BACKGROUND

SHP-2 is a ubiquitously expressed cytosolic protein tyrosine phosphatase and transmits signals in cells that are activated by various ligands, including growth factors, cytokines, hormones, and MHC-antigen complexes. It is composed of two amino-terminal SH2 domains, a central phosphatase domain and a carboxy-terminal tail. SHP-2 is essentially inactive under basal conditions. Upon activation of cells with different stimuli, SHP-2 is recruited to the plasma membrane where it can associate with a number of tyrosine phosphorylated molecules, including receptor tyrosine kinases (e.g. growth factor receptors), multisite adapter proteins and cell adhesion molecules, and becomes phosphorylated on tyrosine residues. Both tyrosine phosphorylation of SHP-2 and binding of its SH2 domains to tyrosine phosphorylated peptides enhance its catalytic activity, possibly through the release of negative regulatory constraints on the phosphatase domain mediated by the SH2 domains of SHP-2.[1] Moreover, the regulation of protein tyrosine phosphatase (PTPase) SHP-2 is proposed to involve tyrosine phosphorylation on two tail tyrosine residues. It was shown that a phosphonate at Tyr542 interacts intramolecularly with the N-terminal SH2 domain to relieve basal inhibition of the PTPase, whereas a phosphonate at Tyr-580 stimulates the PTPase activity by interaction with the C-terminal SH2 domain. a single phosphorylation of Tyr-542 of SHP-2 is sufficient to activate the MAP kinase pathway in living cells.[2]

SHP-2 is widely involved in a variety of signaling pathways triggered by cytokines and growth factors, including the MAP kinase, Jak-Stat, NF-kB and PI3 kinase pathways. It has been clearly demonstrated that this phosphatase plays an important role in transducing signals relayed from the cell surface to the nucleus, and is a critical intracellular regulator for a diversity of cell functions, such as mitogenic activation, metabolic control, transcription regulation, and cell migration. SHP-2 (or *Csw*) is critical for normal development in *Xenopus laevis* and *Drosophila*; mice that are homozygous for mutant or null SHP-2 alleles die in utero. In addition to binding activated receptors, SHP-2 binds receptor substrates like IRS-1, Gab1 and several recently identified adhesion molecules, including membrane-spanning SHPS/SIRP and PECAM proteins. SHP-2 is thought to function as a positive mediator of signals generated by activated membrane receptor complexes although the number and diversity of binding partners and substrates identified thus far suggests that it may have other functions. SHP-2 appears to play different positive roles in various mitogenic signaling pathways leading to ERK activation, while it acts as a negative effector in JNK activation by heat shock.[3] The positive regulatory role of SHP-2 in signal cascades leading to cell growth suggests involvement in tumorigenesis, raising the possibility that SHP-2 may be a target in the treatment of some forms of cancer. In addition, SHP-2 may participate in cell signaling independent of its phosphotase activity. Following PDGF or epidermal growth factor (EGF) stimulation, the tyrosine-phosphorylated growth factor receptors bind to the N-terminal SH2 domains of SHP-2. SHP-2, in turn, binds to the SH2 domain (after PDGF stimulation) or the Src homology 3 (SH3) domain (after EGF stimulation) of Grb2-Sos and this leads to Ras activation. Thus, in addition to functioning as a phosphatase, SHP-2 also functions as an adaptor protein, linking growth factor receptor tyrosine kinase and Ras signaling pathways. It was also shown that SHP-2 can activate the Src tyrosine kinase by a non-enzymatic mechanism.[4]

References:
1. Hof, P. et al: Cell 92:441-50, 1998
2. Lu, W. et al: Mol. Cell 8:759-69, 2001
3. Shi, Z-Q. et al: J. Biol. Chem. 273:4904-8, 1998
4. Walter, A.O. et al: Oncogene 18:1911-20, 1999

TECHNICAL INFORMATION

Source:
SHP-2 antibody is a rabbit antibody raised against a short peptide from N-terminal sequence of human SHP-2.

Specificity and Sensitivity:
This antibody detects endogenous SHP-2 proteins without cross-reactivity with other family members.

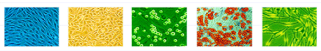
Storage Buffer: 0.1 M Tris-Glycine (pH 7.4), 150 mM NaCl with 0.05% sodium azide.

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 ug/mL
IP	n/d
IHC	n/d
ICC	4 ug/mL
FACS	n/d

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

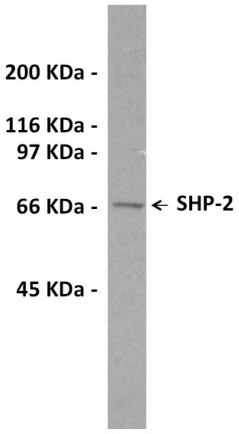


SHP-2 Antibody

Cat. No. CG1546

Applications:	**WB, ICC**
Detected MW:	**64 kDa**
Species & Reactivity:	**Human, Mouse, Rat**
Isotype:	**Rabbit IgG**

QUALITY CONTROL DATA



A431 cell lysate was probed with anti-SHP-2/SHPTP-2 (1µg/ml).