UC San Diego
MOORES CANCER CENTER

2021 Gleiberman Head and Neck Cancer Center Pilot Grant

Study of antitumor B cell immunity in head and neck cancer patients

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Scientific Abstract:

In Head and Neck cancer (HNSC), recent evidence indicates that intratumoral B cells are associated with a better clinical outcome. Intra-tumoral B cells are often part of tumor-associated tertiary lymphoid structures (TLS). It is hypothesized that in TLS antigen specific-T and B cells interact and cooperate to mount cellular and humoral immunity. However, information about this phenomenon is lacking.
This pilot project seeks to shed lights on the possible cooperation between B and T cells in the generation of an antitumor antibody response in HNSC. Specifically, our goal is to perform a systematic screening of HNSC plasma for the presence of circulating antibodies to a conserved tumor antigen, telomerase reverse transcriptase (TERT) and human papillomavirus (HPV), as a proxy for T-B cooperation in TLS and in the draining lymph nodes. To this end, we will: 1) Test for TERT- and HPV-reactive antibodies in the plasma of HNSC patients, and 2) Evaluate the function and magnitude of circulating TERT and HPV-specific memory B cells.
In our mind this represents the first step of a broader project in which, based on evidence collected under the aegis of the Gleiberman pilot grant project, we will conduct a more complex and technically demanding interrogation based on B-cell receptor (BCR) analysis of circulating B cells to identify biomarkers useful to predict the clinical response to cancer therapies.

Lay Abstract:

The propagation of tumor cells is subjected to control by the immune system, a function best achieved by antigen-specific cells, T and B cells. In most cancers T cell infiltrates are associated with improved survival. In contrast, much less is known about the prognostic value of B cells. In head and neck cancer (HNSC), recent evidence suggests that B cells within tumors may contribute to the generation of an efficient antitumor immunity. Whereas this implies that B cells may interact with T cells the nature of the tumor antigen(s) they recognize remains unclear.
As a first step to understand the anti-tumor role of B cells in HNSC we will screen for circulating antibodies against the conserved tumor antigen telomerase reverse transcriptase (TERT), an enzyme presents in ~ 90% of cancers, and the human papillomavirus antigen (HPV) which is one principal causal factor of HNSC. Specifically, we will: 1) Test for TERT- and HPV-reactive antibodies in the sera of HNSC patients, and 2) Quantify the number of functional circulating TERT and HPV-specific B cells.
This first step is meant to advance our understanding of B cells participation to anti-tumor immunity in HNSC. The success of this project will create the premises for a comprehensive study of B cells in HNSC and their interaction with T cells. Our long-term goal is to identify tumor-specific B cells that could serve as biomarker to predict the clinical response to cancer therapies and as a basis for the development of novel immunotherapies in HNSC.