Supplementary Information (SI)

Exchange Capacity of QCurd/Curd hydrogels

The exchange capacity of the hydrogels (EC) was determined by titration method, using a 712 Metrohm Conductometer (Herisau, Switzerland) with 6.0908.110 cell for the conductometric titrations. Briefly, 100 mg hydrogels were swollen in 20 mL twice-distilled water for 6 h. After that, an excess of 0.1N HCl solution (1 mL) was added and maintained for 2 h under gentle stirring, and then the solution was subjected to conductometric titration with a 0.1N NaOH solution. The exchange capacity (EC, meqiv./g) was calculated from conductometric data and expressed as meq. ammonium groups / g dried hydrogel.

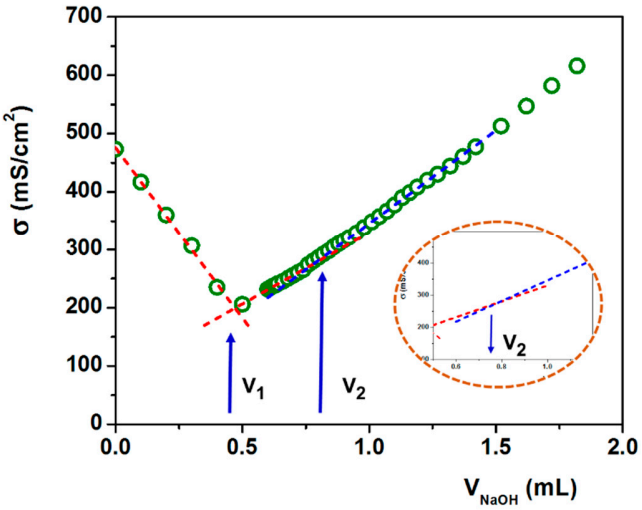


Figure S1. Conductometric titration curve of QCurd/Curd hydrogel

$$EC = \frac{(V_2 - V_1)N_{NaOH}10^{-3}}{m} \quad \text{(S1)}$$

m – mass of sample (g) taken to titration, N_{NaOH} – the normal concentration of NaOH solution; V_1 and V_2 – the volume (mL) of NaOH used for the titration of 1 mL 0.1N HCl added in excess and for the ammonium groups from the hydrogel, respectively

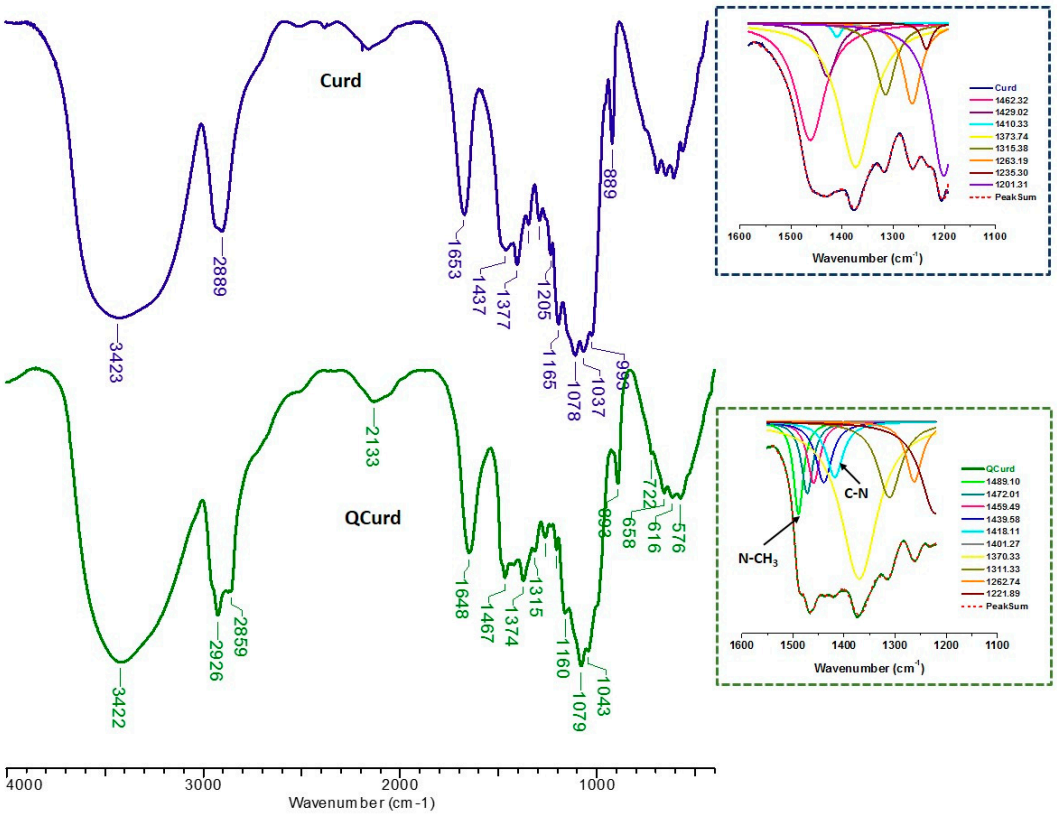


Figure S2. FTIR spectra of the Curd and QCurd

Swelling behaviour

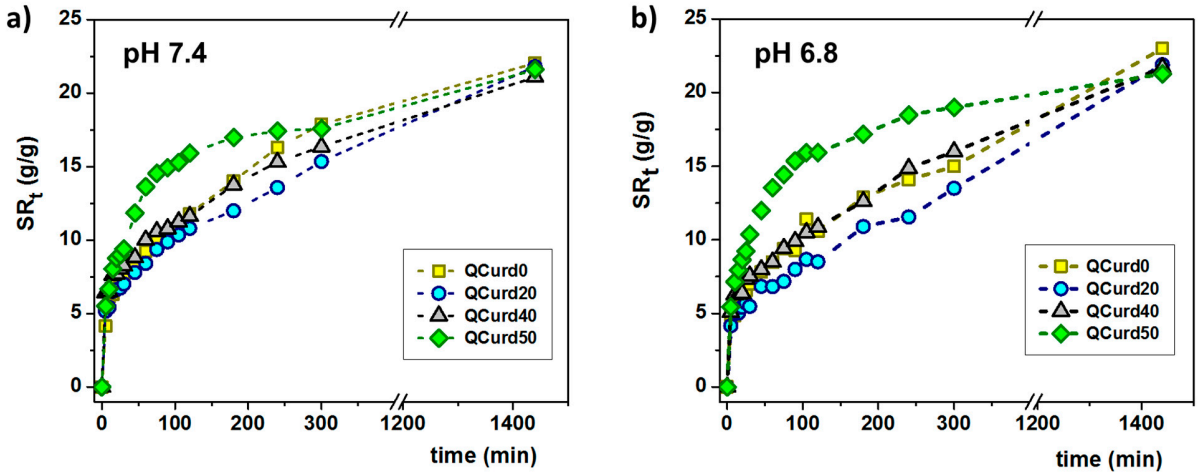


Figure S3. Swelling kinetics of QCurd/Curd hydrogels performed in PBS 7.4 (a) and 6.8 (b), at 32^{0}C

Antimicrobial assay

The antimicrobial efficacy is evaluated by calculating the logarithmic reduction (*LR*) and the percentage on the logarithmic scale (*LR%*) of the values resulting from the comparison of the number of bacterial colonies (colony forming units, CFU/ml) from the initial suspension (control sample) with the number of microorganisms still alive after contact with the test samples.

$$\text{Log}_{10}\text{ reduction } (LR) = \text{mean } \log_{10}(\text{microbial population}) \times \text{mean } \log_{10}(\text{surviving population}) \quad \text{(S2)}$$

$$\textit{Percent Reduction } (\%) = 100 \times (1 - 10^{-LR}) \quad \text{(S3)}$$

To facilitate the evaluation of the results, the CFU/mL values were converted to $\log_{10}$ values and expressed as a percentage, where a reduction of 1 Log_{10} is known to correspond to a bacterial reduction of 90%, while a reduction of 6 Log_{10} corresponds to a reduction of 99.9999%.

Table S1. The results of the antimicrobial activity of QCurd/Curd hydrogels which were obtained using the `kill time` technique and evaluated at different contact times by quantifying the logarithmic reduction values

Bacteria	**Times**	**Samples**			
		QCurd0	**QCurd20**	**QCurd40**	**QCurd50**
S. aureus	**Control**	1,5x10^{8}CFU/mL	1,5x10^{8}CFU/mL	1,5x10^{8}CFU/mL	1,5x10^{8}CFU/mL
ATCC 25923	**Log$_{10}$**	8.17609	8.17609	8.17609	8.17609
	6h	UQ	UQ	UQ	UQ
	12 h	UQ	UQ	UQ	UQ
	24 h	UQ	892	1267	316
	48 h	UQ	806	36	6
	Log reduction (48 h)	0	5.2697	6.6197	7.3979
	% reduction (48 h)	0	99.9994	99.9999	99.9999
MRSA	**Control**	1,5x10^8	1,5x10^8	1,5x10^8	1,5x10^8
ATCC 43300	**6h**	UQ	UQ	UQ	UQ
	12 h	UQ	316	30	38
	24 h	UQ	8	0	0
	48 h	UQ	0	0	0
	Log reduction (48 h)	0	Infinity	Infinity	Infinity
	% reduction (48 h)	0	100	100	100
E. coli ATCC 25922	**Control**	1,5x10^8	1,5x10^8	1,5x10^8	1,5x10^8
	6h	UQ	UQ	UQ	UQ
	12 h	UQ	UQ	1839	326
	24 h	UQ	UQ	1121	71
	48 h	UQ	1904	304	0

	Log reduction (48 h)	0	4.8964	5.6932	Infinity
	% reduction (48 h)	0	99.9987	99.9997	100
P. aeruginosa ATCC 9027	**Control**	$1,5x10^8$	$1,5x10^8$	$1,5x10^8$	$1,5x10^8$
	6h	UQ	UQ	UQ	UQ
	12 h	UQ	UQ	430	326
	24 h	UQ	UQ	368	71
	48 h	UQ	UQ	49	0
	Log reduction (48 h)	0	0	6,486	Infinity
	% reduction (48 h)	0	0	99.9999	100

CFU = colony-forming unit; UQ = unquantifiable; h= hours; Control - 0,5 McFarland turbidity