PRODUCT INFORMATION

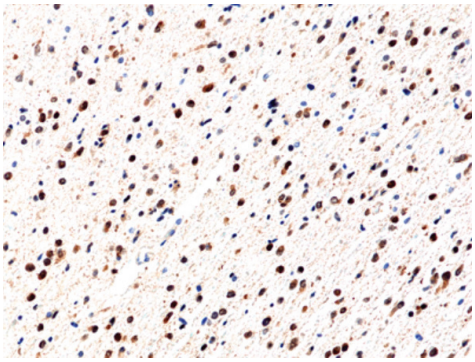
IDH1 R132H Rabbit Monoclonal Antibody (RM390)

Item No. 32326

Overview and Properties

Contents:	This vial contains 100 µl of protein A-affinity purified monoclonal antibody.
Synonym:	Isocitrate Dehydrogenase 1
Immunogen:	Peptide corresponding to the IDH1 R132H mutant
Cross Reactivity:	(+) IDH R132H; (-) IDH without the R132H mutation
Species Reactivity:	(+) Human
Form:	Liquid
Storage:	-20°C (as supplied)
Stability:	≥1 year
Storage Buffer:	PBS, with 50% glycerol, 1% BSA, and 0.09% sodium azide
Clone:	RM390
Host:	Rabbit
Isotype:	IgG
Applications:	Immunohistochemistry (IHC); the recommended starting dilution is 1:100-1:200. Other applications were not tested, therefore optimal working concentration/dilution should be determined empirically.

Image



Immunohistochemical staining of formalin-fixed and paraffin-embedded human glioblastoma tissue using IDH1 R132H Rabbit Monoclonal Antibody (RM390) at a dilution of 1:100.

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Description

Isocitrate dehydrogenase 1 (IDH1) is a $NADP^+$-dependent enzyme and a member of the IDH family.[1] It is composed of a large domain, a small domain, and a clasp domain and exists as an asymmetric homodimer with active-site clefts formed by the large and small domains of one monomer and the small domain of the other. IDH1 is localized to the cytoplasm and catalyzes the oxidative decarboxylation of isocitrate to α-ketoglutarate (α-KG) using $NADP^+$ as a cofactor.[2] A mutant form of IDH1, where arginine is replaced by histidine at position 132 ($IDH1^{R132H}$), changes the conformation of the $IDH1^{R132H}$ homodimer and $IDH1^{R132}$/$IDH1^{R132H}$ heterodimer.[3,4] The $IDH1^{R132}$/$IDH1^{R132H}$ heterodimer is unable to achieve the closed conformation needed to produce α-KG and is enzymatically inactive. The $IDH1^{R132H}$ homodimer is not only enzymatically inactive for its native function but gains the ability to reduce α-KG to D-hydroxyglutarate (D-2-HG) using NADPH as a cofactor. Exogenous $IDH1^{R132H}$ is oncogenic *in vitro* and the expression of $IDH1^{R132H}$ in the mouse brain induces tumor nodules in a process resembling gliomagenesis.[5,6] The $IDH1^{R132H}$ mutation has frequently been found in tumor tissue derived from patients with secondary glioblastomas but is associated with increased survival.[5] Cayman's IDH1 R132H Rabbit Monoclonal Antibody (RM390) can be used for immunohistochemistry (IHC) applications.

References

1. Xu, X., Zhao, J., Xu, Z., *et al.* Structures of human cytosolic NADP-dependent isocitrate dehydrogenase reveal a novel self-regulatory mechanism of activity. *J. Biol. Chem.* **279(32)**, 33946-33957 (2004).
2. Frezza, C., Tennant, D.A., and Gottlieb, E. IDH1 mutations in gliomas: When an enzyme loses its grip. *Cancer Cell* **17(1)**, 7-9 (2010).
3. Yang, B., Zhong, C., Peng, Y., *et al.* Molecular mechanisms of "off-on switch" of activities of human IDH1 by tumor-associated mutation R132H. *Cell Res.* **20(11)**, 1188-1200 (2010).
4. Zhao, S. and Guan, K.-L. IDH1 mutant structures reveal a mechanism of dominant inhibition. *Cell Res.* **20(12)**, 1279-1281 (2010).
5. Huang, L.E. Friend or foe—IDH1 mutations in glioma 10 years on. *Carcinogenesis* **40(11)**, 1299-1307 (2019).
6. Bardella, C., Al-Dalahmah, O., Krell, D., *et al.* Expression of $Idh1^{R132H}$ in the murine subventricular zone stem cell niche recapitulates features of early gliomagenesis. *Cancer Cell* **30(4)**, 578-594 (2016).

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