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What is Immunotherapy?

Immunotherapy is a cancer treatment that uses the body's immune system to fight the disease. It works by helping the immune system recognize and attack cancer cells, making it an effective treatment option for various types of cancer. Immunotherapy is an innovative approach for treating cancer that is increasingly being used alongside other treatments. However, not all patients respond to immunotherapy and its efficacy can vary.

Types of immunotherapy

Immunotherapy can be used either alone or in combination with other treatments. Some common types of immunotherapy are:

Checkpoint inhibitors

These drugs block specific proteins in immune cells, allowing them to better recognize and attack cancer cells.

Adoptive cell therapy

This type of immunotherapy involves removing immune cells from the patient, modifying them to enhance their cancer-killing abilities and infusing them back into the patient. Adoptive cell therapy can help the immune system target and destroy cancer cells more effectively.

Vaccines

Cancer vaccines prime the immune system to recognize and attack cancer cells.

Monoclonal antibodies

These are laboratory-made versions of natural immune system proteins that can target and neutralize specific cancer cells.

Cytokine therapy

Cytokines are naturally occurring proteins that are crucial in regulating the immune response. In cytokine therapy for cancer, synthetic cytokines or cytokines derived from human or animal sources are administered to the patient to stimulate the growth and activation of immune cells, which can then attack cancer cells.

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Immunotherapy response prediction and limitations

Several immunotherapies are available as standard treatments for certain types of cancer, while others are only accessible through clinical trials.

Predictive biomarkers for immunotherapy

The following FDA-approved predictive markers can help identify which patients are more likely to benefit from immunotherapy.

PD-L1 expression | **MSI** microsatellite instability | **dMMR** deficient mismatch repair | **TMB** tumor mutational burden

FDA-approved biomarkers

While these predictors have shown clinical utility, their status does not guarantee therapy response or positive outcomes.

Key points to consider

Variability across cancer types

Different cancer types may require different predictive markers. The markers mentioned may not show any predictive value for certain cancer types.

Variability across laboratories

Different laboratories may use varying methods and cut-offs when testing predictive markers, leading to variability in results.

Other types of therapies might be more effective

While immunotherapy can effectively treat certain cancers, targeted therapy may be a better option in some cases. For example, studies[1] show targeted therapy is more effective in non-small cell lung cancer with an *EGFR* mutation.

Combining immunotherapy and targeted therapies

In some cases, targeted therapy and immunotherapy can be used together, enhancing treatment effectiveness.

[1] Mazieres J, Drilon A, Lusque A, et al. Immune checkpoint inhibitors for patients with advanced lung cancer and oncogenic driver alterations: results from the IMMUNOTARGET registry. Ann Oncol 2019;30:1321-1328.

Adverse events

Immunotherapy can lead to immune-related adverse events. When these events occur, the immune system attacks the body's organs and tissues. Clinically, these complications are very diverse.

Immunotherapy can cause fatigue and may affect the skin, bowel, liver, endocrine organs, muscles, joints, lungs, heart, nervous system, eyes and others. You should inform your doctor of any side effects you are experiencing for effective management.

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Choosing treatment

Selecting the appropriate treatment plan can be challenging, but understanding your specific cancer can aid in that process. Comprehensive genomic testing can provide a more thorough view of the genetic changes driving your cancer and assist in making treatment decisions, leading to improved outcomes.

For more information, please visit:

NCCN Guidelines for Patients

National Cancer Institute (NCI)

American Cancer Society (ACS)

Cancer.Net ASCO

American Association for Cancer Research

American Cancer Society Cancer Action Network℠

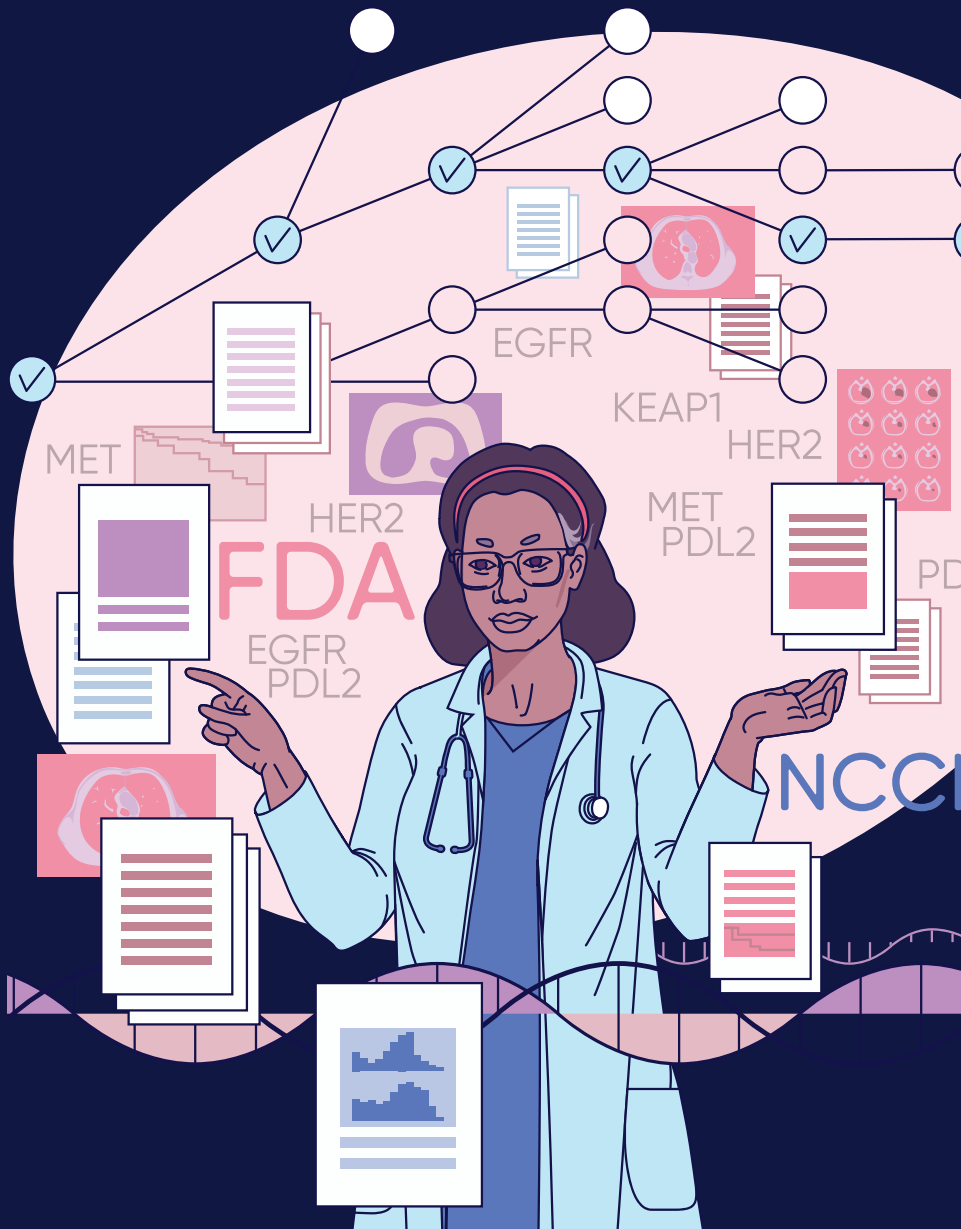
MD Anderson Cancer Center

Memorial Sloan Kettering Cancer Center

Dana Farber Cancer Institute

Transforming cancer care

The BostonGene Tumor Portrait™ test provides an accurate and comprehensive overview of your tumor genomics. Results are integrated into a simple report that includes your medical history and the latest clinical recommendations to personalize your treatment plan.

In addition to detecting FDA-approved predictive markers for immunotherapy response, our test also includes a proprietary prediction score that estimates the likelihood of a positive response to immunotherapy for several types of cancer, including lung, bladder, gastric and skin cancers.

To learn more about the BostonGene Tumor Portrait™ test visit **www.bostongene.com**