PRODUCT INFORMATION

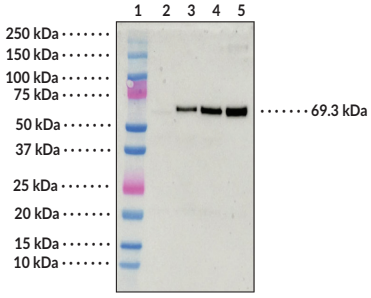
4-hydroxy Nonenal Monoclonal Antibody (HNEJ-1/Clone IG10) - Biotinylated

Item No. 45026

Overview and Properties

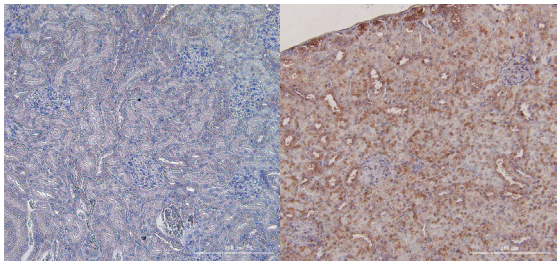
Contents:	This vial contains 100 µg of biotinylated protein G-purified monoclonal antibody
Synonyms:	4-HNE
Immunogen:	4-HNE-modified KLH
Cross Reactivity:	(+) 4-HNE-modified proteins
Species Reactivity:	Species Independent
Form:	Liquid
Storage:	-20°C (as supplied)
Stability:	≥2 years
Storage Buffer:	PBS, pH 7.2, containing 50% glycerol and 0.02% sodium azide
Clone:	IG10
Host:	Mouse
Isotype:	IgG1
Applications:	Western blot (WB) and Immunohistochemistry (IHC); the recommended starting dilution is 1:500 for WB and 1:200 for IHC. Other applications were not tested; therefore optimal working concentration/dilution should be determined empirically.

Images



Lane 1: Bio-Rad Precision Plus Protein Dual Color Standard
Lane 2: BSA (500 ng)
Lane 3: 4-HNE-BSA (Item No. 44081) (100 ng)
Lane 4: 4-HNE-BSA (Item No. 44081) (250 ng)
Lane 5: 4-HNE-BSA (Item No. 44081) (500 ng)

SDS-PAGE Analysis of 4-hydroxy Nonenal Monoclonal Antibody (HNEJ-1/Clone IG10) - Biotinylated.



Immunohistochemistry analysis of formalin-fixed, paraffin-embedded (FFPE) rat kidney after heat-induced antigen retrieval in citrate buffer, pH 6.0. Tissue was incubated with 4-hydroxy Nonenal Monoclonal Antibody (HNEJ-1/Clone IG10) - Biotinylated at a 1:100 dilution, followed by streptavidin-HRP and chromogen (DAB).

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent *via* email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

4-hydroxy Nonenal (4-HNE) is a lipid peroxidation product that reacts with lysine, cysteine, or histidine residues in proteins.[1] It is found in all tissues and serum, and the formation of 4-HNE-modified proteins is associated with oxidative stress. 4-HNE can ligate to and inactivate cytosolic and mitochondrial proteins, leading to mitochondrial dysfunction, loss of cell proliferation and differentiation, increased intracellular calcium levels and production of pro-inflammatory cytokines, and apoptosis. 4-HNE levels are negatively regulated by aldehyde dehydrogenases (ALDHs), glutathione S-transferases (GSTs), and aldo-keto reductases (AKRs). Increased levels of 4-HNE protein adducts are found at the cell membrane, in the mitochondria, and in the cytosol during ferroptosis *in vitro*.[2] 4-HNE reduces mitochondrial oxygen consumption and membrane potential, as well as increases intracellular levels of reactive oxygen species (ROS), *in vitro*.[3] 4-HNE protein adducts increase in an age-related manner in the kidney, spleen, ovary, and uterus, but not the liver, in rats.[2] 4-HNE protein adducts are increased and GST levels are decreased in the brain of older mice in a Tg2576 mouse model of Alzheimer's disease, and increased levels of 4-HNE-modified proteins, including manganese superoxide dismutase (Mn-SOD), α-enolase, and malate dehydrogenase, are found in the inferior parietal lobule in postmortem brain from patients with early Alzheimer's disease.[4,5] HNEJ-1 has high affinity for 4-HNE modifications at lysine, cysteine, or histidine residues, whereas HNEJ-2-5 have varying affinities for lysine and cysteine adducts.[6] Cayman's 4-hydroxy Nonenal Monoclonal Antibody (HNEJ-1/Clone IG10) - Biotinylated can be used for immunohistochemistry (IHC) and Western blot (WB) applications.

References

1. Breitzig, M., Bhimineni, C., Lockey, R., *et al.* 4-Hydroxy-2-nonenal: A critical target in oxidative stress? *Am. J. Physiol. Cell Physiol.* **311(4)**, C537-C543 (2016).
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4. Benedetti, E., D-Angelo, B., Cristiano, L., *et al.* Involvement of peroxisome proliferator-activated receptor β/δ (PPAR β/δ) in BDNF signaling during aging and in Alzheimer disease: Possible role of 4-hydroxynonenal (4-HNE). *Cell Cycle* **13(8)**, 1335-1344 (2014).
5. Reed, T.T., Pierce, W.M., Markesbery, W.R., *et al.* Proteomic identification of HNE-bound proteins in early Alzheimer disease: Insights into the role of lipid peroxidation in the progression of AD. *Brain Res.* **1274**, 66-76 (2009).
6. Ozeki, M., Miyagawa-Hayashino, A., Akatsuka, S., *et al.* Susceptibility of actin to modification by 4-hydroxy-2-nonenal. *J. Chromatogr. B Analyt. Technol. Biomed. Life Sci.* **827(1)**, 119-126 (2005).

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