

Oligodendroglioma

While gliomas are the most common primary neoplasm of the central nervous system, individual tumors can have strikingly different clinical outcomes. Although attempts have been made to define clinical and histologic features that correlate with a favorable prognosis, none have been sufficiently reliable at predicting response to adjuvant chemotherapy. However, studies have shown that loss of 1p36 and 19q13 is associated with an oligodendroglial phenotype, favorable response to chemotherapy and overall prolonged survival. FISH studies provide a direct method for identifying loss of 1p36 and 19q13 in formalin-fixed, paraffin-embedded tissue sections.

Atypical teratoid/rhabdoid tumor

Germline and somatic inactivating mutations of the INI1 gene characterize an interesting cohort of tumors, including renal and extrarenal rhabdoid tumors, as well as atypical teratoid/rhabdoid tumors (AT/RTs), aggressive neoplasms typically presenting as a posterior fossa tumor in children. Immunohistochemical demonstration of loss of nuclear INI1 protein expression is a characteristic finding in AT/RTs, and has been suggested as a useful marker to distinguish AT/RTs from other malignant pediatric central nervous system (CNS) tumors such as medulloblastoma, supratentorial primitive neuroectodermal tumors, anaplastic ependymomas, and others.

Mutant IDH1 in astrocytoma

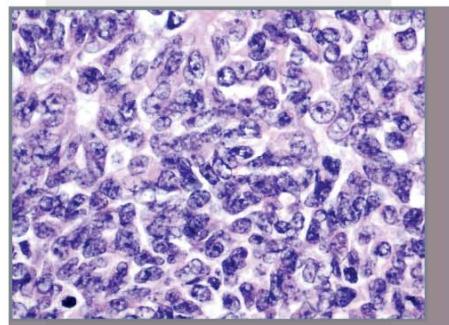
Isocitrate dehydrogenase 1 (IDH1) gene mutations, primarily of the R132H type, occur in approximately 60-90% of diffuse and anaplastic gliomas and secondary glioblastomas, and can be detected using IHC with a mutation-specific antibody. The presence of IDH1 mutations in gliomas is associated with patient age, histopathological diagnosis, and patient survival. Therefore, testing of the IDH1 status is relevant for diagnostic and prognostic considerations in primary brain tumors. The presence of IDH1 mutations may also distinguish low-grade gliomas from reactive gliosis.

CNS tumors have distinctive phenotypic or genotypic profiles as shown in the heat map below:

	Cytokeratin	GFAP	Synaptophysin	PR	S-100	Neu-N	INI-1 Loss	CRX	Mutant IDH1	OTHER MARKERS
Astrocytoma										
Glioblastoma										
Oligodendro-glioma										Loss of 1p & 19q via FISH
Ependymoma										
Choroid plexus papilloma/CA										Transthyretin
Central neurocytoma										
Olfactory neuroblastoma										Chromogranin A
Pineocytoma/pineoblastoma										
Meningioma										EMA, Claudin-1
Medulloblastoma										
Atypical Teratoid/Rhabdoid Tumors										
Central PNET										Neurofilaments
Retinoblastoma										

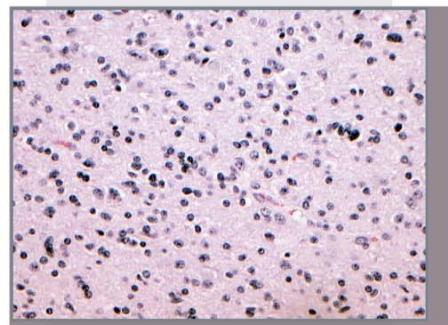
Heatmap content available in the printed Pathology Reference Guide

Atypical Teratoid / Rhabdoid Tumor



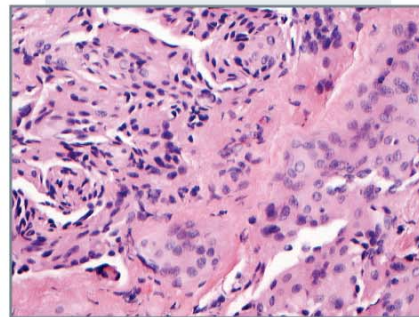
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Astrocytoma

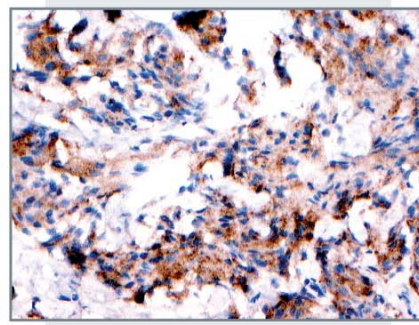


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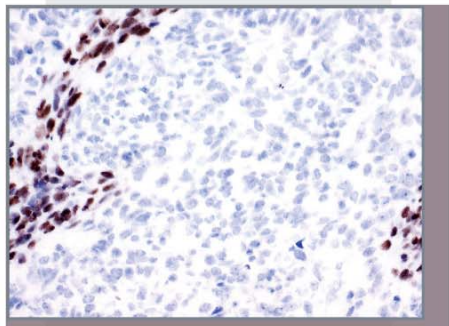
Meningioma



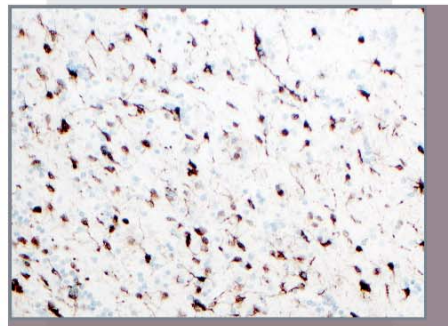
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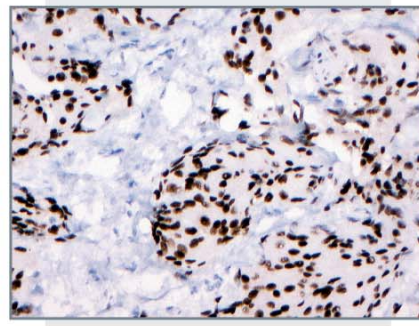
EMA



INI-1



IDH-1



Progesterone Receptor

Almost always positive	Usually positive	Not helpful	Usually negative	Almost always negative

See introduction to heat maps page 15