Editorial

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A Note on Cancer Biomarkers

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About the Study

Cancer biomarkers are biological substances generated by a cancer patient's body or tumour. Biomarker testing assists in identifying tumour cells. Biomarkers might be tumour-specific DNA, RNA, protein, or metabolomic profiles. Genomic testing, which examines the DNA sequence, DNA or RNA tests to check for gene fusions, and tests to assess RNA or protein levels. Cancer biomarker includes Gene mutations, Proteins, Extra copies of genes, etc.

Cancer biomarkers

• **BRCA1 and BRCA2 genes:** The mutations in the genes may double a woman's risk of breast and ovarian cancer. It may raise the risk of prostate cancer in males.

• **PSA:** Prostate Specific Antigen is a protein that may signal prostate cancer. This biomarker might be used not just to detect the condition, but also to track its course and how well the therapy is functioning.

• **HER2:** Human Epidermal growth factor Receptor 2 is detected in a number of malignancies, most notably breast cancer. Trastuzumab, a targeted therapy medication, and other related monoclonal antibodies may be an option for people with HER2-positive malignancies.

• **BCR-ABL:** Patients with chronic myelogenous leukaemia have this gene, also known as the Philadelphia chromosome. The presence of the gene may signal that the patient will benefit from treatment with a tyrosine kinase inhibitor such as imatinib.

• **PD-L1:** Programmed Death Ligand 1 is the PD-1 associate receptor. It might be an indication of a cancer's capacity to avoid the immune system. Checkpoint inhibitors, which are immunotherapy medications, may be an option for treating malignancies with high PD-L1 levels.

• **CA-125:** Cancer Antigen-125 levels are elevated in many malignancies and other disorders. Treatment options for CA-125 tumours differ based on where the disease originated.

• **MSI-H:** Microsatellite Instability-high is a DNA mutation identified in many malignancies, specifically colorectal cancer. Checkpoint inhibitors have been authorized for the treatment of tumours with MSI-H.

Cancer biomarker research is divided into four categories

In addition to discovering novel targets and establishing their importance, new research focuses on:

• **Immunotherapy response:** Immunotherapy has revolutionised cancer therapy, but not all patients respond the same way. Biomarkers that predict immune response are being identified by researchers in order to assess whether patients benefit from which type of immunotherapy.

• **Liquid biopsies:** Liquid biopsies can detect circulating tumour DNA, which is DNA released by the tumour. A simple blood sample can reveal common DNA changes to personalise treatment options; it may also assess whether the tumour is responding and investigate how the tumour develops resistance to certain medicines based on additional genetic variations discovered in subsequent blood tests.

• **Minimal residual disease:** This biomarker can be assessed through liquid biopsy testing after treatment has been finished and there is no identifiable disease present on assessment and image analysis. Through blood testing, minimal residual illness assesses remaining disease at the molecular level. It might be used to evaluate which patients would benefit from more severe treatment and which could be avoided for such treatment.

• **Pharmacodynamics markers:** These employ a biopsy before and during treatment to examine dynamic molecular changes inside the tumour and identify whether or not the medicine is performing as expected.

Uses of Biomarkers

• To analyse the individual's risk of developing cancer

• To determine an individual's risk of cancer recurrence

• Predict the likelihood that a given therapy will work for a specific patient

• To Monitor a disease's progression to know about the therapy

Conclusion

Cancer biomarkers are essential in oncology and clinical practise for risk assessment, screening, diagnosis in association with other diagnostic methods, and most importantly for determining prognosis and response to therapy and/or relapse. Cancer biomarkers can also help with cancer diagnosis at the molecular level. Clinicians and researchers must have a detailed understanding of molecular aspects, clinical utility, and efficiency of biomarkers in order to determine whether biomarker is clinically useful or not for patient care and whether additional evaluation is required or not before integration into routine medical practise.