JAX Neuro-Oncology Testing

The JAX Advanced Precision Medicine Laboratory offers molecular testing methods for primary brain tumor biomarkers to complement standard histopathological assessment. This provides clinicians and their patients with a comprehensive profile of each tumor, supporting diagnostic, prognostic, and treatment decision-making.

JAX SOMATICSEQ

The JAX SomaticSeq is a 517 gene next-generation sequencing-based tumor profiling assay utilizing DNA and RNA from FFPE specimens. Reports identify variants in WHO-classified key diagnostic genes in primary CNS tumors including ATRX, BRAF, EGFR, IDH1/2, NF1, NF2, and the TERT promoter. [1]

MGMT PROMOTER METHYLATION

The JAX MGMT Promoter Methylation Assay utilizes a quantitative PCR (qPCR) followed by high-resolution melt analysis (HRM) to identify MGMT promoter methylation. MGMT promoter methylation is the key mechanism of MGMT gene silencing and predicts a favorable outcome in patients with glioblastoma who are exposed to alkylating agent chemotherapy.[3] MGMT promoter methylation confers a survival advantage in glioblastoma and is used for risk stratification in clinical trials.[4]

JAX ONCOMETHYL™ ARRAY

CNS Tumor Classification from DNA Methylation Profiling The JAX OncoMethyl™ Array utilizes a machine learning algorithm intended to provide supplemental information for the classification of central nervous system (CNS) tumors based on genomic methylation profiling data. [2] The 2021 WHO Classification of Tumors of the Central Nervous System has identified methylome profiling as "an effective ancillary method for brain and spinal cord tumor classification when used alongside other, standard technologies, including histology." [1]

ABOUT JAX APML

The JAX Advanced Precision Medicine Laboratory is a CLIA-certified, CAP-accredited, and NCI-MATCH-designated laboratory delivering precise genomic testing and critical data analysis services to help improve treatment options for patients.

[1]Louis et al., The 2021 WHO Classification of Tumors of the Central Nervous System: a summary. Neuro Oncol. 2021 Aug 2;23(8):1231-1251. doi: 10.1093/neuonc/noab106. PMID: 34185076; PMCID: PMC8328013.

[2]Capper et al., DNA methylation-based classification of central nervous system tumours. Nature. 2018 Mar 22;555(7697):469-474. doi: 10.1038/nature26000. Epub 2018 Mar 14. PMID: 29539639; PMCID: PMC6093218.

[3] Weller M, Stupp R, Reifenberger G, Brandes AA, van den Bent MJ, Wick W, Hegi ME. MGMT promoter methylation in malignant gliomas: ready for personalized medicine? Nat Rev Neurol. 2010 Jan;6(1):39-51. doi: 10.1038/ nrneurol.2009.197. Epub 2009 Dec 8. PMID: 19997073.

[4] Rivera, Andreana L, et al. "MGMT Promoter Methylation Is Predictive of Response to Radiotherapy and Prognostic in the Absence of Adjuvant Alkylating Chemotherapy for Glioblastoma." Neuro-Oncology, Oxford University. 2010 Feb; 12(2): 116–121.doi: 10.1093/ neuonc/ nop020.PMID: 20150378, PMCID: PMC2940581.

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