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Perspective

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Genetic biomarkers and their importance in treatment of several diseases

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Description

In genetics, biomarkers (considered genetic markers) are DNA sequences that cause disease or are associated with susceptibility to disease. They can be used to create a genetic map of any organism under study. Biomarkers are molecules that indicate normal or abnormal processes that occur in our body and can be a sign of an underlying condition or disease. Many types of molecules, such as DNA (genes), proteins, or hormones, can be used as biomarkers because they all indicate our health. Biomarkers can be produced by the cancer tissue itself or by other cells in the body in response to cancer. They can be found in blood, faeces, urine, tumor tissue or other body tissues or body fluids. In particular, biomarkers are not limited to cancer. There are biomarkers for heart disease, multiple sclerosis and many other diseases. A biomarker that causes abnormal cell growth and reproduction

Example of biomarker

An example of this type of biomarker is the HER2 protein, which helps control cell growth. If HER2 is "overexpressed" in cancer cells, these cells are considered "HER2 positive", which means they produce more protein than normal cells. This condition causes the cells to grow faster and increases their chances of transferring (spreading) to other parts of the body. This also means that treatments that are known to disrupt the HER2 signaling pathway can help prevent the growth of cancer. Biomarkers support cellular or molecular therapy.

Another type of biomarker is an example of a gene called SPARC, which represents a secreted, acidic, cysteinergic protein. SPARC helps to transfer albumin (a protein found in blood, egg white, milk, and other substances) into cells. Some chemotherapy drugs bind to albumin ("bundles") to prevent it from dissolving in the bloodstream before reaching the target cells. Therefore, overexpression of SPARC helps albumin-binding therapy work more effectively by delivering the treatment directly to the cell.

Importance of biomarker

Some chemotherapy drugs are made with platinum to destroy tumor DNA. However, there is a protein called ERCC1 that can repair tumor DNA. If the biomarker test detects high levels of ERCC1 in the patient's tumor, it is unlikely that platinum-based drugs will be very effective for the patient. Even in the above biomarker categories, there is diversity. For example, the molecules that trigger abnormal cell growth can come from genetic mutations or from extra copies of other healthy genes in tumor DNA. It is necessary to detect and measure biomarkers to develop a personalized cancer treatment plan.

Conclusion

To determine certain biomarkers are present in our body (cancer), your doctor must collect samples of tumor tissue or body fluids and send them to the laboratory for serial testing, testing of advanced pathology and molecular analysis. These tests will detect and measure the level of biomarkers specific to your cancer. The information obtained is then compared with studies published by the world's leading cancer researchers to determine which treatments may and may not be effective. Your doctor will then receive a report that lists all the biomarkers detected in the sample and the treatments that have been determined to be positively and negatively related to these biomarkers.

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