

# CPTC-BTK-1 (CAB080300)

**Uniprot ID:** Q06187

**Protein name:** BTK\_HUMAN

**Full name:** Tyrosine-protein kinase BTK

**Tissue specificity:** Predominantly expressed in B-lymphocytes.

**Function:** Non-receptor tyrosine kinase indispensable for B lymphocyte development, differentiation and signaling. Binding of antigen to the B-cell antigen receptor (BCR) triggers signaling that ultimately leads to B-cell activation. After BCR engagement and activation at the plasma membrane, phosphorylates PLCG2 at several sites, igniting the downstream signaling pathway through calcium mobilization, followed by activation of the protein kinase C (PKC) family members. PLCG2 phosphorylation is performed in close cooperation with the adapter protein B-cell linker protein BLNK. BTK acts as a platform to bring together a diverse array of signaling proteins and is implicated in cytokine receptor signaling pathways. Plays an important role in the function of immune cells of innate as well as adaptive immunity, as a component of the Toll-like receptors (TLR) pathway. The TLR pathway acts as a primary surveillance system for the detection of pathogens and are crucial to the activation of host defense. Especially, is a critical molecule in regulating TLR9 activation in splenic B-cells. Within the TLR pathway, induces tyrosine phosphorylation of TIRAP which leads to TIRAP degradation. BTK also plays a critical role in transcription regulation. Induces the activity of NF-kappa-B, which is involved in regulating the expression of hundreds of genes. BTK is involved on the signaling pathway linking TLR8 and TLR9 to NF-kappa-B. Transiently phosphorylates transcription factor GTF2I on tyrosine residues in response to BCR. GTF2I then translocates to the nucleus to bind regulatory enhancer elements to modulate gene expression. ARID3A and NFAT are other transcriptional target of BTK. BTK is required for the formation of functional ARID3A DNA-binding complexes. There is however no evidence that BTK itself binds directly to DNA. BTK has a dual role in the regulation of apoptosis.

**Subcellular location:**

Cytoplasm

Cell membrane (Topo: Peripheral membrane protein)

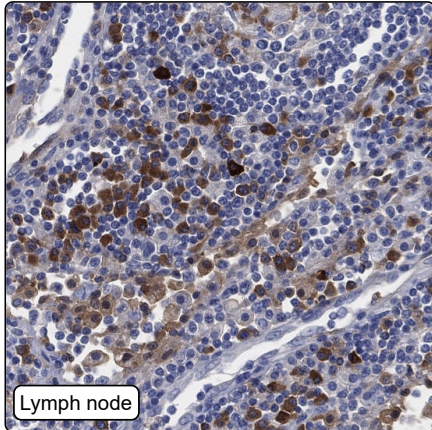
Nucleus

**NOTE:** In steady state, BTK is predominantly cytosolic. Following B-cell receptor (BCR) engagement by antigen, translocates to the plasma membrane through its PH domain. Plasma membrane localization is a critical step in the activation of BTK. A fraction of BTK also shuttles between the nucleus and the cytoplasm, and nuclear export is mediated by the nuclear export receptor CRM1.

**Protein existence:** Experimental evidence at protein level

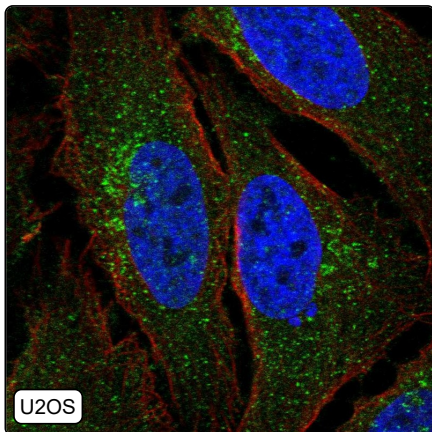
**Comment:**

## Immunohistochemistry



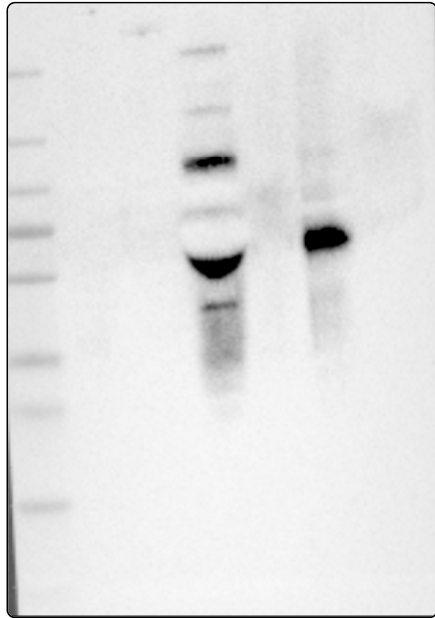
<b>IHC protocol:</b>	HIER pH6, Dilution 1:400
<b>IHC test staining:</b>	Cytoplasmic positivity in immune cells.
<b>Literature conformance:</b>	Consistent with extensive gene/protein characterization data
<b>Literature significance:</b>	
<b>RNA similarity:</b>	Medium consistency between antibody staining and RNA expression data
<b>RNA tissue specificity:</b>	Tissue enhanced (bone marrow, lymphoid tissue)
<b>RNA tissue distribution:</b>	Detected in many
<b>IHC Sibling similarity:</b>	

## Immunofluorescence



<b>IF Overlay:</b>	antibody (green), anti-tubulin (red) and DAPI (blue)
<b>IF main location:</b>	Golgi apparatus - 5: <b>Approved</b> (auto) Vesicles - 5: <b>Approved</b> (auto)
<b>IF additional location:</b>	
<b>IF approved for publication on HPA:</b>	No
<b>IF in THP-1:</b>	Golgi Vesicles
<b>IF in U2OS:</b>	Golgi Vesicles

# Western blot



<b>WB Size markers (kDa):</b>	250, 130, 100, 70, 55, 35, 25, 15, 10
<b>WB Lanes:</b>	Marker (1), RT-4 (2), U-251MG (3), Plasma (4), Liver (5), Tonsil (6)
<b>WB Target weight (kDa):</b>	56, 66, 76, 80
<b>WB Validation:</b>	Supported (Band of predicted size in kDa (+/-20%) with additional bands present.)