BACKGROUND

Liver kinase B1 (LKB1) (also known as Stk11) gene encodes a serine/threonine protein kinase that was first identified as a tumor suppressor gene in human chromosome 19p13. Germ line mutations in the LKB1 gene are associated with the Peutz–Jeghers polyposis and cancer syndrome. Somatic mutations in Lkb1 are observed in sporadic pulmonary, pancreatic and biliary cancers and melanomas. Expression of Lkb1 induces G1 cell cycle arrest, and *Lkb1*$^{-/+}$ mice are predisposed to developing hamartomatous intestinal polyps associated with activation of mTOR kinase. The LKB1 serine–threonine kinase functionally and biochemically links control of cellular structure and energy utilization through activation of the AMPK family of kinases. Lkb1 regulates cell polarity through downstream kinases including AMPKs, MARKs and BRSKs, and nutrient utilization and cellular metabolism through the AMPK–mTOR pathway. LKB1 has been shown to affect normal chromosomal segregation, TGF-beta signaling in the mesenchyme and WNT and p53 activity. Although each of the LKB1-dependent processes and downstream pathways have been individually delineated through work across a range of experimental systems, how they relate to Lkb1's role as a tumor suppressor remains to be fully explored and elucidated. The recent development of mouse cancer models harboring engineered mutations in Lkb1 have offered insights into how LKB1 may be functioning to restrain tumorigenesis and how its role as a master regulator of polarity and metabolism could contribute to its tumor suppressor function.[1] In addition, it was shown that deletion of the *Lkb1* gene in mice caused increased haematopoietic stem cell (HSC) division, rapid HSC depletion and pancytopenia. HSCs depended more acutely on Lkb1 for cell-cycle regulation and survival than many other haematopoietic cells. HSC depletion did not depend on mTOR activation or oxidative stress. Lkb1 is required for HSC maintenance through AMPK-dependent and AMPK-independent mechanisms, revealing differences in metabolic and cell-cycle regulation between HSCs and some other haematopoietic progenitors.[2] LKB1 activity is regulated by the pseudokinase STRAD-alpha and the scaffolding protein MO25-alpha through an phosphorylation-independent mechanism. STRAD-alpha adopts a closed conformation typical of active protein kinases and binds LKB1 as a pseudosubstrate. STRAD-alpha and MO25-alpha promote the active conformation of LKB1, which is stabilized by MO25-alpha interacting with the LKB1 activation loop. This mechanism of kinase activation may be relevant to understanding the evolution of other pseudokinases.[3] LKB1 appears to be phosphorylated in cells at several sites, including human LKB1 at Ser31/325/428 and Thr189/336/363. It was shown that phosphorylation of LKB1 does not directly affect its nuclear localization or its catalytic activity *in vitro*, but that its phosphorylation at Thr336, and perhaps to a lesser extent at Thr366, inhibits LKB1 from suppressing cell growth.[4]

References:
1. Alessi, D.R. et al: Annu. Rev. Biochem. 75:137-63, 2006
2. Nakada, D. et al: Nature 468:653-8, 2010
3. Zeqiraj, E. et al: Science 326:1707-11, 2009
4. Sapkota, G.P. et al: Biochem. J. 362:481-90, 2002

TECHNICAL INFORMATION

Source:
LKB1 Antibody is a mouse monoclonal antibody raised against recombinant human LKB1 fragments expressed in *E. coli*.

Specificity and Sensitivity:
This antibody detects endogenous LKB1 proteins without cross-reactivity with other family members.

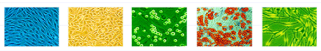
Storage Buffer: PBS and 30% glycerol

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.*

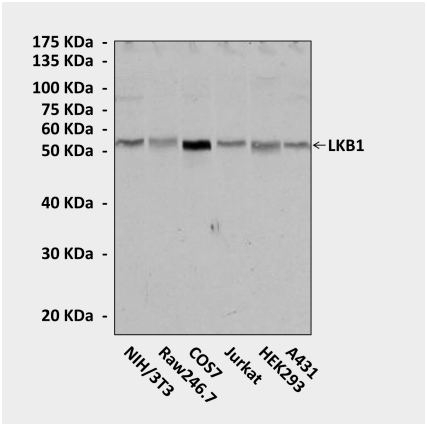


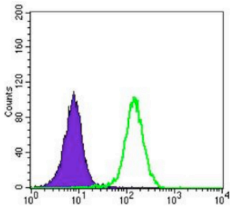
LKB1 Antibody

Cat. No. CP10350

Applications:	**WB, ICC**
Detected MW:	**54 kDa**
Species & Reactivity:	**Human, Mouse, Rat**
Isotype:	**Mouse IgG1**

QUALITY CONTROL DATA





Top: Western Blot detection of LKB1 proteins in various cell lysates using LKB1 Antibody. **Bottom:** FACS analysis of K562 cells using LKB1 Antibody (LKB1 Antibody: green; control: purple).