Commentary

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A Brief Note on Cancer Biomarkers and its Uses

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Description

A cancer biomarker is a component or mechanism that can be used to detect the presence of cancer in the body. A biomarker is a substance produced by a tumour or a specific body reaction to the existence of cancer. For cancer diagnosis, prognosis, and epidemiology, genetic, epigenetic, proteomic, glycolic, and imaging biomarkers can be utilized. Such indicators should ideally be tested in non-invasively collected bio fluids such as blood or serum.

The term "biomarker" is defined differently by different organisations and publications. Biomarkers are proteins that may be identified or measured in the blood or urine in various fields of medicine. But, the term is often used to any quantifiable or easily measurable molecular, biochemical, physiological, or anatomical characteristic.

While there are significant problems in transferring biomarker research into clinical practise, a number of gene and protein-based biomarkers have already been used in patient care, including AFP (liver cancer), BCR-ABL (chronic myeloid leukaemia), BRCA1/BRCA2 (breast/ovarian cancer), BRAF V600E (melanoma/colorectal cancer), CA-125 (ovarian cancer), CA19.9 (pancreatic cancer), CEA (Because they can only derive from an existing tumour), mutant proteins discovered by Selective Reaction Monitoring (SRM) have been reported to be the most specific biomarkers for malignancies. Around 40% of malignancies can be treated if caught early enough with tests.

A biological molecule detected in blood, other bodily fluids, or tissues is a sign of normal or abnormal activity condition or disease. A biomarker can be used to measure howmuch the body's reaction to treatment for an illness or condition. Also known as a molecular marker or a signature molecule.

Biomarkers are utilised in cancer research and medicine in three ways.

1. To aid in the diagnosis of diseases, such as malignancies in their early stages (diagnostic).

2. To predict the severity of an illness, such as evaluating a patient's prognosis in the absence of treatment (prognostic).

3. To forecast a patient's response to treatment (predictive).

Biomarker uses in cancer research

Biomarkers are frequently employed throughout the cancer medication discovery process, in addition to their usage in cancer therapy. For example, researchers discovered in the 1960s that the majority of individuals with chronic myelogenous leukaemia had a genetic mutation on chromosomes 9 and 22 known as the Philadelphia chromosome. When these two chromosomes come together, they form BCR-ABL, a cancer-causing gene. In such patients, this gene serves as the primary starting point for all of the leukaemia's physiological symptoms. For many years, the BCR-ABL was merely utilised as a biomarker to classify a certain leukaemia subtype. Imatinib, a potent medicine that efficiently blocked this protein and dramatically reduced the generation of cells with the Philadelphia chromosome, was later developed by pharma developers.

Surrogate endpoints are another intriguing application of biomarkers. In this application, biomarkers are used to mimic the impact of a drug on cancer progression and survival. In a perfect world, the use of validated biomarkers would eliminate the need for tumour biopsies and lengthy clinical trials to determine whether a new treatment was beneficial. The current gold standard for determining a drug's efficacy is to examine if it reduces cancer progression in humans and, eventually, extends survival. If ineffective drugs could be weeded out of the development pipeline before entering clinical trials, biomarker surrogates might save a lot of time.