Supplementary Materials

Highly aligned bacterial cellulose/PPy gradient conductive membranes for directed cell differentiation under electrical stimulation

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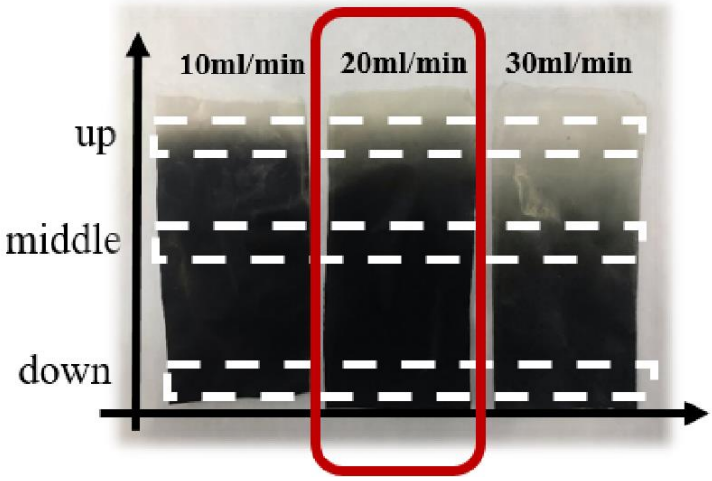


Figure S1. Digital images of 10, 20, 30-BC/PPy gradient conductive membranes.

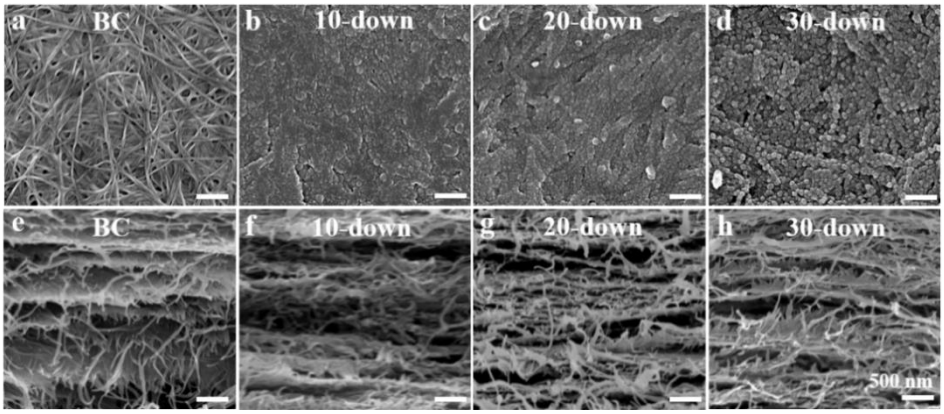


Figure S2. Surface (a-d) and cross-sectional (c-h) FESEM images of the BC (a, e), 10 (b, f), 20 (c, g) and 30 (d, h)-down segment of BC/PPy gradient conductive membrane. Scale bars are 500 nm.

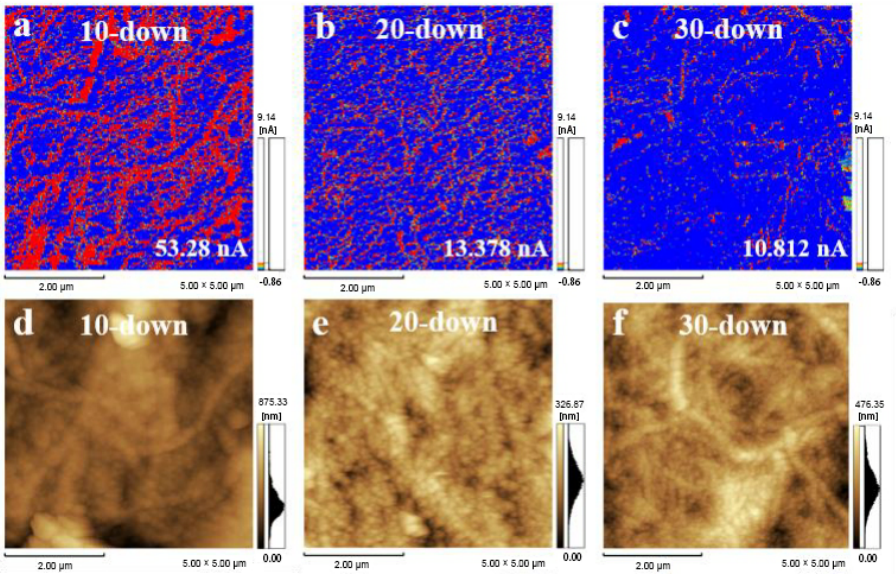


Figure S3. AFM images of current (a-c) and height (d-f) of 10 (a, d), 20 (b-e) and 30 (c-f) -down segment of BC/PPy conducative gradient membranes.

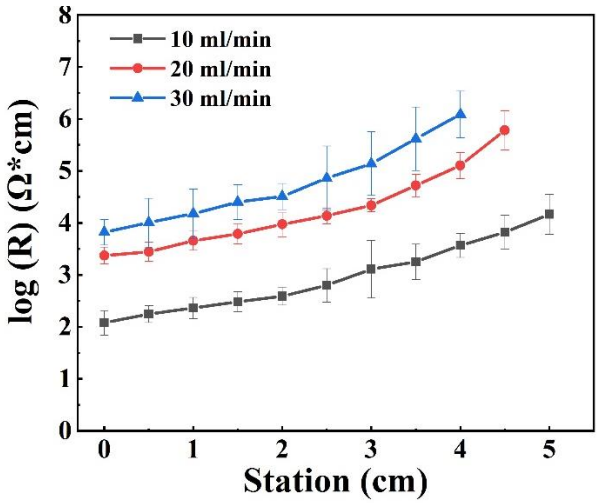


Figure S4. The log (R) values of 10, 20, 30-BC/PPy conducative gradient membranes. n = 3. Error bars represent standard deviation (SD).

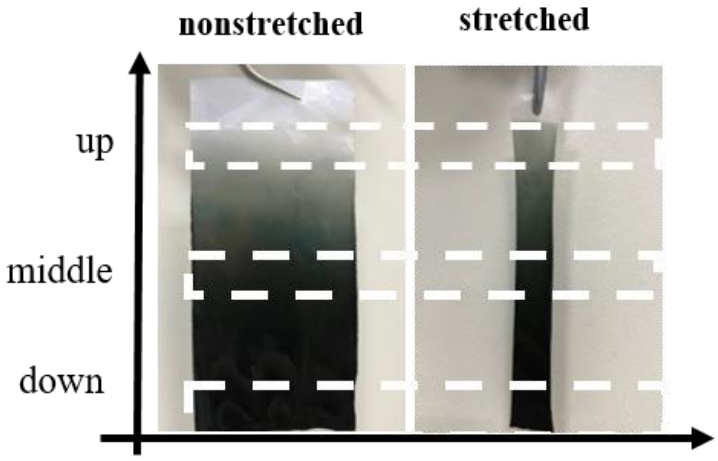


Figure S5. Digital images of nonstretched and stretched BC/PPy gradient conductive membranes.

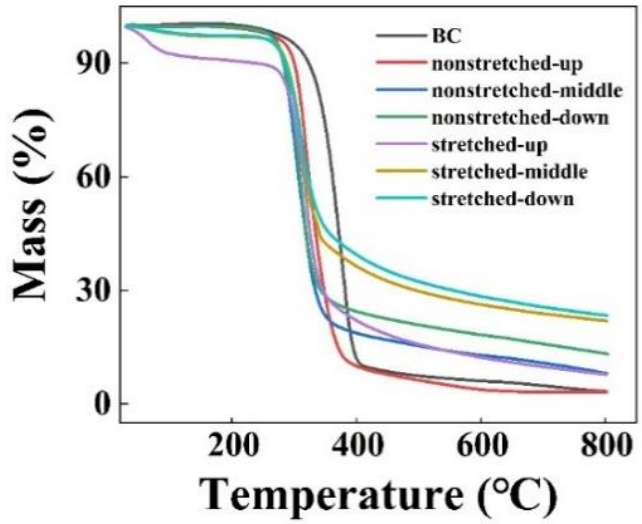


Figure S6. TGA images of BC, nonstretched and stretched BC/PPy conducative gradient membranes.

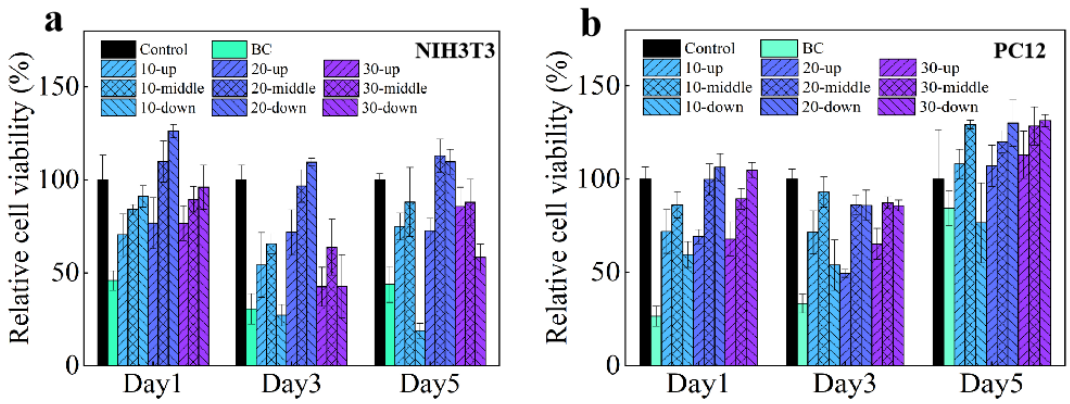


Figure S7. MTT assay of NIH3T3 (a) and PC12 (b) cells cultured on Control (petri dish), BC, 10, 20 and 30-BC/PPy conductive gradient membranes. n = 3. Error bars represent standard deviation (SD).

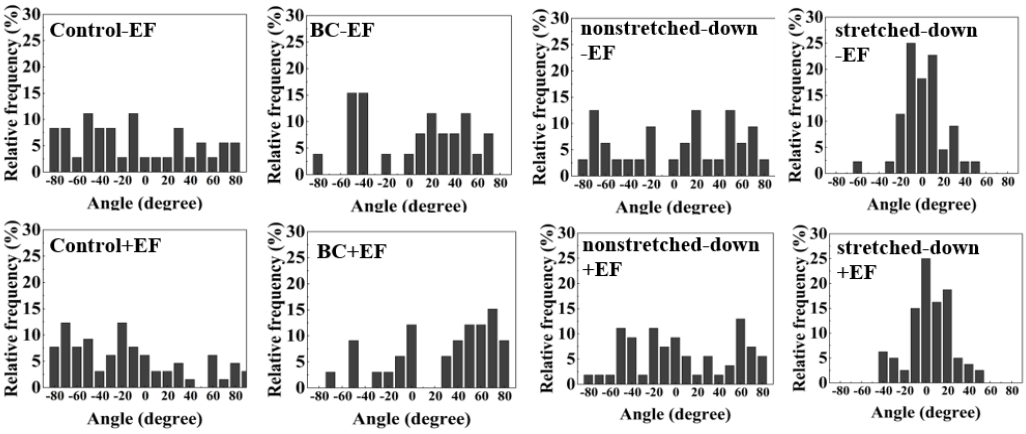
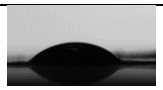
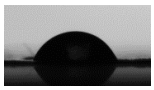
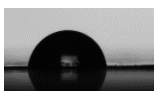


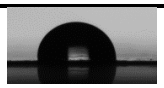
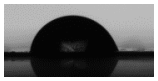
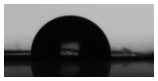
Figure S8. The direction of PC12 cell neurite extension after culturing on Control (petri dish), BC, nonstretched-down and stretched-down BC/PPy gradient conductive membranes in the absence or presence of electrical stimulation, respectively. n =3.

Table S1. Elements analysis of BC, nonstretched and stretched BC/PPy conducative gradient membranes.

Sample	Elements (atomic %)			
	C	N	Cl	S
BC	98.56	1.44	0	0
nonstretched-up	96.43	3.57	0	0
nonstretched-middle	93.58	5.32	0	1.11
nonstretched-down	88.61	9.37	0.26	1.76
stretched-up	95.9	3.9	0	0.4
stretched-middle	90.1	8.3	0.2	1.5
stretched-down	88.1	9.6	0.4	1.9

Table S2. Contact angles of the nonstretched and stretched BC/PPy gradient conductive membranes.

Samples	Water contact angle (°)	Image of drops
BC	46	
nonstretched-up	68	
nonstretched-middle	88	

nonstretched-down	96	
stretched-up	83	
stretched-middle	90	
stretched-down	122