

Supporting Material

Table SM1.

Physicochemical properties of the three LDH samples used.

Sample	Average particle size (nm)	Polydispersity index (PDI)	Zeta Potential ¹ (mV)	d-spacing ² (nm)	Estimated chemical formula
LDH 42	42	0.223	+42 (W) +25 (T)	0.79	Mg ₃ Al(OH) ₈ (NO ₃)·mH ₂ O
LDH 104	104	0.165	+35 (W) +29 (T)	0.76	Mg ₂ Al(OH) ₆ (Cl)·mH ₂ O
LDH 208	208	0.061	+38 (W) +26 (T)	0.76	Mg ₂ Al(OH) ₆ (Cl)·mH ₂ O

¹Measurements were made either in de-ionized water (W) or 10 mM Tris, pH 7.4 (T).

²X-ray diffraction patterns were collected at a scanning rate of 2° per minute from 2θ = 5° to 2θ = 80° with Co K_α radiation (λ=0.17902 nm) on a Rigaku Miniflex X-ray diffractometer with a variable slit width. The d-spacing was calculated using the formula: $d = (d_{003} + 2d_{006} + 3d_{009})/3$.

Figure SM1.

Particle size of LDH nanoparticles as a function of time, after dilution to 50 ppm in 10 mM Tris, pH 7.4, at t=0 min.

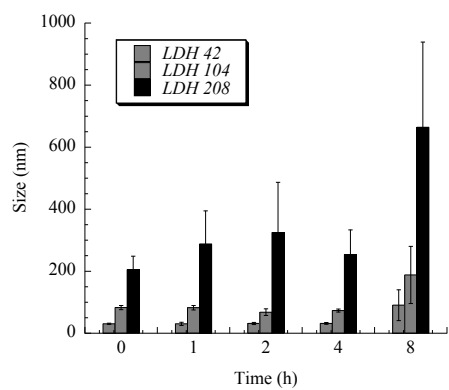
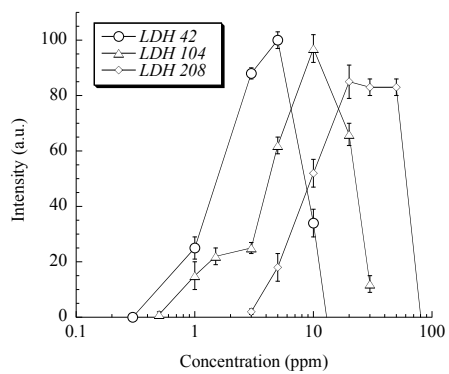


Figure SM2.

Fluorescence intensity for CF-loaded (a) DOPE/DOPG and (b) DOPC/cholesterol liposomes versus LDH particle concentration. Measurements were performed in 10 mM Tris, pH 7.4.

(a)



(b)

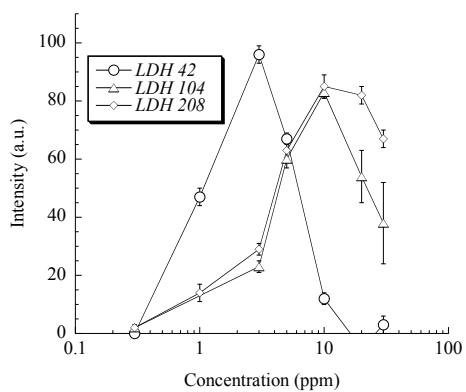
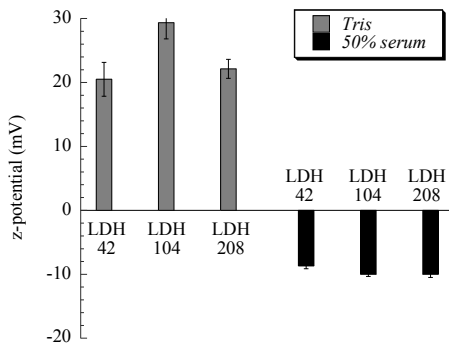


Figure SM3.

(a) Anionic serum proteins bind extensively to LDH nanoparticles, resulting in charge reversal, demonstrated by z-potential measurements of LDH nanoparticles in 10 mM Tris, pH 7.4, before and after exposure for 60 minutes to 50% serum. (b) Hemolysis induced by LDH nanoparticles. Measurements were performed either in 5% EDTA blood (where serum proteins are largely absent) or in 5% citrate blood (in which serum proteins are abundant). As seen, the presence of serum proteins (essentially all of which are net anionic) results in dramatic suppression of LDH hemolysis through masking of the positive surface potential of the bare LDH nanoparticles.

(a)



(b)

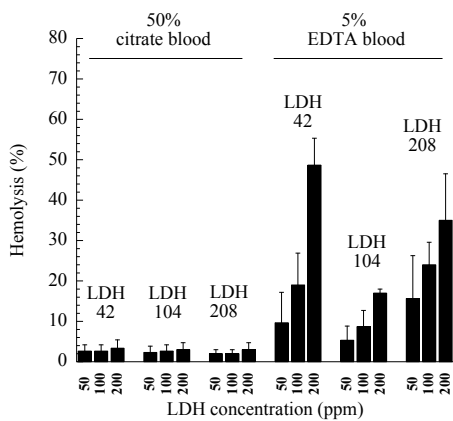


Figure SM4.

Fraction of *E. coli* in aggregates after mixing 10^8 cfu bacteria with 100 ppm LDH nanoparticles in 10 mM Tris, pH 7.4.

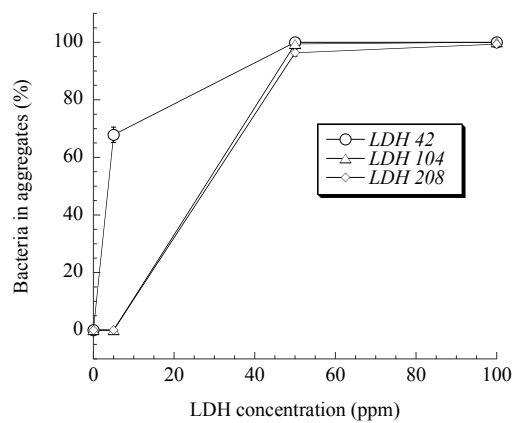


Figure SM5.

Representative confocal microscopy images obtained by live-dead staining, showing 100% live (upper), 100% dead (middle) *E. coli* (10^8 cfu) in 10 mM Tris, pH 7.4. Shown also (bottom) are corresponding live-dead images obtained for LDH 104 nm at 200 ppm in the absence and presence of 50 μ M LL-37, demonstrating that LL-37, but not the LDH nanoparticles, displays membrane-disrupting antimicrobial effects.

