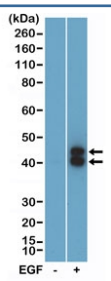
Phospho-ERK1/2 (pThr202/pTyr204) Antibody / MAPK Signaling and Proliferation Marker [clone RM451] (R20465)

Catalog No.	Formulation	Size
R20465-0.1ML	Antibody in PBS with 50% glycerol, 1% BSA and 0.09% sodium azide	100 ul

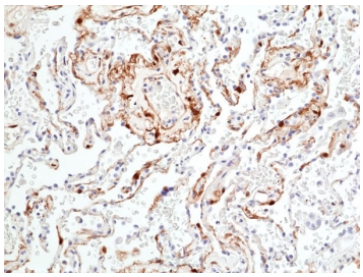
Recombinant RABBIT MONOCLONAL

Bulk quote request

Availability	1-3 business days
Species Reactivity	Human
Format	Purified
Host	Rabbit
Clonality	Recombinant Rabbit Monoclonal
Isotype	Rabbit IgG
Clone Name	RM451
Purity	Protein A purified from animal origin-free supernatant
UniProt	P27361, P28482
Applications	Immunohistochemistry (FFPE) : 1:100-1:200 Western Blot : 1:500 -1:1000
Limitations	This Phospho-ERK1/2 (pThr202/pTyr204) Antibody / MAPK Signaling and Proliferation Marker is available for research use only.



Phospho-ERK1/2 (pThr202/pTyr204) Antibody A431 WB. Western blot analysis of human A431 cell lysates untreated (-) or treated (+) with epidermal growth factor (EGF) using phospho-ERK1/2 antibody detecting ERK1 and ERK2 phosphorylated at Thr202 and Tyr204, clone RM451. Two bands are detected at approximately 42 kDa and 43 kDa, corresponding to ERK1 and ERK2 respectively. Signal intensity is increased in the EGF-treated sample, consistent with activation of MAPK signaling and growth factor-induced kinase phosphorylation.



Phospho-ERK1/2 Antibody Lung Tissue IHC. Immunohistochemistry analysis of FFPE human lung tissue stained with phospho-ERK1/2 antibody detecting ERK1 and ERK2 phosphorylated at Thr202 and Tyr204, clone RM451. Epithelial cells show cytoplasmic and focal nuclear HRP-DAB brown staining, consistent with activated MAPK signaling within airway and alveolar structures, while surrounding stromal elements display lower signal. Nuclei are counterstained blue. HIER: heat-mediated antigen retrieval in EDTA buffer.

Description

Extracellular signal-regulated kinases 1 and 2 (ERK1 and ERK2), also known as MAPK3 and MAPK1 respectively, are central components of the mitogen-activated protein kinase (MAPK) signaling pathway that regulates cell proliferation, differentiation, and survival. Phospho-ERK1/2 (pThr202/pTyr204) Antibody, clone RM451, is designed to detect ERK1/2 phosphorylated at threonine 202 and tyrosine 204, residues required for full activation of the kinase and downstream signaling activity.

ERK1/2 activation occurs through a well-characterized signaling cascade initiated by receptor tyrosine kinases such as EGFR. Upon stimulation by ligands including epidermal growth factor (EGF), upstream kinases RAF and MEK phosphorylate ERK1/2 at Thr202 and Tyr204, triggering a conformational change that activates kinase function. Detection of phosphorylation at these sites is widely used as a direct readout of MAPK pathway activation and mitogenic signaling.

Activated ERK1/2 translocates from the cytoplasm to the nucleus, where it phosphorylates transcription factors and other regulatory proteins that control gene expression and cell cycle progression. Through these mechanisms, ERK signaling promotes cellular proliferation, differentiation, and survival. Phospho-ERK1/2 is therefore a key marker of growth factor signaling and is frequently used to monitor pathway activation in response to extracellular stimuli.

Unlike total ERK1/2 detection, which reflects protein abundance, phospho-specific detection at Thr202/Tyr204 provides insight into signaling activity and pathway engagement. Phosphorylation is highly dynamic and rapidly induced following stimulation with growth factors such as EGF, while basal levels are typically low in unstimulated cells. This makes phospho-ERK1/2 an ideal marker for studying signal transduction, drug response, and kinase pathway modulation.

Subcellularly, phosphorylated ERK1/2 is detected in both cytoplasmic and nuclear compartments. Cytoplasmic staining reflects activation at the membrane-proximal signaling complexes, while nuclear localization corresponds to transcriptional regulation and downstream signaling effects. Immunofluorescence and immunohistochemistry studies often reveal increased nuclear staining following pathway activation.

Dysregulation of the MAPK pathway is a hallmark of many cancers, where constitutive ERK activation drives uncontrolled proliferation and tumor progression. Elevated phospho-ERK1/2 levels are commonly observed in tumor tissues and are associated with increased mitogenic signaling and resistance to targeted therapies. Detection of Thr202/Tyr204 phosphorylation is therefore widely used in cancer research to assess pathway activation and therapeutic response.

Phospho-ERK1/2 (pThr202/pTyr204) Antibody, clone RM451, enables selective detection of the activated forms of ERK1 and ERK2, supporting studies of MAPK signaling, growth factor response, and cellular proliferation. Its ability to distinguish phosphorylated ERK from total protein levels makes it a valuable tool for investigating dynamic signaling events and kinase pathway regulation.

This antibody is part of our full phospho antibody collection which can be explored for additional phosphorylation-specific targets and pathway markers.

Application Notes

The stated application concentrations are suggested starting points. Titration of the Phospho-ERK1/2 (pThr202/pTyr204)

Antibody / MAPK Signaling and Proliferation Marker may be required due to differences in protocols and secondary/substrate sensitivity.

Immunogen

A phospho-peptide corresponding to human Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204) was used as the immunogen for the Phospho-ERK1/2 (pThr202/pTyr204) Antibody.

Storage

Store the Phospho-ERK1/2 (pThr202/pTyr204) Antibody at -20oC.