

## PI3K (p110α(E545K)/p85α), Active

Full-length recombinant protein expressed in Sf9 cells

Catalog # P27-152H

Lot # X3610-8

### Product Description

Recombinant full-length human p110α (E545K) mutant subunit and human p85α wild-type subunit were co-expressed by baculovirus in Sf9 insect cells using an N-terminal His tag on both proteins. The p110α gene accession number is [NM\\_006218](#); p85α is [NM\\_181523](#).

### Gene Aliases

p110α: PIK3CA, MGC142161, MGC142163, p110-alpha  
p85α: PIK3R1, GRB1, p85-ALPHA

### Formulation

Recombinant protein stored in 50mM sodium phosphate, pH 7.0, 300mM NaCl, 150mM imidazole, 0.1mM PMSF, 0.25mM DTT, 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

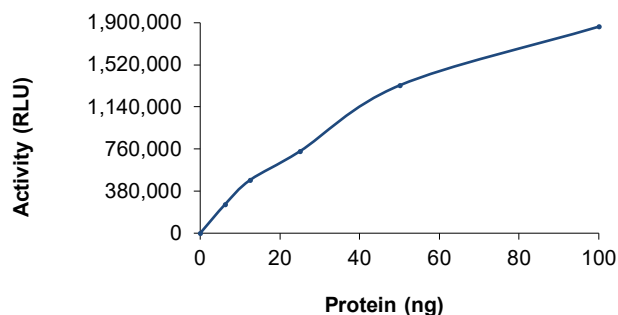
The PI3K comprises of a 110 kDa catalytic subunit and a 85 kDa regulatory subunit. A number of isoforms of the 110 kDa catalytic subunit and the 85 kDa regulatory subunit exist in cells. The p110α catalytic subunit (PIK3CA) is frequently mutated or amplified in a variety of cancers including ovarian and colon and this protein is one of the PI3K mutants (1). PIK3CA gene copy number is increased in over 30% of ovarian cancers and this leads to increased PI3-kinase activity. Furthermore, the activity of p110α is essential for vascular development and inactivation of p110α leads to severe defects in angiogenic sprouting and vascular remodeling (2).

### References

- Samuels, Y. et al: High frequency of mutations of the PIK3CA gene in human cancers. *Science* 304: 554 only, 2004.
- Graupera, M. et al: Angiogenesis selectively requires the p110-alpha isoform of PI3K to control endothelial cell migration. *Nature* 453: 662-666, 2008.

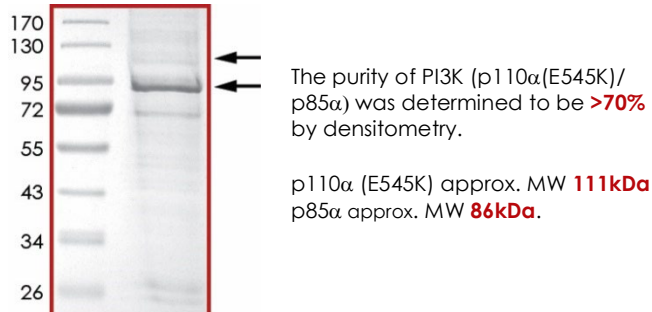
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### Specific Activity



The specific activity of PI3K (p110α(E545K)/p85α) was determined to be **8,129 nmol/min/mg** as per activity assay protocol.

### Purity



## PI3K (p110α(E545K)/p85α), Active

Full-length recombinant protein expressed in Sf9 cells

|                    |                                                                                                                                                                                                                                                                     |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Catalog #          | P27-152H                                                                                                                                                                                                                                                            |
| Specific Activity  | 8,129 nmol/min/mg                                                                                                                                                                                                                                                   |
| Lot #              | X3610-8                                                                                                                                                                                                                                                             |
| Purity             | >70%                                                                                                                                                                                                                                                                |
| Concentration      | 0.05 µg/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. |

# Activity Assay Protocol

## Reaction Components

### Active Kinase (Catalog #: P27-152H)

Active PI3K (E545K) (0.05 $\mu$ g/ $\mu$ l) diluted with 1x Lipid Kinase Buffer (Catalog #: L01-09) 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 PI3K (E545K) for optimal results).

### Lipid Kinase Buffer (5x) (Catalog #: L01-09)

250mM HEPES pH 7.5, 250mM NaCl, 10mM MgCl<sub>2</sub>, 2.5mM EGTA, 125 $\mu$ g/mL BSA and 0.2% Triton X-100. Dilute to 1x and add 0.05mM fresh DTT prior to use.

### Lipid Dilution Buffer (1x) (Catalog #: L21-09)

25mM HEPES pH 7.5 and 0.5mM EGTA.

### ADP-Glo™ Kinase Assay Kit (Promega, Cat # V9101)

ATP solution, 10 mM  
ADP solution, 10 mM  
ADP-Glo™ Reagent  
Kinase Detection Reagent

### 1M MgCl<sub>2</sub> Solution – Required for ADP-Glo reaction

### 250 $\mu$ M ATP Assay Solution

Prepare the ATP assay solution by diluting ATP solution, 10 mM (Promega, Cat # V9101) to 250  $\mu$ M in 1x Lipid Assay Buffer (prepared from Lipid Kinase Buffer 5x; Catalog #: L01-09).

### Substrate (Catalog #: P429-59)

PI(4,5)P<sub>2</sub>:PS substrate solution contains 125 $\mu$ M of PI(4,5)P<sub>2</sub> and 1000 $\mu$ M of PS in 1x Lipid Dilution Buffer.

## Assay Protocol

The PI3K assay is performed using the ADP-Glo™ Kinase Assay kit (Promega; Cat# V9101) which quantifies the amount of ADP produced by the PI3K reaction. The ADP-Glo™ Reagent is added to terminate the kinase reaction and to deplete the remaining ATP, and then the Kinase Detection Reagent is added to convert ADP to ATP and to measure the newly synthesized ATP using luciferase/luciferin reaction.

- Step 1.** Thaw the Active PI3K, Lipid Kinase Buffer, Substrate and Lipid Dilution Buffer on ice.
- Step 2.** In a pre-cooled 96-well opaque plate, add the following reaction components bringing the initial reaction volume up to 20 $\mu$ l:

|                     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| <b>Component 1.</b> | 10 $\mu$ l of diluted Active PI3K(Catalog #P27-152H)                                  |
| <b>Component 2.</b> | 5 $\mu$ l of PI(4,5)P <sub>2</sub> :PS substrate (sonicate for 1 minute prior to use) |
| <b>Component 3.</b> | 5 $\mu$ l 1x Lipid Kinase Buffer                                                      |
- Step 3.** Set up the blank control as outlined in step 3, excluding the addition of the substrate. Replace the substrate with an equal volume of Lipid Dilution Buffer.
- Step 4.** Initiate the reaction by the addition of 5 $\mu$ l of 250  $\mu$ M ATP Assay Solution thereby bringing the final volume up to 25 $\mu$ l. Shake the reaction mixture in the 96-well opaque plate for 2 minutes and continue the incubation at 30°C for 40 minutes.
- Step 5.** After the 40 minute incubation period, terminate the reaction and deplete the remaining ATP by adding 25 $\mu$ l of ADP-Glo™ Reagent with 10mM MgCl<sub>2</sub>. Shake the 96-well plate and then incubate the reaction mixture for another 40 minutes at ambient temperature.
- Step 6.** Then add 50 $\mu$ l of the Kinase Detection Reagent to the 96-well plate and incubate the reaction mixture for another 30 minutes at ambient temperature.
- Step 7.** Read the 96-well reaction plate using the KinaseGlo Luminescence Protocol on a GloMax plate reader (Promega; Cat# E7031).
- Step 8.** Determine the corrected activity (RLU) by removing the blank control value (see Step 3) for each sample and calculate the kinase specific activity as outlined below.

### Calculation of Specific Activity of ADP (RLU/pmol)

From ADP standard curve, determine RLU/pmol of ADP

### Kinase Specific Activity (SA) (pmol/min/ $\mu$ g or nmol/min/mg)

Corrected RLU from reaction / [(SA of ADP in RLU/pmol)\*(Reaction time in min)\*(Enzyme amount in  $\mu$ g or mg)]

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# SAFETY DATA SHEET

## Article 1 – Product Identification

**Product Name: PI3K (p110 $\alpha$ (E545K)/p85 $\alpha$ ), Active**

**Catalog # P27-152H**

*This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.*

Manufacturer's Name: SignalChem Biotech Inc.  
 Street Address: 110-13120 Vanier Place  
 City, Prov. Postal Code: Richmond, BC, V6V 2J2  
 Fax: 604-232-4601  
 EMERGENCY PHONE: 604-232-4600

## Article 2 - Hazard Identification

- **WHMIS Classification:** Not WHMIS controlled.
- **GHS classification:** Skin irritation (Category 3); Eye irritation (Category 2B).
- **Hazard Pictograms:** none.
- **Signal words:** Warning.
- **Hazard statements:** Causes mild skin irritation (H316); Causes eye irritation (H320).
- **Precautionary statements:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305 + P351 + P338).
- **Other hazards:** none known.

## Article 3 – Composition/Information on Ingredients

**Chemical Characterization:** Mixtures.

**Description:** This product consists of the substances listed below.

| Common name                          | Chemical name                         | CAS-No.           | Concentration |
|--------------------------------------|---------------------------------------|-------------------|---------------|
| Glycerol                             | Glycerol                              | 56-81-5           | 25%           |
| NaCl                                 | Sodium chloride                       | 7647-14-5         | 1.75%         |
| Imidazole                            | 1,3-Diaza-2,4-cyclopentadiene         | 288-32-4          | ≤1.02%        |
| Sodium Phosphate, Dibasic            | Sodium Phosphate, Dibasic             | 7782-85-6         | 1.34%         |
| Protein                              |                                       | No data available | ≤0.02%        |
| DTT; Dithiothreitol                  | (R*,R*)-1,4-Dimercaptobutane-2,3-diol | 3483-12-3         | 0.0038%       |
| PMSF; Phenylmethanesulfonyl fluoride | $\alpha$ -Toluenesulphonyl fluoride   | 329-98-6          | 0.002%        |

## Article 4 – First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** Breathe in fresh air. If cannot breath, give artificial respiration and consult a physician.
- **After skin contact:** Immediately wash with soap and plenty of water and rinse thoroughly. Consult a physician.
- **After eye contact:** Rinse opened eyes with plenty of water for at least 15 minutes. Consult a physician.
- **After swallowing:** rinse the mouth with plenty of water and consult a physician.

## Article 5 - Fire-fighting Measures

- **Suitable extinguishing media:** Use water spray, extinguishing powder, carbon dioxide, or other appropriate measure that is suitable to the environment.
- **Specific hazards arising from the substance or mixture:** None known.
- **Special protective equipment and precautions for fire-fighters:** Self-contained breathing apparatus if necessary.

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## Article 6 – Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Apply standard laboratory practices and personal protective equipment. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation.
- **Environmental precautions:** Do not allow to enter drains.
- **Methods and materials for containment and cleaning up:** Absorb on sand or vermiculite and place in closed containers for disposal.

## Article 7 - Handling and Storage

- **Precautions for safe handling:** Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.
- **Conditions for safe storage:** Store in a dry and well-ventilated place in -70 °C. Keep container upright and tightly closed.

## Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:**  
Glycerol (CAS-No: 56-81-5)

| Values | Control parameters                      | Regulations              |
|--------|-----------------------------------------|--------------------------|
| TWA    | 10 mg/m <sup>3</sup> for mist           | British Columbia, Canada |
| TWA    | 3 mg/m <sup>3</sup> for respirable mist | British Columbia, Canada |
| TWA    | 10 mg/m <sup>3</sup>                    | Alberta, Canada          |
| TWAEV  | 10 mg/m <sup>3</sup>                    | Ontario, Canada          |
| TWAEV  | 10 mg/m <sup>3</sup>                    | Quebec, Canada           |
| TWA    | 10 mg/m <sup>3</sup>                    | USA                      |

- **Appropriate engineering controls:**  
Apply adequate ventilation including mechanical exhaust or laboratory fume hood. Follow standard laboratory practices.
- **Individual protection measures:**  
**Respiratory protection:**  
Use appropriate respirator if there is inadequate ventilation by following the government standards.  
**Hand protection:**  
Wear gloves and use proper glove removal technique to avoid skin contact. Discard gloves after use by following the applicable laboratory regulations. Wash and dry hands.  
**Eye/face protection:**  
Safety goggles with side-shields approved under appropriate government standards.  
**Skin/body protection:**  
Use appropriate clothing, footwear and any additional protection measures to protect from splashing or contamination.

## Article 9 – Physical and Chemical Properties

|                                                       |                                                                           |
|-------------------------------------------------------|---------------------------------------------------------------------------|
| <b>Appearance:</b> Colorless fluid.                   | <b>Danger of explosion:</b> Product does not present an explosion hazard. |
| <b>Odour/Odour Threshold:</b> Not determined.         | <b>Explosion limits:</b> Lower: 0.9 Vol %; Upper: 0.0 Vol %.              |
| <b>pH:</b> Not available.                             | <b>Decomposition temperature:</b> Not available.                          |
| <b>Melting point/freezing point:</b> Not determined.  | <b>Vapor pressure at 20 °C:</b> 0.1 hPa                                   |
| <b>Boiling point/Boiling range:</b> 100 °C.           | <b>Density:</b> Not determined.                                           |
| <b>Flash point:</b> > 100 °C.                         | <b>Relative density:</b> Not determined.                                  |
| <b>Flammability (solid, gaseous):</b> Not determined. | <b>Vapor density:</b> Not determined.                                     |
| <b>Ignition temperature:</b> 400 °C.                  | <b>Evaporation rate:</b> Not determined.                                  |
| <b>Auto-igniting:</b> Product is not self-igniting.   | <b>Solubility in / Miscibility with Water:</b> Fully miscible.            |

## Article 10 - Stability and Reactivity

- **Reactivity:** Stable under recommended transport and storage conditions.
- **Chemical stability:** Stable under recommended transport and storage conditions.
- **Possible hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** Heat and moisture.
- **Incompatible materials:** Strong acids/bases, strong oxidizing/reducing agents.
- **Hazardous decomposition products:** Carbon oxides may formed under fire conditions; no known decomposition information for other decomposition products.

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## Article 11 - Toxicological Information

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- **Acute toxicity:** Not available.
- **LD/LC50:** Not available.
- **Skin corrosion/irritation:** Not available.
- **Serious eye damage/eye irritation:** Not available.
- **Respiratory or skin sensitization:** Not available.
- **Germ cell mutagenicity:** Not available.
- **Carcinogenicity:** No components are listed in IARC, or NTP, or OSHA, or ACGIH.
- **Reproductive toxicity:** Not available.
- **Teratogenicity:** Not available.
- **Specific target organ toxicity - single exposure/ - repeated exposure (GHS):** Not available.
- **Aspiration hazard:** Not available.
- **Potential health effects:**  
**Inhalation:** May be harmful if inhaled. May cause respiratory tract irritation.  
**Ingestion:** May be harmful if swallowed.  
**Skin:** May be harmful if absorbed through skin. May cause skin irritation.  
**Eyes:** May cause eye irritation.
- **Signs and Symptoms of Exposure:**  
Prolonged or repeated exposure can cause: Nausea, Dizziness.
- **Synergistic effects:** Not available.

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## Article 12 - Ecological Information

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- **Eco-toxicity:** Not applicable.
- **Biodegradability:** Not applicable.
- **Bio-accumulative potential:** Not applicable.
- **Mobility in soil:** Not applicable.
- **PBT and vPvB assessment:** Not applicable.
- **Other adverse effects:** Not applicable.

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## Article 13 - Disposal Considerations

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- **Disposal methods:** In accordance to applicable national, regional, or local laws and regulations. For additional handling information and protection of employees please refer to Article 7 and 8.
- **Contaminated packaging:** Disposal should be made in accordance to official regulations. Use water or cleansing agents to clean the area.

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## Article 14 - Transport Information

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- **DOT:** Not dangerous goods.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

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## Article 15 - Regulatory Information

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- **WHMIS Classification:** Non-hazardous.
- **GHS label elements:** Not applicable.
- **Signal word:** Not applicable.
- **Hazard statements:** Not applicable.

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## Article 16 - Other Information

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The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. SignalChem shall not be held liable for any damage resulting from handling or from contact with the above product. See the Technical Specification, Packing Slip, Invoice, and Product Catalog for additional terms and conditions of sale.

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