# Key Terms on Biomarker Testing

A **biomarker**, or biological marker, is a characteristic of the body that is a sign of a normal or abnormal process, condition, or disease. Biomarkers can be used in the diagnosis, prognosis, monitoring, and/or treatment selection of different conditions and diseases, such as brain and spinal tumors.

**Biomarker testing**, also called molecular testing, somatic testing, and tumor profiling, is a laboratory test used to analyze tissue, blood, or other bodily fluids for specific mutations, gene alterations, proteins, and/or other biomarkers. Biomarker testing of brain and spinal tumors can help individuals and their care teams identify the correct diagnosis, prognosis, and appropriate treatment options. Biomarker testing can involve single analyte tests, which examine a single biomarker; multiple-analyte panels, which examine a set of biomarkers; and more complex tests, such as next-generation sequencing (NGS).

A **biopsy** is a medical procedure to remove a sample of tissue or cells so that it can be examined by a pathologist. The pathologist may study the sample under a microscope and/or perform other tests, such as biomarker testing.

A **biospecimen** is a sample of tissue, blood, or other bodily fluid.

**Genetic testing for inherited cancer risk**, also called germline testing, is a laboratory test that can show if an individual has inherited a genetic change that increases their risk of cancer. While cancer itself cannot be passed down from parents to children, a genetic change that increases the risk of cancer can be passed down if it is present in the parent's egg or sperm cells. Genetic testing for inherited cancer risk is not biomarker testing.

A tumor **grade** is a number used to describe how abnormal the tumor cells and tissue look under a microscope when compared to healthy cells and tissue. Grades can be 1, 2, 3, or 4, with lower numbers considered "low-grade" tumors and higher numbers considered "high-grade" tumors. Low-grade tumors tend to appear more like healthy cells and tissue under a microscope. High-grade tumors tend to appear more abnormal and disorganized under a microscope.

**Histopathology** is the study of tissue or cells under a microscope to look for the presence of disease.

A **mutation** is a change in one's DNA that can result from a random mistake or exposure to a substance, organism, or agent capable of inducing changes in DNA. Mutations can cause a harmful, beneficial, or neutral effect on the individual. Mutations that occur in germ cells like egg and sperm cells are called germline mutations and can be passed on to one's children. Mutations that occur in other cells of the body are called somatic mutations and are not passed on.

**Next-generation sequencing**, abbreviated NGS, is a newer technology used to sequence DNA and detect mutations that is faster and less expensive than the earlier, first-generation method. For people with brain and spinal tumors, next-generation sequencing can help care teams identify the diagnosis, prognosis, and treatment options.

**Precision medicine**, also called personalized medicine or individualized medicine, is an approach that uses information about an individual's genes, environment, and lifestyle to guide decisions related to their medical management. Biomarker testing can help care teams determine a more precise diagnosis and determine targeted treatment options for people with brain and spinal tumors.

The **WHO Classification of Tumours**, also known as the WHO Blue Book, provides an evidence-based classification system of tumors to standardize diagnosis and improve patient care worldwide. The 2021 WHO Classification of Tumors of the Central Nervous System, the current gold standard for brain and spinal tumors, emphasizes the importance of an integrated diagnosis, which layers information about the tumor's histopathology, grade, and biomarkers.

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