Technical Information about Sp-cAMPS

PDE resistant activator of cAMP-dependent protein kinases type I and II

Update: July 03, 2012 WH

Abbreviation: Sp-cAMPS

<table>
<thead>
<tr>
<th>Formula</th>
<th>CAS No.</th>
<th>Molecular Weight</th>
<th>UV</th>
<th>BIOLOG Cat. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_{10}H_{11}N_{5}O_{5}PS.C_{6}H{16}N</td>
<td>[93602-66-5]</td>
<td>446.5</td>
<td>(\lambda_{\text{max}} 259 \text{ nm} / \varepsilon 15200 / \text{pH 7})</td>
<td>A 003 T</td>
</tr>
</tbody>
</table>

Name: Adenosine- 3', 5'- cyclic monophosphorothioate, Sp- isomer, triethyl ammonium salt

Description: Sp-cAMPS is an analogue of the natural signal molecule cyclic AMP in which the axial one of the two exocyclic oxygen atoms in the cyclic phosphate moiety is replaced by sulfur. The suffix "p" indicates that R/S nomenclature refers to phosphorus.

Properties:
- Activator of cyclic AMP-dependent protein kinase I and II \(^2, ^5\),
- very high metabolic stability towards mammalian cyclic nucleotide-responsive phosphodiesterases \(^1, ^3, ^4, ^6, ^7, ^9, ^10\),
- membrane permeability comparable to 8-bromo-cyclic AMP \(^8\),
- minimal disturbance of cellular functions due to only minor structural differences to natural cyclic AMP.

Specification: Crystallized triethyl ammonium salt. Equal concentrations of Sp-cAMPS can appear very different in volume depending on humidity. The compound can even contract to small volume droplets. Normally the product is located in the conical bottom of the tube. Micromolar quantities are determined by UV at \(\lambda_{\text{max}}\). The sodium salt of Sp-cAMPS is offered as well (Cat. No. A 003 S).

Purity: Typical analysis is > 98% for the triethyl ammonium salt (Economy Grade) by HPLC / UV / 258 nm. A "High Purity Grade" quality with > 99% is available as well (Cat. No. A 003 S). The product is not sterile and has not been tested for endotoxins. BIOLOG’s Sp-cAMPS is strictly checked for absence of the inhibitory Rp-cAMPS or cyclic AMP.

Stability and Storage: Sp-cAMPS has sufficient stability at room temperature and does not need special care during handling or shipment. Nevertheless, we recommend that the compound should be stored in the freezer, for longer storage periods preferably in freeze-dried form, since cyclic AMP can be formed by oxidation processes.

Toxicity and Safety: Since cyclic AMP has multiple tasks in every organism, it is possible that cAMP analogues will interfere with many cell regulation processes in vivo. However, due to the rather small quantities to work with no health hazards have been reported. Nevertheless please keep in mind that the in vivo properties of this compound are not sufficiently characterized up to now. Avoid skin contact or ingestion and allow only trained personnel to handle the product.

Our products are designed, developed and sold for research purposes only. They are intended for in vitro and nonhuman in vivo laboratory applications. Any other use requires approval of health authorities. Not for drug, household or related uses!
Solubility: Detailed information on the solubility of Sp-cAMPS in water and various buffers are listed in the solubility chart below. Concentrations have been tested at ambient temperature and can be considered as minimum concentrations usually obtainable. When opening the tube please make sure that no substance is lost within the cap. Please rinse tube walls carefully and preferably use ultrasonic or vortex to achieve total and uniform mixing.

<table>
<thead>
<tr>
<th>No.</th>
<th>Solvent</th>
<th>Solubility [mM]</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>H₂O</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>DMSO</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>DMF</td>
<td>100</td>
</tr>
<tr>
<td>IV</td>
<td>Ethanol 96%</td>
<td>50</td>
</tr>
<tr>
<td>V</td>
<td>Methanol</td>
<td>100</td>
</tr>
<tr>
<td>VI</td>
<td>PBS, pH 7.4</td>
<td>100</td>
</tr>
<tr>
<td>VII</td>
<td>100 mM Na₂HPO₄, pH 7.0</td>
<td>100</td>
</tr>
<tr>
<td>VIII</td>
<td>25 mM Hepes/NaOH, pH 7.2</td>
<td>100</td>
</tr>
<tr>
<td>IX</td>
<td>25 mM Tris/HCl, pH 7.4</td>
<td>100</td>
</tr>
</tbody>
</table>

Selected References for Sp-cAMPS: Since its first synthesis by F. Eckstein, Göttingen/Germany, there have been several hundred papers published with Sp-cAMPS, and it is impossible to list them all. However, since we were among the first to offer this structure commercially, we have quite a lot of data and experience with it. Please ask for a search in our data base for articles relevant for your field. For an extended reference list please refer to our website [http://www.biolog.de](http://www.biolog.de).


Sjöholm, A., FEBS Lett., 289, 249 - 252 (1991); "Inhibition of Fetal Rat Pancreatic β-Cell Replication by Interleukin-1 in Vitro is Not Mediated Through Pertussis Toxin-sensitive G-Proteins, a Decrease in Cyclic AMP, or Protease Activation"


Scheinman, S.J.; Stec, W.J.; Coulson, R., Miner. Electrolyte Metab., 11, 85 - 90 (1985): "Effects of (Sp)- and (Rp)-Adenosine Cyclic 3',5' Phosphorothioates on Electrolyte Excretion by the Isolated Perfused Rat Kidney"


References cited in this Technical Information:


