

CpG DNA delivery system for cancer immunotherapy

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Single-stranded oligonucleotides containing CpG dinucleotides (CpG DNA) are recognized by Toll-like receptor (TLR)-9 on antigen presenting cells, to stimulate Th-1 type immune responses. Therefore, CpG DNA have been used as monotherapeutic agent in cancer or adjuvant in cancer vaccines. For the effective use of CpG DNA, following matters should be considered; i) avoiding enzymatic degradation, ii) enhancing cellular uptake, and iii) improving the production of Th-1 type cytokines. To control these procedures, CpG DNA delivery system is needed to develop. Therefore, we studied CpG DNA delivery to antigen presenting cells by non-viral vectors *in vivo*. As far as the non-viral carrier types are concerned, CpG DNA/cationic liposome complex (CpG DNA/lipoplex) showed more potent immune activation than CpG DNA/cationic polymer complex, which is prepared by linear polyethylenimine. The expression of mannose receptors is restricted to antigen presenting cells; therefore, we developed mannosylated liposomes (Man-liposomes) for targeting of CpG DNA to antigen presenting cells. CpG DNA/Man-liposomes complex (CpG DNA/Man-lipoplex) showed significantly higher immune activation than CpG DNA/lipoplex. In this symposium, I will present our CpG DNA delivery approaches for cancer immunotherapy.