

## BACKGROUND

Checkpoint kinase 2 (Chk2) is a Serine/Threonine kinase that along with Chk1 participated in DNA damage signaling, regulation of cell cycle and DNA damage induced apoptosis. Upon phosphorylation and activation by the upstream sensor-associated kinases ATM (ataxia telangiectasia mutated) and ATR (ATM and Rad3-related), Chk2 will amplify the DNA damage signal by phosphorylating several substrates that mediate cell-cycle arrest, DNA repair and apoptosis.<sup>1</sup> Chk2 kinases were first identified as checkpoint kinases in *Schizosaccharomyces pombe* and *Saccharomyces cerevisiae*. The *S. pombe* Chk2 (Cds1) protein, along with Chk1, regulates the G2/M transition via phosphorylation of Cdc25 in response to replication interference and DNA damage, respectively.<sup>2</sup> Chk2 (Cds1) phosphorylates the mitosis-promoting phosphatase Cdc25c in an inhibitory residue, providing a binding site for 14-3-3 protein. The nuclear exclusion mediated by 14-3-3 blocks Cdc25c interaction with its substrate, thus preventing cells from entering mitosis in the presence of damaged DNA. Chk2 phosphorylates Cdc25A, promoting a proteasome-dependent degradation of the phosphatase with consequent arrest of the cell cycle in the G1 and S phases. The fission and budding yeast Chk2 orthologs (Cds1 and Rad53) also have a role in the recovery from replication blocks and stalled replication forks. Chk2 has been postulated to have a role in the repair of DNA strand breaks via phosphorylation of Brca1.<sup>3</sup> Cells lacking CHK2 have a defect in apoptosis, suggesting that Chk2 has a role in DNA damage-induced apoptosis, presumably by up-regulating p53 levels or by phosphorylating the E2F1 transcription factor or promyelocytic leukemia (PML) protein.<sup>4</sup>

### References:

1. Perona R et al.: Clin Transl Oncol. 10:538-42, 2008.
2. Kumar S & Huberman JA: J Biol Chem. 279:43574-80, 2004.
3. Miyabe I et al.: J Cell Sci. 122:3638-43, 2009.
4. Roos WP & Kaina B: Trends Mol Med. 12:440-50, 2006.

## TECHNICAL INFORMATION

### Source:

Chk2 Antibody is a mouse monoclonal antibody raised against *E. coli*-expressed recombinant protein containing human CHK2 (aa481-531) sequence.

### Specificity and Sensitivity:

This monoclonal antibody detects endogenous levels of Chk2 proteins in various cell lysates.

**Storage Buffer:** PBS and 30% glycerol

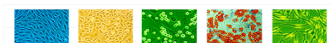
### Storage:

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

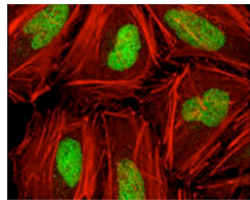
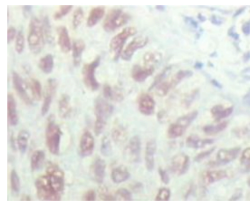
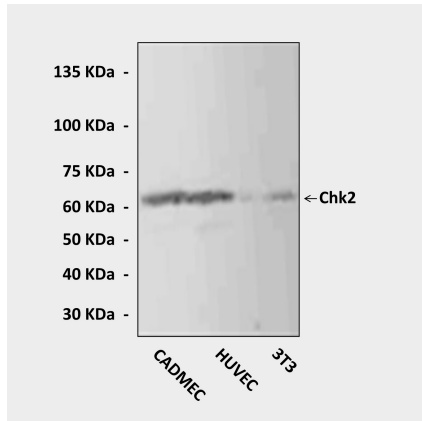
## APPLICATIONS

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

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



### QUALITY CONTROL DATA



**Top:** Various primary cell lysates were subjected to Western Blot analysis using Chk2 Antibody. **Middle:** Immunohistochemical Analysis of paraffin-embedded human lung tissue using CHK2 Antibody. **Bottom:** Immunofluorescence analysis of HeLa cells using Chk2 Antibody (Chk2 Antibody: green; Actin filaments: Red).

