
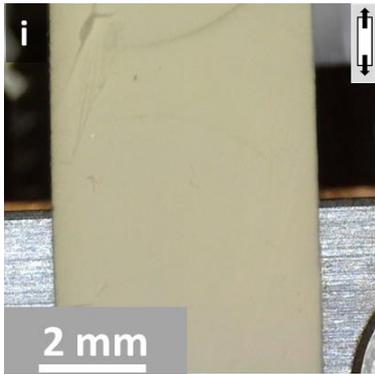
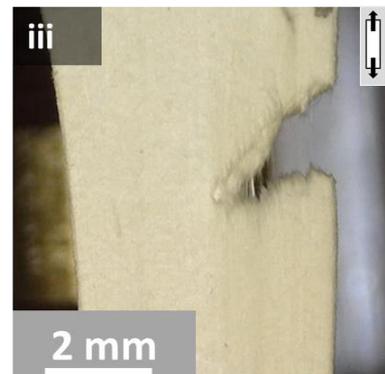
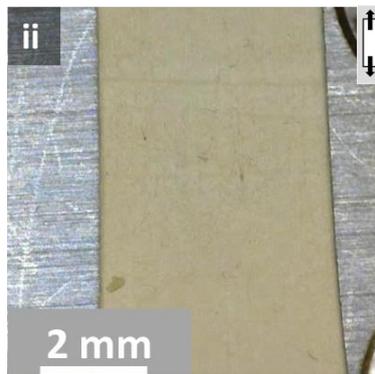


Figure S1: Overview of all stress strain curves grouped per orientation and damage type.

### Random oriented



### Parallel oriented



### Perpendicular oriented

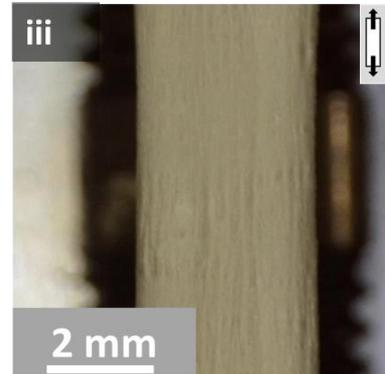
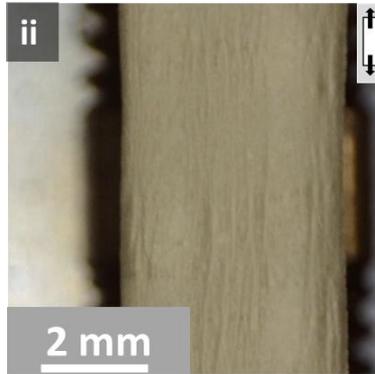
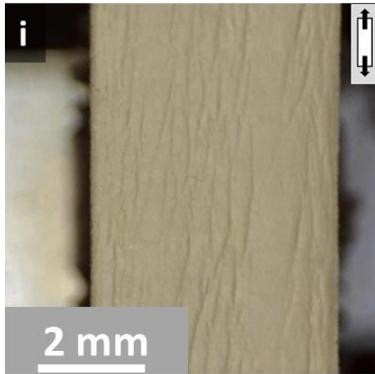


Figure S2: Subsequent deformation images of random, parallel, and perpendicular oriented membranes. Similar behavior is observed for the three different kinds of membranes.

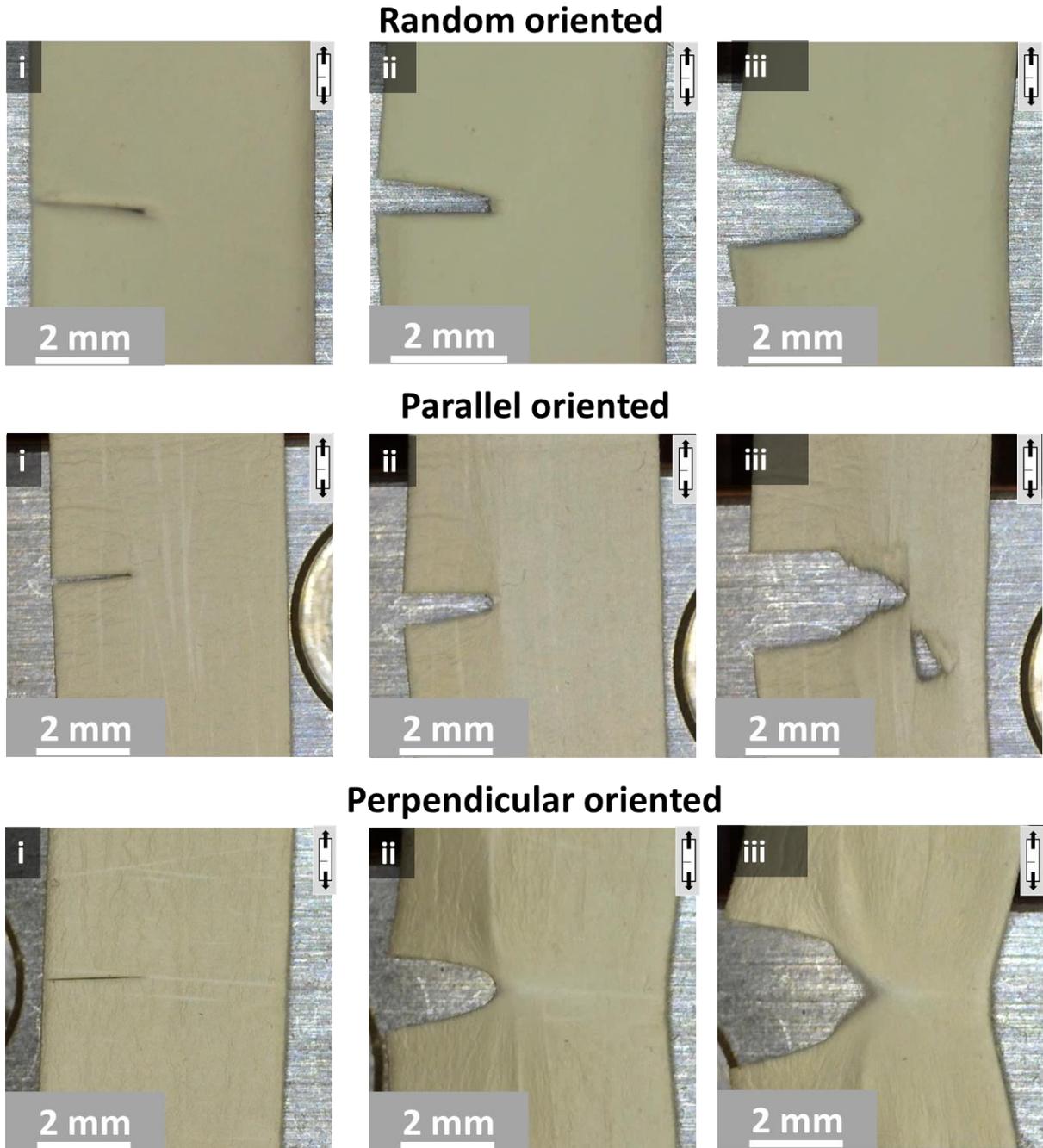
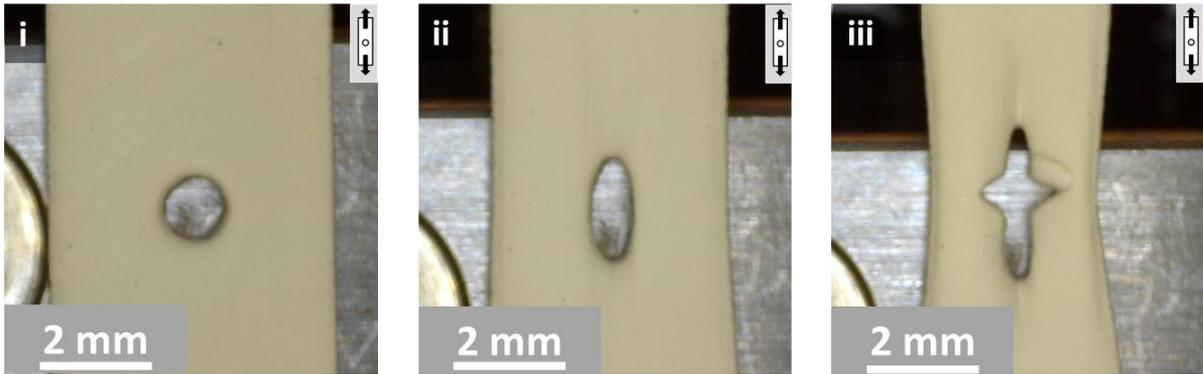
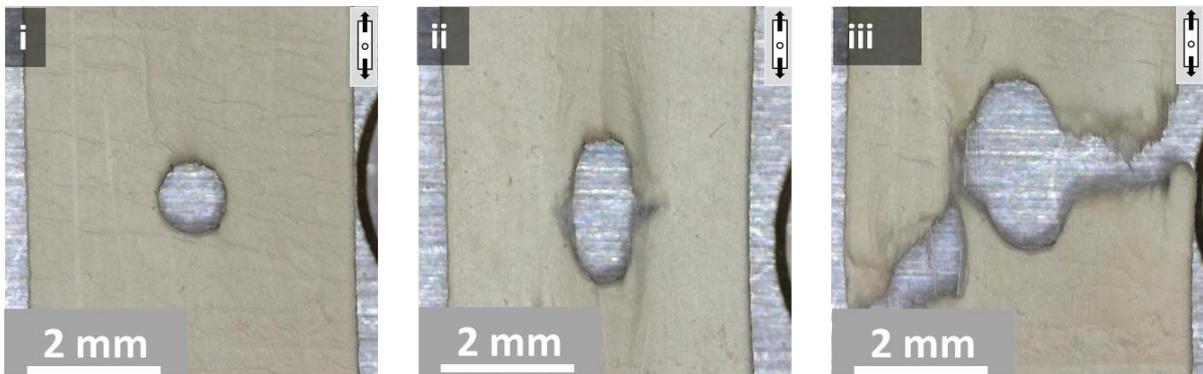


Figure S3: Subsequent deformation images of random, parallel, and perpendicular oriented membranes pre-damaged with a line rupture. Similar behavior macroscopic behavior of crack opening and propagation is observed up to the point of final fracture.

### Random oriented



### Parallel oriented



### Perpendicular oriented

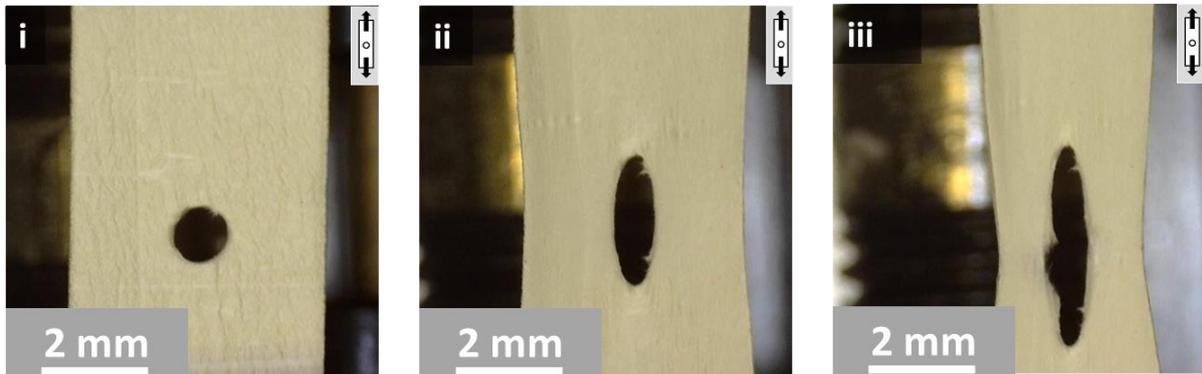


Figure S4: Subsequent deformation images of random, parallel, and perpendicular oriented membranes pre-damaged with a puncture. Similar behavior macroscopic behavior of hole elongation, crack initiation, and propagation is observed.

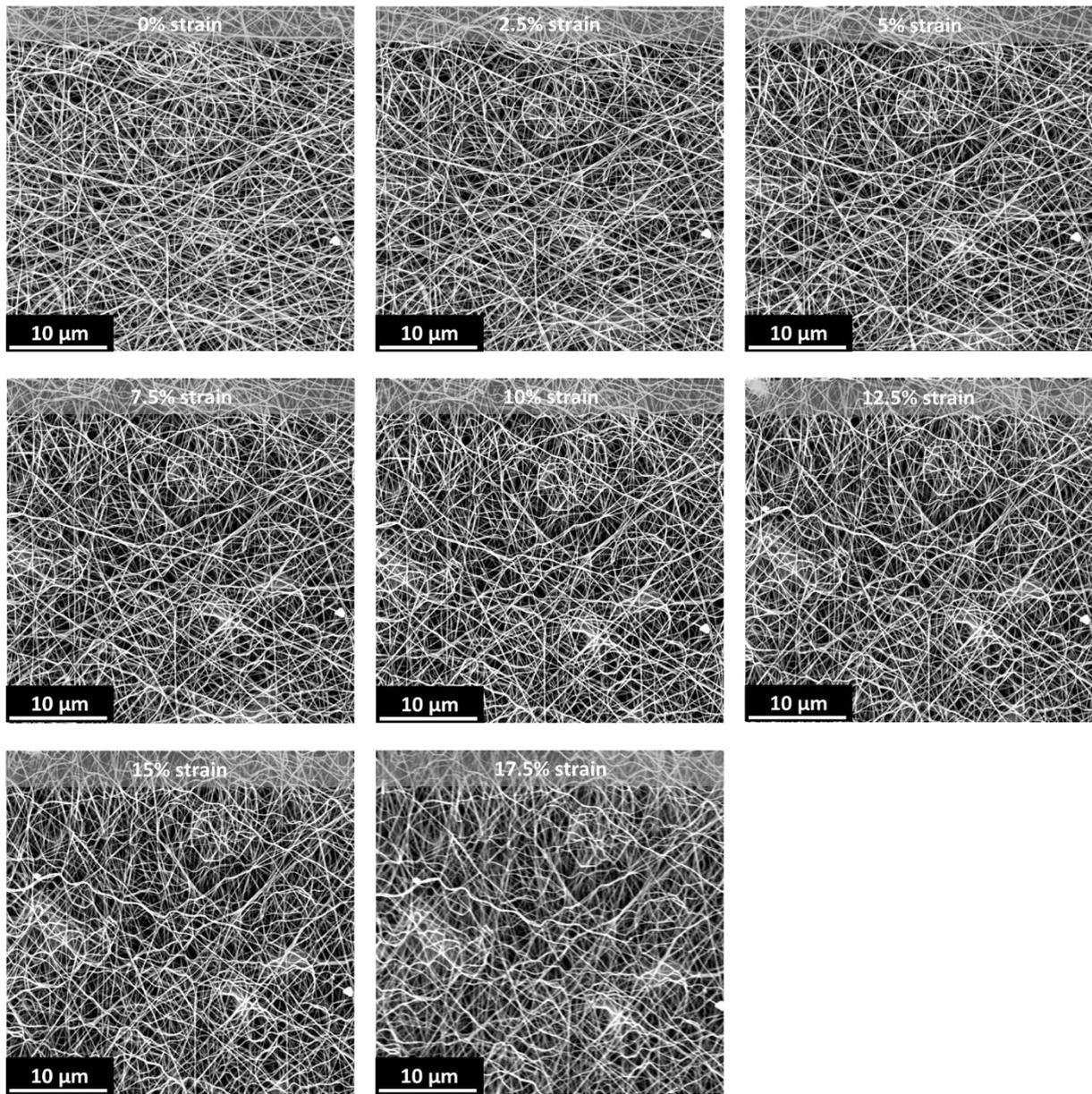


Figure S5: Subsequent SEM deformation images of a pristine random oriented nanofiber membrane.

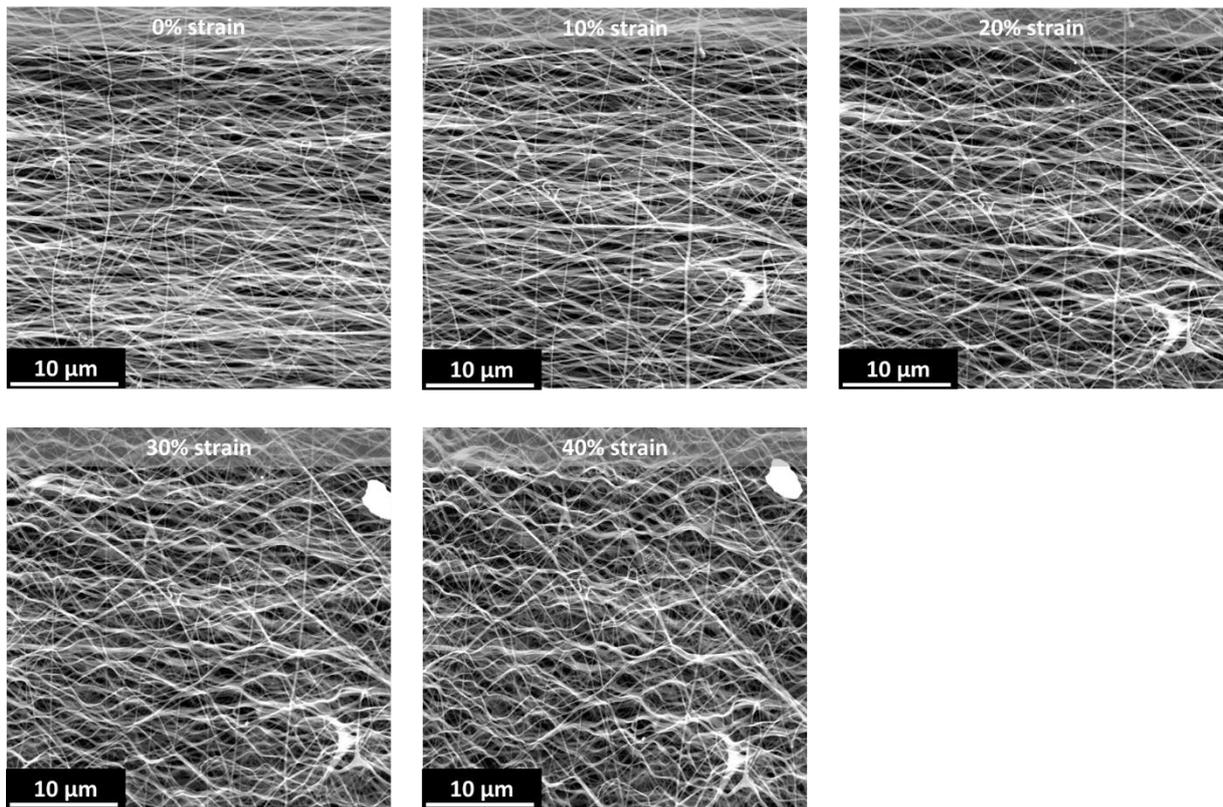


Figure S6: Subsequent images of a pristine parallel oriented nanofiber membrane.