

Evaluation of HPV16 L1-L2 fusion protein expression in mammalian cells

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Background and Aim: High-risk type of human papilloma viruses (HPVs) can be considered as the etiologic agents of cervical cancer. At present, two prophylactic vaccines have been designed to prevent HPV infections. Both vaccines (Cervarix and Gardasil) are included VLP structure derived from L1 protein of HPV16 and 18. Both of these vaccines are highly immunogenic and elicit high titers of neutralizing antibody responses. Type-specific antibody responses of L1 VLPs are one limitation of these vaccines. So, current vaccine strategy provides protection against HPV types associated with cervical cancer and it won't be able to induce immunity against other important HPV types. Alternatively, L2 minor capsid protein is a suitable candidate for next-generation of HPV vaccine. L2 has important functions in both papilloma virus assembly and the infectious process. Sequence analysis indicates L2 proteins as highly conserved with no changes in amino acid sequences during development. Indeed, L2 vaccine targeting can provide much more comprehensive protection against infection by various HPV types. However, L2 VLP typically elicits much lower neutralizing antibody titers than L1 VLP. The aim of this study is to evaluate the L1-L2 protein expression in mammalian cell lines.

Methods: Two plasmid DNA fusion constructs harboring HPV16 L1-L2 (pEGFP-L1-L2 and/or pcDNA-L1-L2) were generated by sequential cloning processes. The constructs were confirmed by sequence analysis. Then, gene expression was evaluated and compared in different cell lines (COS-7 and HEK293) using fluorescent microscopy, flow cytometry and western blot analysis.

Results: The results showed that vector modification and cell type have an effect on L1-L2 protein expression, in vitro. These parameters can influence the protein expression in vivo resulting to various immunological responses.

Conclusion: Regarding to the studies, the use of different linkers (IRES or proteasomal residues) can involve the levels of expression and subsequently stimulation of immune responses. We are going to investigate the effects of these motifs on the expression of L1-L2 protein in near future.

Biography

Ali Namvar has published papers in the field of New Biology and Cardiovascular Diseases, and now is working on HPV VLPs (Virus Like Particles) to develop the next generation of vaccine for cervical cancer at Pasteur Institute of Iran.

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