

FUNCTIONALIZED CARBON NANOTUBES: PROMISING NANOADJUVANTS IN VACCINE TECHNOLOGY

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Despite the success of current vaccines, there is a clear need for the development of preventive and therapeutic vaccines. Vaccine improvements may include the addition of biomaterials and immuno-modulators to bypass important milestones including efficient proliferation of antigen-specific effector cell populations and enhanced immune response against pathogen. CNTs are attractive biomaterials for immuno-modulating applications and are assumed to fulfil mentioned challenges. CNTs possess unique properties such as high aspect ratio, flexible surface chemistry which would be customized for transporting of antigens, target APCs effectively, triggering enhanced cellular response. Additionally, the ability of CNTs to translocate easily through the lipid bilayer in their 'nanoneedle' form provides a tremendous advantage for priming a cellular immune response. The tendency of CNTs to activate pro-inflammatory pathways in addition to the classic complement pathway may also enhance the immunogenicity of their antigenic cargo. In this review, we will address the current achievements in the development of novel nanoadjuvants. We would discuss how surface chemistry and charge impact immunological outcomes. We would also focus on current understandings of therapeutic efficacy and mechanisms of immunotoxicology of functionalized carbon nanotubes (f-CNT) as antigen carriers in vaccine formulations.

Biography

Naghmeh Hadidi has completed her PharmD and PhD from School of Pharmacy, Shaheed Beheshti University of Medical Sciences. She is the CEO of GMP co. Ltd, a knowledge based company active in antiviral and probiotics production. She has about 14 years of experience in Pharmaceutical Industry, Product Development and Technology Transfer. She is the Member of the board and Vice President of Tehran Youth Council of chamber of commerce. She is the Reviewer in a number of journals and funding semi-public associations. She has registered three internal patents in novel drug delivery systems. She was Technical Consultant of General Director of Pasteur Institute of Iran. She is mainly interested in researches including carbon nanotubes application in nanobiomedicine and theranostics.

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