

# The Development of Surface-Modified Liposomes as an Intranasal Delivery System for Group A *Streptococcus* Vaccines

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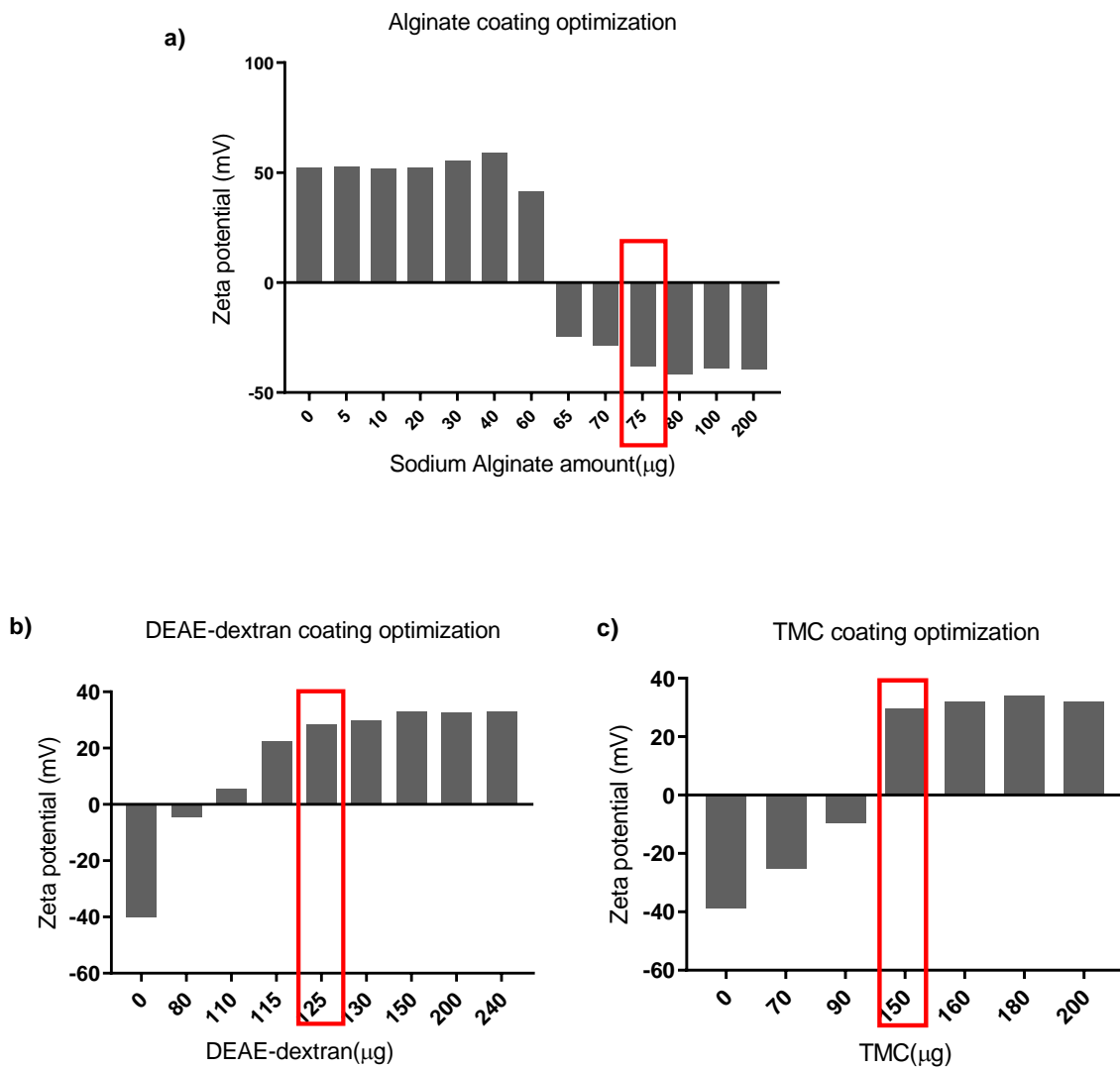
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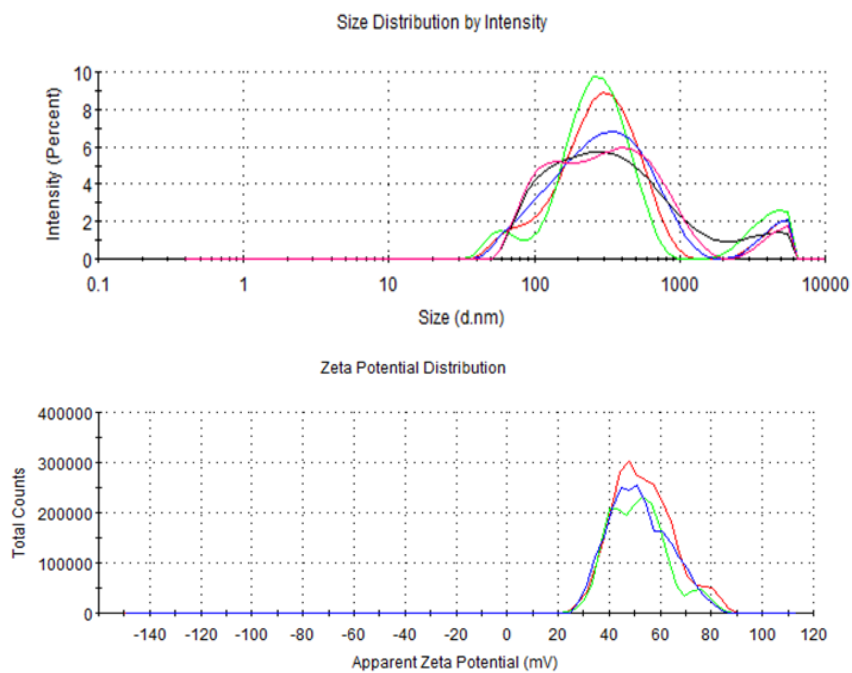
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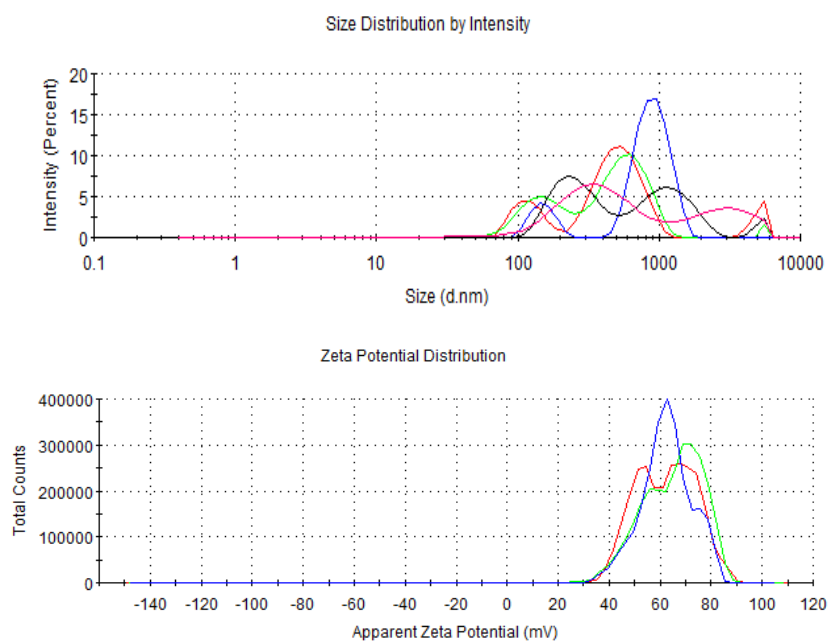
**Figure S1.** Coating of polyelectrolyte-coated liposomes. Effect of concentration of sodium alginate, TMC and DEAE-dextran on zeta potentials of LCP-1 loaded liposome formulation. Zeta potential changes during coating of liposome with a) sodium alginate; b) DEAE-dextran; c) with TMC. Red box mark values selected for final liposomes coating.

a)



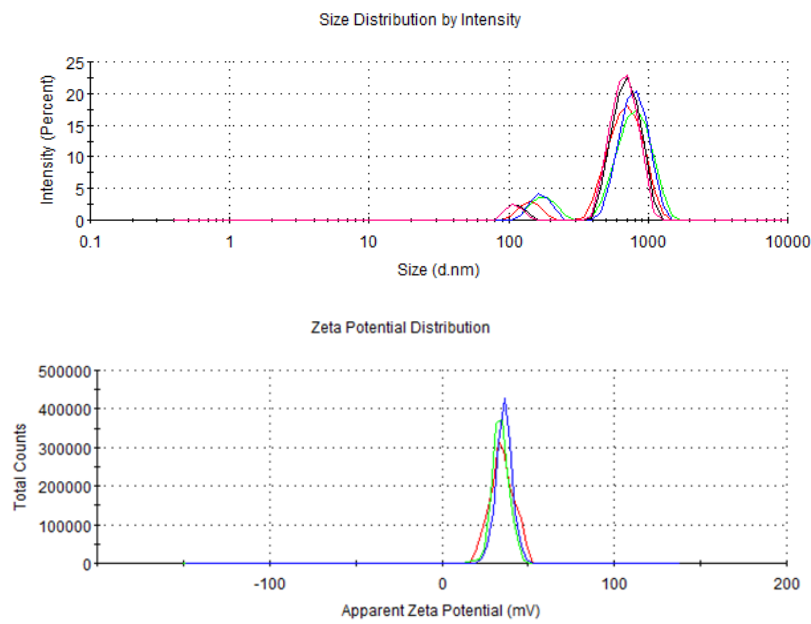
Liposomes	Coating/anchored moieties	Particle size (nm)	Polydispersity index (PDI)	Zeta potential (mV)
<b>L1</b>	lipoKALA	Peak 1: $96 \pm 45$	$0.42 \pm 0.02$	$57 \pm 2$
		Peak 2: $379 \pm 83$		
		Peak 3: $4273 \pm 286$		

b)



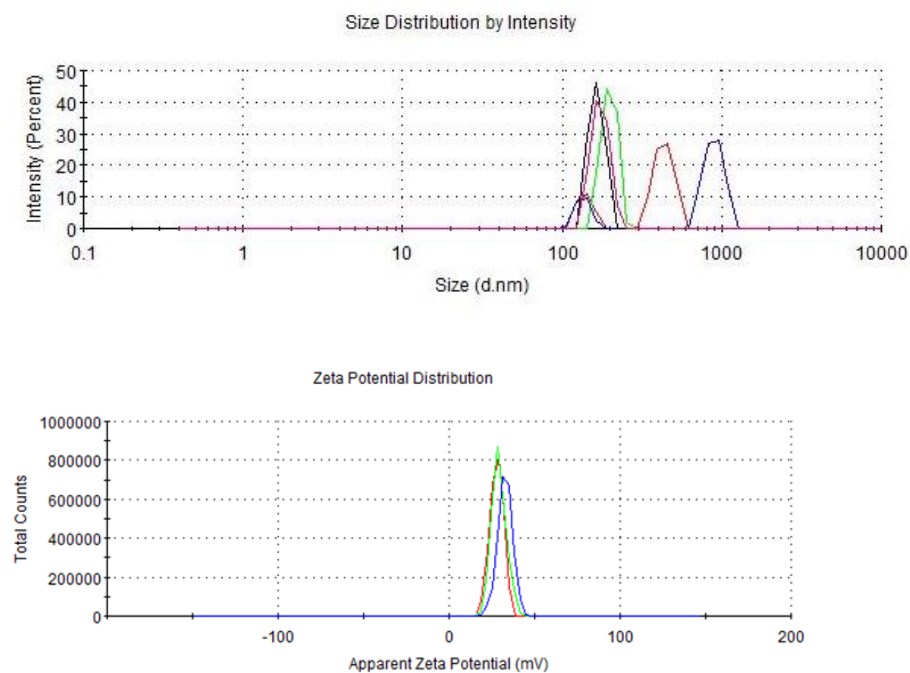
Liposomes	Coating/anchored moieties	Particle size (nm)	Polydispersity index (PDI)	Zeta potential (mV)
<b>L2</b>	OTMC	Peak 1: $250 \pm 227$	$0.51 \pm 0.04$	$63 \pm 2$
		Peak 2: $641 \pm 421$		
		Peak 3: $4645 \pm 1202$		

c)



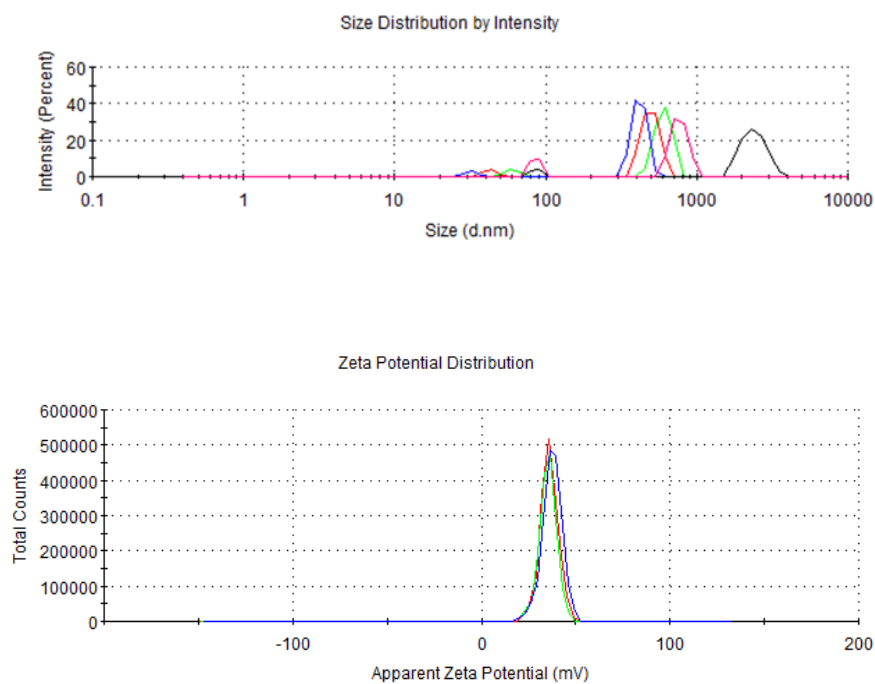
Liposomes	Coating/anchored moieties	Particle size (nm)	Polydispersity index (PDI)	Zeta potential (mV)
<b>L3</b>	lipoPEI	Peak 1: $184 \pm 116$	$0.61 \pm 0.03$	$63 \pm 2$
		Peak 2: $694 \pm 156$		

d)



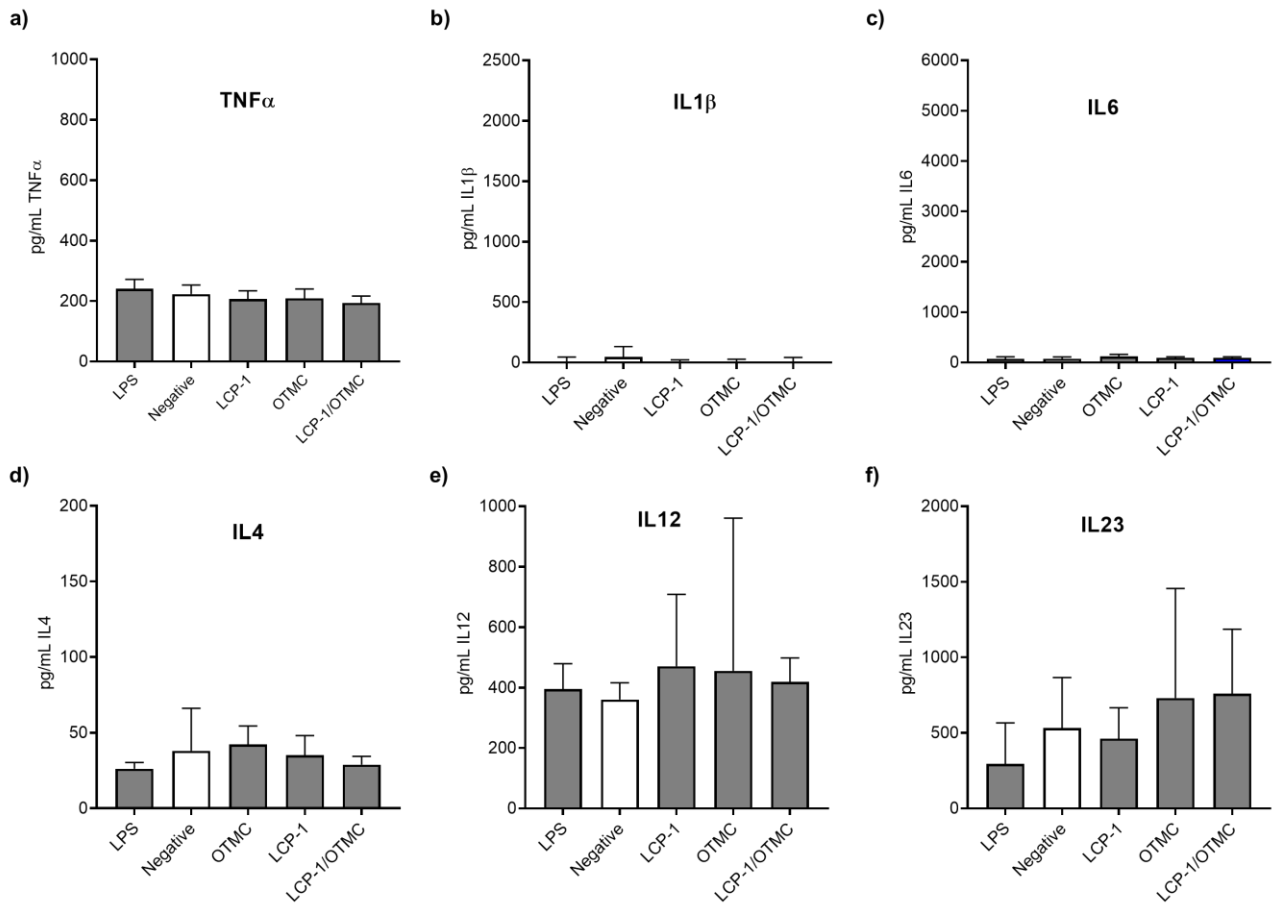
Liposomes	Coating/anchored moieties	Particle size range (nm)	Polydispersity index (PDI)	Zeta potential (mV)
<b>L4</b>	alginate/DEAE-dextran	Peak 1: $164 \pm 26$	$0.46 \pm 0.33$	$30 \pm 2$
		Peak 2: $667 \pm 329$		

e)



Liposomes	Coating/anchored moieties	Particle size range (nm)	Polydispersity index (PDI)	Zeta potential (mV)
<b>L5</b>	alginate/TMC	Peak 1: $61 \pm 25$	$0.64 \pm 0.13$	$36 \pm 1$
		Peak 2: $935 \pm 824$		

**Figure S2.** DLS spectra of particles of a) **L1**, b) **L2**, c) **L3**, d) **L4**, e) **L5**. Size distributions by intensity, PDI and zeta potential.



**Figure S3.** Production of a) TNF $\alpha$ ; b) IL-1 $\beta$ ; c) IL6; d) IL4; e) IL12; and IL23 cytokines following stimulation of BMDC in cold controlled conditions (4°C). Stimulation was performed with LPS, none (negative control), OTMC, LCP-1, and OTMC mixed with LCP-1. No any significant difference between the groups were detected.