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EVALUATION OF SYNERGISTIC EFFECT OF CPG-ODN-7909 AND PROTAMINE ON TRANSFECTION PROCESS MEDIATED BY CALCIUM PHOSPHATE NANOPARTICLES

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Bacille Calmette-Guerin (BCG) is still the only authenticated vaccine against tuberculosis. But due to its drawbacks, a need to a new formula has emerged. Implication of "Nanovaccinology" is one of the possible alternatives. The non-viral vectors have low transfection ability. In the context, this work aims to add two adjuvants to calcium phosphate nanoparticles (CPNPs) functionalized with ESAT-6 cloned pc DNA3.1 (+) plasmid. ESAT-6 gene is specific to *Mycobacterium tuberculosis complex* (MTC) and encodes a T-cell antigen. The adjuvants in practice are Herring protamine and CpG-ODN 7909. Each has different strategies in enhancing the immune response, protamine is particulate adjuvant while CpG is an immunopotentiator substance. Nanocomplex was transfected in to after THP-1 monocytic cell line its activation to macrophage via 100ng/ml PMA. Cellular immune response, IL-12 and TNF- also ESAT-6 protein production were assayed via Sandwich ELISA technique. Results revealed that, CPNPs offer only a partial protection to the adsorbed plasmid against enzymatic degradation. Nanocomplex formula with two adjuvants resulted in significantly higher cellular immune response comparing to formula carrying one adjuvant. In conclusion, implication of CPNPs in gene delivery accompanied with two adjuvants each possess different strategy will result in partial protection to the delivered gene with upsurge cellular immune response.

Biography

Dr. Ghassaq AlUbaidi, has completed her PhD in Medical Microbiology at age of 42, from Dep. of Microbiology/ College of Medicine/ AL-Nahrain University. The dissertation involved the application of nanomaterials in pathogens diagnosis and gene delivery. She has been working a biological researcher since 2003. Now, she is working as a researcher in the Medical research unit / College of Medicine/ AL-Nahrain University. She is a member in the British Society for Immunology (BSI) since 2017. She has published 7 articles in fields of Virology and nanomaterials. Now, she is actively involved in searching for a DNA vaccine against *M. tuberculosis*, which represent a serious health problem in Middle East and African countries.

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