Supplementary Material

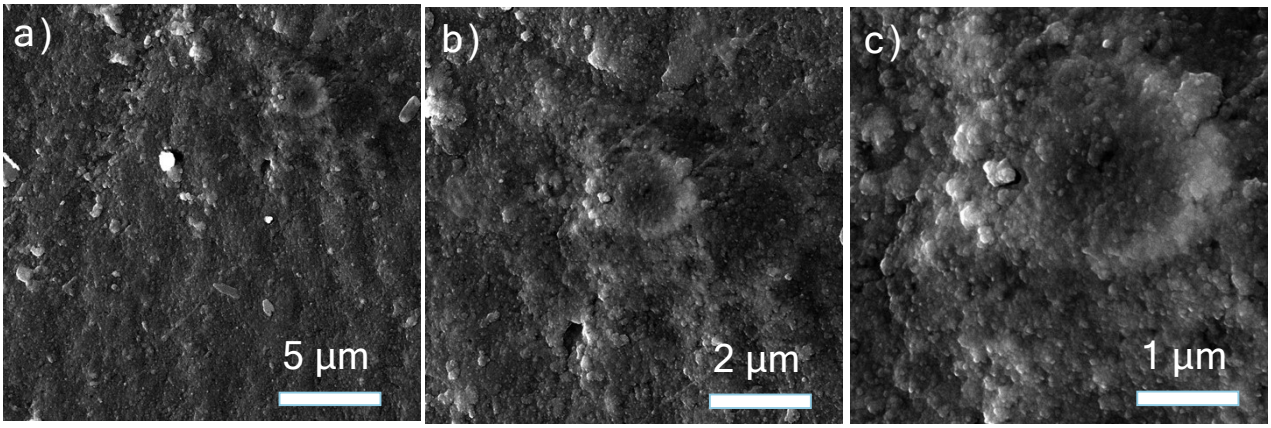
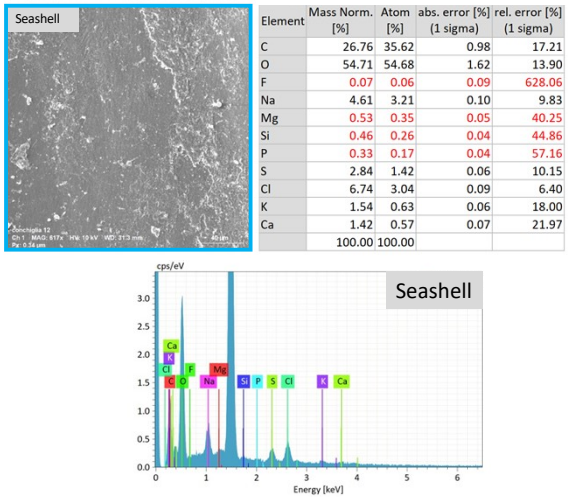


Fig. S1. SEM/EDS of *L. anatina* seashell.



Element	Mass Norm. [%]	Atom [%]	abs. error [%] (1 sigma)	rel. error [%] (1 sigma)
C	26.76	35.62	0.98	17.21
O	54.71	54.68	1.62	13.90
F	0.07	0.06	0.09	628.06
Na	4.61	3.21	0.10	9.83
Mg	0.53	0.35	0.05	40.25
Si	0.46	0.26	0.04	44.86
P	0.33	0.17	0.04	57.16
S	2.84	1.42	0.06	10.15
Cl	6.74	3.04	0.09	6.40
K	1.54	0.63	0.06	18.00
Ca	1.42	0.57	0.07	21.97
	100.00	100.00		

Fig. S2. EDS data of the seashell

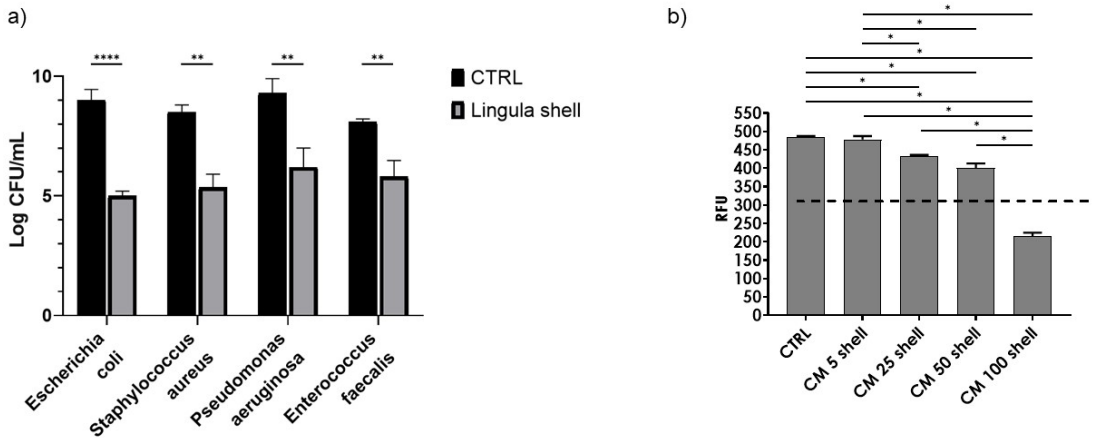


Fig. S3. a) Antibacterial activity of lingula seashell. b) Cell viability of MG-63 after 24h of maintenance with conditioned medium (CM) derived from shell at different dilutions with fresh

culture medium (100:0, 50:50, 25:75, and 5:95). The dashed line is for CTRL at just seeded. *: p-value < 0.05; ** p-value < 0.01; ****: p-value < 0.0001.

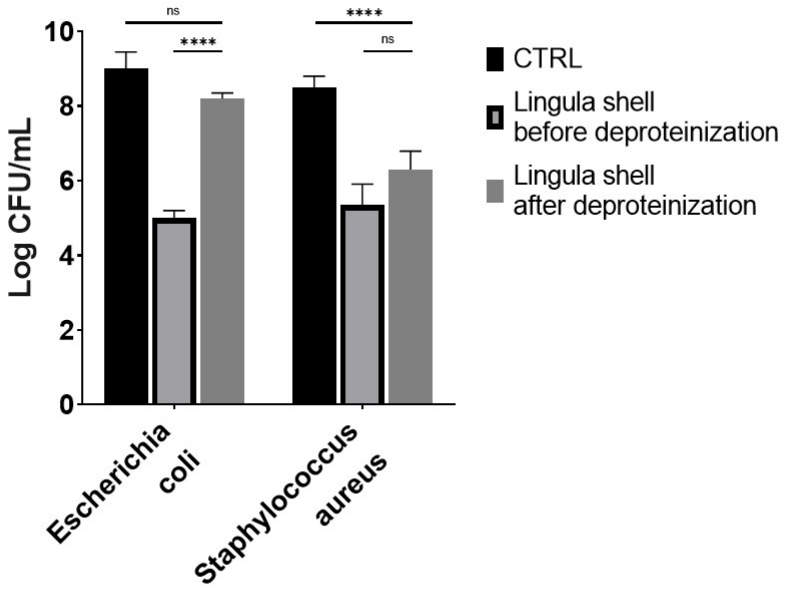
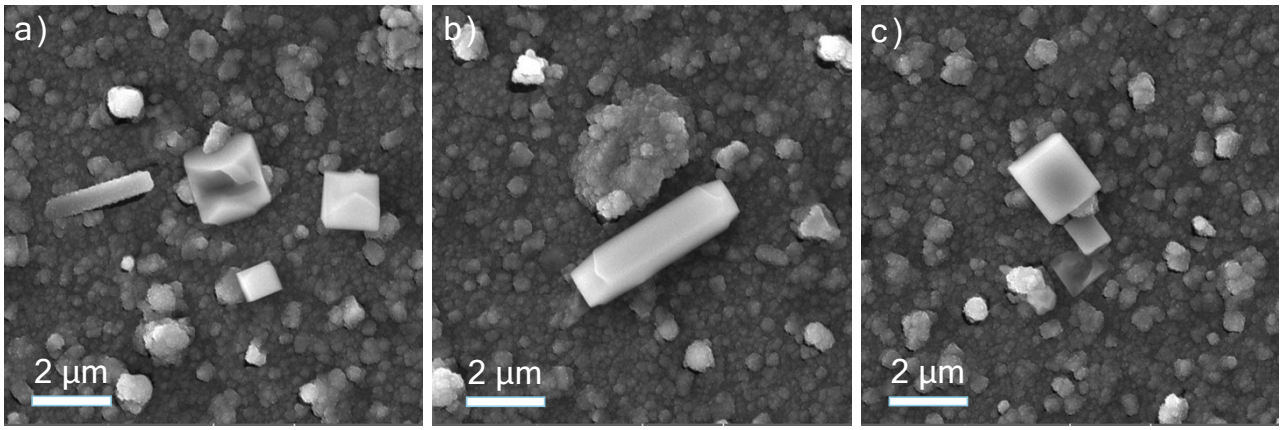


Fig. S4. Antibacterial efficacy of the shell before and after deproteinization. ns (not significant): p-value > 0.05; ****: p-value < 0.0001.



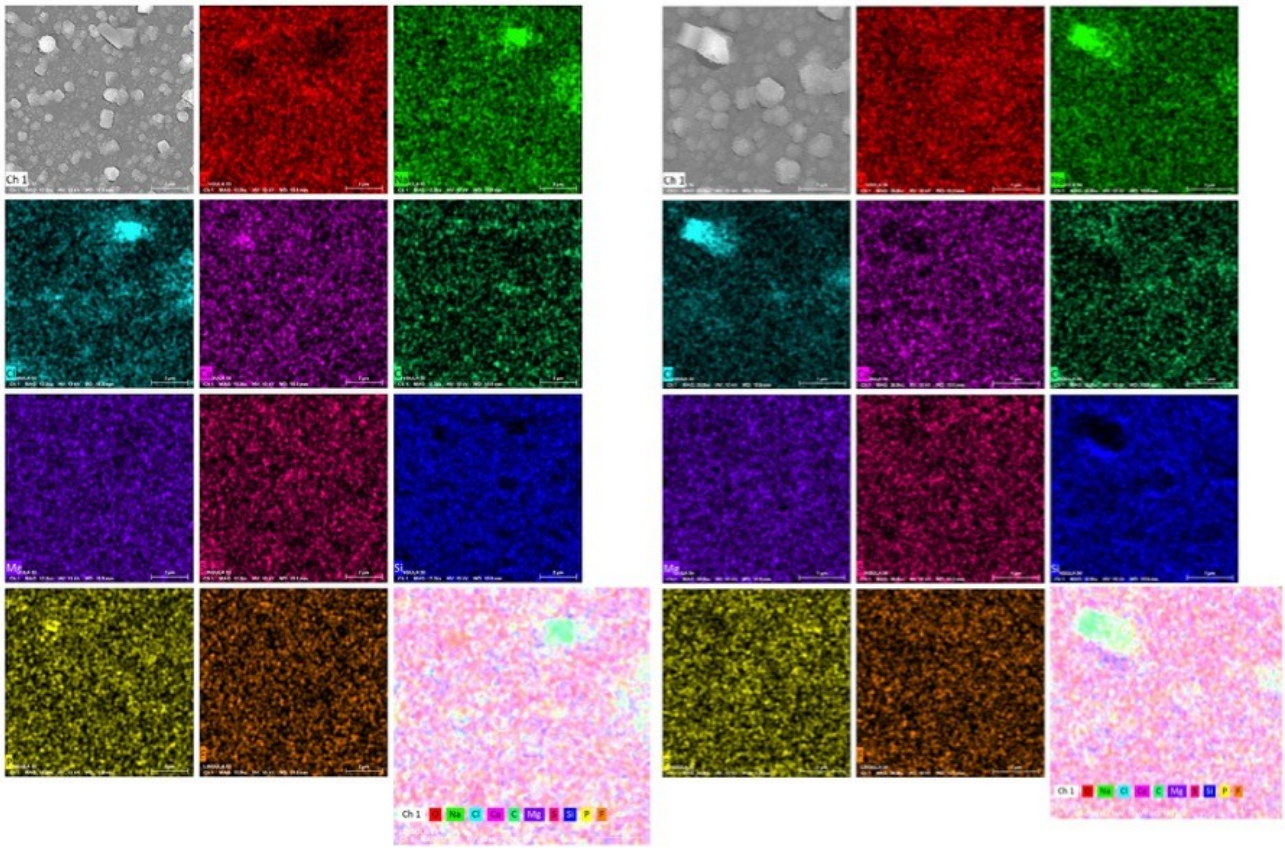


Fig. S5. NaCl crystals, if not removed, reform on the coating surface.

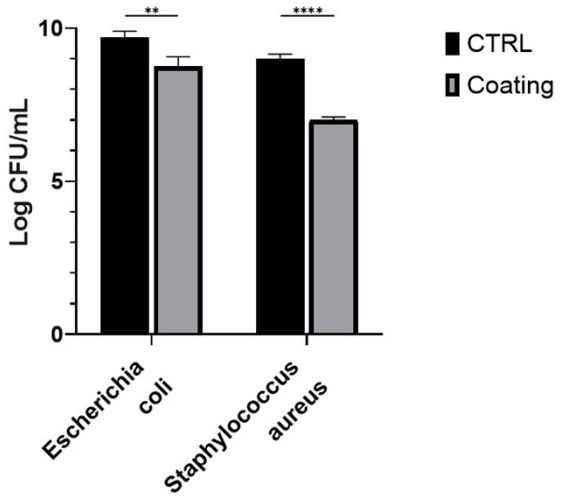


Fig. S6. Antimicrobial efficacy of the lingula coatings.

Table S1

Bacterial reduction efficacy of *Lingula* shell with and without heat treatment

	Lingula shell	Lingula shell after 400 °C treatment
Escherichia coli	99.99%[a]	84.15%
Staphylococcus aureus	99.93%	99.37%
Pseudomonas aeruginosa	99.92%	ND[b]
Enterococcus faecalis	99.49%	ND

[a] Bacterial reduction is expressed as percentage of bacterial concentration (CFU mL^{-1}) reduction compared to control experiments

[b] ND = not determined

Table S2. Substitution ratios, as assessed by ICP[a]

	Lingula shell	Coating
K/Ca	0.054	0.029
Mg/Ca	0.073	0.033
Mn/Ca	0.001	0,002
Na/Ca	0,189	0,042
Sr/Ca	0,003	0,007
Zn/Ca	0,001	0,037

[a] Values are calculated as the ratio between ppm of each ion and ppm of Ca, for the shell and the coating.