

# p- $\alpha$ PAK (17.Thr 423): sc-135755

## BACKGROUND

p21-activated kinases (PAK) are serine/threonine kinases that link Rho GTPases to cytoskeletal reorganization and nuclear signaling. Three common isoforms are  $\alpha$ PAK p68,  $\beta$ PAK p65 and  $\gamma$ PAK p62.  $\alpha$ ,  $\beta$  and  $\gamma$ PAK isoforms associate with Rac 1 and Cdc42 in their active GTP-bound state, inhibiting their intrinsic GTPase activity and mediating their autophosphorylation.  $\gamma$ PAK can undergo phosphorylation on Ser 19, Ser 141 and Thr 402, and phosphorylation of Ser 141 and Thr 402 correlates with  $\gamma$ PAK activation. Autophosphorylation of  $\alpha$ PAK Thr 423 (Thr 402 for  $\beta$ PAK and Thr 421 for  $\gamma$ PAK) is catalyzed by Cdc42 and is required for kinase activation of PAK. Once phosphorylated and their affinity for Rac/Cdc42 reduced, PAK isoforms disassociate from the complex to seek downstream substrates. One such substrate is MEK kinase, an upstream effector of MEK4 which is involved in the JNK signaling pathway.

## REFERENCES

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- Manser, E., et al. 1994. A brain serine/threonine protein kinase activated by Cdc42 and Rac 1. *Nature* 367: 40-46.
- Yan, M., et al. 1994. Activation of stress-activated protein kinase by MEK1 phosphorylation of its activator SEK1. *Nature* 372: 798-800.
- Minden, A., et al. 1994. Differential activation of ERK and JNK mitogen-activated protein kinases by Raf-1 and MEK. *Science* 266: 1719-1723.
- Coso, O.A., et al. 1995. The small GTP-binding proteins Rac 1 and Cdc42 regulate the activity of the JNK/SAPK signaling pathway. *Cell* 81: 1137-1146.
- Martin, G.A., et al. 1995. A novel serine kinase activated by Rac 1/Cdc42Hs-dependent autophosphorylation is related to PAK65 and STE20. *EMBO J.* 14: 1970-1978.
- Zenke, F.T., et al. 1999. Identification of a central phosphorylation site in p21-activated kinase regulating autoinhibition and kinase activity. *J. Biol. Chem.* 274: 32565-32573.

## CHROMOSOMAL LOCATION

Genetic locus: PAK1 (human) mapping to 11q13.5; Pak1 (mouse) mapping to 7 E2.

## SOURCE

p- $\alpha$ PAK (17.Thr 423) is a mouse monoclonal antibody raised against a short amino acid sequence containing Thr 423 phosphorylated  $\alpha$ PAK of human origin.

## PRODUCT

Each vial contains 200  $\mu$ g IgG<sub>2b</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

p- $\alpha$ PAK (17.Thr 423) is available conjugated to agarose (sc-135755 AC), 500  $\mu$ g/0.25 ml agarose in 1 ml, for IP; and to HRP (sc-135755 HRP), 200  $\mu$ g/ml, for WB, IHC(P) and ELISA.

## APPLICATIONS

p- $\alpha$ PAK (17.Thr 423) is recommended for detection of Thr 423 phosphorylated  $\alpha$ PAK of mouse and human origin, and corresponding rat homolog origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for  $\alpha$ PAK siRNA (h): sc-29700,  $\alpha$ PAK siRNA (m): sc-29701,  $\alpha$ PAK shRNA Plasmid (h): sc-29700-SH,  $\alpha$ PAK shRNA Plasmid (m): sc-29701-SH,  $\alpha$ PAK shRNA (h) Lentiviral Particles: sc-29700-V and  $\alpha$ PAK shRNA (m) Lentiviral Particles: sc-29701-V.

Molecular Weight of p- $\alpha$ PAK: 65 kDa.

Positive Controls: SK-N-SH cell lysate: sc-2410.

## RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended:  
 1) Western Blotting: use m-IgG $\kappa$  BP-HRP: sc-516102 or m-IgG $\kappa$  BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto B Blocking Reagent: sc-2335 (use 50 mM NaF, sc-24988, as diluent), Lambda Phosphatase: sc-200312A and Western Blotting Luminol Reagent: sc-2048.

## SELECT PRODUCT CITATIONS

- Uzair, I., et al. 2020. Rapid estrogen and progesterone signaling to dendritic spine formation via cortactin/Wave1-Arp2/3 complex. *Neuroendocrinology* 110: 535-551.
- Zhang, M., et al. 2020. Sea cucumber *Cucumaria frondosa* fucoidan inhibits osteosarcoma adhesion and migration by regulating cytoskeleton remodeling. *Oncol. Rep.* 44: 469-476.
- Romano, R., et al. 2021. RAB7A regulates vimentin phosphorylation through AKT and PAK. *Cancers* 13: 2220.

## STORAGE

Store at 4° C, \*\*DO NOT FREEZE\*\*. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.