Documents

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Hyaluronic acid-antigens conjugates trigger potent immune response in both prophylactic and therapeutic immunization in a melanoma model
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Abstract
Immunotherapy of advanced melanoma has encountered significant hurdles in terms of clinical efficacy. Here, we designed a clinically translatable hyaluronic acid (HA)-based vaccine delivering a combination of major histocompatibility complex (MHC) class I- and class II-restricted melanoma antigens (TRP2 and Gp100, respectively) conjugated to HA. HA-nanovaccine (HA-TRP2-Gp100 conjugate) exhibited tropism in the lymph nodes and promoted stimulation of the immune response (2.3-fold higher than the HA+TRP2+Gp100). HA-nanovaccine significantly delayed the growth of B16F10 melanoma and extended survival in both the prophylactic and therapeutic settings (median survival of 22 and 27, respectively, vs 17 days of the untreated group). Moreover, mice prophylactically treated with the HA-nanovaccine displayed significantly higher CD8+ and CD4+ T-cell/Treg ratios in both the spleen and tumor at day 16, suggesting that the HA-nanovaccine overcame the immunosuppressive tumor microenvironment. Superior infiltration of active CD4+ and CD8+ T cells was observed at the endpoint. This study supports the conclusion that HA potentiates the effect of a combination of MHC I and MHC II antigens via a potent immune response against melanoma. Graphical Abstract: [Figure not available: see fulltext.]. © 2023, Controlled Release Society.

Author Keywords
Cancer vaccines; Hyaluronic acid; Immunotherapy; Melanoma; Polymer-drug conjugates

Index Keywords
cancer vaccine, gamma interferon, glycoprotein gp 100, hyaluronic acid, major histocompatibility antigen class 1, major histocompatibility antigen class 2, melanoma antigen, hyaluronic acid; animal cell, animal experiment, animal model, Article, cancer immunotherapy, cancer survival, carcinogenesis, CD4+ T lymphocyte, CD8+ T lymphocyte, chemical modification, conjugate, controlled study, enzyme linked immunospot assay, female, flow cytometry, immune response, immunization, immunoassay, lymph node, major histocompatibility complex, median survival time, melanoma, mouse, nonhuman, nuclear magnetic resonance, photon correlation spectroscopy, prophylaxis, regulatory T lymphocyte, reversed phase high performance liquid chromatography, spleen, tropism, tumor growth, tumor microenvironment, vaccination, zeta potential, animal, immunity, immunization, melanoma; Animals, CD8-Positive T-Lymphocytes, Hyaluronic Acid, Immunity, Immunization, Melanoma, Mice, Tumor Microenvironment

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