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The interplay of interleukin-17A (IL-17A) and breast cancer tumor microenvironment as a novel approach to increase tumor immunogenicity

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Statement of the Problem: Breast cancer is the most common cancer in females being the leading cause of cancer mortality in women. The continuous interactions of cancerous cells with their surrounding microenvironment infiltrating immune cells shape their immunogenicity as well as the ability to tumor progression and metastasis. Interleukin-17A (IL-17A) has a promoting role in carcinogenesis, tumor metastasis and resistance to chemotherapy. It enhances tumor cell survival and invasiveness and inhibits the antitumor immune response. Pro-tumor effects of IL-17A may occur via an increase in suppressive functions of myeloid-derived suppressor cells (MDSCs). The expression of IL-17A and programmed death ligand 1 (PDL1) is increased in breast cancer. The PDL1-PD1 (programmed death protein 1) signaling pathway promotes escape from immune surveillance in tumor cells. The purpose of this study is to address the potential suppressive effects of monoclonal anti-IL-17 antibodies on IL-17 tumorigenic activities in intact tumor microenvironment of breast cancer (BC) as a novel immunotherapeutic reagent.

Methodology & Theoretical Orientation: Fresh tumor tissue samples and peripheral blood were taken from 50 BC patients. IL-17A and PDL1 expression were primarily assessed. Cultures of tumor tissues either supplemented or not with anti-IL-17 monoclonal antibodies were subjected to evaluation of PDL1, MDSCs and T-cell activities.

Findings: Our results revealed that IL-17A stimulated PDL1 expression in tumor BC cultures and were correlated to clinicopathological features. Culturing with anti-IL-17 monoclonal antibodies suppressed PDL1 expression and promoted T-cell proliferation and functions. Tumors cultured with anti-IL-17 showed a significant decrease in the expression of MDSCs cells in the tumor microenvironment.

Conclusion & Significance: The results indicate that recombinant anti-IL-17 monoclonal antibodies could represent a novel effective element of immunotherapeutic treatment strategy for BC. The selectivity and anti-potential of anti-IL-17 is highly hopeful in IL-17 abundant BC tumor microenvironment.

Biography

Mai Moaaz is an Assistant Professor of Immunology. She has a passion in the field of tumor immunology and an expertise in tumor tissue culture system and experimenting new modalities for cancer immunotherapy. Her tissue culture system provides the ex vivo tissue architecture that is necessary to maintain or reconstitute an environment closely resembling that of the tumor tissue to reflect the complex tissue architecture of an individual tumor. She is conducting current studies on tumors as an approach to cancer immunotherapy.

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