

Table 1. Review of natural PSs-based API conditions used in different studies.

Ref.	Photosensitizer (PS)	Bacteria species/strains (CFU×mL ⁻¹)		Modes of growth	Concentration of PS/dark toxicity	Preincubation time/medium	Light source; wavelength; irradiance	Light dose/illumination time	API efficiency
106	Hypericin (Hyp)	<i>Staphylococcus aureus</i> (10 ⁶ –10 ⁷)	ATCC 25923	1P	1 µg/mL/ ³ DS	5 min/ ⁴ PBS buffer	⁵ LED; 590 nm; 80 mW/cm ²	48 J/cm ² /10 min	6.3 log ₁₀
		<i>Escherichia coli</i> (10 ⁶ –10 ⁷)	ATCC 25922						6.2 log ₁₀
		<i>Enterococcus faecalis</i> (10 ⁶ –10 ⁷)	ATCC 1700						6.5 log ₁₀
		<i>Pseudomonas aeruginosa</i> (10 ⁶ –10 ⁷)	ATCC 27853						0.7 log ₁₀
107	Hyp	<i>S. aureus</i> (6×10 ⁸)	ATCC 25923	P	0.5 µg/mL/DS	5 min/PBS buffer	LED; 590 nm; ⁶ —	8 J/cm ² /5 min	6.5 log ₁₀
			UTMC 1484	² B				16 J/cm ² /10 min	⁷ NS
				B				8 J/cm ² /5 min	5.5-6.7 log ₁₀
			UTMC 1474	P				16 J/cm ² /10 min	NS
				B				8 J/cm ² /5 min	5.5-6.7 log ₁₀
			all type	B				16 J/cm ² /10 min	NS
								0.5 µg/mL/DS	10 min/ acetylcysteine
100	Hyp	<i>P. aeruginosa</i> (10 ⁷ –10 ⁸)	PAO1	P	10 µM/DS;	30 min/ ⁸ LB medium	LED; 590 nm; 150 ±20 W/m ²	162 J/cm ² /180 min	NS
		<i>S. aureus</i> (10 ⁷ –10 ⁸)	KCTC 3881					54 J/cm ² /60 min	~ 6.5 log ₁₀
			KCTC 1916						~ 7 log ₁₀

			2659 (MRSA)						~ 5.5 log ₁₀				
105	Hyp	<i>S. aureus</i> (10 ⁶)	ATCC 29213 (MSSA)	P	0.25 μM/DS	5 min/ °TSB medium	LED; 602±10 nm; 14 mW/cm ²	8 J/cm ² /10 min	complete (6 log ₁₀)				
				P	0.015 μM/DS			25 J/cm ² /30 min	complete (6 log ₁₀)				
				B	0.015 μM/DS	24 h/PBS buffer		25 J/cm ² /30 min	3.5 log ₁₀				
			ATCC 33591 (MRSA)	P	1 μM/DS	5 min/TSB medium		8 J/cm ² /10 min	complete (6 log ₁₀)				
				P	0.015 μM/DS			25 J/cm ² /30 min	complete (6 log ₁₀)				
				B	250 μM/DS	20 min/PBS buffer		25 J/cm ² /30 min	2.3 log ₁₀				
			112	Hyp	<i>Salmonella enterica</i> (10 ⁷)	DS88(SL56 76 Smr Plm32)		P	1×10 ⁻⁵ M/DS	60 min/PBS buffer	LED; 585 nm; 3.84 mW/cm ²	13.8 J/cm ² /—	1 log ₁₀
											LED+HPPL	13.8 J/cm ² + 0.023 J/cm ² /—	6.7 log ₁₀
<i>Listeria monocytogenes</i> (10 ⁷)	ATCL3C 7644	1×10 ⁻⁷ M/DS			60 min/PBS buffer	LED; 585 nm; 3.84 mW/cm ²	9.22 J/cm ² /—		7 log ₁₀				
					5 min/PBS buffer		2.3 J/cm ² /—		2.2 log ₁₀				

							LED+HPPL	2.3J/cm ² + 0.023 J/cm ² /—	7 log ₁₀
113	Hyp	<i>Bacillus cereus</i> (10 ⁷)	ATCC 12826	P	1×10 ⁻⁷ M/DS	2 min/PBS buffer	LED; 585 nm; 3.84 mW/cm ²	9.2 J/cm ² /40 min	3.5 log ₁₀
						60 min/PBS buffer			4.4 log ₁₀
					1×10 ⁻⁷ M/DS	2 min/PBS buffer			2.2 log ₁₀
						60 min/PBS buffer			2.5 log ₁₀
115	Hyp	<i>E. coli</i> (10 ⁷)	—	P	36 μM/DS	68 min/PBS buffer	LED; 590 nm; 16.4 mW/cm ²	5.9 J/cm ² /260 sec	4.1 log ₁₀
102	Hyp	<i>S. aureus</i> (~ 10 ⁷)	CECT 239	P	4 μM; washed/DS	30 min/PBS buffer	LED; green light; —	18 J/cm ² /15 min	~ 7 log ₁₀
						30 min/20% PBS- DMSO mixture			~ 6.5 log ₁₀
					4 μM; washed/DS	30 min/PBS buffer			~ 6 log ₁₀

						30 min/20% PBS-DMSO mixture			$\sim 5.8 \log_{10}$
	Hyp-2 β -LG (Hyp complex with the dimeric form of β -lactoglobulin)				4 μ M-200 μ M/DS	30 min/PBS buffer	18 J/cm ² /5 min		5 \log_{10}
						30 min/20% PBS-DMSO mixture			$\sim 3 \log_{10}$
					4 μ M -200 μ M; washed/DS	30 min; PBS buffer			$\sim 5.8 \log_{10}$
						30 min/20% PBS-DMSO mixture			$\sim 3 \log_{10}$
109	Hyp	<i>S. aureus</i> ($\sim 10^7$)	CECT 239	P	8 μ M/DS	30 min; PBS buffer	LED; green light; —	18 J/cm ² /15 min	$\sim 7 \log_{10}$
	Hyp-2 β -LG				8 μ M -10 μ M/DS			37 J/cm ² /30 min	5 \log_{10}
101	Hyp	<i>S. aureus</i> ($\sim 10^7$)	CECT 239	P	10 μ M/DS	30 min/PBS buffer	LED; green light; —	18 J/cm ² /15 min	$\sim 7 \log_{10}$
	Hyp-ApoMb (Hyp and apomyoglobin complex)				10 μ M (1:2)/DS			37 J/cm ² /30 min	$\sim 5.5 \log_{10}$
104	PVP-Hyp (synthesized by non-covalently binding Hyp to polyvinylpyrrolidone)	<i>S. aureus</i> ($\sim 10^8$)	DSMZ 18587	P	100 nM/DS	5 min/TSB medium	1200 red light halogen lamp; 75 mW/cm ²	135 J/cm ² /30 min	5 \log_{10}

110	Hyp	<i>S. aureus</i> (10 ⁸)	Clinical isolate (MRSA)	P	8 µM/DS	30 min/PBS buffer and ¹⁰ NB medium	400 W quartz-halogen lamp; 600-800 nm; 14 mW/cm ²	30 J/cm ² /—	complete (> 6 log ₁₀)	
			ATCC 25923 (MSSA)		40 µM/DS				0.18 log ₁₀	
108	Hyp	<i>E. coli</i> (10 ⁸)	ATCC 25922	P	4 µM/DS	10 min; PBS buffer	Lumacare LC122 lamp; 590 nm; 100 mW/cm ²	40 J/cm ² /—	0.93 log ₁₀	
			ATCC 35556						4.25 log ₁₀	
	Hyp	<i>E. coli</i> (10 ⁸)	ATCC 25922						40 J/cm ² /—	3.5 log ₁₀
			ATCC 35556							6.85 log ₁₀
111	Hyp	<i>S. mutans</i> (10 ⁸)	OMZ 918	P	10 µg/mL/DS	30 min/ ¹¹ FUM medium	halogen polymerization device; 400-505 nm; 1070 mW/cm ²	256.8 J/cm ² /2×120 s	99.9 %	
			OMZ 176		2.5 µg/mL/DS	15 min/FUM medium		128.4 J/cm ² /120 s	100%	
114	Hyp	<i>Shigella flexneri</i> (10 ⁹)	1a	P	2.4×10 ⁻⁵ M/dm ³ /Toxic effect	NaCl/dimethylformamide	white light; 5mW/cm ²	27 J/cm ² /90 min	1.3%	
			1b						78.3 %	
			2a						37.2 %	

		<i>E. coli</i> (10 ⁹)	K12 781						1.2 %
			K1 959						47.6 %
		<i>B. subtilis</i> (10 ⁹)	3						24.3 %
103	aHyp (non-purified, hydrophilic extract of <i>Hypericum perforatum</i>)	<i>S. aureus</i> (~ 10 ⁷)	ATCC 25923	P	1 μM/DS	30 min; PBS buffer	LED; 515 nm; 16 mW/cm ²	9.6 J/cm ² /10 min	7 log ₁₀
117	Hypocrellin B	<i>S. aureus</i> (10 ⁸)	—	P	2.5 μM/DS	60 min/—	LED; 470 nm; 60 mW/cm ²	0.3 J/cm ² /—	~ 1.8 log ₁₀
118	Hypocrellin B	<i>E. coli</i> (10 ⁸)	DH5α	P	25 μM/DS	60 min/LBmedium	LED; 470 nm; 60 mW/cm ²	12 J/cm ² /—	~ 90 %
119	Hypocrellin B	<i>S. aureus</i> (10 ⁷)	ATCC 29213	P	100 μM/DS	30 min/PBS buffer	50 W xenon lamp; 400-780 nm; 0.08 W/cm ²	72 J/cm ² /900 sec	~ 7 log ₁₀
				B					3.56 log ₁₀
			Clinical isolate (MRSA)	P					~ 7 log ₁₀
				B					3.71 log ₁₀
		<i>E. faecalis</i> (10 ⁷)	ATCC 29212	P					~ 7 log ₁₀
				B					3.29 log ₁₀
			VRE (ATCC 51299)	P					~ 7 log ₁₀
				B					3.35 log ₁₀

		<i>S. pneumonia</i> (10 ⁷)	ATCC 49619	P					~ 7 log ₁₀
					B				
		<i>S. pneumonia</i> (10 ⁷)	Clinical isolate of MDR	P					~ 7 log ₁₀
						B			
		<i>E. coli</i> (10 ⁷)	ATCC 25922	P					2 log ₁₀
		<i>K. pneumonia</i> (10 ⁷)	ATCC 700603	P					2 log ₁₀
120	Hypocrellin A	<i>S. aureus</i> (10 ⁷ -10 ⁸)	6538	P	1 μM/DS	60 min/PBS buffer	50W halogen-tungsten lamp; 30 mW/cm ²	126 J/cm ² /120 min	The survival 0.02%
		<i>B. subtilis</i> (10 ⁷ -10 ⁸)	9372			60 min/PBS buffer			The survival less than 0.1%
		<i>E. coli</i> (10 ⁷ -10 ⁸)	ATCC 25922			60 min/PBS buffer			NS
						+CaCl ₂			decreased the survival to 1.2%
						+MgCl ₂			decreased the survival to 1.7%
		<i>SalmonellaTyphimurium</i> (10 ⁷ -10 ⁸)	50013			60 min/PBS buffer			NS
187		<i>in situ</i> oral biofilms		B	32 mg/mL/—			60 J/cm ² /5 min	complete

	Hypericum perforatum extract					2 min; intraoral devices with fixed bovine enamel slabs	VIS + wIRA; 200 mW/cm ²		
138	Riboflavin (RF)	<i>S. aureus</i> (10 ⁵)	MRSA Strain 1	P	0.1%/11% inhibition	0 min/NB agar	LED; 375 nm; 3 mW/cm ²	5.4 J/cm ² /30 min	98%
							ambient light (300 lux); 107 μW/cm ²	0.193 J/cm ² /30 min	13%
			MRSA Strain 2	P	0.1%/3% inhibition		LED; 375 nm; 3 mW/cm ²	5.4 J/cm ² /30 min	100%
							ambient light (300 lux); 107 μW/cm ²	0.193 J/cm ² /30 min	15%
188	RF	<i>L. monocytogenes</i> ; 4 strains cocktail (3.5 log CFU/cm ²)	1/2a	P	100 μM/DS	—/on smoked salmon	LED; 460 nm; 15 mW/cm ²	2400 J/cm ² /—	1.2 log CFU/cm ² (at 4 °C)
			1/2b						
			3a						
			4b						
								1.1 log CFU/cm ² (at 12 °C)	
189	RF	<i>E. coli</i> (10 ⁷)		P	50 μM/DS	0 min/PBS buffer	Visible white light; 38.6 W/m ²	27,8 J/cm ² /2 h	~ 4.5 log ₁₀
145	RF	<i>S. aureus</i> (8×10 ⁵)	MRSA	P	0.01%/DS	0 min/fluid layer of 1.2 mm	450 nm; —	84 J/cm ² /—	complete

190	RF	<i>S. epidermidis</i> (6.5×10^7)	ATCC 12228	P	50 μ M/DS	–/in platelet concentrates	UV lamps; 265 – 370 nm; –	6.2 J/ cm ² /8-10 min	≥ 4.15 log
		<i>E. coli</i> (1.1×10^8)	ATCC 25922						≥ 4.38 log
142	RF	<i>S. epidermidis</i> ($1.6\text{--}2.5 \times 10^4$)	RS 30 (s1) ATCC 12228	P	400 μ M/DS	–/in thin layers of fluid (0.4–1.76 mm)/RPMI (cell culture media)	UV-X;365nm; 2.7-3.3 mW/cm ²	10.8 J/cm ² /60 min	mean reduction from start point ranging between 86 and 90%
		<i>S. aureus</i> ($2.5\text{--}4.0 \times 10^4$)	RS 12(s1) CCUG 15915						mean reduction from start point ranging between 61 and 71%
			RS (s1) ATCC 29213						mean reduction from start point ranging between 98 and 100%
<i>P. aeruginosa</i> ($9.4 \times 10^3\text{--}3.1 \times 10^4$)	RS 11(s1) CCUG 17619	RS 11 (s1) ATCC 27853	P	0.03%/DS	–/in thin layers of fluid (0.4–1.76 mm); RPMI (cell culture media)	UVA; 365 nm; –	10.8 J/cm ² /60 min	80%	
	0.09%/DS							50%	

143	RF	<i>S. epidermidis</i> (1.7–3.37×10 ⁴)	ATCC 12228 (S)	P	0.01%/DS	⇒/in thin layers of fluid (0.4–1.76 mm); RPMI (cell culture media)	UVA; 365nm; 3 mW/cm ²	5.4 J/cm ² /30 min	80%-92%
			CCUG3525 7 (methicillin and oxacillin R)						60%-70%
		<i>S. aureus</i> (1.7–3.37×10 ⁴)	ATCC29213/CCUG15915(S)						80%-92%
			ATCC43300/CCUG41586 (oxacillin R, MecA+, nuc+)						80%-92%
		<i>P. aeruginosa</i> (1.7–3.37×10 ⁴)	ATCC27853(S)						80%-92%
			CCUG37384 (ciprofloxacin R)						80%-92%
		<i>E. faecalis</i> (1.7–3.37×10 ⁴)	ATCC29212/CCUG9997(S)						60%-70%
			CCUG34062 (vancomycin R)						

144	RF	<i>S. aureus</i> (1.7–3.37×10 ⁴)	CCUG4158 6/ATCC 43300 (MRSA)	P	0.01%/DS	–/RPMI (cell culture media)	commercially available lamp for treatment of acne TRIA Beauty lamp; 412 nm; 47.7 mW/cm ²	28.6 J/cm ² /10 min	99%
							prototype lamp; 450nm; 47.4 mW/cm ²	28.4 J/cm ² /10 min	98%
139	RF	<i>B. subtilis</i> (–)	–	P	10 μM/DS	10 min in glucose minimal medium	500 watt tungsten- halogen lamp; –	–/20 min	effective
140	RF	<i>S. aureus</i> (~ 10 ⁸)	ATCC 29213	P	0.1 %/DS	0 min/NB medium	UVA;365 nm; 3 mW/cm ²	5.4 J/cm ² /30 min	Not susceptible
146	FLASH-01a (synthesized RF derivative with	<i>P. aeruginosa</i> (10 ⁸)	ATCC BAA-44 (MRSA)		100 μM/DS	10 s/aqueous solutions	Non-coherent light; 380-600 nm;	1.5 J/cm ² /30 s	6.8 log ₁₀

	single positive charge)	<i>E. coli</i> (10 ⁸)	O104:H4 (EHEC)		50 μM/DS;		50 mW/cm ²	12 J/cm ² /240 s	6.5 log ₁₀
		<i>Acinetobacter baumannii</i> (10 ⁸)	clinical isolate		100 μM;/DS		9 J/cm ² /180 s	6.6 log ₁₀	
		<i>S. aureus</i> (10 ⁸)	ATCC 25923 (MRSA)		50 μM/DS		3 J/cm ² /60 s	6.6 log ₁₀	
	FLASH-07a (synthesized RF derivative with eight positive charge)	<i>P. aeruginosa</i> (10 ⁸)	ATCC BAA-44 (MRSA)		50 μM/DS		3 J/cm ² /60 s	6.7 log ₁₀	
		<i>E. coli</i> (10 ⁸)	O104:H4 (EHEC)		50 μM/DS		9 J/cm ² /180 s	6.6 log ₁₀	
		<i>A. baumannii</i> (10 ⁸)	clinical isolate		50 μM/DS		4.5 J/cm ² /90 s	6.7 log ₁₀	
		<i>S. aureus</i> (10 ⁸)	ATCC 25923 (MRSA)		100 μM/DS		1.5 J/cm ² /30 s	6.5 log ₁₀	
148	FMN (RF-5-phosphate)	<i>S. aureus</i> (1.5×10 ⁸)	clinical isolate	P	1 mg/dl/DS	15 min/PBS buffer	LED; blue light; —	—/120 min	~ 4.5 log ₁₀
		<i>P. aeruginosa</i> (1.5×10 ⁸)						—/180 min	~ 6 log ₁₀
149	FMN	<i>E. coli</i> (1.2×10 ¹⁰)	DH5α	P	30 μM/DS	0 min/PBS buffer	LED; 462 (410–510) nm; 2 mW/cm ²	14.4 J/cm ² /120 min	96%
150	FMN	<i>S. aureus</i> (10 ⁷)	BCRC 10451	P	120 μM/DS	0 min/PBS buffer	Blue light; 2 mW/cm ²	14.4 J/cm ² /120 min	94.9 %
					30 μM/DS		Violet light; 1 mW/cm ²	1.8 J/cm ² /30 min	96.3 %

			MRSA JD004		120 µM/DS		Blue light; 2 mW/cm ²	14.4 J/cm ² /120 min	95.2 %
191	Curcumin (CUR)	<i>L. monocytogenes</i> (10 ⁸)four strain cocktail	ATCC 19115	P	0.5 µM/DS	20 min/0.85% physiological saline	LED; 455-460 nm; 1.8 mW/cm ²	1.62 J/cm ² /15 min	complete (7.65 log ₁₀)
			ATCC 13932						
			ATCC 7644	B	20 µM/DS			6.48 J/cm ² /60 min	OD ₆₀₀ : from 2.10 to 0.93
			4bLM						
192	CUR	Intact dentin caries biofilms	3-day B		600 µM/L; 45 % reduction after 5 min incubation	LED; 455 nm; 40 mW/cm ²	75 J/cm ² /-	1min/ Glass slabs	62%
								5 min/ Glass slabs	~ 62 %
			5-day B		600 µM/L; ~ 22% reduction after 2 min incubation			1 min/ Glass slabs	17%
								5 min/ Glass slabs	~ 50 %
160	CUR	<i>S. mutans</i> and <i>Lactobacillus acidophilus</i> (grown simultaneously in dentine carious lesions (10 ⁸))		5 g/L/DS	to inoculate the bacterial-induced caries on human dentine slabs	LED; 450 nm; -	5.7 J/cm ² /5 min	~ 70%	
							5.7 J/cm ² /2 min		
193	CUR	<i>Propionibacterium acnes</i> (2×10 ⁵)	BCRC 10723	P	25 µM/ inhibition rate below 20 %	-/RCM medium	LED; 462 nm 3 mW/cm ²	0.09 J/cm ² /30 sek	100%
153	CUR	<i>E. faecalis</i> (5×10 ⁹)		P	136 µM/DS	5 min;TSBmedium	LED;	12.5 J/cm ²	

			ATCC 29212				450 nm; 151 mW/cm ²		completely eliminate
		<i>P. acnes</i> (5×10 ⁹)	ATCC 6919		14 μM/DS	5 min/BHI medium			
161	CUR	<i>S. aureus</i> (10 ⁷)	ATCC 25923	P	75 μM/DS	10 min/0.85% saline	LED; 470 nm; —	139 J/cm ² /10 min	3.27 log ₁₀
								278 J/cm ² /20 min	~ 3.57 log ₁₀
		417 J/cm ² /30 min	complete (~ 6 log ₁₀)						
		139 J/cm ² /10 min	3.33 log ₁₀						
		278 J/cm ² /20 min	complete (~ 6 log ₁₀)						
		417 J/cm ² /30 min	complete (~ 6 log ₁₀)						
		139 J/cm ² /10 min	1.29 log ₁₀						
		278 J/cm ² /20 min	2.65 log ₁₀						
		417 J/cm ² /30 min	complete (~ 6 log ₁₀)						
		139 J/cm ² /10 min	1.26 log ₁₀						
		278 J/cm ² /20 min	1.81 log ₁₀						
		417 J/cm ² /30 min	2.82 log ₁₀						
		139 J/cm ² /10 min	0.24 log ₁₀						
		278 J/cm ² /20 min	0.3 log ₁₀						
417 J/cm ² /30 min	0.33 log ₁₀								
161	CUR	<i>S. aureus</i> (10 ⁸)	ATCC 27853	P	2.5 μM/DS	60 min/LB medium	LED; 470 nm; 60 mW/cm ²	3 J/cm ² /—	2 log ₁₀

195	CUR	<i>S. aureus</i> (10 ⁶)	ATCC 25923 (MSSA)	P	5 µM/DS	20 min; in sterile saline	LED; 455 nm; 22 mW/cm ²	18 J/cm ² ;	complete (6 log ₁₀)	
			ATCC 33591 (MRSA)		10 µM/DS			25.5 J/cm ² ;		
					20 µM/DS			37.5 J/cm ²		
					20 µM/DS			37.5 J/cm ² /		
196	CUR	<i>L. innocua</i> (1.3×10 ⁷)	NCTC 11288	B	0.6 mg/L/DS	30 min; in ringer solution	LED; 400-500; 150 mW/cm ²	270 J/cm ² /30 min	4.4×10 ³ CFU/mL	
					3.7 mg/L/DS				1.7×10 ² CFU/mL	
					P				0.6 mg/L/DS	5.3 log
									3.7 mg/L/DS	6.1 log
	CUR rich extract			B	0.6 mg/L;/DS;				1.4×10 ⁵ CFU/mL (2 log)	
					1.1 mg/L;/DS				1.1×10 ⁴ CFU/mL (3.1 log)	
				P	0.6 mg/L/DS;				3.5 log	
					1.1 mg/L/DS				5.4 log	
155	CUR	<i>E. faecalis</i> (10 ⁶)	A197A	P	2.5 µM (in a 5% DMSO preparation)/DS	30 min/PBS buffer	Light-polymerisation unit equipped with three fluorescent tubes emitting	0.5 J/cm ² /—	99.8 %	

		<i>S. intermedius</i> (10 ⁶)	ATCC 27335				blue light; 430 nm; 17.3 mW/cm ²		
		<i>E. coli</i> (10 ⁶)	ATCC 25922		25 μM (in a 5% DMSO preparation)/DS			30 J/cm ² /—	~ 100 %
197	CUR	<i>Lactobacilli</i> (10 ⁸)	ATCC 4646	P	10 μM/L/DS	15 min/0.9% NaCl	Dental light source; 380-500 nm; —	—/240 sek	100%
154	CUR	<i>E. faecalis</i> (10 ⁸)		P	20 μM/DS	5 min/ NaCl	LED; 450 nm; 100 mW/cm ²	5 min	41%
157	CUR	<i>S. mutans</i> (10 ⁹)	OMZ 918	P	2 μM/DS	5 min/0.9% NaCl	Dental QTH lamp; 360-550 nm; 450 mW/cm ²	54 J/cm ² /120 s	95%
				B	60 μM/DS	10 min/0.9% NaCl			44 % (± 12 %)
159	CUR	<i>S. mutans</i> (10 ⁷)	ATCC 25175	P	4000 μM	1 min/0.9% NaCl	LED/ 450 ±30 nm; 240.1 mW/cm ²	72 J/cm ² /300 s	5.3 log ₁₀
158	CUR	<i>S. mutans</i> (~2×10 ⁹)	ATCC 700610 UA 159	P	0.75 mM/ 0.90 log ₁₀ reduction	1 min/PBS buffer	LED; 420 ±20 nm; 95.5 mW/cm ²	72 J/cm ² /4 min	complete (5.97 log ₁₀)

156	CUR	<i>E. faecalis</i> (5×10 ⁶)	135737	P	10 μM/DS	30 min/PBS buffer	dental quartz— tungsten— halogen; 450 nm	240 s	complete
				B					complete
95	Lyophilised extract of Solanumverbascif olium flower	<i>S. epidermidis</i> (3×10 ⁸)		P	0,05 mg/mL/DS	60 min/PBS buffer	ELH tungsten halogen GE Quartzline lamps with a reflector; 23 mW/cm ²	55 J/cm ² /40 min	4 log ₁₀
									10 min/PBS buffer
165	Psoralen	<i>E. coli</i> (~ 10 ⁷)	CN-13 (ATCC 700609)	P	—	+ Lime Slurry	solar exposures	30-minute	> 6.1 logs
						+ Lime Juice			5.6 log
198	Protochlorophylli de (a biosynthetic intermediate during bacteriochlorophy ll or chlorophyll biosynthesis), extract from Rhodobactercaps ulatus ZY5;	<i>S. aureus</i> (~10 ⁷)	DSM 4910	P	10 mg/L	—/LB medium	60W tungsten lamp; 700 Lux; 0.1 mWcm ²	1.08 J/cm ² /3 h	7.1 log ₁₀
		<i>B. subtilis</i> (~10 ⁸)	DSM 618					1.08 J/cm ² /3 h	5.1 log ₁₀
		<i>L. monocytogenes</i> (~ 10 ⁸)	DSM 20600					1.08 J/cm ² /3 h	3.1 log ₁₀
		<i>Yersinia pseudotuberculosis</i> (~ 10 ⁷)	YPIII					1.08 J/cm ² /5.5 h	complete
		<i>E. coli</i> (~ 10 ⁷)	DH10B					0.72 J/cm ² /2 h	7.0 log ₁₀
					10 mg/L Pchl ide + 50 mg/L PMBN/ DS			0.54 J/cm ² /1.5 h	8.2 log ₁₀
176		<i>S. aureus</i> (5×10 ⁶)	ATCC8096		10 ⁻⁵ M/DS	1 h /NaCl;		—/1 h	3.1 log ₁₀

	Sodium chlorophyllin (not copperized chlorophyll sodium salt); (Chl)	<i>B. cereus</i> (5×10 ⁶)	ATCC9634			on plate count agar	Halogen photoptic lamp (1000 W); —		3.1 log ₁₀
		<i>B. subtilis</i> (5×10 ⁶)	ATCC1904						
93	Chl	<i>L. monocytogenes</i> (10 ⁷)	ATCL ₃ C 7644	P	7.5×10 ⁻⁷ M/DS	2 min; in PBS buffer	LED; 400 nm; 20 mW/cm ²	6 J/cm ² /5 min	complete (7 log ₁₀)
		<i>B. cereus</i> (10 ⁷)	ATCC 12826		7.5×10 ⁻⁷ M/DS			2.4 J/cm ² /2 min	
					7.5×10 ⁻⁸ M/DS			6 J/cm ² /5 min	
		<i>S. enterica</i> (10 ⁷)	DS88(SL56 76 Smr Plm32)	7.5×10 ⁻⁵ M/DS	60 min; in PBS buffer	24 J/cm ² /20 min	1.6 log ₁₀		
178	Chl	<i>L. monocytogenes</i> (10 ⁷)	ATCL ₃ C 7644	P	7.5×10 ⁻⁷ M/DS	2 min/PBS buffer	LED; 405 nm; 20 mW/cm ²	6 J/cm ² /5 min	complete (7 log ₁₀)
		<i>L. monocytogenes</i> (10 ⁷)	56 Ly					36 J/cm ² /30 min	
179	Chl	<i>L. monocytogenes</i> (~10 ⁷)	ATCL ₃ C 7644	B	1.5×10 ⁻⁵ M;	22 min; on the surface of packaging samples	LED; 405 nm; 12 mW/cm ²	3.6 J/cm ² /5 min	1.5 log ₁₀
					1.5×10 ⁻⁴ M				4.5 log ₁₀ (to undetectable level)

		<i>B. cereus</i> (~ 10 ⁷)	SV 90	P	7.5×10 ⁻⁷ M/DS	2 min; PBS buffer		21.6 J/cm ² /30 min	~3.5 log ₁₀
173	Chl	<i>S. aureus</i> (10 ⁸)	CECT 86	P	PS immobilized in gellan films. It was added to the solution at 80 µg/mL./DS	0 min/on the surface of TSA	quartz/halogen lamps; white light; LED; 470 nm;	30,000 lux/5 min	5 log ₁₀
		<i>L. monocytogenes</i> (10 ⁸)	CECT 934						~5 log ₁₀
		<i>E. coli</i> (10 ⁸)	CECT 515						Not susceptible
		<i>Salmonella</i> spp. (10 ⁸)	CECT 409						Not susceptible
	Chlorophyllin sodium copper salt (CuChlNa)	<i>S. aureus</i> (10 ⁸)	CECT 86						4 log ₁₀
		<i>L. monocytogenes</i> (10 ⁸)	CECT 934						~ 4 log ₁₀
		<i>E. coli</i> (10 ⁸)	CECT 515						Not susceptible
		<i>Salmonella</i> spp. (10 ⁸)	CECT 409						Not susceptible
199	CuChlNa	<i>S. aureus</i> (~ 5×10 ⁸)	ATCC 25923	P	5 µM/DS	30 min/NaCl	LED; 405 nm; 8.3 mW/cm ²	30 J/cm ² /60 min	Complete
		<i>E. coli</i> (~ 5×10 ⁸)	ATCC 25922	P	5 µM/DS+ DMSO	120 min/NaCl			Not susceptible
180	Chl	<i>L. monocytogenes</i> (10 ⁵)	CECT 911 (ATCC 19112)	P	1% (incorporated with PE)/DS	0 min/on the surface of TSA	500 W Haloline 64702 halogen lamps (Osram); infrared region;	15 min	0.65 log ₁₀

								7,25 log ₁₀
								7.01 log ₁₀
								7.09 log ₁₀
		<i>E. coli</i> (10 ⁵)	CECT 434 (ATCC 25922)					0.67 log ₁₀
					1% (incorporated with PE)/DS	on the surface of TSA plates; 40 mM EDTA	50 W 81.575/Dia LED lights (Electro DH); 450 nm and 550 nm;	7.47 log ₁₀
					1% (incorporated with PVOH)/DS			
					1% (incorporated with HPMC)/DS			7.04 log ₁₀

					1% (incorporated with G)/DS				7.04 log ₁₀
182	Chl(E)	<i>E. coli</i> ; OD ₅₉₀ = 0.1 (corresponding to 0.8×10 ⁸)	DH5α	P	10 mg/L/ DS	LB medium	LED; 12 mW/cm ²	129.6 J/cm ² /180 min	Not susceptible
					10 mg/L Chl+0.1 µg/L colistin; ~ OD 0.2				~ OD 0.5
		S. Typhimurium OD ₅₉₀ = 0.1 (corresponding to 0.8×10 ⁸)	Ames9274		0.5 mg/L/ DS				Completely inhibited the growth
					0.5 mg/L Chl+0.1 µg/L colistin;/ ~ OD 0.2				Completely inhibited the growth
94	Chl(prepared from frozen spinach)	<i>E. coli</i> (10 ⁸)	DH5α	P	25 mg/L/DS	0 min/LB medium	LED; 12 mW/cm ²	30-180 min	Not susceptible
		<i>E. coli</i> (10 ⁶)	NR698 (MC4100 <i>lptD4213</i>)		5 mg/L/DS			60 min	Completely inactivated
		<i>B. subtilis</i> (10 ⁸)	168 (<i>trpC2</i>)		0.5 mg/L/DS			60 min	Completely inactivated

200	Chl	<i>E. coli</i> (10 ⁷)	O157:H7	P	1×10 ⁻⁵ M/DS	60 min;	LED; 405 nm; 9.6 mW/cm ² from top and 11.5 mW/cm ² from bottom	38 J/cm ² /30 min	~3 log ₁₀
	Chl + ZnO nanoparticles.				1×10 ⁻⁴ M/DS	15 min with ZnO + 15 min with Chl/PBS buffer			4.5 log ₁₀
177	Chl	<i>L. monocytogenes</i> (10 ⁷)	ATCL ₃ C 7644	P	7.5×10 ⁻⁷ M/DS	2 min/PBS buffer	LED; 400 nm; 20 mW/cm ²	3.6 J/cm ² /5 min	7 log ₁₀
		<i>S. enterica</i> (10 ⁷)	DS88(SL56 76 Smr Plm32)		7.5×10 ⁻⁵ M/DS			28.8 J/cm ² /40 min	~2.2 log ₁₀
	Chl + 5-aminolevulinic acid hydrochloride (Ala)	<i>L. monocytogenes</i> (10 ⁷)	ATCL ₃ C 7644		7.5×10 ⁻⁷ M Chl + 7.5×10 ⁻³ M Ala/DS	2 min; in PBS buffer		17.3 J/cm ² /30 min	undetectable level (~ 7.5 log ₁₀)
		<i>S. enterica</i> (10 ⁷)	DS88(SL56 76 Smr Plm32)		7.5×10 ⁻⁵ M Chl + 7.5×10 ⁻³ M Ala/DS	60 min/PBS buffer			undetectable level (~ 7.5 log ₁₀)
201	Chl-KCHS (chitosan)	<i>S. enterica</i> (10 ⁸)	DS88(SL56 76 Smr Plm32)	P	0.001% - 0.1%/DS	0-4 h/ LB medium	LED; 405 nm; 9.6 mW/cm ²	17.3 J/cm ² /30 min	Not susceptible
		<i>L. monocytogenes</i> (~ 10 ⁸)	ATCL ₃ C 7644		0.001%-0.1%/ 5.4 log ₁₀ -after 4 h incubation	0-4 h/LB medium		2.9 J/cm ² /5 min	complete (8 log ₁₀)
202/ 175	Chl- ¹² CHSconjugate	<i>S. enterica</i> (10 ⁷)		P	1.5×10 ⁻⁵ M - 0.1%/2.15 log ₁₀ -	0-120 min/0.9% NaCl	LED; 405 nm;	38 J/cm ² /30 min	complete (7 log ₁₀)

			DS88(SL56 76 Smr Plm32)		after 2 h incubation		21 mW/cm ²		
181	Chl-CHS	<i>L. monocytogenes</i> (~ 10 ⁷)	ATCL ₃ C 7644	P	0.0001%-0.001%/ 2.1 log ₁₀ - after 2 min incubation	2 min/0.9% NaCl	LED; 405 nm; 9.6-11.52 mW/cm ²	2.9 J/cm ² /2 min	7.01 log ₁₀
		<i>E. coli</i> (~ 10 ⁷)	157:H7		0.001% - 0.1%/ 0.5 log ₁₀ - after 1 h incubation	60 min/0.9% NaCl		38 J/cm ² /30 min	4.5 log ₁₀
								76 J/cm ² /60 min	7 log ₁₀
96	water extract of the calyces of <i>Hibiscus sabdariffa</i> L (cHs WE)	<i>E. coli</i> (~ 10 ⁷)	Nissle 1917	P	1 mg/mL	in d H ₂ O	Slide Projector—Zett Royal II afs; 420 nm; 10 mW/cm ²	12 J/cm ² /20 min	complete -8.5 log
		<i>B. subtilis</i> (10 ⁸)	DB 104		0.0625 mg/mL				2.2 log
	methanol extract of the calyces of <i>H. Sabdariffa</i> (cHs ME)	<i>E. coli</i> (~10 ⁷)	Nissle 1917		1 mg/mL				4.8 log
		<i>B. subtilis</i> (10 ⁸)	DB 104		0.0625 mg/mL				complete- 8.5 log

¹P - planktonic cells; ²B - biofilms; ³DS- doesn't show; ⁴PBS – phosphate-buffered saline; ⁵LED- light emitting diode; ⁶—no information; ⁷NS – not susceptible; ⁸LB - Luria Bertani; ⁹TSB - tryptic soy broth; ¹⁰NB - nutrient broth; ¹¹FUM - fluid universal medium; ¹²CHS- chitosan