

Supplementary Materials: Engineering alginate-based dry powder microparticles to a size suitable for direct pulmonary delivery of antibiotics

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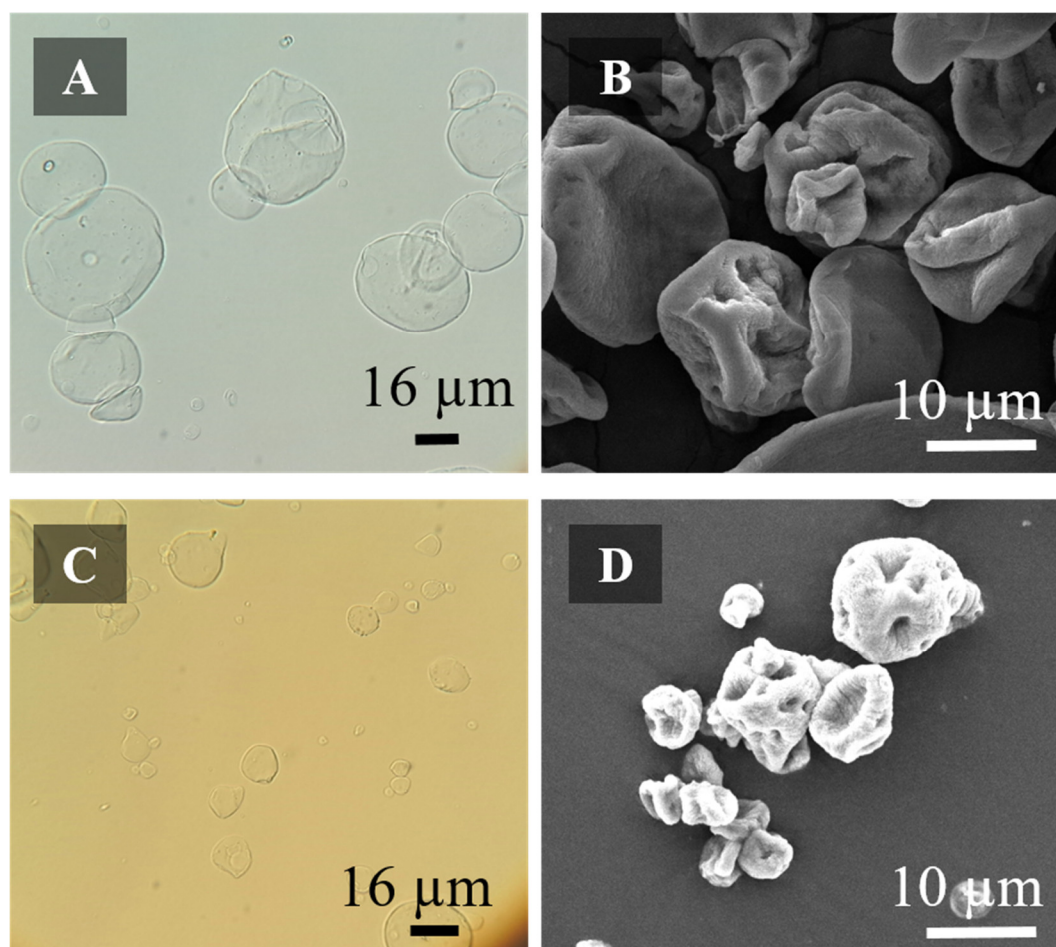


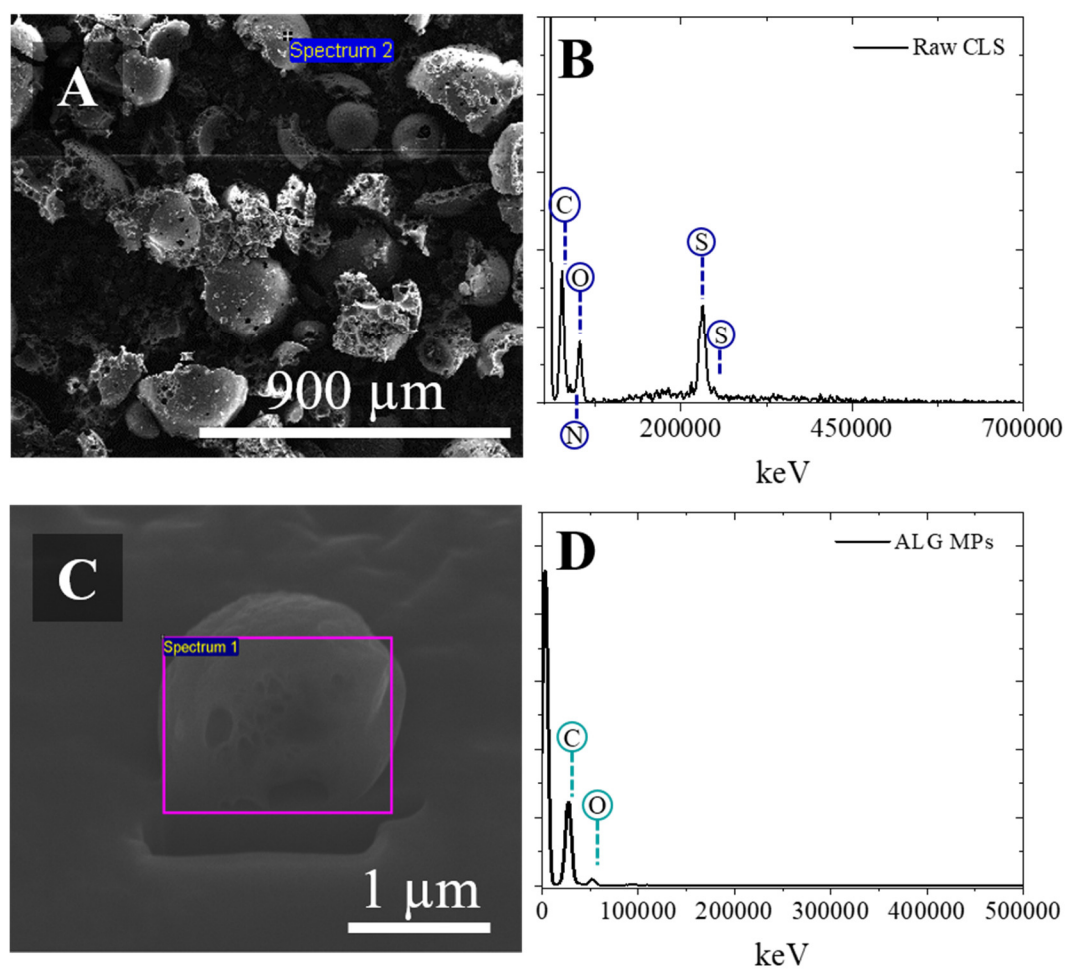
Figure S1. Optical and SEM microscopes images of alginate microparticles; (A - B) Alginate 2% w/v; (C - D) Alginate 2.5% w/v.

Table S1. Size of alginate microparticles.

Samples	Optical microscope (μm) (in water)	SEM (μm) (as powder)
Alginate 2% w/v MPs	36.10 ± 14.50	11.53 ± 5.02
Alginate 2.5% w/v MPs	16.70 ± 7.90	7.57 ± 4.18

Table S2. EDX analysis.

Element	Raw Colistin		Alginate Microparticles	
	Weight%	Atomic%	Weight%	Atomic%
C K	44.03	54.18	78.92	82.58
N K	18.32	19.33	7.76	6.96
O K	19.74	18.24	13.32	10.47
S K	17.90	8.25	-	-
Ba L	-	-	-	-
Total	100.00		100.00	

**Figure S2.** EDX analysis. SEM and Dual-Beam images and spectrums: (A) Raw colistin sulfate; (B) EDX of raw colistin sulfate; (C) Alginate microparticles; (D) EDX of alginate microparticles.

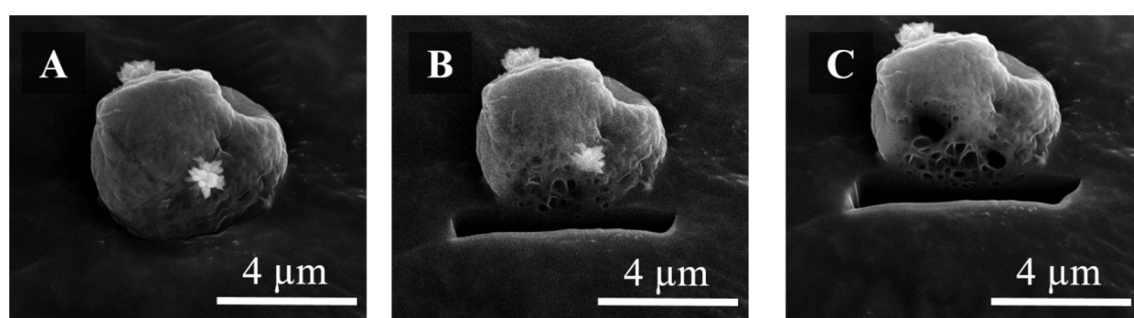


Figure S3. Alginate microparticles with colistin sulfate images from Dual-Beam microscope: **(A)** Initial ALG@CLS MPs; **(B - C)** Internal structure of microparticles after two cuts.

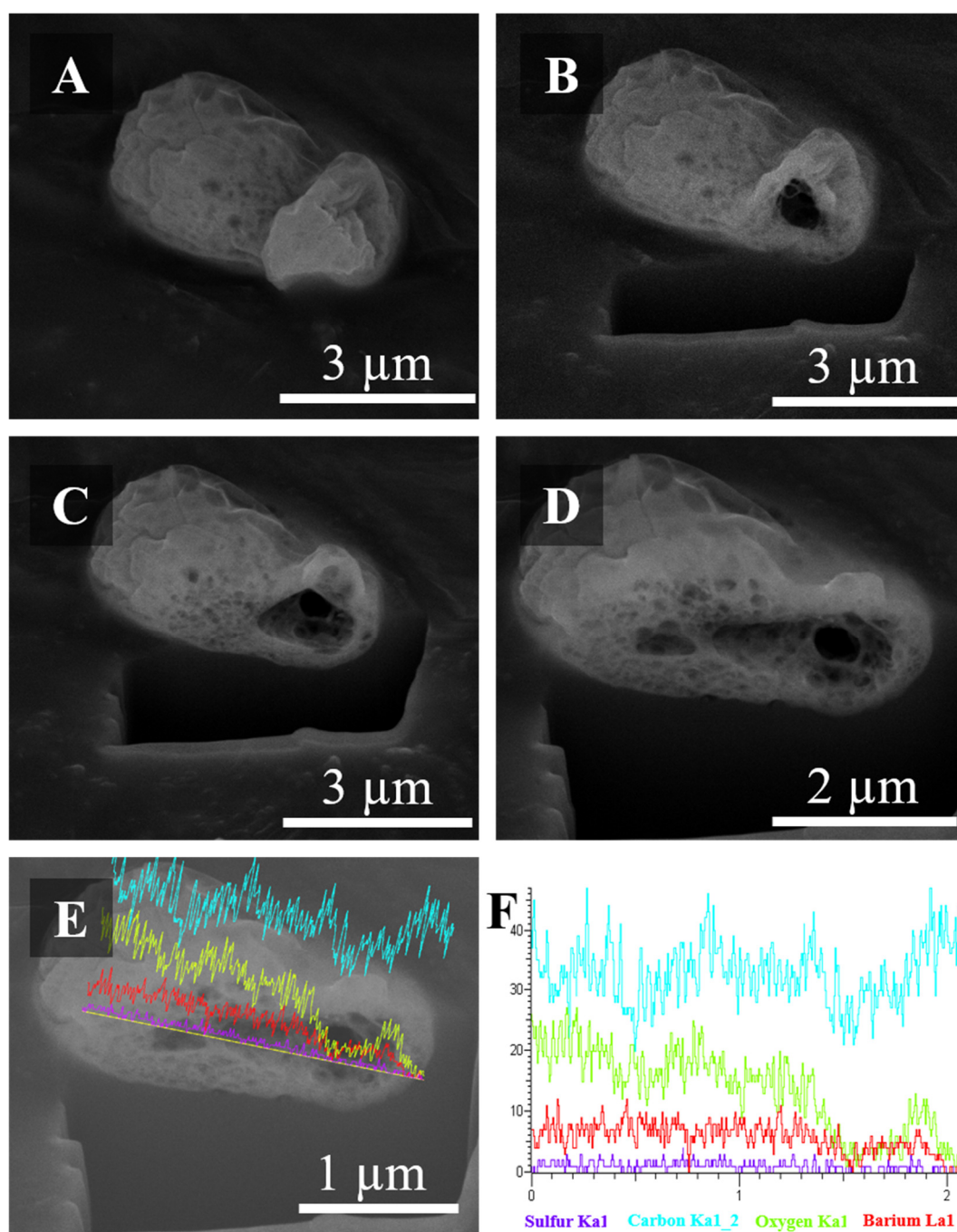


Figure S4. Alginate microparticles without drug, images from Dual-Beam microscope: (A) Initial alginate microparticle; (B - D) Internal structure of microparticles after three cuts; (E - F) Internal analysis composition of microparticle (oxygen, carbon, barium and sulfur).

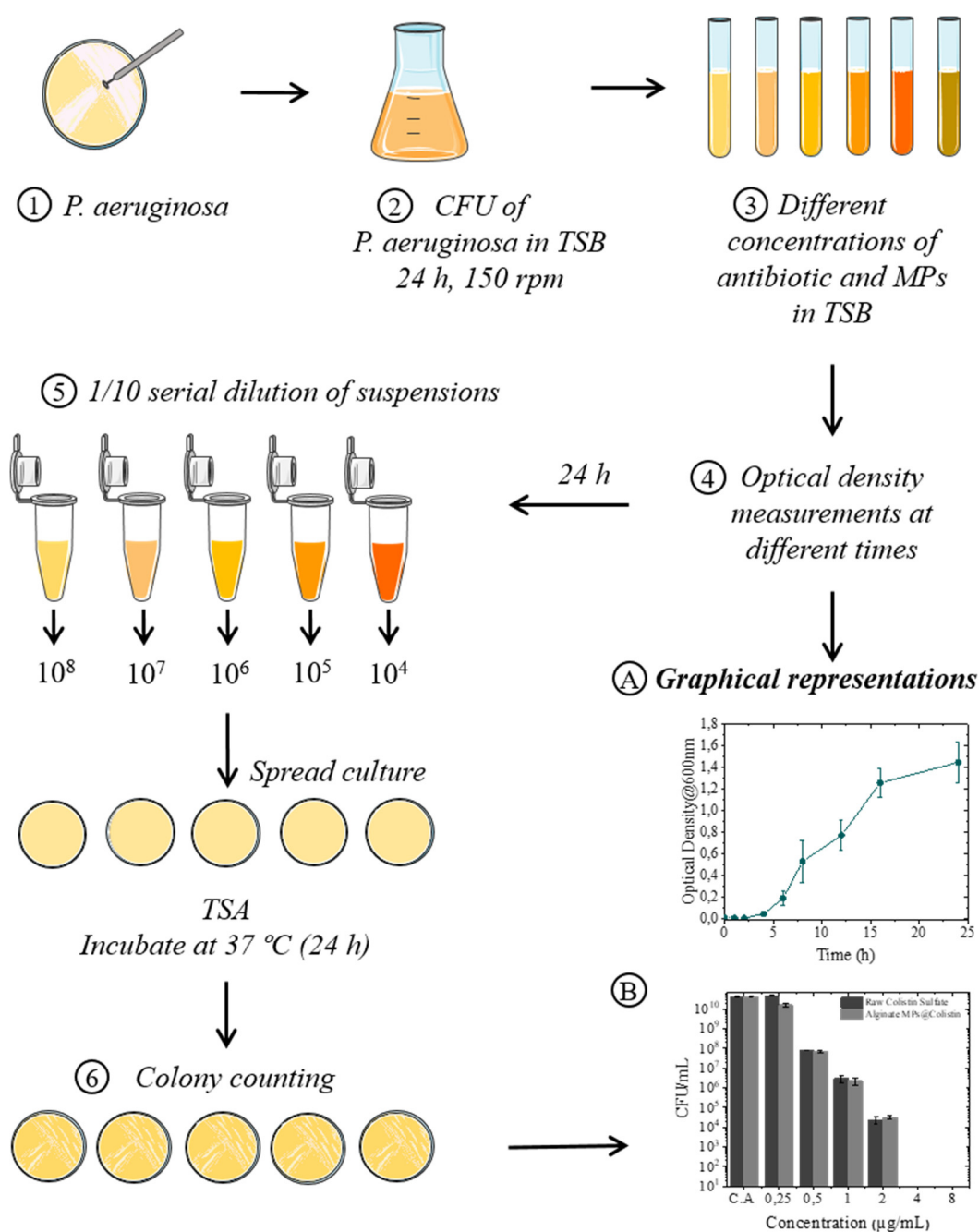


Figure S5. Protocol to determinate MIC and MBC concentrations of colistin sulfate against *P. aeruginosa*.