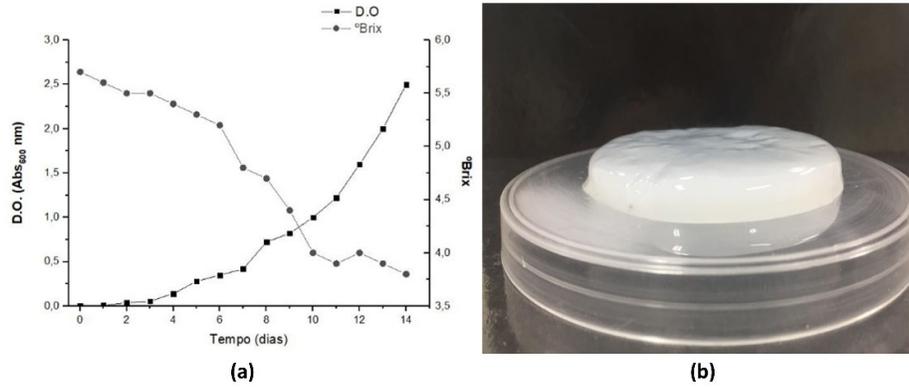
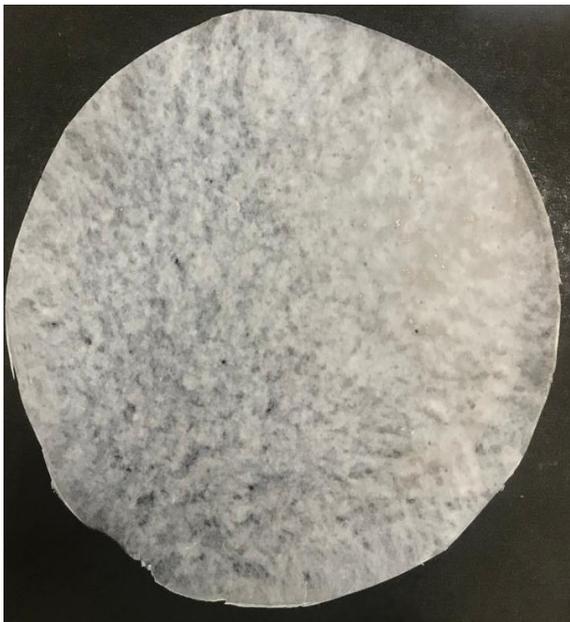


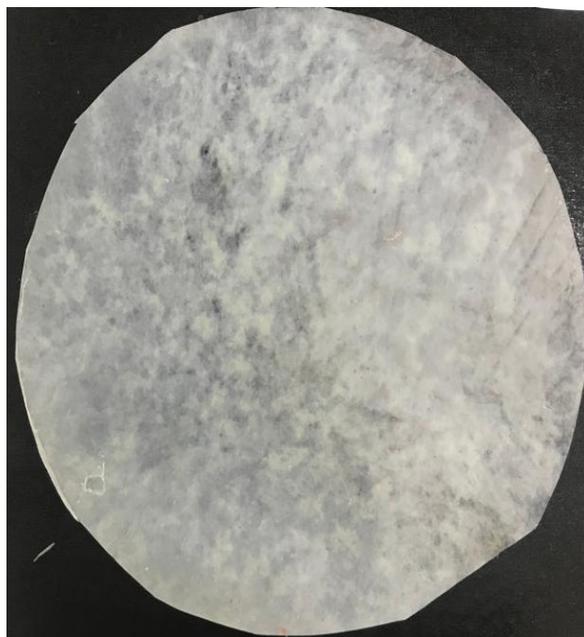
## Supplementary Material



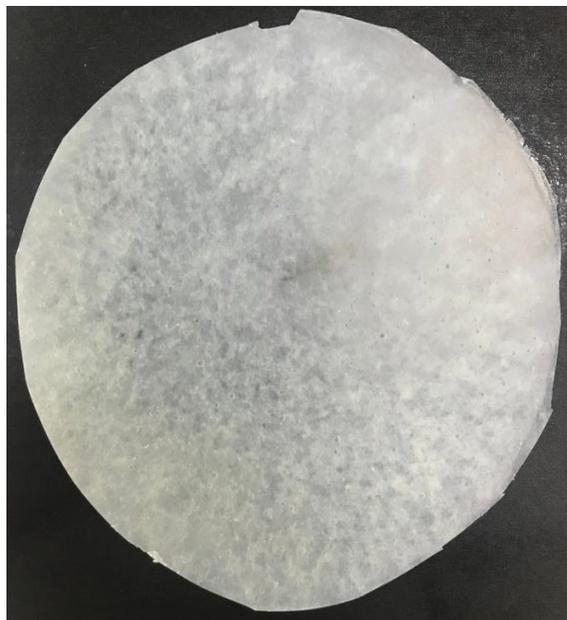
**Figure S1.** (a) Bacterial cellulose production kinetics determined from bacterial growth ( $OD_{Abs500nm}$ ) and total soluble solids content ( $^{\circ}Brix$ ) during 14 days of static culture; (b) Purified cellulose membrane after alkaline treatment.



**Figure S2.** Original image of wound dressing F1.



**Figure S3.** Original image of wound dressing F2.



**Figure S4.** Original image of wound dressing F3.



**Figure S5.** Original image of wound dressing F4.



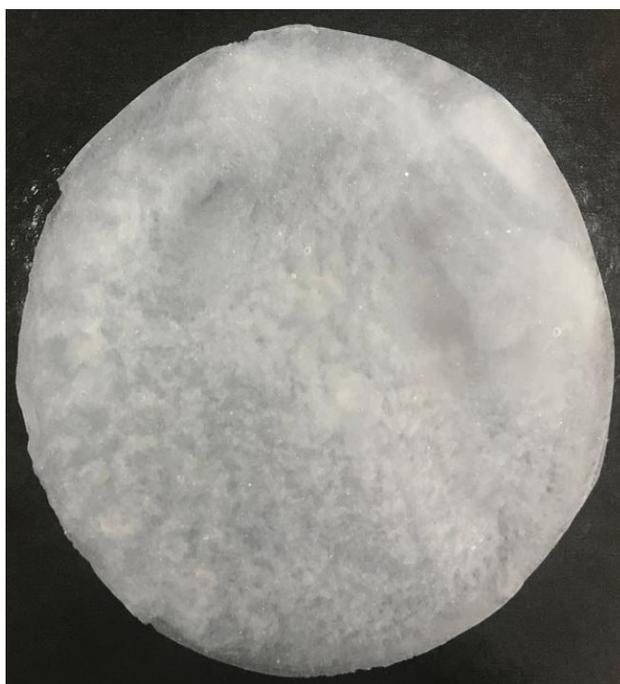
**Figure S6.** Original image of wound dressing F5.



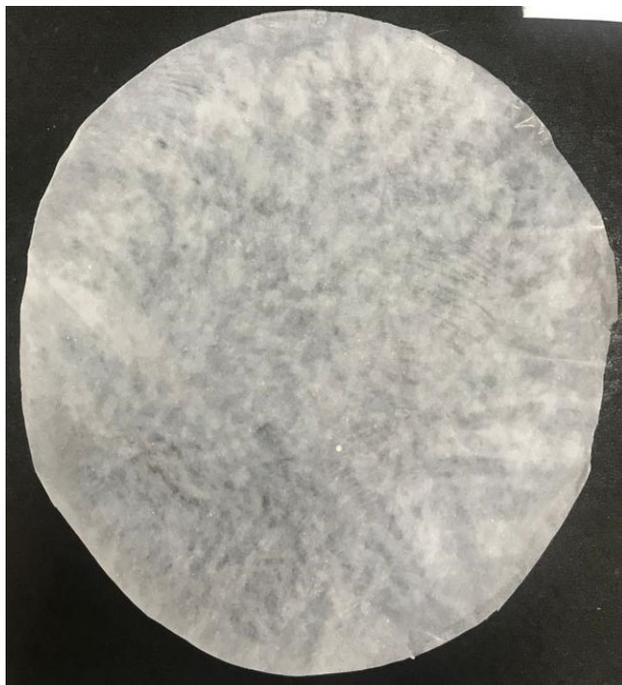
**Figure S7.** Original image of wound dressing F6.



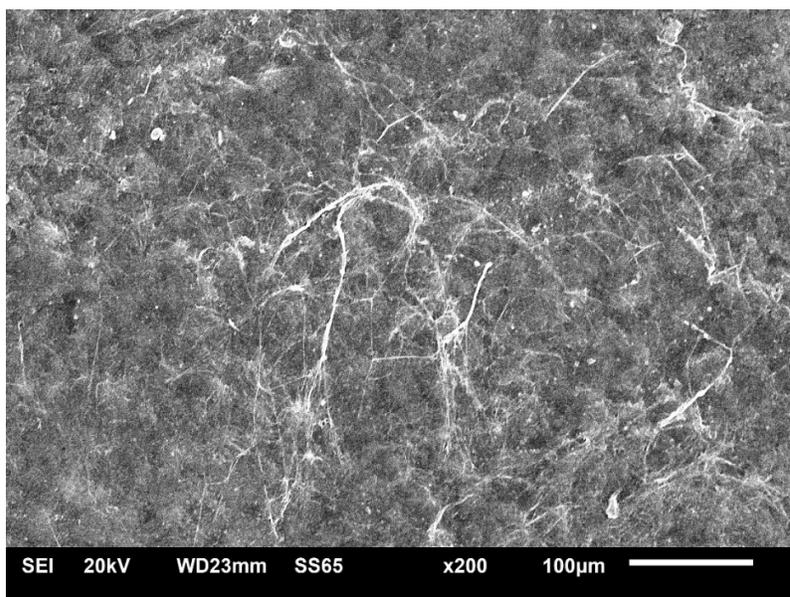
**Figure S8.** Original image of wound dressing F7.



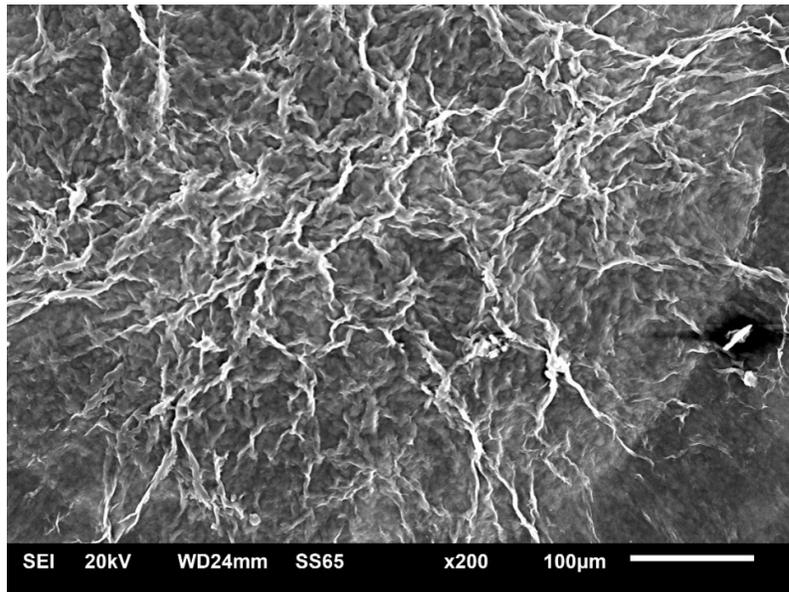
**Figure S9.** Original image of wound dressing F8.



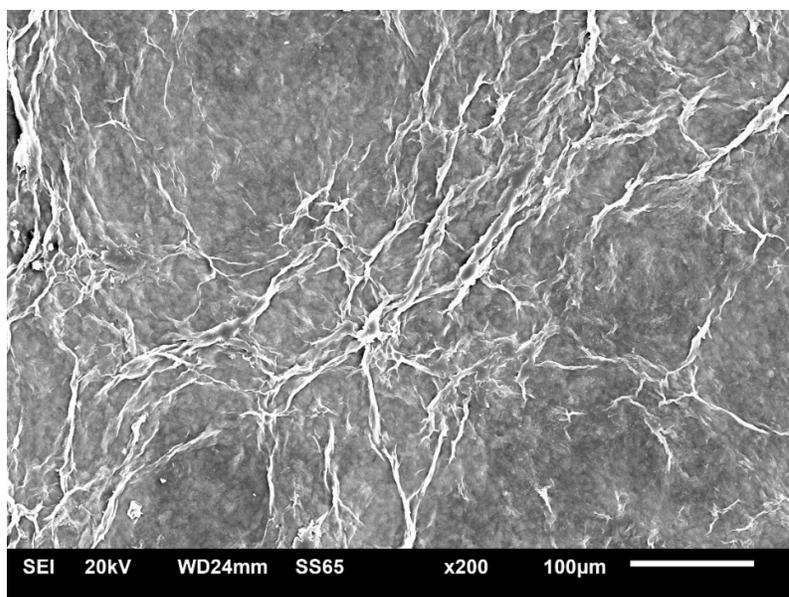
**Figure S10.** Original image of wound dressing F9.



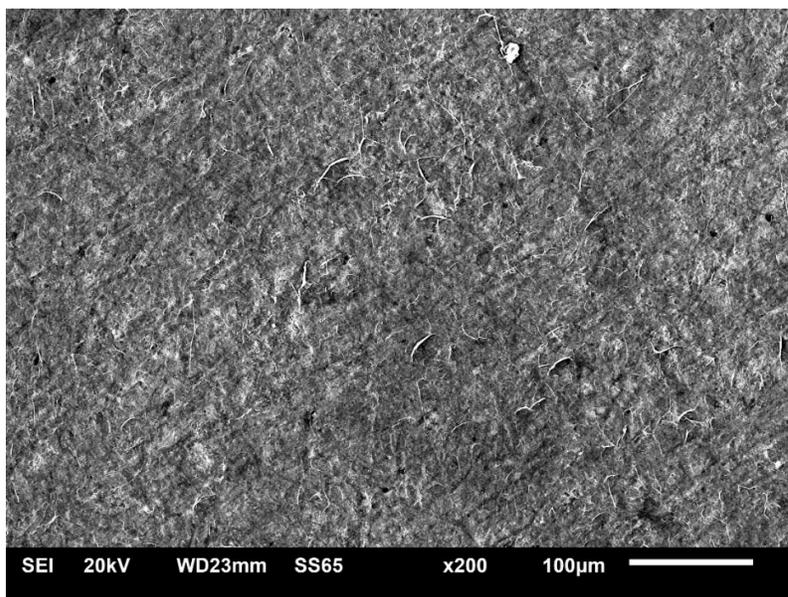
**Figure S11.** Original format of the scanning electron microscopy surface micrograph of the surface of the F1 wound dressing.



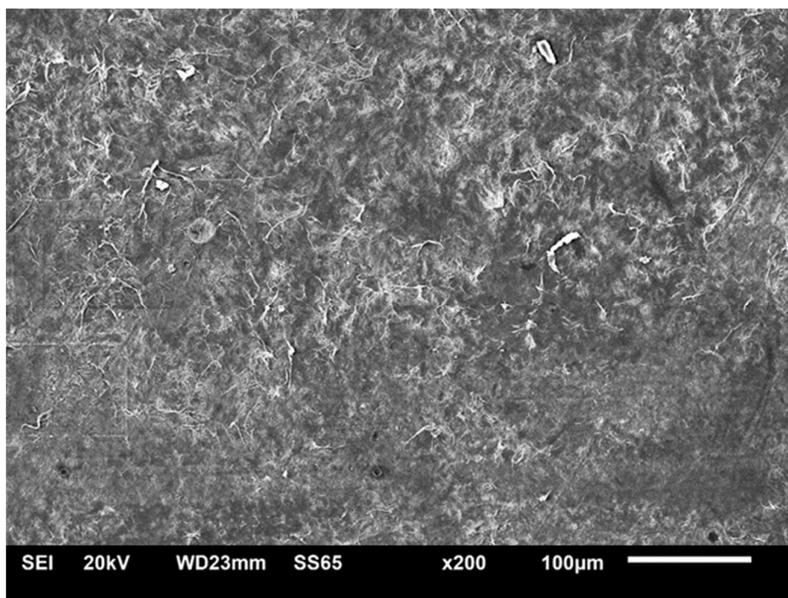
**Figure S12.** Original format of the scanning electron microscopy surface micrograph of the surface of the F2 wound dressing.



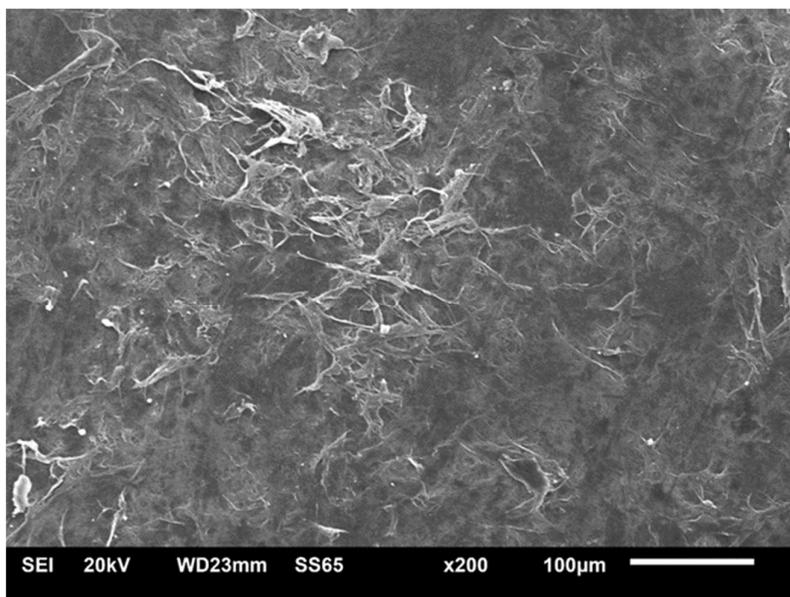
**Figure S13.** Original format of the scanning electron microscopy surface micrograph of the surface of the F3 wound dressing.



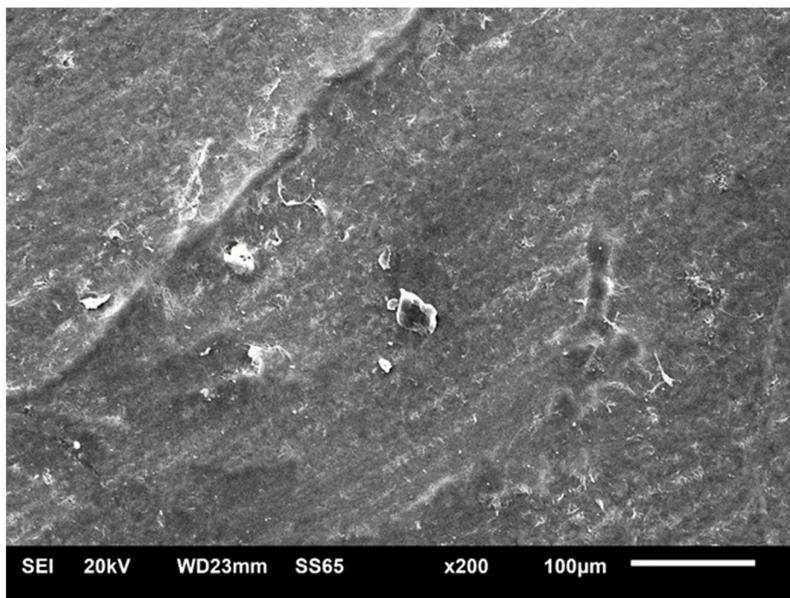
**Figure S14.** Original format of the scanning electron microscopy surface micrograph of the surface of the F4 wound dressing.



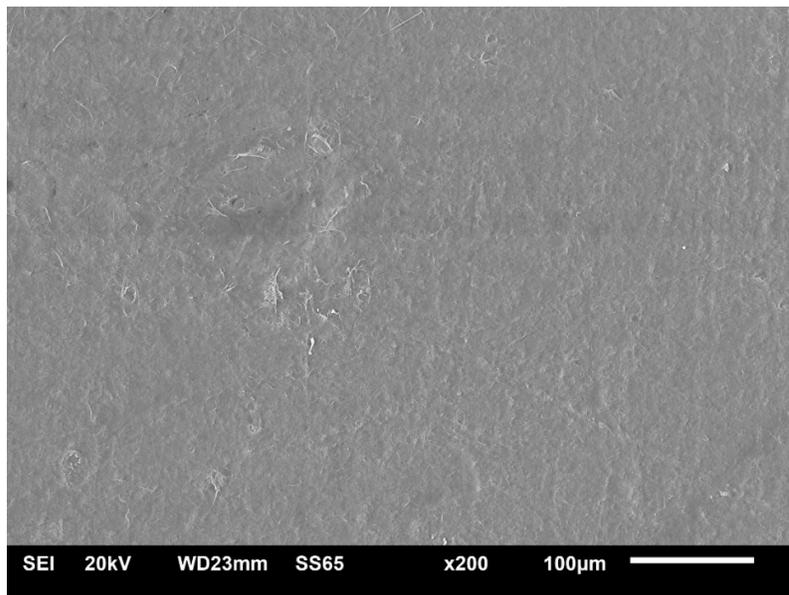
**Figure S15.** Original format of the scanning electron microscopy surface micrograph of the surface of the F5 wound dressing.



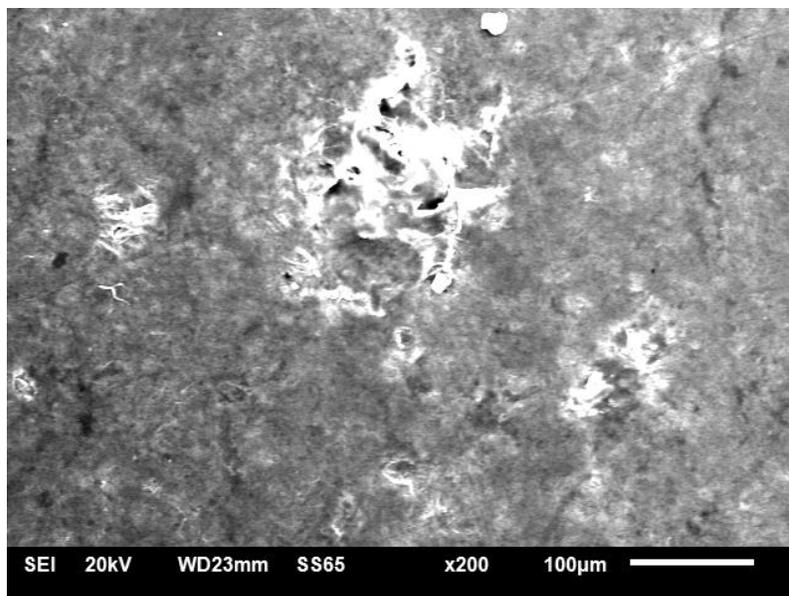
**Figure S16.** Original format of the scanning electron microscopy surface micrograph of the surface of the F6 wound dressing.



**Figure S17.** Original format of the scanning electron microscopy surface micrograph of the surface of the F7 wound dressing.



**Figure S18.** Original format of the scanning electron microscopy surface micrograph of the surface of the F8 wound dressing.

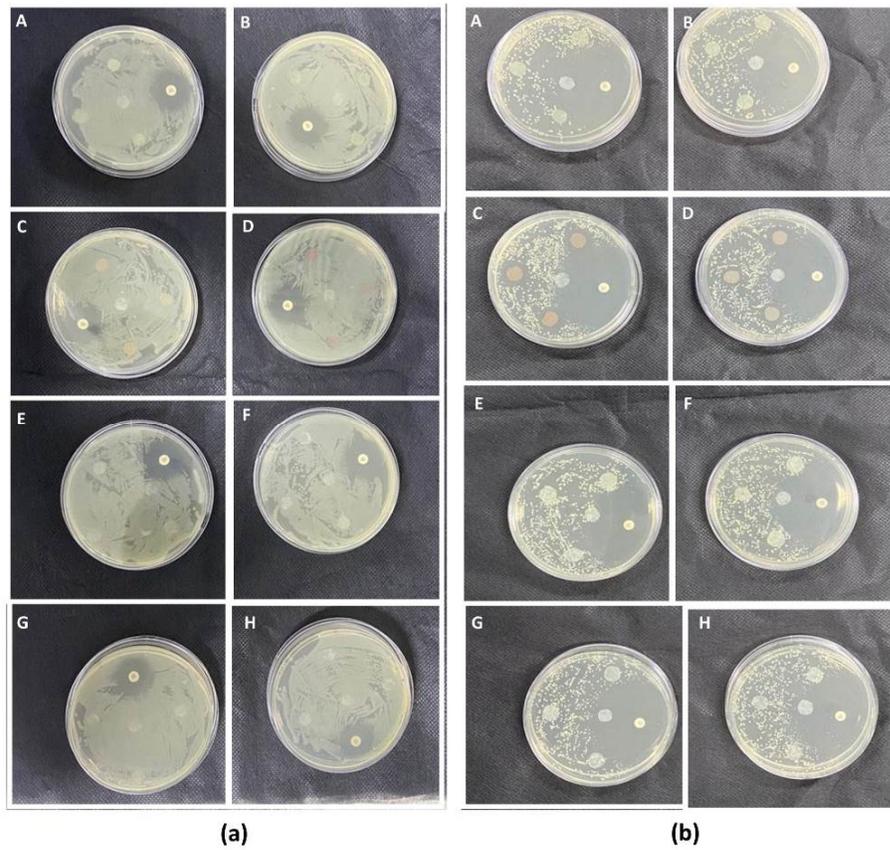


**Figure S19.** Original format of the scanning electron microscopy surface micrograph of the surface of the F9 wound dressing.

**Table S1.** Optical, Physical, barrier, and mechanical properties, as well as TFC, TPC and antioxidant activity of nine wound dressings based on bacterial cellulose and different active substances (ethanolic extract of green and red propolis, *p*-coumaric acid and biochanin A). No significant difference between values with the same superscript letter (a,b,c,d) in the same row ( $p > 0.05$ ), according to the Tukey test with 95% confidence.

Tests	Samples								
	F1	F2	F3	F4	F5	F6	F7	F8	F9
Transparency ( $T_{600} \cdot \text{mm}^{-1}$ )	31.80±2.569 <sup>e</sup>	33.80±2.228 <sup>de</sup>	28.59±0.908 <sup>e</sup>	87.71±8.771 <sup>ab</sup>	58.43±9.237 <sup>b</sup>	53.99±8.861 <sup>cd</sup>	94.50±1.798 <sup>c</sup>	93.53±11.301 <sup>a</sup> b	110.62±12.07 7 <sup>a</sup>
Opacity ( $A_{500} \cdot \text{mm}^{-1}$ )	50.48±0.151 <sup>a</sup>	34.54±3.207 <sup>bc</sup>	39.45±1.004 <sup>b</sup>	29.85±1.171 <sup>c</sup>	41.63±2.947 <sup>b</sup>	42.40±6.381 <sup>a</sup> b	35.95±2.489 <sup>bc</sup>	34.31±2.817 <sup>bc</sup>	28.43±1.804 <sup>c</sup>
Grammage ( $\text{g} \cdot \text{cm}^{-2}$ )	0.006±0.001 <sup>ab</sup>	0.009±0.003 <sup>a</sup>	0.007±0.001 <sup>ab</sup>	0.008±0.001 <sup>ab</sup>	0.009±0.001 <sup>a</sup>	0.008±0.001 <sup>a</sup> b	0.004±0.001 <sup>b</sup>	0.006±0.001 <sup>ab</sup>	0.005±0.001 <sup>b</sup>
Thickness (mm)	0.029±0.001 <sup>bc</sup>	0.023±0.001 <sup>c</sup>	0.029±0.004 <sup>bc</sup>	0.024±0.001 <sup>c</sup>	0.034±0.006 <sup>b</sup>	0.029±0.004 <sup>bc</sup>	0.031±0.006 <sup>b</sup>	0.033±0.005 <sup>b</sup>	0.046±0.006 <sup>a</sup>
$a_w$	0.354±0.010 <sup>bc</sup>	0.344±0.012 <sup>bcd</sup>	0.360±0.001 <sup>b</sup>	0.324±0.001 <sup>cde</sup>	0.338±0.008 <sup>bcd</sup>	0.435±0.029 <sup>a</sup>	0.455±0.011 <sup>a</sup>	0.314±0.007 <sup>de</sup>	0.292±0.003 <sup>e</sup>
Water solubility (%)	6.25±0.000 <sup>e</sup>	32.89±7.292 <sup>bcd</sup>	33.89±7.978 <sup>bc</sup>	34.63±6.258 <sup>bc</sup>	11.04±1.204 <sup>e</sup>	44.49±6.969 <sup>b</sup>	65.58±4.073 <sup>a</sup>	28.54±1.628 <sup>cd</sup>	18.97±1.012 <sup>de</sup>
Moisture Content Index (%)	27.44±10.819 <sup>c</sup>	70.32±3.576 <sup>ab</sup>	65.38±9.093 <sup>ab</sup>	62.75±3.179 <sup>ab</sup>	58.33±15.362 <sup>a</sup> b	66.97±0.755 <sup>a</sup> b	84.87±2.270 <sup>a</sup>	64.96±1.567 <sup>ab</sup>	56.36±2.421 <sup>b</sup>
Swelling Index (%)	48.93±6.020 <sup>c</sup>	240.52±43.694 b	234±12.222 <sup>bc</sup>	169.83±23.752 bc	202.03±10.184 bc	202.90±6.862 bc	405.55±4.811 <sup>a</sup>	185.85±12.962 bc	175.44±5.196 bc
WVTR	7.86±1.530 <sup>c</sup>	33.36±1.488 <sup>a</sup>	38.11±5.762 <sup>a</sup>	8.78±0.577 <sup>c</sup>	8.66±0.678 <sup>c</sup>	19.42±0.261 <sup>b</sup>	11.79±0.805 <sup>c</sup>	9.173±0.642 <sup>c</sup>	11.84±1.769 <sup>c</sup>

(g.m <sup>2</sup> .day <sup>-1</sup> )									
WPV (g.mm/m <sup>2</sup> .day.P a)	2.29±0.444 <sup>e</sup>	7.48±0.329 <sup>b</sup>	10.30±0.195 <sup>a</sup>	2.32±0.155 <sup>e</sup>	2.45±0.189 <sup>e</sup>	6.64±0.196 <sup>b</sup>	5.68±0.860 <sup>c</sup>	2.50±0.176 <sup>e</sup>	3.74±0.560 <sup>d</sup>
Maximum Tensile Strength (MPa)	3.00±1.276 <sup>ab</sup>	3.14±0.229 <sup>ab</sup>	2.01±0.351 <sup>bcd</sup>	4.15±0.701 <sup>a</sup>	2.97±0.933 <sup>ab</sup>	0.67±0.163 <sup>de</sup>	0.53±0.043 <sup>e</sup>	1.01±0.676 <sup>cde</sup>	2.30±0.590 <sup>bc</sup>
Elongation (%)	132.20±35.057 <sub>bc</sub>	165.11±15.196 <sub>bc</sub>	204.50±28.861 <sub>ab</sub>	136.34±25.093 <sub>bc</sub>	130.90±11.457 <sub>bc</sub>	99.13±0.548 <sup>c</sup>	262.39±104.39 <sub>g<sup>a</sup></sub>	147.67±65.324 <sub>bc</sub>	137.62±34.31 <sub>bc</sub>
Flavonoids (mgQE.g <sup>-1</sup> )	0.05±0.003 <sup>f</sup>	12.03±0.152 <sup>d</sup>	17.43±0.153 <sup>c</sup>	24.30±0.871 <sup>b</sup>	39.16±0.072 <sup>a</sup>	0.07±0.004 <sup>f</sup>	0.07±0.001 <sup>f</sup>	1.19±0.066 <sup>e</sup>	1.51±0.005 <sup>e</sup>
Phenolic Compounds (mgGAE.g <sup>-1</sup> )	0.00 <sup>g</sup>	380.43 <sup>d</sup>	857.34 <sup>c</sup>	1084.10 <sup>b</sup>	1228.33 <sup>a</sup>	0.04 <sup>e</sup>	0.40 <sup>e</sup>	0.02 <sup>f</sup>	0.02 <sup>f</sup>
DPPH (%)	86.76±4.152 <sup>a</sup>	56.26±4.085 <sup>d</sup>	55.73±2.218 <sup>d</sup>	32.93±4.026 <sup>e</sup>	21.23±3.453 <sup>f</sup>	58.90±1.212 <sup>cd</sup>	58.20±5.729 <sup>cd</sup>	75.13±2.742 <sup>b</sup>	68.96±5.130 <sup>bc</sup>



**Figure S20.** Analysis of the antimicrobial activity of the 8 active wound dressings developed (F2, F3, F4, F5, F6, F7, F8 and F9, referring to letters A, B, C, D, E, F, G and H, respectively): against (a) *E. coli* and (b) *S. aureus*.