Supplementary Material

Cellulose-Based Hydrogels Towards an Antibacterial Wound Dressing

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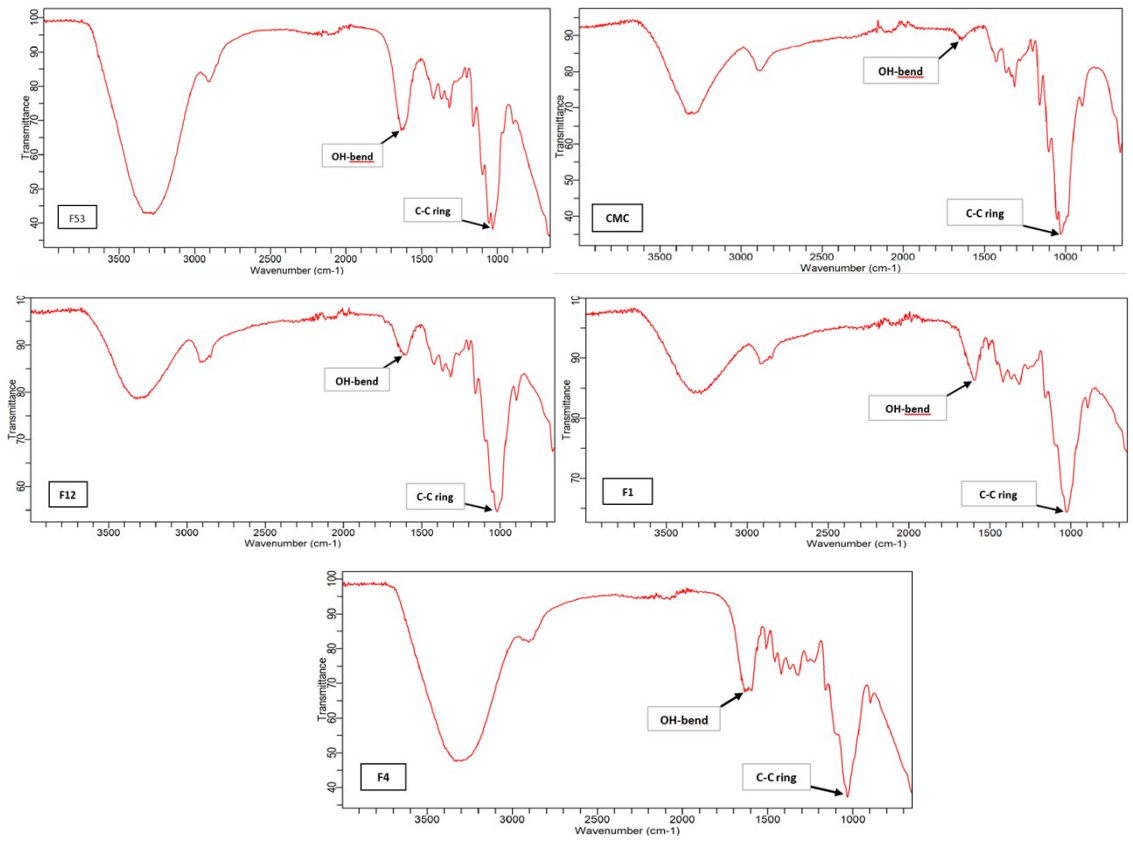
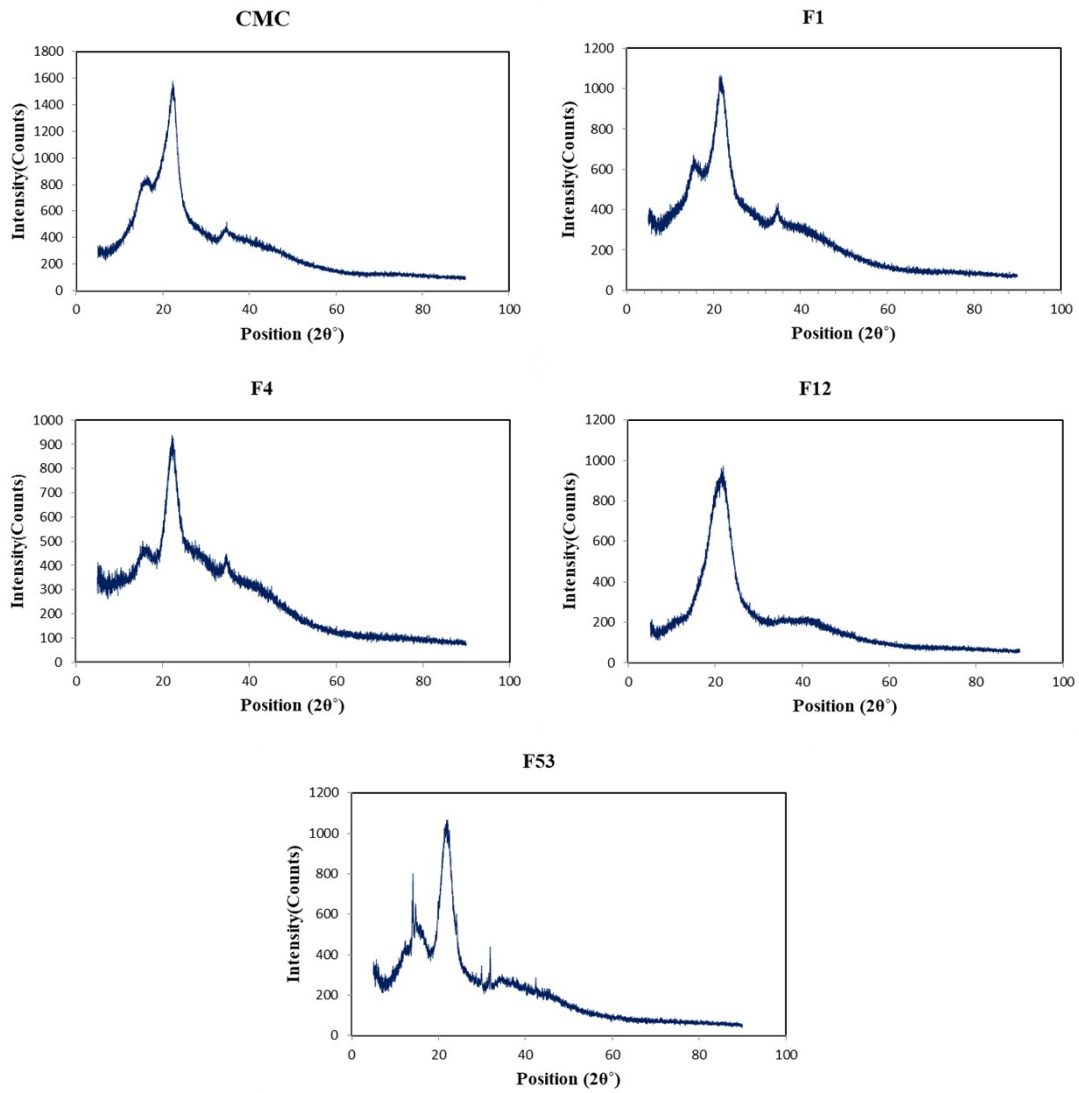
Supplementary Figure 1.



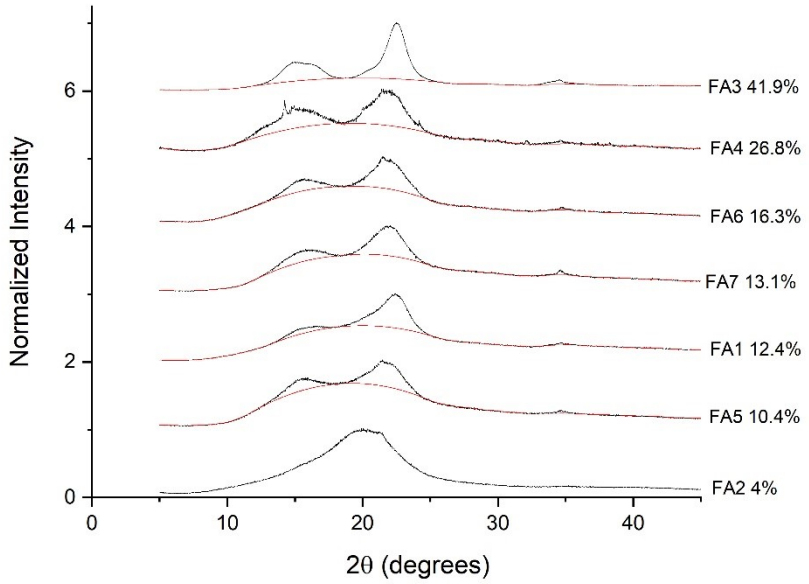
Supplementary Figure 1. Fourier-transform infrared spectra of natural cellulose compared to commercial cellulose: CMC, F53, F12, F7, and F1.

Supplementary Figure 2.

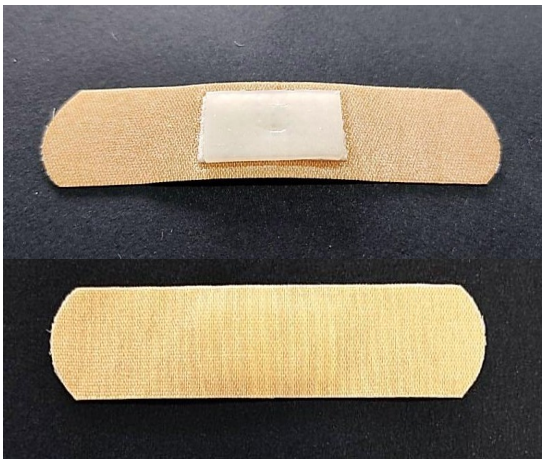


Supplementary figure 2: X-ray diffraction analysis of the cellulose samples CMC, F1, F4, F12, and F53. By using Equation 1 we can see that F53 has the bigger crystallinity index; crystallinity is a factor that affects the properties of cellulose.

Supplementary Figure 3.



Supplementary Figure 4.



Supplementary Figure 4: Prototype design of the cellulose-based hydrogel for a wound healing bandage, here the hydrogel was formed in the top of the white fiber as a coating so it can provide moisture and bacterial defense in wounds.

Appendix A: Raw data of the absorption test of cellulose-hydrogels

Table S1. Weigh measures of the dry hydrogels for the absorption test

SAMPLES	Weight/Dry					Mean
	1	2	3	4	5	
F1	0,1206	0,1298	0,1221	0,1272	0,1248	0,1249
F4	0,1275	0,1273	0,1239	0,1298	0,1245	0,1266
F12	0,0601	0,0597	0,0589	0,0587	0,0576	0,059

F53	0,0534	0,0569	0,0565	0,0586	0,05219	0,055518
CMC	0,1349	0,1311	0,1302	0,1347	0,1386	0,1339

Table S2. Weigh measures of the dry hydrogels after absorbing the PBS for the absorption test.

SAMPLES	Weight/With PBS					Mean
	1	2	3	4	5	
F1	0,5297	0,5279	0,5439	0,5227	0,5198	0,5288
F4	0,5601	0,5897	0,5689	0,5446	0,5472	0,5621
F12	0,4618	0,5222	0,4921	0,4894	0,4895	0,491
F53	0,6172	0,6137	0,6143	0,6147	0,6201	0,616
CMC	0,5523	0,5386	0,5381	0,5318	0,5157	0,5353

Appendix B: Raw data of the ex-vivo antibacterial test as proof of concept

Table S3. : Raw results of the antibacterial test, at four different times, for the hydrogels against bacteria.

REPLICA 1				
HYDROGEL	To	T1	T2	T3
F4	0	21	57	150
F12	0	5	42	150
F53	0	5	7	32
CMC	0	27	74	150
CONTROL	0	30	73	150
DIPER	0	9	56	150
REPLICA 2				
HYDROGEL	To	T1	T2	T3
F4	0	24	66	150
F12	0	10	37	150
F53	0	2	11	41
CMC	0	31	67	150
CONTROL	0	37	79	150
DIPER	0	21	63	150
REPLICA 3				
HYDROGEL	To	T1	T2	T3
F4	0	27	60	150
F12	0	9	38	150
F53	0	2	6	41
CMC	0	32	72	150
CONTROL	0	35	79	150
DIPER	0	12	55	150

Table S4. One-Way Anova Test of the ex-vivo antibacterial test

RESUMEN

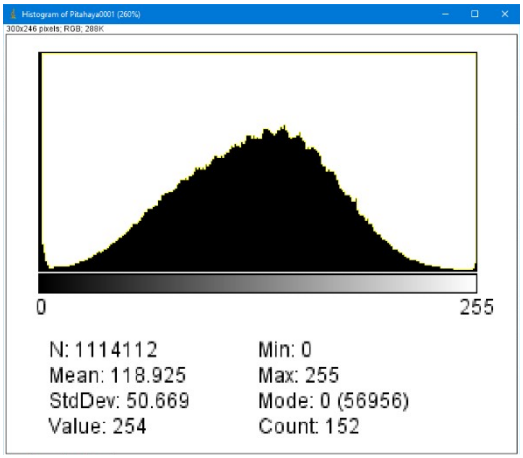
Grupos	*Cuenta*	*Suma*	*Promedio*	*Varianza*
Columna 1	5	0	0	0
Columna 2	5	99	19,8	186,2
Columna 3	5	256	51,2	792,2
Columna 4	5	638	127,6	2508,8

ANÁLISIS DE VARIANZA

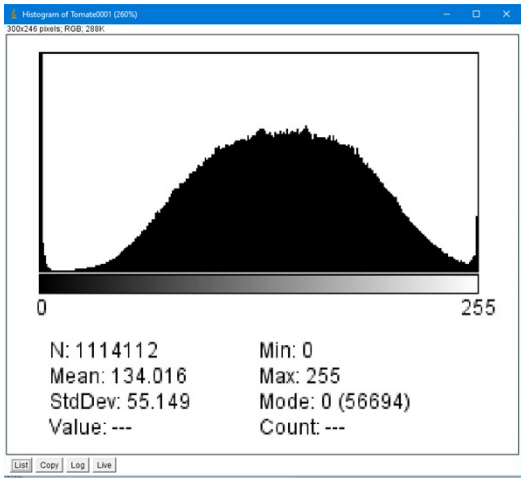
Origen de las variaciones	*Suma de cuadrados*	*Grados de libertad*	*Promedio de los cuadrados*	*F*	*Probabilidad*	*Valor crítico para F*
Entre grupos	47173,75	3	15724,5833	18,036916	2,1926E-05	3,23887152
Dentro de los grupos	13948,8	16	871,8			
Total	61122,55	19				

ImageJ Darkness Processing for Porosity Estimation

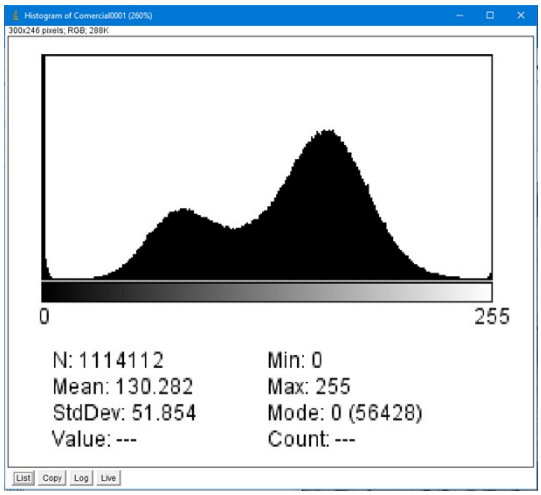
F53 – 300X



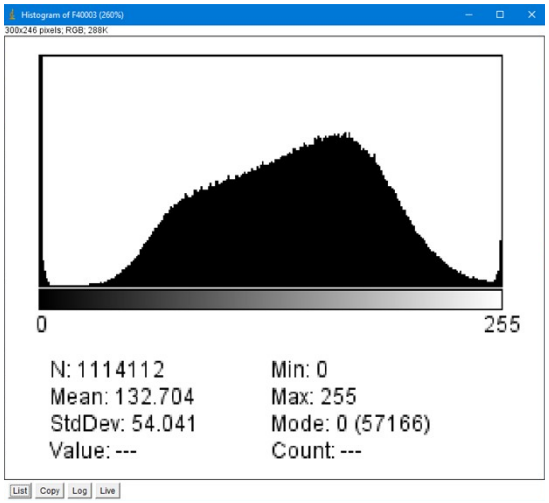
F12 – 300X



CMC – 300X



F4 – 300X



MEAN VALUES OF THE GRAYSCALE ANALYSIS

Gray scale indicates porosity, the darker the color more porous is the material and the wither represents less porosity. Minimum brightness is 0 and maximum of brightness is 255

HYDROGEL	CMC	F53	F12	F4
MEAN OF BRIGHTNESS	130,28	118,925	134,016	132,7

According with the analysis, F53 has the smallest degree of brightness, therefore we can assume the porosity on this material is higher than in the others.