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Double-Stranded RNA Immunomodulators in Prostate Cancer

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Andres M. Salazar and Esteban Celis

Relatively simple, synthetic, double-stranded RNAs can be powerful viral pathogen-associated molecular pattern (PAMP) mimics, inducing a panoply of antiviral and antitumor responses that act at multiple stages of host defense. Their mechanisms of action and uses are beginning to be understood, alone, in combination with other therapeutics, or as novel PAMP-adjuvants providing the critical danger signal that has been missing from most cancer and other modern vaccines. Dose, timing, route of administration combinations, and other clinical variables can have a critical impact on immunogenicity. This article reviews advances in the use of polyinosinic-polycytidylic acid and derivatives, in particular poly-ICLC.

Immune Escape in Prostate Cancer: Known and Predicted Mechanisms and Targets

e9

Boris A. Reva, Tatiana Omelchenko, Sujit S. Nair, and Ashutosh K. Tewari

Complex immune evasion mechanisms and lack of biomarkers predicting responsiveness to immune checkpoint blockade therapies compromise immunotherapy's therapeutic efficacy for patients with prostate cancer. The authors review established and nominated immune evasion mechanisms in prostate cancer and discuss how the precise treatment strategies can be developed to improve efficacy of immunotherapy.

The Tumor Microenvironment and Immunotherapy in Prostate and Bladder Cancer

e17

Sujit S. Nair, Rachel Weil, Zachary Dovey, Avery Davis, and Ashutosh K. Tewari

Bladder cancer has been successfully treated with immunotherapy, whereas prostate cancer is a cold tumor with inadequate immune-related treatment response. A greater understanding of the tumor microenvironment and methods for harnessing the immune system to address tumor growth will be needed to improve immunotherapies for both prostate and bladder cancer. Here, we provide an overview of prostate and bladder cancer, including fundamental aspects of the disease and treatment, the elaborate cellular makeup of the tumor microenvironment, and methods for exploiting relevant pathways to develop more effective treatments.