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SCREENING OF LIPOSOME FEATURES FOR IMMUNOMODULATION

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MOTIVATIONS & OBJECTIVES

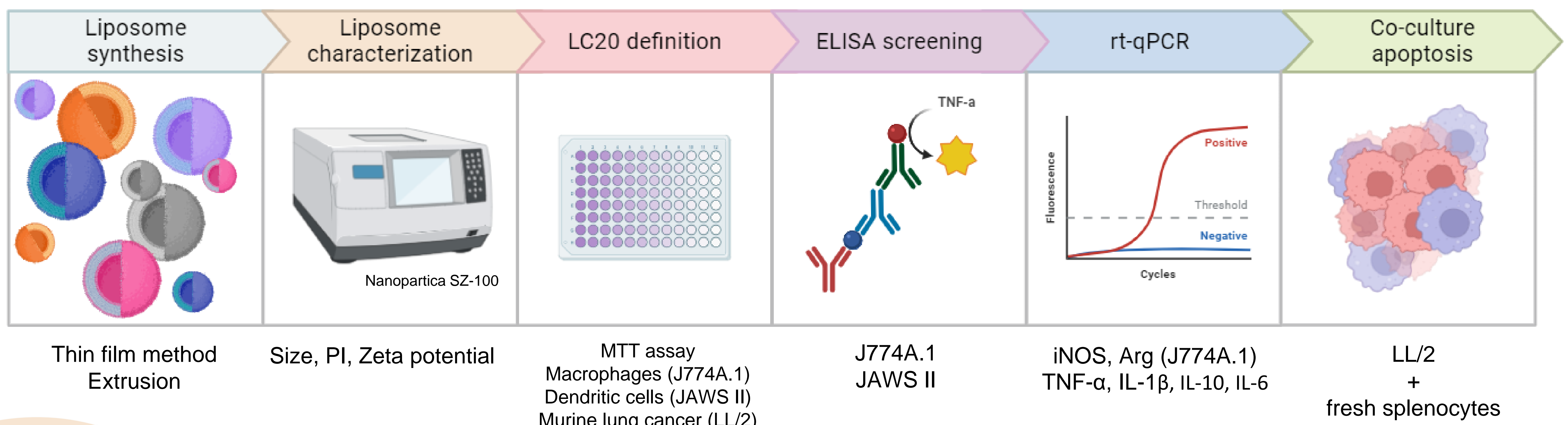


Associations to nanoparticles have been explored, mostly focusing on preexisting or complex nanosystems. Thus, we want to propose a **generic lipidic NanoBooster** that can **easily be transposed in the clinic**.

Immunotherapy is a major innovation in cancer drug. However, because of limited immunogenicity, these treatments are only beneficial to a small percentage of patients.

Impact of composition (DOTAP, DOTMA, DDA, DC-chol PC), cholesterol ratio, size (Small (S) and Large (L) population) and zeta potential of liposomes were investigated.

METHODS



RESULTS

Liposome characterization and LC20 definition

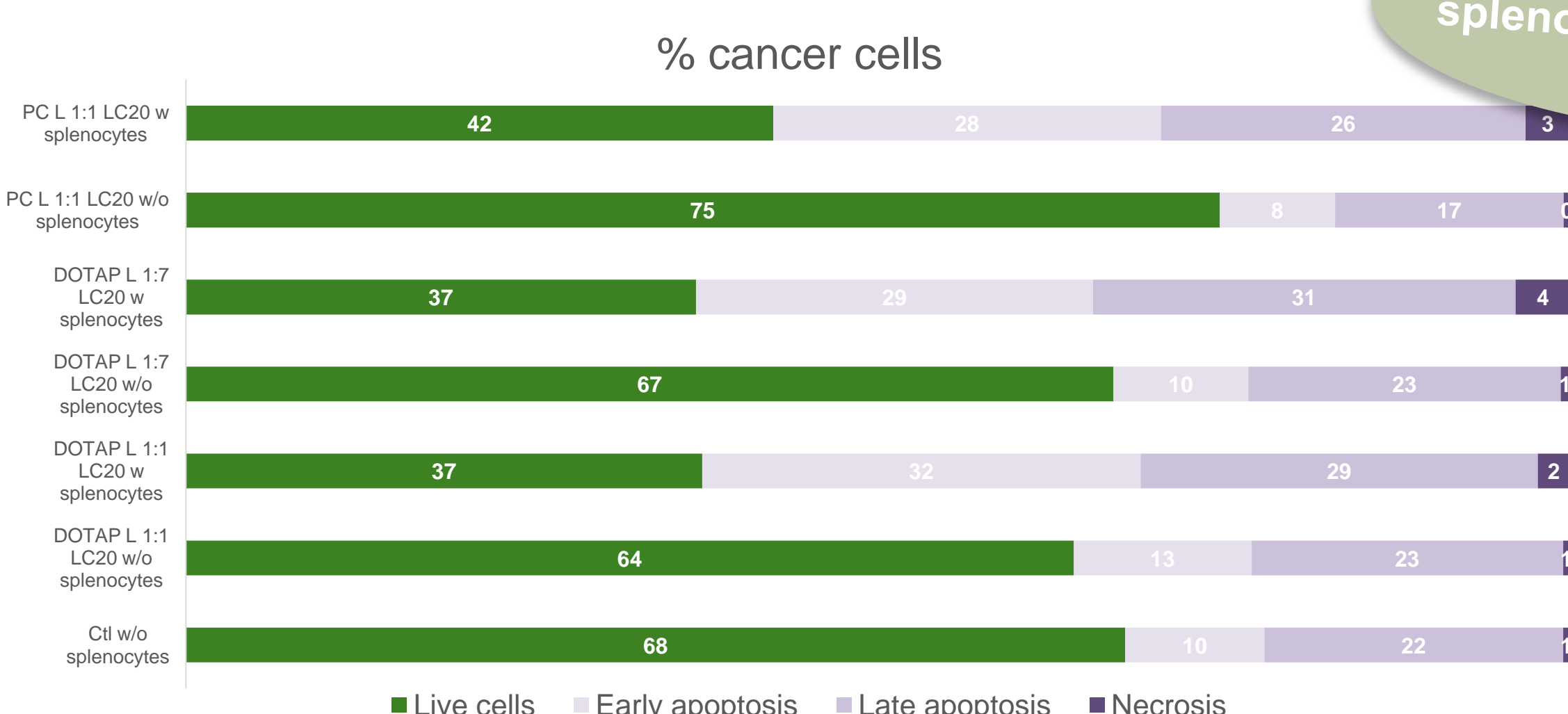
Lipids:chol	Population size	Size (nm)	PI	Zeta potential (mV)	LC20 LL/2 (µg/ml)
DOTAP 1:1	L	277 ± 43	0,29	83 ± 3	2,5 ± 0
	S	112 ± 13	0,14	87 ± 21	6,2 ± 1
DOTAP 1:7	L	210 ± 41	0,20	115 ± 17	6,5 ± 0,4
	S	91 ± 3	0,18	110 ± 9	6,1 ± 0,9
DOTMA 1:1	L	212 ± 28	0,33	65 ± 10	8,5 ± 0,7
	S	93 ± 3	0,19	73 ± 18	1,8 ± 0,4
DDA 1:1	L	317 ± 48	0,33	83 ± 14	25 ± 9
	S	118 ± 7	0,15	81 ± 9	24 ± 5
DC-Chol 1:1	L	277 ± 25	0,3	85 ± 2	0,9 ± 0,1
	S	121 ± 1	0,08	77 ± 8	4,7 ± 1
PC 1:1	L	245 ± 70	0,23	-10 ± 17	15 ± 5
	S	98 ± 3	0,08	-4 ± 7	60 ± 14

PC and DDA formulations are much less cytotoxic

ELISA Screening (24H, 50µM)

Composition and charge dependant

Co-culture apoptosis

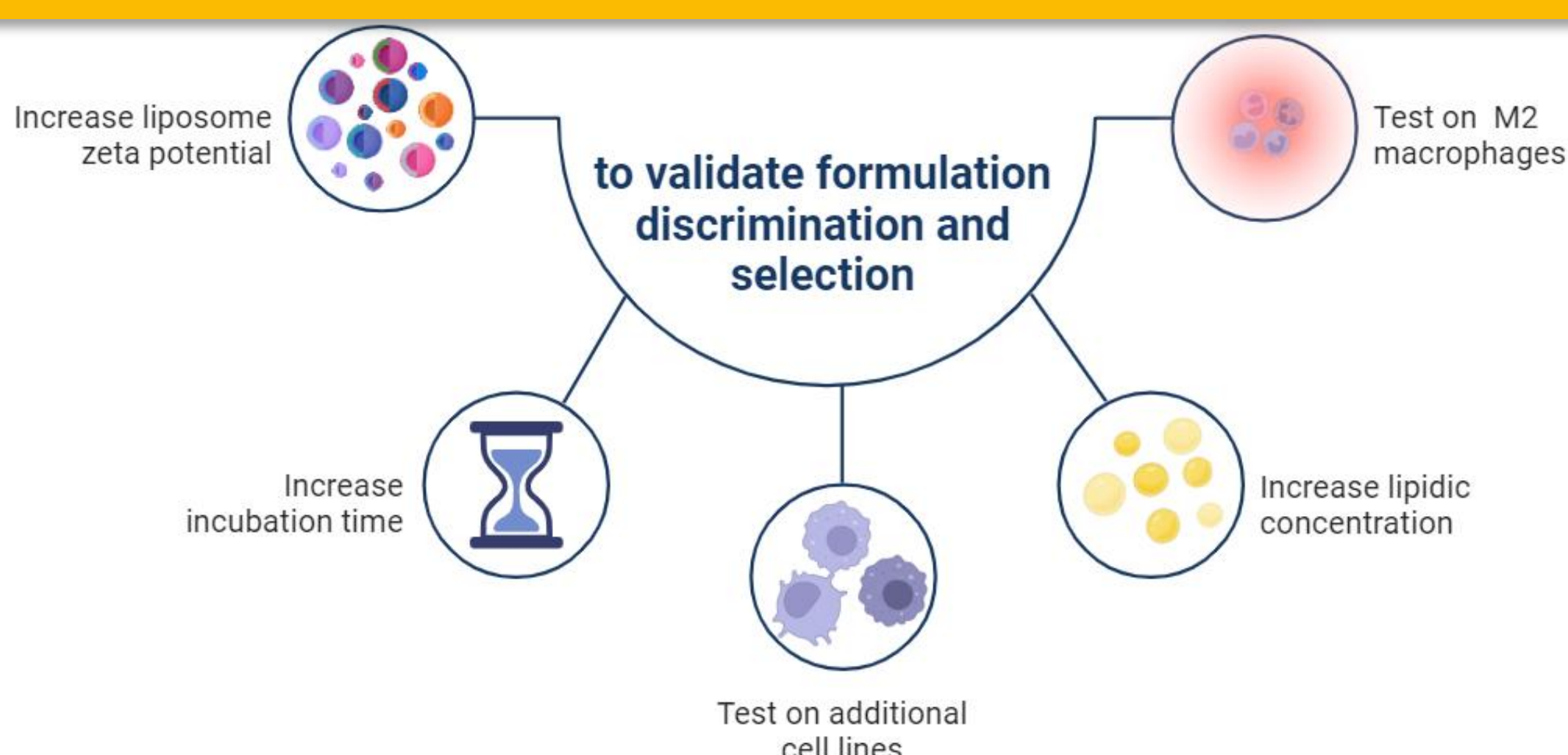


Apoptosis induction with splenocytes and liposomes DOTAP > PC

DOTAP > DOTMA > DC-Chol > DDA ≥ PC
 ~ Pop L > S
 1:7 > 1:1

Rt-qPCR (6H, 50 µM)

PERSPECTIVES



ACKNOWLEDGMENTS

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Shetab Boushehri, M.A.; Yazeji, T.; Stein, V.; Lamprecht, A. Modulation of Nanostructure-Based Lipopolysaccharide Active Immunotherapy in Cancer: Size and Composition Determine Short- and Long-Term Tolerability. Mol Pharm 2019, 16, 4507–4518
 Rodallec, A.; Sicard, G.; Fanciullino, R.; Benzekry, S.; Lacarelle, B.; Milano, G.; Ciccolini, J. Turning Cold Tumors into Hot Tumors: Harnessing the Potential of Tumor Immunity Using Nanoparticles. Expert Opinion on Drug Metabolism & Toxicology 2018