**Development of Highly Immunogenic Nanovaccines Targeting Human Papillomavirus-associated Cancers**

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**Background and Aims**

Cervical and other anogenital cancers are largely caused by persistent infection with high-risk human papillomavirus genotype 16 (HPV16)[1]. Current commercially available HPV vaccines can prevent high-risk HPV infection and associated cancers, but are not effective to combat existing HPV infections and related malignancies[2]. It remains a challenge to develop effective therapeutic HPV vaccines. Our aim was to develop highly immunogenic therapeutic nanovaccines to treat pre-existing HPV infection or associated diseases.

**Methods**

The potency of designed nano-adjuvant (underway for patent application) was developed and investigated its ability and potency in combination of HPV peptide/DNA vaccines in inducing anti-HPV immunity using established HPV16E7-expressing tumour and E7-expressing skin grafting models in mice.

**Results**

The developed nano-adjuvant acted as self-adjuvants, activating the inflammatory signaling pathway, thus promoting recruitment of innate immune cells to the injection site and dendritic cell activation. This nano-adjuvant further served as delivery platforms, facilitating cross-presentation of antigen in antigen presenting cells. Hence, the nanovaccines comprising nano-adjuvants and HPV peptide/DNA vaccines, induced robust antigen-specific CD8+ T cell responses, leading to remission of established HPV16 E7-expressing solid TC-1 tumours and significant reduction of E7 transgenic skin grafts sharing a common gene signature with high-grade HPV-associated intraepithelial neoplasia in humans[3].

**Conclusion**

In conclusion, we developed a highly immunogenic nano-adjuvant. The combination of nano-adjuvant and HPV peptide or DNA vaccines showed enhanced therapeutic efficacy in HPV-preclinical mouse models. This approach has strong translational value, making significant improvement in the treatment of established HPV infection associated cancers.

**References**

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