BACKGROUND

Rab GTPases are key regulators of membrane trafficking. Rabs cycle between an inactive GDP-bound and an active GTP-bound state. They are recruited from the cytosol onto cell membranes in the inactive form, are activated by guanine nucleotide exchange factors and then bind a large number of Rab effector proteins. In this way, Rabs co-ordinate the assembly of effector complexes and generate functional membrane domains. Following inactivation by GTP hydrolysis, Rabs release their effectors and become available for the next round of activation and effector binding. Rab effector proteins are functionally diverse, which allows Rabs to co-ordinate multiple aspects of membrane trafficking, including transport vesicle formation, motility, docking and fusion. Many Rabs have been specifically linked to particular transport pathways and are therefore useful landmarks to map out the intracellular trafficking network. For example, a number of Rab proteins have been implicated in the endocytic recycling pathway including Rab4, Rab11, and Rab15 in the clathrin pathway, and Rab22 and the more distantly related Arf6 in the recycling of cargo internalized independently of clathrin.[1]

Rab10, first isolated from a clone of Madin-Darby Canine kidney (MDCK) cells belongs to a subfamily of Rab proteins that includes Rab8 and Rab13. This subfamily of Rabs represents the closest mammalian relatives of the Sec4p, one of the first described Rab proteins, which mediates polarized transport from the *trans*-Golgi network (TGN) to the site of bud formation in yeast. Rab10 has a single isoform, is conserved throughout metazoan evolution and is ubiquitously expressed in mouse and human tissues. The mammalian Rab10 has been found at the late Golgi in fibroblasts. Moreoever, it was shown that that interfering with Rab10 function leads to defects in endocytosis in polarized cells. In *Caenorhabditis elegans*, lack of Rab10 impairs endocytic recycling in the intestine. In MDCK cells, mutant variants of Rab10 affect early endocytic events. Moreoevr, it was shown that Rab10 is closely associated with common endosomes, accessible to both the apical and the basolateral recycling pathways. Nevertheless, the homology to Sec4p suggests that Rab10 may also play a role in exocytic trafficking in MDCK cells. Moreover, insulin treatment leads to elevation of the GTP form of Rab10, which regulated the signalling pathway for GLUT4 translocation.[2] Despite their function in membrane trafficking, Rab may also be involved in signal transduction by regulating the membrane trafficking of cell surface receptors for hormone, cytokine, and chemokine. Indeed, Rab10 is associated with clathrin-independent endocytosis. It was shown that Rab10 is a clathrin-independent regulator of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid-type glutamate receptors (AMPARs) and IL-2 receptors trafficking.[3] In addition, it was shown that Rab10 plays a critical role in TLR4 signaling. Rab10 expression can up-regulate LPS-induced production of TNF-α, IL-6, and IFN-β, as well as potentiate LPS-induced activation of multiple intracellular signaling pathways, including MAPK, NF-κB, and IFN regulatory factor 3 (IRF3) signaling pathways. Rab10 is a positive regulator of TLR4 signaling, possibly by promoting transport of TLR4 from the Golgi to plasma membrane. Moreover, TLR4 expression via overexpression of Rab10 in macrophages exaggerates LPS-induced lung injury in vivo model of human acute respiratory distress syndrome (ARDS). Thus, Rab10 maybe a potential therapeutic target for treatment of ARDS as well as other inflammatory diseases in humans.[4]

References:

1. Pereira-Leal, J. & Seabra, M.: J. Mol. Biol. 313: 889–901, 2001
2. Sano, H. et al: Biochem. J. 411:89–95, 2008
3. Glodowski, D.R. et al: Mol. Biol. Cell 18:4387-96, 2007
4. Wang, D. et al: Proc. Natl. Acad. Sci. USA 107:13806-11, 2010

TECHNICAL INFORMATION

Source:
Rab10 Antibody is a mouse monoclonal antibody raised against recombinant human Rab10 fragments expressed in *E. coli*.

Specificity and Sensitivity:
This antibody detects endogenous Rab10 proteins without cross-reactivity with other family members.

Storage Buffer: PBS and 30% glycerol

Storage:
Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

APPLICATIONS

Application:	*Dilution:
WB	1:1000
IP	n/d
IHC	n/d
ICC	1:50-200
FACS	n/d

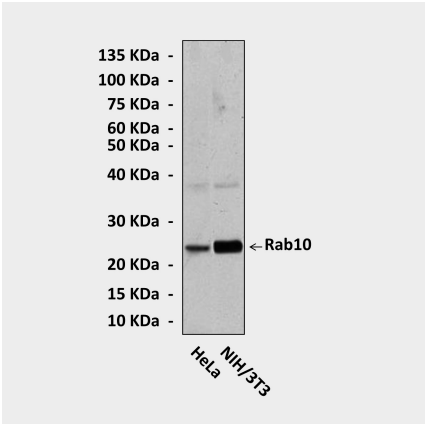
*****Optimal dilutions must be determined by end user.*

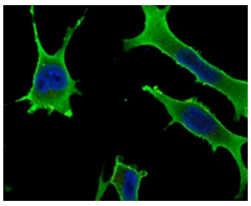
Rab10 Antibody

Cat. No. CP10317

Applications:	**WB, ICC**
Detected MW:	**23 kDa**
Species & Reactivity:	**Human, Mouse, Rat**
Isotype:	**Mouse IgG1**

QUALITY CONTROL DATA





Top: Western Blot detection of Rab10 proteins in HeLa and NIH3T3 cell lysates using Rab10 Antibody. **Bottom:** This antibody stains LOVO cells in confocal immunofluorescent analysis (Rab10 Antibody: Green; DRAQ5 DNA Dye: Blue).