Identification of immunogenic MAGED4B peptides for vaccine development in oral cancer immunotherapy.

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Abstract

The ever-increasing number of tumor-associated antigens has provided a major stimulus for the development of therapeutic peptides vaccines. Tumor-associated peptides can induce high immune response rates and have been developed as vaccines for several types of solid tumors, and many are at various stages of clinical testing. MAGED4B, a melanoma antigen, is overexpressed in oral squamous cell carcinoma (OSCC) and this expression promotes proliferation and cell migration. In this study, we have identified 9 short peptides derived from MAGED4B protein that are restricted in binding to the HLA subtypes common in the Asian population (HLA-A2, A11, and A24). The peptides had good binding affinity with the MHC-Class I molecules and stimulated ex-vivo IFN-gamma and Granzyme-B production in blood samples from OSCC patients, suggesting that they are immunogenic. Further, T cells stimulated with peptide-pulsed dendritic cells showed enhanced T-cell cytotoxic activity against MAGED4B-overexpressing OSCC cell lines. In summary, we have identified MAGED4B peptides that induce anti-tumor immune responses advocating that they could be further developed as vaccine candidates for the treatment of OSCC.

KEYWORDS:

APC, antigen presenting cell; DC, dendritic cell; HC, healthy control; HLA, human leukocyte antigen; MAGED4B; MAGED4B, melanoma-associated antigen D4B; MHC, major histocompatibility complex; OSCC, oral squamous cell carcinoma; PBMC, peripheral blood mononuclear cell; immune system; immunotherapy; oral cancer; peptide vaccine

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