Cancer Immunotherapy: Advances, Challenges, and Future Directions

Nesrin Ibrahim Tarbiah, PhD*

ABSTRACT

Cancer immunotherapy represents a novel approach that harnesses the immune system to recognise and eliminate malignant cells. Physician must be well versed in this field, not only in treating cancer itself, but also in manging immune system-related complications. An additional crucial focus of cancer research is understanding how the tumour microenvironment (TME) regulates the rates of tumour growth and metastasis, so that parallel tests and proper treatments can be accordingly developed. The presence of TME, together with its immune cells infiltrating the tumours, crucially influences the outcome of immunotherapy by sometimes converting the anti-tumour response into a pro-tumour type. Mass cytometry and single-cell analysis approaches have facilitated our understanding of TME by demonstrating the variety of immune cells which might be potential targets of treatment. This review covers various types of immunotherapies, including immune checkpoint inhibitors (ICIs), Adoptive cell transfer (ACT) and oncolytic viral therapies. In addition, it discusses novel strategies targeting the TME that hold promise for improving outcomes in cancer immunotherapy.

Keywords: cancer immunotherapy, tumour microenvironment, immune checkpoint inhibitors, CAR-NK and CAR-Tcell.

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* Biochemistry Department, Faculty of Science
King Abdulaziz University, Jeddah, Saudi Arabia.
Email: ntarabah@kau.edu.sa