AKT1, Active
Full-length recombinant protein expressed in Sf9 cells

Catalog # A16-10G
Lot # W305-3

Product Description
Recombinant full-length human AKT1 was expressed by baculovirus in Sf9 insect cells using an N-terminal GST tag. The gene accession number is NM_005163.

Gene Aliases
PKB; RAC; PRKBA; MGC99656; RAC-ALPHA

Formulation
Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 150mM NaCl, 10mM glutathione, 0.1mM EDTA, 0.25mM DTT, 0.1mM PMSF, 25% glycerol.

Storage and Stability
Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles.

Scientific Background
AKT1/PKBα is a serine/threonine kinase that belongs to the AKT family. AKT1 is activated in cells in response to diverse stimuli such as hormones, growth factors and extracellular matrix components and is involved in glucose metabolism, transcription, survival, cell proliferation, angiogenesis, and cell motility [1]. AKT1 is frequently overexpressed and active in many types of human cancers including cancers of colon, breast, brain, pancreas and prostate as well as lymphomas and leukemias [2].

References

Specific Activity
The specific activity of AKT1 was determined to be 122 nmol/min/mg as per activity assay protocol.

Purity
The purity was determined to be >95% by densitometry. Approx. MW 85kDa.

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Catalog Number A16-10G
Specific Activity 122 nmol/min/mg
Specific Lot Number W305-3
Purity >95%
Concentration 0.1µg/µl
Stability 1yr at –70°C from date of shipment
Storage & Shipping Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

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Activity Assay Protocol

Reaction Components

**Active Kinase (Catalog #: A16-10G)**
Active AKT1 (0.1µg/µl) diluted with Kinase Dilution Buffer V (Catalog #: K25-09) and assayed as outlined in sample activity plot. (Note: these are suggested working dilutions and it is recommended that the researcher perform a serial dilution of Active AKT1 for optimal results).

**Kinase Dilution Buffer V (Catalog #: K25-09)**
Kinase Assay Buffer I (Catalog #: K01-09) diluted at a 1:4 ratio (5X dilution) with 5% glycerol solution.

**Kinase Assay Buffer I (Catalog #: K01-09)**
Buffer components: 25mM MOPS, pH 7.2, 12.5mM β-glycerol-phosphate, 25mM MgCl₂, 5mM EGTA, 2mM EDTA. Add 0.25mM DTT to Kinase Assay Buffer prior to use.

**[³²P]-ATP Assay Cocktail**
Prepare 250µM [³²P]-ATP Assay Cocktail in a designated radioactive working area.

**10mM ATP Stock Solution (Catalog #: A50-09)**
Prepare ATP stock solution by dissolving 55mg of ATP in 10ml of Kinase Assay Buffer I (Catalog #: K01-09). Store 200µl aliquots at -20°C.

**Substrate (Catalog #: A05-58)**
Akt (PKB) synthetic peptide substrate (CKRPRAASFAE) diluted in 25mM Tris-HCl buffer (pH7.5) to a final concentration of 1mg/ml.

**Assay Protocol**

Step 1. Thaw [³²P]-ATP Assay Cocktail in shielded container in a designated radioactive working area.
Step 2. Thaw the Active AKT1, Kinase Assay Buffer, Substrate and Kinase Dilution Buffer on ice.
Step 3. In a pre-cooled microfuge tube, add the following reaction components bringing the initial reaction volume up to 20µl:
   - Component 1. 10µl of diluted Active AKT1 (Catalog #A16-10G)
   - Component 2. 5µl of 1mg/ml stock solution of substrate (Catalog #A05-58)
   - Component 3. 5µl distilled H₂O (4°C)

Step 4. Set up the blank control as outlined in step 3, excluding the addition of the substrate. Replace the substrate with an equal volume of distilled H₂O.
Step 5. Initiate the reaction by the addition of 5µl [³²P]-ATP Assay Cocktail bringing the final volume up to 25µl and incubate the mixture in a water bath at 30°C for 15 minutes.
Step 6. After the 15 minute incubation period, terminate the reaction by spotting 20µl of the reaction mixture onto individual pre-cut strips of phosphocellulose P81 paper.
Step 7. Air dry the pre-cut P81 strip and sequentially wash in a 1% phosphoric acid solution (dilute 10ml of phosphoric acid and make a 1L solution with distilled H₂O) with constant gentle stirring. It is recommended that the strips be washed a total of 3 intervals for approximately 10 minutes each.
Step 8. Count the radioactivity on the P81 paper in the presence of scintillation fluid in a scintillation counter.
Step 9. Determine the corrected cpm by removing the blank control value (see Step 4) for each sample and calculate the kinase specific activity as outlined below.

**Calculation of [P³²]-ATP Specific Activity (SA) (cpm/pmol)**
Specific activity (SA) = cpm for 5µl [³²P]-ATP / pmoles of ATP (in 5µl of a 250µM ATP stock solution, i.e., 1250 pmoles)

**Kinase Specific Activity (SA) (pmol/min/µg or nmol/min/mg)**
Corrected cpm from reaction / ([SA of [³²P]-ATP in cpm/pmol]*[Reaction time in min]*[Enzyme amount in µg or mg]) / [Reaction Volume] / [Spot Volume]

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