

## Data availability

The data supporting this article have been included as part of the Supplementary Information.

## Supplementary Information

Table SI 1: Water contact angle values of the 7 groups of surfaces before and after subjected to hydrothermal treatment.

Surface roughness ( $\mu\text{m Ra}$ )	WCA ( $^\circ$ ) before hydrothermal					WCA ( $^\circ$ ) after hydrothermal				
	1	2	3	Mean	SD	1	2	3	Mean	SD
1.44	82.48	64.69	78.99	75.39	7.70	0	0	0	0.00	0.00
1.29	100.13	94.41	78.24	90.93	9.27	10.19	17.85	15.51	14.52	3.21
0.87	102.39	95.25	95.71	97.78	3.26	19.9	7.13	0	9.01	8.23
0.64	97.42	103.12	101.86	100.80	2.44	0	0	0	0.00	0.00
0.40	102.97	98.64	99.75	100.45	1.84	0	0	0	0.00	0.00
0.31	96.81	100.23	104.51	100.52	3.15	0	0	0	0.00	0.00
0.25	71.65	70.97	68.17	70.26	1.51	0	0	0	0.00	0.00

Table SI 2: Number of live bacterial cells on the surface

		Number of live cells							
Trial #	Image #	1.44	1.29	0.87	0.64	0.40	0.31	0.25	Control
Trial 1	1	3280	957	14137	8449	10717	7389	5601	97244
	2	2622	2371	8300	33032	8029	16185	17346	128062
	3	2417	1797	10917	7041	9703	4646	25704	126095
	4	4200	4220	10064	5556	13589	20394	51329	112526
	5	1778	3807	4474	38095	12892	7316	56574	492016
	6	2804	1753	7780	6800	10032	12090	27212	379975
	7	1483	2991	5187	19528	8499	16079	22857	106426
	8	2461	4841	2568	16868	9472	31579	136	441967
	9	1486	1112	9895	21356	18836	11150	13213	218816
	10	2623	1399	6240	3279	32863	15344	57173	292345
Trial 2	1	5426	2249	12418	12274	34859	1295	2073	246323
	2	5494	2718	21431	19787	23664	1078	741	293742
	3	2437	6229	7255	20058	13208	6996	2705	266844
	4	2799	4203	5773	27729	10427	5085	51834	372875
	5	1650	1435	7651	17395	6337	5552	24890	333745
	6	3101	3380	27410	27509	6063	10241	16112	158558
	7	11478	3440	10113	10197	8165	2846	95555	280018
	8	11778	1451	6198	15430	28841	34065	33892	229920
	9	6872	1728	7082	14886	7258	972	5226	222791
	10	7603	5811	9487	9367	8673	14367	2609	255110
Trial 3	1	4244	1406	16131	9209	5767	20397	27880	339974
	2	7564	954	1524	29854	22392	5231	67712	291284
	3	8297	4576	5058	3969	6719	50500	21165	236734
	4	5283	649	1539	21227	5691	5007	3839	256938
	5	2913	2150	11668	16717	28559	9706	27183	262415
	6	1097	2268	17761	15632	13218	19585	92736	249740

		Number of live cells							
Trial #	Image #	1.44	1.29	0.87	0.64	0.40	0.31	0.25	Control
	7	7054	2768	11974	8319	8929	102669	21608	201105
	8	4791	523	455	3785	50960	48680	22517	276970
	9	4217	1161	12457	5587	28456	35444	26597	330923
	10	3637	2899	3148	6618	14013	262	8510	323599

Table SI 3: Number of dead bacterial cells on the surface

		Number of dead cells							
Trial #	Image #	1.44	1.29	0.87	0.64	0.40	0.31	0.25	Control
Trial 1	1	25413	12825	153514	137248	37469	35651	52255	102
	2	28140	15889	64878	17032	99318	57423	84574	1651
	3	43363	41031	62281	37267	66137	15149	28071	523
	4	48265	32355	103455	68460	51086	40377	161627	1199
	5	45534	18191	65342	78365	55091	46917	68668	2636
	6	23510	55115	124000	109167	68532	53077	64166	4129
	7	45827	29827	114922	79093	157321	47217	37718	3237
	8	41083	59615	24561	40006	49106	63160	24818	1835
	9	41715	12552	147309	123104	60396	25389	14546	3894
	10	33795	40562	100516	27482	16683	44120	81866	2002
Trial 2	1	73009	58710	157751	49277	40131	10159	11161	1338
	2	72974	12378	74995	88725	156488	14071	6760	467
	3	26175	13944	196160	48586	50989	56773	13728	431
	4	43996	28010	86814	91961	20455	17169	26165	252
	5	13456	15536	195291	87187	66702	39169	22338	337
	6	23739	90051	185914	102810	80899	9161	37483	2312
	7	54306	77330	115730	94905	63476	11427	49610	2746
	8	33835	72104	72206	58194	114062	21760	27937	342
	9	39955	28663	87878	105206	83070	1106	56502	589
	10	35509	73065	148035	89877	52891	64085	21136	182
Trial 3	1	51717	18748	61676	44403	23452	12145	48085	283
	2	76704	16380	10443	59104	26208	17484	116211	1593
	3	45325	13676	58974	66770	62443	284578	22778	1102
	4	43836	2350	130229	81034	52854	30193	16132	5571
	5	44779	54115	259198	84470	94577	43639	26241	703
	6	9198	53572	147440	48409	106886	107760	3094	262
	7	28976	33339	117862	84052	99635	276399	94859	686
	8	109981	60725	19809	49862	89678	123293	71241	1078
	9	38059	67393	73018	99367	93881	77991	38750	1988
	10	22884	20739	225672	42420	104236	4412	71922	3716

Table SI 4: Total number of bacterial cells adhered on the surface

		Total number of adhered cells							
Trial #	Image #	1.44	1.29	0.87	0.64	0.40	0.31	0.25	Control
Trial 1	1	28693	13782	167651	145697	48186	43040	57856	97346
	2	30762	18260	73178	50064	107347	73608	101920	129713

		Total number of adhered cells								
Trial #	Image #	1.44	1.29	0.87	0.64	0.40	0.31	0.25	Control	
	3	45780	42828	73198	44308	75840	19795	53775	126618	
	4	52465	36575	113519	74016	64675	60771	212956	113725	
	5	47312	21998	69816	116460	67983	54233	125242	494652	
	6	26314	56868	131780	115967	78564	65167	91378	384104	
	7	47310	32818	120109	98621	165820	63296	60575	109663	
	8	43544	64456	27129	56874	58578	94739	24954	443802	
	9	43201	13664	157204	144460	79232	36539	27759	222710	
	10	36418	41961	106756	30761	49546	59464	139039	294347	
	Trial 2	1	78435	60959	170169	61551	74990	11454	13234	247661
		2	78468	15096	96426	108512	180152	15149	7501	294209
3		28612	20173	203415	68644	64197	63769	16433	267275	
4		46795	32213	92587	119690	30882	22254	77999	373127	
5		15106	16971	202942	104582	73039	44721	47228	334082	
6		26840	93431	213324	130319	86962	19402	53595	160870	
7		65784	80770	125843	105102	71641	14273	145165	282764	
8		45613	73555	78404	73624	142903	55825	61829	230262	
9		46827	30391	94960	120092	90328	2078	61728	223380	
10		43112	78876	157522	99244	61564	78452	23745	255292	
Trial 3	1	55961	20154	77807	53612	29219	32542	75965	340257	
	2	84268	17334	11967	88958	48600	22715	183923	292877	
	3	53622	18252	64032	70739	69162	335078	43943	237836	
	4	49119	2999	131768	102261	58545	35200	19971	262509	
	5	47692	56265	270866	101187	123136	53345	53424	263118	
	6	10295	55840	165201	64041	120104	127345	95830	250002	
	7	36030	36107	129836	92371	108564	379068	116467	201791	
	8	114772	61248	20264	53647	140638	171973	93758	278048	
	9	42276	68554	85475	104954	122337	113435	65347	332911	
	10	26521	23638	228820	49038	118249	4674	80432	327315	

Table SI 5: Bactericidal efficacy demonstrated by each surface

		Bactericidal efficacy							
Trial #	Image #	1.44	1.29	0.87	0.64	0.40	0.31	0.25	Control
Trial 1	1	88.6	93.1	91.6	94.2	77.8	82.8	90.3	0.1
	2	91.5	87	88.7	34	92.5	78	83	1.3
	3	94.7	95.8	85.1	84.1	87.2	76.5	52.2	0.4
	4	92	88.5	91.1	92.5	79	66.4	75.9	1.1
	5	96.2	82.7	93.6	67.3	81	86.5	54.8	0.5
	6	89.3	96.9	94.1	94.1	87.2	81.4	70.2	1.1
	7	96.9	90.9	95.7	80.2	94.9	74.6	62.3	3
	8	94.3	92.5	90.5	70.3	83.8	66.7	99.5	0.4
	9	96.6	91.9	93.7	85.2	76.2	69.5	52.4	1.7
	10	92.8	96.7	94.2	89.3	33.7	74.2	58.9	0.7
Trial 12	1	93.1	96.3	92.7	80.1	53.5	88.7	84.3	0.5

		<b>Bactericidal efficacy</b>							
<b>Trial #</b>	<b>Image #</b>	<b>1.44</b>	<b>1.29</b>	<b>0.87</b>	<b>0.64</b>	<b>0.40</b>	<b>0.31</b>	<b>0.25</b>	<b>Control</b>
	2	93	82	77.8	81.8	86.9	92.9	90.1	0.2
	3	91.5	69.1	96.4	70.8	79.4	89	83.5	0.2
	4	94	87	93.8	76.8	66.2	77.2	33.5	0.1
	5	89.1	91.5	96.2	83.4	91.3	87.6	47.3	0.1
	6	88.4	96.4	87.2	78.9	93	47.2	69.9	1.4
	7	82.6	95.7	92	90.3	88.6	80.1	34.2	1
	8	74.2	98	92.1	79	79.8	39	45.2	0.1
	9	85.3	94.3	92.5	87.6	92	53.2	91.5	0.3
	10	82.4	92.6	94	90.6	85.9	81.7	89	0.1
	<b>Trial 3</b>	1	92.4	93	79.3	82.8	80.3	37.3	63.3
2		91	94.5	87.3	66.4	53.9	77	63.2	0.5
3		84.5	74.9	92.1	94.4	90.3	84.9	51.8	0.5
4		89.2	78.4	98.8	79.2	90.3	85.8	80.8	2.1
5		93.9	96.2	95.7	83.5	76.8	81.8	49.1	0.3
6		89.3	95.9	89.2	75.6	89	84.6	3.2	0.1
7		80.4	92.3	90.8	91	91.8	72.9	81.4	0.3
8		95.8	99.1	97.8	92.9	63.8	71.7	76	0.4
9		90	98.3	85.4	94.7	76.7	68.8	59.3	0.6
10		86.3	87.7	98.6	86.5	88.1	94.4	89.4	1.1

Table SI 6: Arithmetic average surface roughness Ra values obtained with AFM

<b>Group</b>	<b>Arithmetic average surface roughness Ra (nm)</b>			
	<b>Sample #1</b>	<b>Sample #2</b>	<b>Sample #3</b>	<b>Mean</b>
1.44 $\mu\text{m}$ without nanowires	78.20	52.60	133.00	87.93
1.44 $\mu\text{m}$ with nanowires	134.00	139.00	91.00	121.33
1.29 $\mu\text{m}$ without nanowires	166.00	52.10	31.80	83.30
1.29 $\mu\text{m}$ with nanowires	160.00	110.00	147.00	139.00
0.87 $\mu\text{m}$ without nanowires	68.00	87.90	35.30	63.73
0.87 $\mu\text{m}$ with nanowires	117.00	94.80	87.20	99.67
0.64 $\mu\text{m}$ without nanowires	46.30	66.50	59.00	57.27
0.64 $\mu\text{m}$ with nanowires	88.40	95.80	85.00	89.73
0.40 $\mu\text{m}$ without nanowires	60.10	41.50	33.30	44.97
0.40 $\mu\text{m}$ with nanowires	81.70	110.00	69.20	86.97
0.31 $\mu\text{m}$ without nanowires	68.60	48.90	59.20	58.90
0.31 $\mu\text{m}$ with nanowires	110.00	85.70	76.10	90.60
0.25 $\mu\text{m}$ without nanowires	2.27	2.64	1.87	2.26
0.25 $\mu\text{m}$ with nanowires	38.70	37.90	39.50	38.70

Table SI 7: Root mean square roughness Ra values obtained with AFM

<b>Group</b>	<b>Root mean square roughness Rq (nm)</b>			
	<b>Sample #1</b>	<b>Sample #2</b>	<b>Sample #3</b>	<b>Mean</b>
1.44 $\mu\text{m}$ without nanowires	92.20	63.80	152.00	102.67
1.44 $\mu\text{m}$ with nanowires	174.00	194.00	116.00	161.33
1.29 $\mu\text{m}$ without nanowires	197.00	77.00	40.10	104.70

Group	Root mean square roughness Rq (nm)			
	Sample #1	Sample #2	Sample #3	Mean
1.29 $\mu\text{m}$ with nanowires	211.00	139.00	188.00	179.33
0.87 $\mu\text{m}$ without nanowires	87.20	103.00	45.70	78.63
0.87 $\mu\text{m}$ with nanowires	146.00	120.00	114.00	126.67
0.64 $\mu\text{m}$ without nanowires	57.40	85.10	78.60	73.70
0.64 $\mu\text{m}$ with nanowires	110.00	118.00	107.00	111.67
0.40 $\mu\text{m}$ without nanowires	72.80	52.40	45.10	56.77
0.40 $\mu\text{m}$ with nanowires	107.00	138.00	86.40	110.47
0.31 $\mu\text{m}$ without nanowires	83.40	58.80	74.40	72.20
0.31 $\mu\text{m}$ with nanowires	136.00	107.00	95.00	112.67
0.25 $\mu\text{m}$ without nanowires	3.77	4.34	3.34	3.82
0.25 $\mu\text{m}$ with nanowires	49.40	48.30	51.20	49.63

Table SI 8: Skewness values obtained with AFM

Group	Skewness			
	Sample #1	Sample #2	Sample #3	Mean
1.44 $\mu\text{m}$ without nanowires	-0.290	-0.364	0.382	-0.091
1.44 $\mu\text{m}$ with nanowires	0.918	1.340	0.581	0.946
1.29 $\mu\text{m}$ without nanowires	-0.373	1.470	0.155	0.417
1.29 $\mu\text{m}$ with nanowires	0.343	0.206	0.658	0.402
0.87 $\mu\text{m}$ without nanowires	0.218	0.125	-0.716	-0.124
0.87 $\mu\text{m}$ with nanowires	0.442	0.243	0.826	0.504
0.64 $\mu\text{m}$ without nanowires	-0.463	0.077	-1.400	-0.595
0.64 $\mu\text{m}$ with nanowires	0.191	0.054	0.320	0.188
0.40 $\mu\text{m}$ without nanowires	0.210	-0.343	-1.050	-0.394
0.40 $\mu\text{m}$ with nanowires	-0.671	-0.244	0.133	-0.261
0.31 $\mu\text{m}$ without nanowires	-0.132	-0.324	-0.180	-0.212
0.31 $\mu\text{m}$ with nanowires	0.136	0.267	0.367	0.257
0.25 $\mu\text{m}$ without nanowires	4.580	4.740	3.510	4.277
0.25 $\mu\text{m}$ with nanowires	0.514	0.458	0.772	0.581

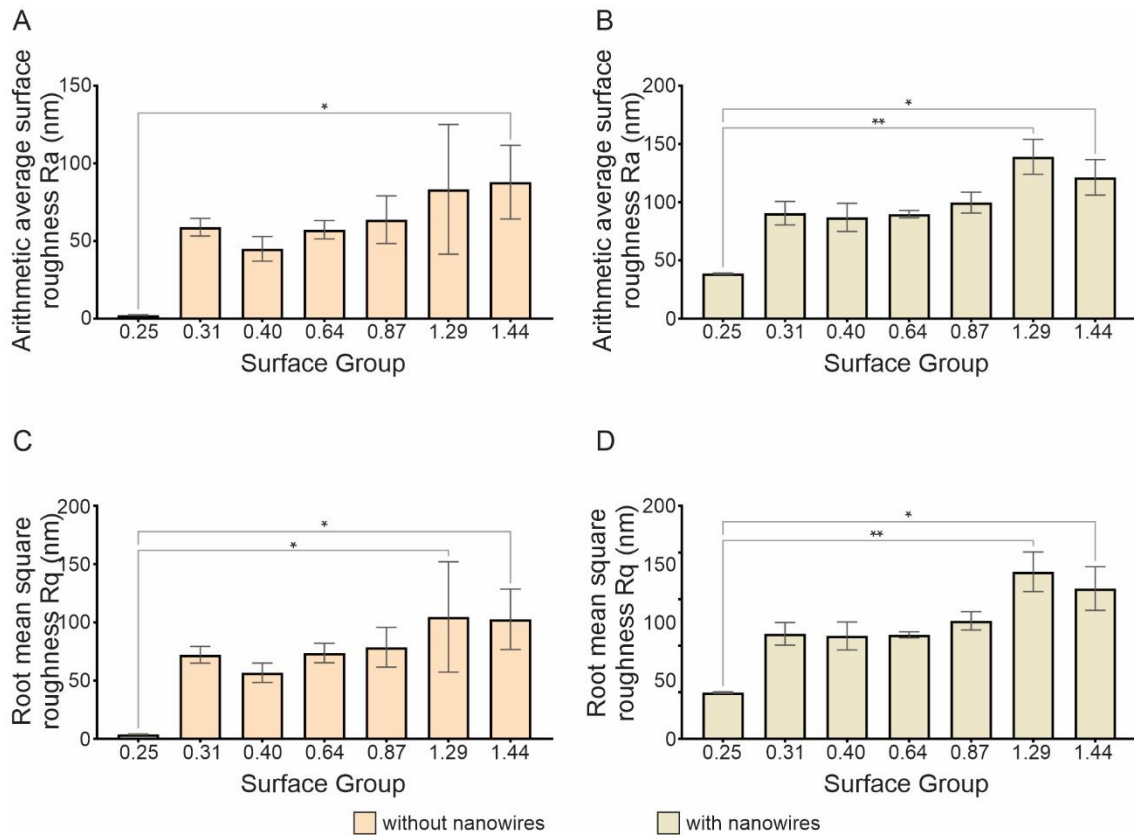


Figure SI 1: Surface characterisation with Arithmetic average surface roughness (Ra), and Root mean square roughness (Rq). (A) Ra values of flat surfaces (without nanowires), (B) Ra values of nanowire structured surfaces, (C) Rq values of flat surfaces (without nanowires), and (D) Rq values of nanowire structured surfaces. \* shows statistical significance with ANOVA. ns: Pairs with no significant ( $P > 0.05$ ) difference (not marked), \*:  $P \leq 0.05$ , \*\*:  $P \leq 0.01$ , \*\*\*:  $P \leq 0.001$ , and \*\*\*\*:  $P \leq 0.0001$ .