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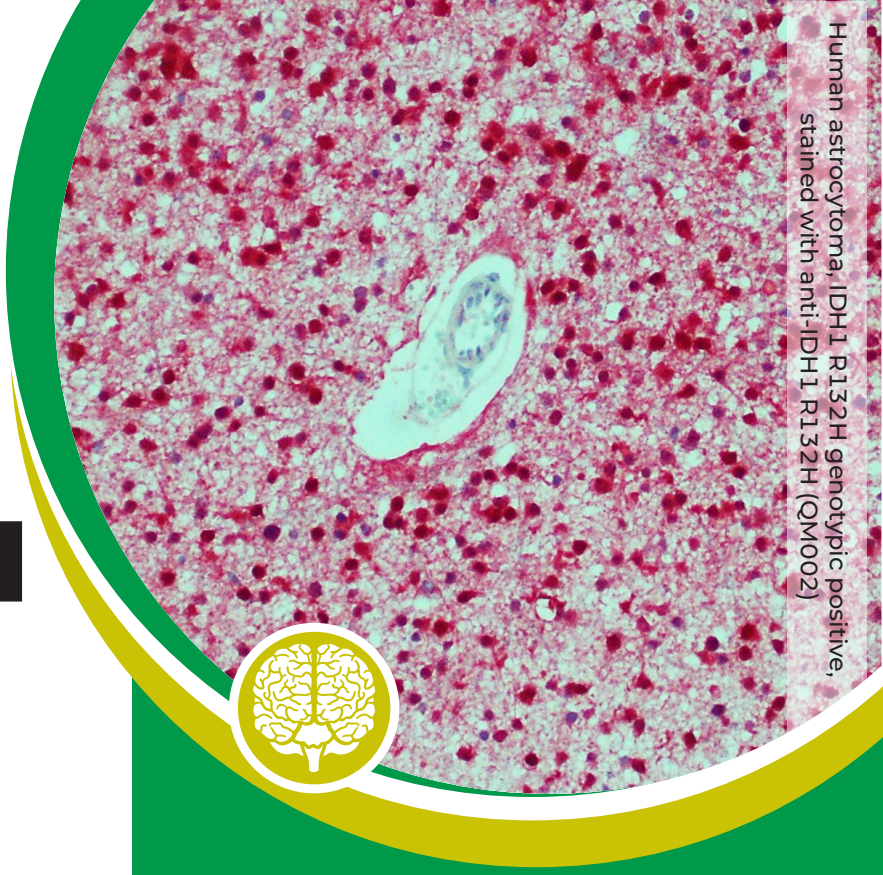
Anti-IDH1 R132H

(clone QM002)



Human astrocytoma, IDH1 R132H genotypic positive, stained with anti-IDH1 R132H (QM002)

MOUSE MONOCLONAL ANTIBODY

The monoclonal antibody is specific for the IDH1 R132H point mutation, is a comparatively strong stainer, shows a very constant performance quality, does not produce any non-specific background and is thus highly suitable to detect mutated IDH1 in FFPE sections for the diagnosis and classification of brain tumors according to the WHO brain tumor classification.

General information about wild-type and mutated IDH1

Isocitrate dehydrogenase 1/ IDH1 is an enzyme that catalyzes the third step of the citric acid cycle, which involves the oxidative decarboxylation of isocitrate, forming alpha-ketoglutarate and CO_2 in a two step reaction. IDH1 protein is localized in the cytoplasm and in peroxisomes. It is expressed in a wide range of species and also in organisms that lack a complete citric acid cycle.

IDH1 mutations typically involve an amino acid substitution in the active site of the enzyme in codon 132. The mutation results in a loss of normal enzymatic function and in abnormal production of 2-hydroxyglutarate. This has been found to inhibit enzymatic function of many alpha-ketoglutarate dependent dioxygenases, including histone and DNA demethylases, causing widespread changes in histone and DNA methylation and potentially promoting tumorigenesis.

Histology	IDH status	Genetic parameters	WHO diagnosis
Astrocytoma Oligoastrocytoma Oligodendroglioma	→ IDH mutant	→ ATRX loss or TP53 mutation → 1p/19q codeletion	→ Diffuse astrocytoma, IDH mutant → Oligodendroglioma, IDH mutant, 1p/19 codeleted
	→ IDH wild-type	→	After exclusion of other entities: Diffuse astrocytoma, IDH wild-type Oligodendroglioma, NOS
Glioblastoma	→ IDH mutant	→	Glioblastoma, IDH mutant
	→ IDH wild-type	→	Glioblastoma, IDH wild-type
Astrocytoma Oligodendroglioma Oligoastrocytoma Glioblastoma	→	→ not available or inconclusive	→ Diffuse astrocytoma, NOS Oligodendroglioma, NOS Oligoastrocytoma, NOS Glioblastoma, NOS

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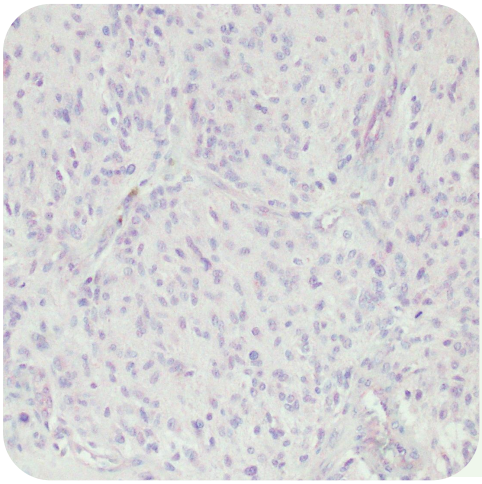
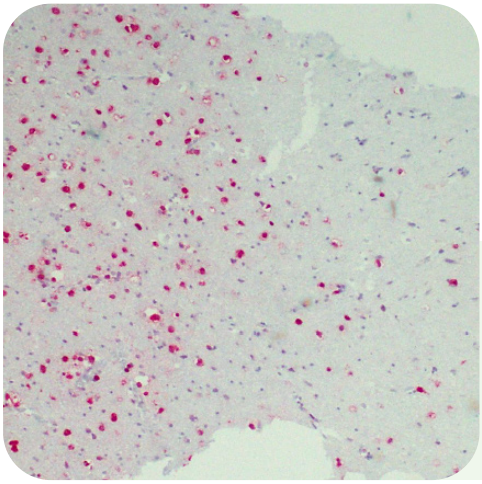
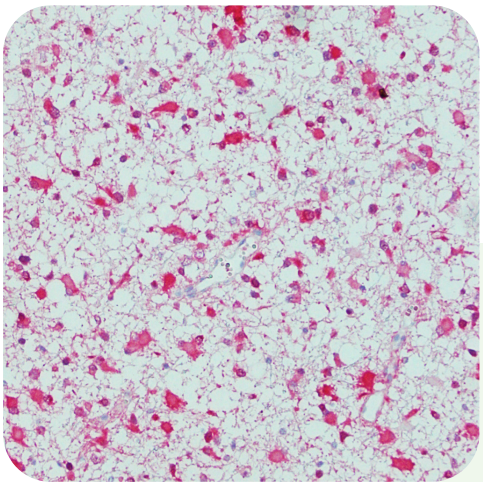


Human astrocytoma, IDH1 R132H genotypic negative, stained with anti-IDH1 R132H (QM002)



Human astrocytoma, IDH1 R132H genotypic positive, with runners into the adjacent healthy brain tissue stained with anti-IDH1 R132H (QM002)



Human brain tumor, IDH1 R132H genotypic positive, stained with anti-IDH1 R132H (QM002)

Status: CE-IVD (Europe); RUO (USA)
Dilution: 1:100 - 1:200
Product code: x-I001-xxx

IDH1 R132H mutation is of high diagnostic value in neuropathlogy

IDH1 R132H point mutation is shown in more than 70 % of gliomas, frequently in WHO grade II and III glioma and secondary grade IV glioblastoma. The following scheme gives an overview of diffuse glioma from histology, its IDH status and other genetic paraemeters according to WHO diagnosis.

The high rates of IDH1 mutations in oligodendroglial tumors make this mutation especially helpful for the differentiation of oligodendrogliomas from other tumors with clear cell appearance. IDH1 mutations have been shown to dominantly inhibit IDH1 catalytic activity.

Assessment of the IDH1 status may be performed by IHC detection of the mutated protein. In cases with negative or inconclusive immunostaining result further analysis by DNA-based methods is necessary.

Testing of the IDH1 status is relevant for diagnostic and prognostic considerations in primary brain tumors. Mutated tumors generally show a better prognosis.

IDH1 R132H point mutation in other tumor types

Various studies have identified IDH mutations in acute myelogenous leukemia (AML), acute lymphoblastic leukemia (ALL), cholangiocarcinoma, cartilaginous tumors, prostate cancer, papillary breast carcinoma, melanoma, angioimmunoblastic T cell lymphoma, and primary myelofibrosis indicating that IDH1 may be an important player in multiple tumor types.

Literature:

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