



Book Review

Immunotherapy of cancer (Advances in cancer research Vol. 143), Wang XY & Fisher PB, editors (Academic Press, Elsevier, London) 2019. 400 pages. Price: not mentioned.

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Immunotherapy of cancer is a type of cancer treatment that involves patient's own immune system to prevent, restrict and eliminate the disease. Over the past few decades, progress has been made in the area of cancer immunotherapy. In this volume of *Advances in Cancer Research*, recent translational advances in this field were reviewed by several internationally eminent scientists regarding the complexity of cancer and host immune cross-talks covering cancer stimulatory and inhibitory networks, importance of immune metabolism, antitumour potency of microbial infection and epigenetic modification of infiltrating immune cells, suggesting new therapeutic opportunities.

Chapter 1, provides a comprehensive overview on various types of immune cells which present in the tumour microenvironment (TME) that could regulate tumorigenesis. Apart from therapeutic efficacies of CTLA-4 and programmed death (PD)-1/PD ligand-1 immune checkpoints, other novel immune checkpoint genes, namely lymphocyte activation gene-3 (*LAG3*), T cell immunoglobulin-3 (*TIM3*), T cell immunoglobulin and ITIM domain (*TIGIT*) and V-domain Ig suppressor of T cell activation (*VISTA*) are also reviewed for their therapeutic potential against cancer. The current knowledge of different cancer immunotherapeutics, namely cytokines, novel immune checkpoints, neoantigen vaccines, metabolic modulators, oncolytic viruses, which were developed through pre-clinical and clinical studies, are discussed. To overcome the adverse effects of immunotherapy and minimise the side effects, authors pointed out future personalized immunotherapy based on patients' genetic/epigenetic, immune and other molecular profiles.

Authors of chapter 2 have reviewed the correlation of cancer and host immune system at first followed by current knowledge about different modalities of cancer immunotherapy, namely cytokines, immune checkpoint targets, vaccine-based therapy and chimeric antigen receptor (CAR) T-cell therapy. Potential strategies to overcome the difficulties faced in these therapies for better patient outcomes are also discussed.

Chapter 3 discusses the interplay between the immunoglobulin and tumour necrosis factor receptors mediated co-stimulatory and co-inhibitory pathways of the T-cell in regulating immune response during cancer development and potential treatment options.

The metabolic deregulation of cancer and immune cells in the TME is an important hallmark of cancer development. In chapter 4, metabolic dysfunctions of cancer and different immune cells as well as their cross-talks are reviewed. In addition, usage of the altered metabolic pathways in both cancer and immune cells to overcome immune suppression and reinvigorate the antitumour functions of immune cells in TME are also discussed. It has been suggested that metabolic reprogramming through pharmacological inhibition of the altered metabolic pathways in combination with other immunotherapies can improve patients outcomes.

In chapter 5, at first, authors reviewed the homeostasis mechanism of the commensal microbiome and immune pathology in healthy individuals. The deleterious effect in perturbation of the microbiome homeostasis in tumour progression and response to immune therapies is highlighted. In addition, the potentiality of microbiome-driven therapeutics for better treatment of cancer patients has also been focused on. It has been indicated that the knowledge of specific microbial signatures or metabolic byproducts may improve early diagnosis and treatment of multiple types of cancer.

In chapter 6, authors reviewed different types breast cancers at first and then the immune landscape during the development of these cancer subtypes. The usefulness of immunotherapy in breast cancer treatment and its future directions to overcome related challenges are discussed. The possibilities of new treatment protocols using combination strategies of dendritic cell vaccines and other targeted chemotherapeutics for improved antitumour immune response and better survival of patients are also reviewed.

In the concluding chapter 7, the importance of CpG island methylation in promoter regions of certain genes in infiltrating immune cells as surrogate markers for diagnosis and prognosis of cancer have been focused on. Methodologies used in the analysis of the methylation profiles of certain infiltrating immune cells apart from primary tumours are discussed. Several surrogate CpG island markers of genes and pathways associated with immune cells are also highlighted. The CpG island profile along with histochemical

analysis and flow cytometry of tumour cells have been thought to provide the signature of immune cells in TME in defining response to immunotherapy for the development of tumour-specific precision medicine.

Overall, this book covers cutting-edge areas in different aspects of cancer immunotherapies with translational importance. The content of the book bridges the gap between technical and clinical information. It is well written, concise, informative and may provide a platform for the readers to develop potentially unique immunotherapeutic agents and strategies for better prognosis and prevention of cancer.

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