Background: The DYRK family includes several dual-specificity tyrosine-phosphorylated and regulated kinases capable of phosphorylating proteins at both tyrosine and serine/threonine residues (1). The DYRK family was identified based on homology to the yeast Yak1 (2) and the Drosophila minibrain (mnb) kinases (3). Seven mammalian isoforms have been discovered, including DYRK1A, DYRK1B, DYRK1C, DYRK2, DYRK3, DYRK4, and DYRK4B. Differences in substrate specificity, expression and subcellular localization are seen across the DYRK family (4,5). All DYRK proteins have a Tyr-X-Tyr motif in the catalytic domain activation loop, with phosphorylation of the second Tyr residue (e.g. Tyr312 of DYRK1A) necessary for kinase activity. DYRKs typically autophosphorylate the tyrosine residue within their activation loop, but phosphorylate substrates at serine and threonine residues (1,6).

DYRK1A phosphorylates serine and threonine residues within a RPX(S/T)P consensus sequence. Substrates include transcription factors such as FoxO1 and cAMP response element-binding proteins such as NFAT (7,8).

DYRK1A is ubiquitously expressed in fetal and adult tissues. Transgenic mice with multiple copies of DYRK1A exhibit learning and motor defects suggesting that it is a dosage-sensitive gene (9). The DYRK1A gene localizes to chromosome 21q22.2, a region implicated in Down syndrome, and may contribute to pathological traits observed in chromosome 21 trisomy (10).

Specificity/Sensitivity: DYRK1A Antibody detects endogenous levels of total DYRK1A protein.

Source/Purification: Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to human DYRK1A. Antibodies are purified by protein A and peptide affinity chromatography.

Application Specific Protocols: For application specific protocols please see the web page for this product at www.cellsignal.com.

Recommended Antibody Dilutions: Western blotting 1:1000
Immunoprecipitation 1:50

Western blot analysis of extracts from SY-SY5Y and PC3 cells using DYRK1A Antibody.