



## CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:  
RP180472

Project Title:  
Mucosal vaccine formulations for targeted therapy of HPV cancers

Award Mechanism:  
Individual Investigator

Principal Investigator:  
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Entity:  
The University of Texas M.D. Anderson Cancer Center

### Lay Summary:

Human papilloma virus (HPV) causes high grade cervical intraepithelial neoplasia (CIN) and invasive cancer that disproportionately affect women in developing countries while HPV associated oral cancers are steadily raising in developed nations. Currently available vaccines based on the HPV protein, L1, are effective for preventing HPV infection but not for treatment of existing HPV infections and cancers, where cancer causing E6/E7 genes are expressed but not the L1. Therapeutic vaccine targeting the HPV E6/E7 genes is an urgent unmet need and may be the only means, especially for underprivileged and economically challenged populations worldwide but equally necessary for those in developed nations to combat these cancers with a potentially positive impact on quality of life issues. We discovered HPV-16 E6/E7 peptides important for T cell memory immunity and disease-free survival in patients treated for high-grade CIN. Intranasal vaccination with these HPV peptides induced strong T cell immunity in genital tissues and significantly reduced HPV tumor growth in pre-clinical mouse models when combined with additional immunotherapy with antibodies that empower the T cells. However, many of these antibodies exhibit high levels of toxicity limiting their widespread usage. We obtained preliminary evidence for an alternate safer approach of HPV peptide vaccination using two adjuvants with superior capacity to enhance vaccine-mediated immunity and recognized for their safety in human clinical trials. This proposal will build on these encouraging data towards preclinical confirmation of the safety and efficacy of this vaccination along with understanding the underlying mechanisms for future implementation in human clinical testing against HPV+ cervical and oral cancers. An added benefit of this vaccination strategy is the nasal delivery that does not require the use of needles and is practical for mass-scale immunization campaigns worldwide.