A Simultaneously Antimicrobial, Protein-Repellent and Cell-Compatible Polyzwitterion Network

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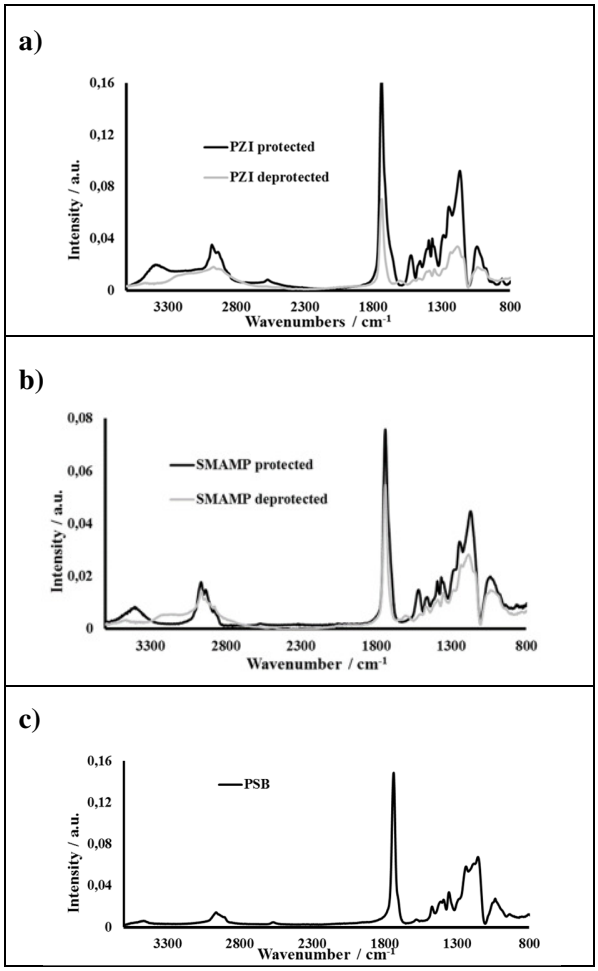
Supporting Information

Table S1: FTIR spectra of the PZI network (a), the SMAMP network (b), and the PSB network (c).



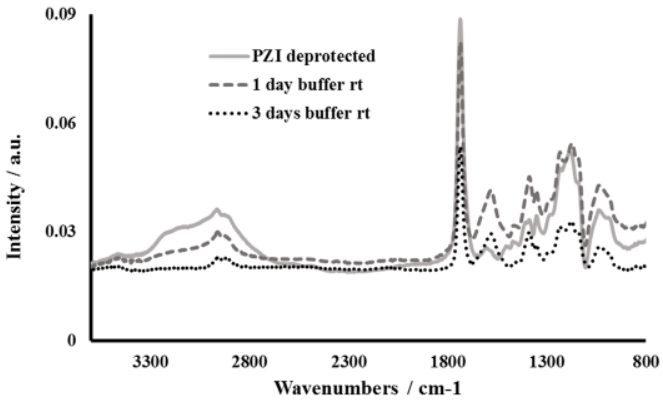
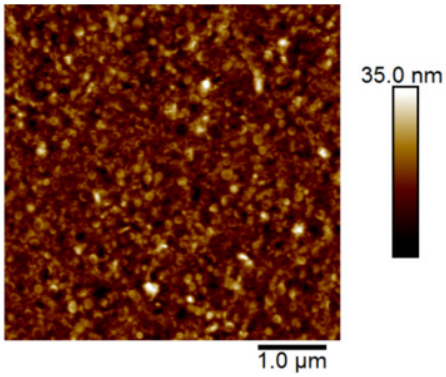
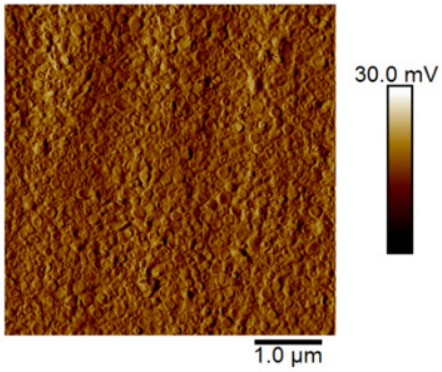
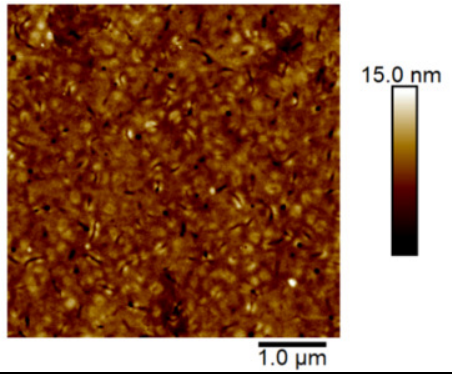
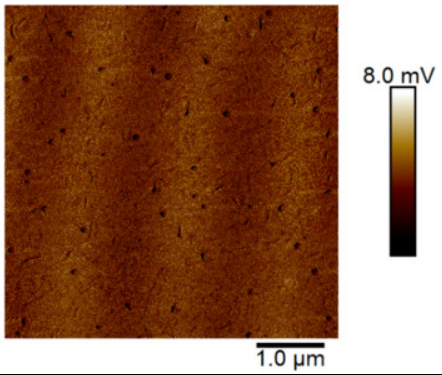
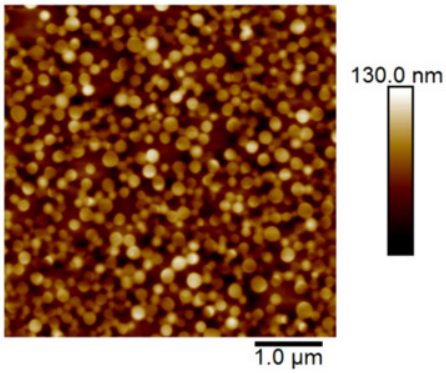
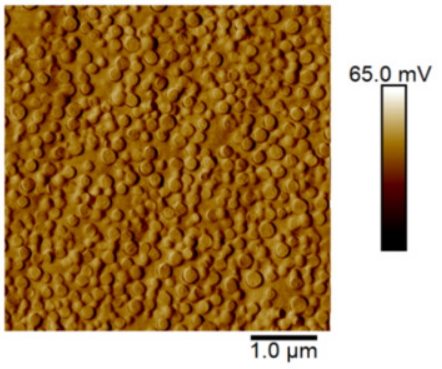


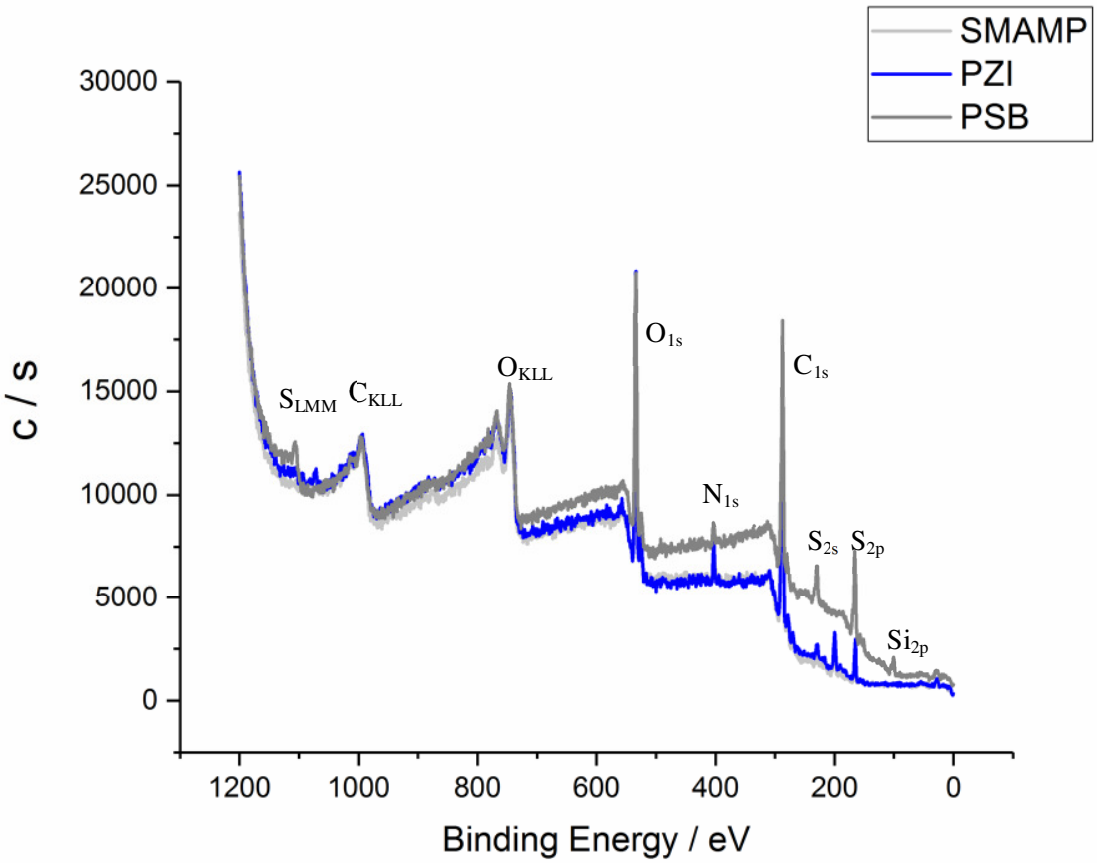
Figure S1: FTIR spectra of the PZI network before immersion into buffer, and after 1 and 3 days in HEPES buffer, respectively.

Table S2: Contact angles of the polymer networks.

	Static / °	**Advancing / °**	**Receding / °**
PZI network	21 ± 2	37 ± 1	14 ± 1
SMAMP network	70 ± 3	68 ± 3	17 ± 2
PSB network	37 ± 2	56 ± 2	22 ± 2

Table S3: AFM height and phase images of the PZI network (a), the SMAMP network (b), and the PSB network (c). Roughness values are included in the first column.

	Height	**Phase**
PZI **R = 5 ± 0.3 nm**		
SMAMP **R = 2 ± 0.2 nm**		
PSB **R = 19 ± 1 nm**		



Figures S2: Photoelectron (XPS) spectra (counts per second vs binding energy) of SMAMP, PZI and PSB. The peaks are labeled with the respective electronic transitions in the PSB spectrum; the other spectra can be assigned analogously.

Table S4. ζ potential titration curves of the polymer networks: Fitting parameters (ζ_{max}, ζ_{min} , k, and n), and data calculated from the curves (IEP, pK, ζ_{phys}).

	ζ_{max} / mV	ζ_{min} / mV	k	n	IEP	ζ_{phys} / mV	pK
PZI	45	-52	6.5	8	6.6 ± 0.1	- 23 ± 5	6.8 ± 0.1
SMAMP	86	-80	7.3	7.7	7.3 ± 0.1	- 2 ± 5	7.2 ± 0.1
PSB	40	-35	2.4	3.5	n/d	-34 ± 5	3.1 ± 0.1

Table S5: SPR results of swelling experiments for the polymer networks. Grey lines: experimental data; black dashed lines: simulation results. Left column: reflectivity curve and simulation of the dry layer; right column: reflectivity curve and simulation of the swollen layer.

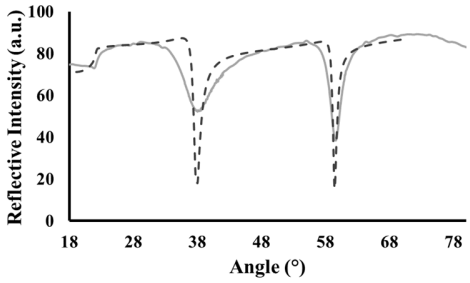
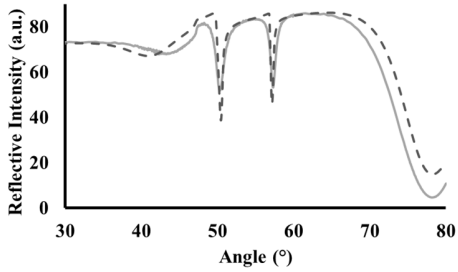
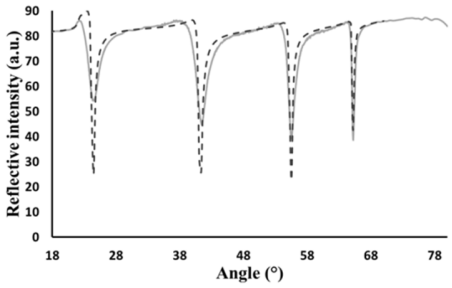
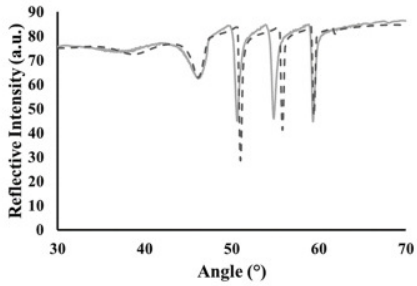
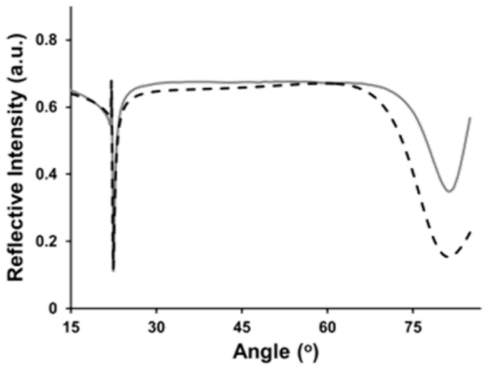
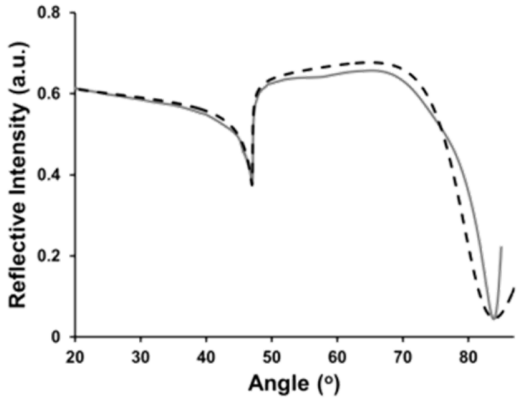
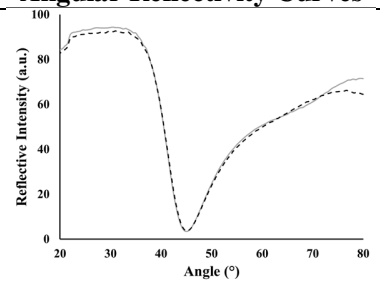
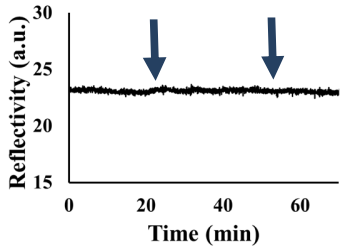
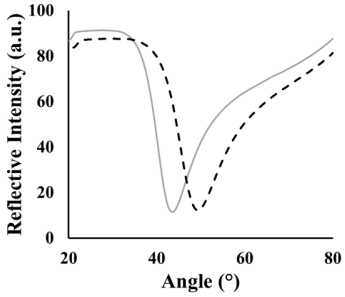
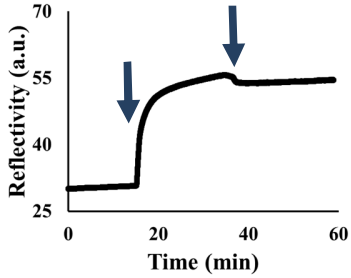
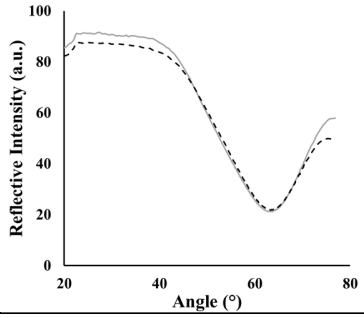
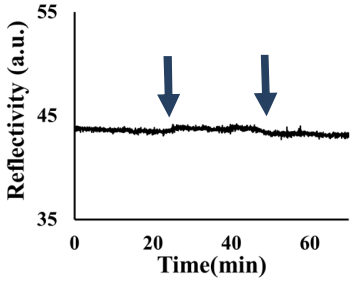
	Dry layer	**In H_2O**
PSB	 **d = 683 nm, ε' = 2.427**	 **d = 1100 nm, ε' = 2.171**
PZI	 **d = 1072 nm, ε' = 2.432**	 **d = 2090 nm, ε' = 2.249**
SMAMP	 **d = 245 nm, ε' = 2.227**	 **d = 302 nm, ε' = 2.278**

Table S6. SPR data obtained from the polymer networks. Left column: reflectivity curves (reflectivity vs. angle) of the dry samples before (grey) and after (black dashed) protein adhesion. Right column: kinetics curve (reflectivity at constant angle vs. time). The first arrow marks the time point when protein was injected; the second arrow indicates the time point of buffer injection.

	Angular Reflectivity Curves	SPR Kinetics Mode
PZI		
SMAMP		
PSB		

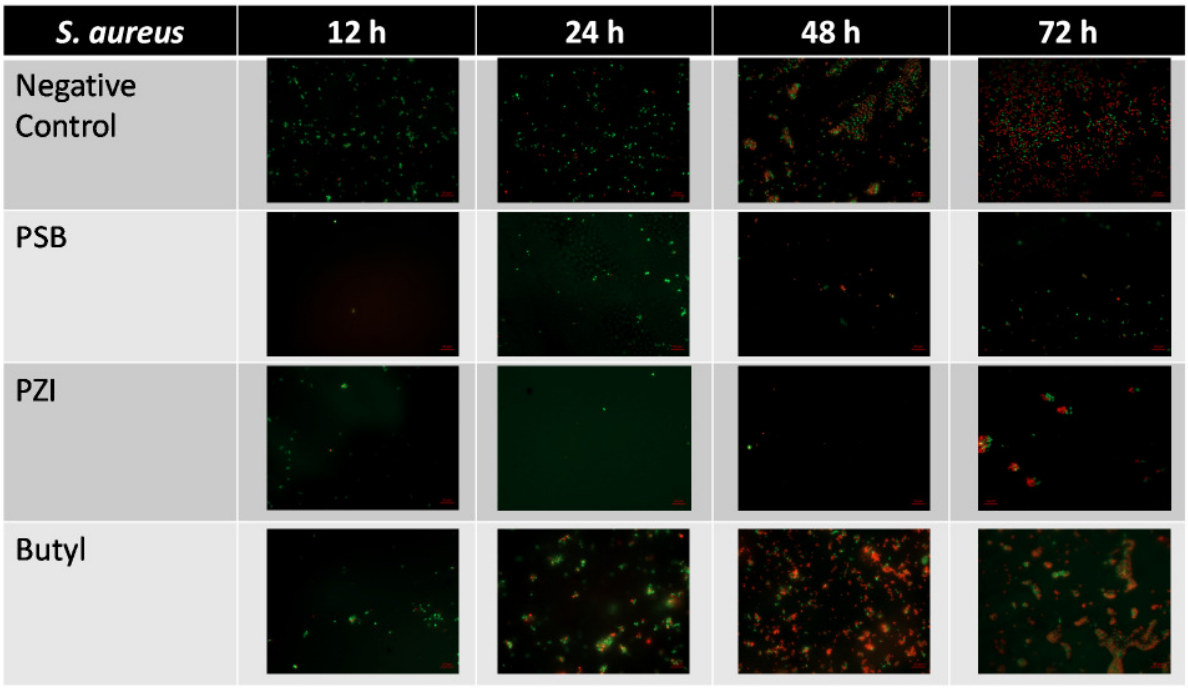


Figure S3: Biofilm formation of *S. aureus* on PZI, SMAMP (=Butyl) and PSB (compared to the negative control (= growth control) after 12, 24, 48 and 72 h. The images are overlay of the green fluorescence and the red fluorescence.

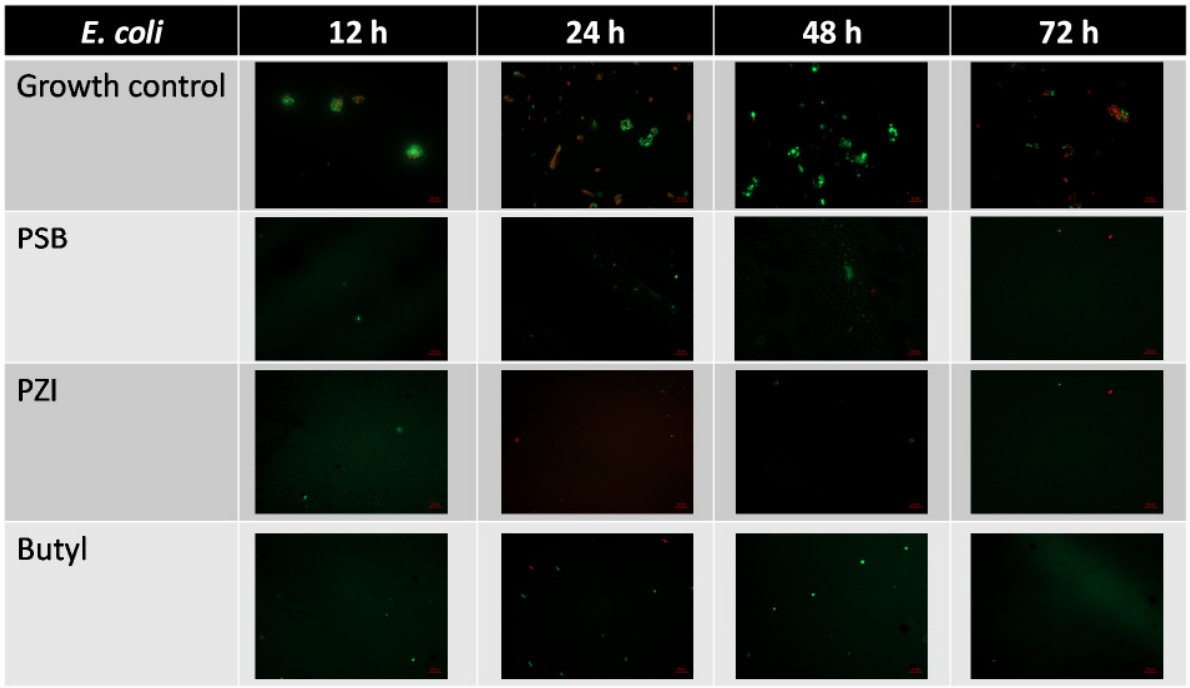


Figure S4: Biofilm formation of *E. coli* on PZI, SMAMP (=Butyl) and PSB (compared to the negative control (= growth control) after 12, 24, 48 and 72 h. The images are overlay of the green fluorescence and the red fluorescence.

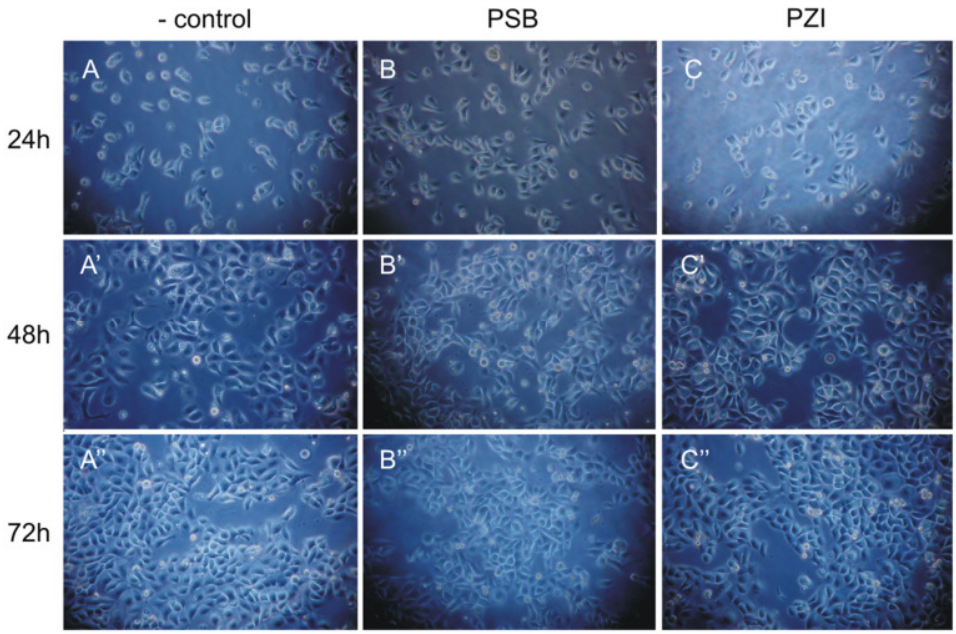


Figure S5: Optical micrographs (phase contrast) of human keratinocytes grown on an uncoated glass slide (- control, growth control), PSB and PZI after 24 h (A to C), 48 h (A' to C') and 72 h (A'' to C''). The cell density and the cell morphology on PSB and PZI is comparable to that on the growth control.

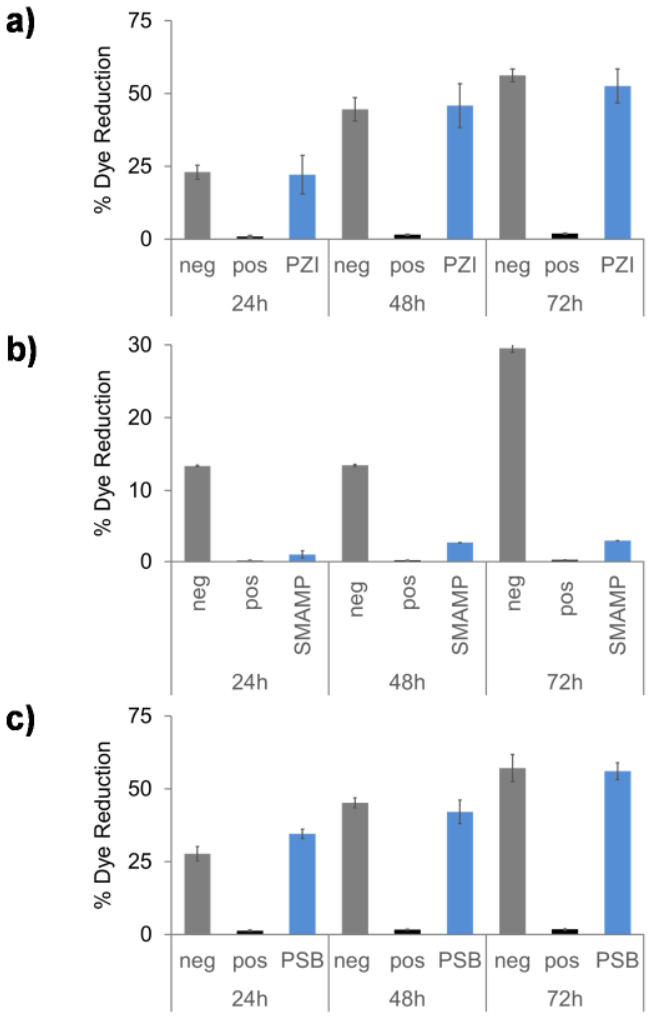


Figure S6: Alamar Blue dye reduction (relative to initial dye concentration) by human keratinocytes grown for 24, 48 and 72 h, respectively, on PZI, SMAMP and PSB. The dye reduction by PZI and PSB was comparable to that of the growth control (neg). The dye reduction of the positive control corresponds to no cell growth.