Ninja warriors Role of immune evasion mechanisms in cancer immunotherapy

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Commentary:
Cancer is considered a major cause of mortality and morbidity worldwide. The immune system defends the body against diseases including cancer through both the innate and the acquired immunity1,2. In cancer, the host immune system perceives the mutated cancerous tissue protein to be an antigen, and in response generates an immune response. Several factors determine the immune response including the individual’s immune status, genetic predispositions, systemic conditions, and diseases3,4. The immune system is considered a double-edged sword, as it can both inhibit and enhance tumor progression. In early stages, as the immune system recognizes the tumor as an antigen, it produces the antigenic response attempting to curb the initiation of cancer. On the contrary, during the advanced stages of cancer, the normal stromal cells surrounding the tumor cells including the immune cells (myeloid-derived suppressor cells, T regulatory cells, tumor activated macrophages, tumor activated neutrophils) aid in the progression of the tumor by countering the anti-cancer defense system. These tumor-promoting cells and stroma in the proximity of the cancer cells are labeled as the tumor microenvironment. The tumor microenvironment can modulate the host immune system to allow the cancer cells to evade the antigenic response by either attenuating the antigenicity of the cancer cells or by suppressing the antigenic response. Additional obstacles in the activation of an immune response are due to the upregulation of immune checkpoints and their corresponding ligands5. The tumor-specific cytotoxic T cells also are a major determinant of the effectiveness of the immune response generated6.

Compared to chemo, radiotherapy, cancer immunomodulation is a relatively less explored form of therapeutic strategy with its own set of challenges4. As we know, “Early diagnosis is the mainstay for better prognosis.” Thus, adequate knowledge of the process of the immune evasion and its role in carcinogenesis will aid in formulating early effective immunomodulation based therapeutic strategy capable of overcoming the tumor resistance4. Future researchers could potentially categorize cancer based on their antigenic and immunogenic nature which in turn could be crucial to customize treatment strategies potentially enhancing the overall patient prognosis and quality of life5.

The present poster provides an overview of the current understanding in cancer-associated immune evasion and also recapitulates the mechanistic strategies that have been studied in tumor progression2.

References

Keywords: Anti-tumor Immunity; Cell-cell Fusion; Immune Checkpoints; Immune Evasion; Tumor Microenvironment.

How to cite this article: R Keerthika, Kamboj M, Narwal A, Devi A. - Ninja warriors Role of immune evasion mechanisms in cancer immunotherapy, PosterJ 2021; 10(1):05.

Source of Support: Nil.

DOI:10.15713/ins.dpj.087

Conflict of interest: None Declared.

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