

The Role of Biomarkers in Cancer Research and Medicine

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Opinion Article

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DESCRIPTION

Cancer biomarkers are genes, proteins, or other chemicals that can be tested for in order to disclose vital information about a person's cancer. There are numerous recognised cancer biomarkers, and new ones are discovered on a regular basis. Biomarker testing may not be appropriate for everyone. However, for people with a variety of cancers, biomarker testing may provide useful information that may influence their treatment options. More biomarkers that assist doctors predict whether specific therapies could work are identified as doctors sought ways to tell which people would benefit from different treatments. Not all cancer biomarkers must be cancer-specific. Some biomarkers detected in the circulatory system can be utilised to diagnose aberrant cell development in the body. All of these biomarkers can be recognised using diagnostic blood tests, which is one of the key reasons to get health checked on a regular basis. Many health disorders, such as cancer, can be detected early on by getting checked on a regular basis, avoiding many deaths.

Biomarker tests can be beneficial in cancer treatment

Cancer cells are not all same. Even among people with the same type of cancer (for example, lung or breast cancer), the cancer cells may have different gene changes or levels of certain proteins that aid in the growth of the cancer cells. These changes may also affect how well the cancer responds to certain types of treatment, such as targeted drug therapy and immunotherapy, which work best when cancer cells differ from normal cells. Some of these variations can be detected using biomarkers. Cancer medications are not equally successful for all patients, regardless of whether they were developed to target certain biomarkers. More biomarkers that assist predict when specific therapies might work have been identified as doctors sought ways to tell which people would benefit from different treatments.

Risk analysis

Cancer biomarkers, especially those associated with genetic mutations or epigenetic alterations, frequently provide a quantitative way of determining when people are predisposed to specific types of cancer.

Tracking treatment response

Cancer biomarkers have also proven useful in assessing the efficacy of a treatment over time. Much research is being conducted in this field because good biomarkers have the potential to significantly reduce patient care costs, as existing image-based procedures like as CT and MRI for monitoring tumor status are quite expensive.

Diagnosis

Cancer biomarkers can also aid in the establishment of a specific diagnosis. This is especially true when it comes to determining whether tumors are primary or metastatic. To make this distinction, researchers can compare the chromosomal alterations found on cells from the primary tumor site to those found on cells from the secondary tumor site. If the alterations match, the secondary tumor is considered metastatic; if the alterations differ, the secondary tumor is considered a distinct primary tumor. People with tumors, for example, have significant quantities of circulating tumor DNA due to death of tumor cells. This tumor marker can be found in blood, saliva, and urine.

Predictions of prognosis and treatment

Another application of biomarkers in cancer medicine is disease prognosis, which occurs after a person has been diagnosed with cancer. In this case, biomarkers can help determine the malignancy as well as its chance of responding to a certain treatment. This owes, to the fact that cancers displaying specific biomarkers may be susceptible to treatments based on the expression or presence of that biomarker.