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Perspective

Pathobiology of Immune System Malignancies

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DESCRIPTION

The interaction of immune activation with the etiology of cancer provides a framework for a new field known as immuno-oncology. In the rapidly evolving field of immuno-oncology, understanding tumor-specific immune responses advances the understanding of cancer resistance. The basics of incorporating precision medicine to discover new immune biomarkers and predictive signatures. A personalized approach can have a significant positive impact on the use of oncolytic agents and lead to safer and more effective treatments. The relationship between the immune system and cancer has been widely recognized for over a century and was first highlighted by Rudolf Wilhyo over 150 years ago. The underlying basis of this relationship between cancer and immunity includes three basic principle of how the immune system protects the individual from tumor growth. It also recognizes "foreign" antigens as pathogens/infected/malignant cells. It includes effector functions that target and destroy pathogens or infected/malignant cells while protecting the host. It then develops immunological memory through an adaptive immune response for subsequent defense mechanisms after injury or attack on the host. Through this process, the immune system has acquired properties that lead to a paradigm known in the field of oncology as immune editing that balances immune surveillance and cancer progression. This multifaceted mechanism consists of three major stages including elimination, equilibrium, and escape. Which contribute to cancer elimination, quiescence, and progression respectively. The immune system plays an important role in preventing the development and progression of cancer. However, a complex network of cells and soluble factors that make up the tumor microenvironment can direct the differentiation of tumor-infiltrating leukocytes and shift the antitumor immune response to promote tumor growth. With the advent of cancer immunotherapy, there is new interest in defining how tumor microenvironment forms an antitumor immune response. This interest has revealed microbiota for cancer immunosurveillance. Increasing evidence suggests that the microbial flora may confer susceptibility or resistance to certain cancer and may affect treatments, especially responses to immune checkpoint inhibitors. In the age of precision medicine, it is important to define the factors that influence the immune system-microbiota-cancer triad interaction. The T-immune system plays an important role in preventing the development and progression of cancer.

However, a complex network of cells and soluble factors that make up the tumor microenvironment (TME) can direct the differentiation of tumor-infiltrating leukocytes and shift the antitumor immune response to promote tumor growth. With the advent of cancer immunotherapy, there is new interest in defining how TME forms an antitumor immune response. This interest has revealed a microbiota as a new player in the design of cancer immunosurveillance. Indeed, increasing evidence suggests that the microbial flora may confer susceptibility or resistance to certain cancers and may affect treatments, especially responses to immune checkpoint inhibitors. In the age of precision medicine, it is important to define the factors that influence the immune system-microbiota-cancer triad interaction. Multiple myeloma is an incurable malignant tumor of plasma cells that grows in a bone marrow.

The bone marrow supports malignant transformation by promoting uncontrolled proliferation and resistance to cell death of Multiple myeloma cells and blocking the immune response to tumor clones. Therefore, it is expected that restoring the host's anti-multiple myeloma immunity may bring therapeutic benefits to multiple myeloma patients. Several immunotherapeutic approaches have already shown promising results in the clinical environment. Multiple myeloma is a cancer that begins with a type of white blood cell called plasma cells. Healthy plasma cells help to fight infection by making antibodies that recognize and attack bacteria. In multiple myeloma, cancerous plasma cells accumulate in the bone marrow, causing healthy blood cells to swarm. Instead of making useful antibodies, cancer cells make abnormal proteins that can cause complications.

Treatment for multiple myeloma is not always immediately necessary. If multiple myeloma grows slowly and does not cause any signs or symptoms, doctors may recommend close

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monitoring rather than immediate treatment. For people with multiple myeloma who need treatment, there are many options available to help control the disease.