Technical Information about N⁶-Phenyl-cAMP

Potent membrane-permeant, site-selective and PDE-resistant activator of cAMP-dependent protein kinases

Update: October 12, 2017

Abbreviation: 6-Phe-cAMP

<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>C₁₆H₁₅N₅O₆P·Na</td>
<td>[34051-30-4]</td>
<td>427.3</td>
<td>( \lambda_{\text{max}} 288 \text{ nm} / \varepsilon 20800 / \text{pH 7} )</td>
<td>P 006</td>
</tr>
</tbody>
</table>

Name: N⁶-Phenyladenosine-3',5'-cyclic monophosphate

Description: 6-Phe-cAMP is an analogue of the natural signal molecule cyclic AMP in which one of the hydrogen atoms of the amino group in position 6 of the adenine moiety is replaced by a lipophilic phenyl ring.

Properties:
- One of the most potent activators of cAMP-dependent protein kinase isozymes which does not activate Epac
- Excellent selectivity between cAMP- and cGMP protein kinases
- High metabolic stability towards cyclic nucleotide-responsive phosphodiesterases¹
- Site-selective analogue with strong preference for the A-sites of PKA type I and type II²
- Suitable partner for synergistic activation of PKA I or II by pairs of analogues (please ask for corresponding information)
- High lipophilicity and good membrane permeability while still soluble in aqueous solvents

6-Phe-cAMP is an extraordinary potent and site-selective cAMP agonist with unusual high affinity for the A sites of PKA. When combined with analogues of corresponding B-site selectivity (e.g. Sp-5,6-DC1-cBIMPS, Cat. No. D 014) it is a powerful tool for synergistic activation of PKA type I and type II, respectively. Furthermore, 6-Phe-cAMP does not activate Epac and thus can be used as an Epac-negative control.

Specification: Crystallized or lyophilized sodium salt. Other salt forms are available upon request. Equal concentrations of 6-Phe-cAMP can appear very different in volume due to sensitivity of the lyophilized form to 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 \( \lambda_{\text{max}} \).

Purity: Typical analysis is better than 98% (HPLC / UV / 288 nm). The product is not sterile and has not been tested for endotoxins.

Stability and Storage: 6-Phe-cAMP 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.

Toxicity and Safety: Since cyclic AMP has multiple tasks in every organism, it is very likely that lipophilic 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 6-Phe-cAMP in water and various buffers is listed in the solubility chart below. Concentrations have been determined at ambient temperature and can be considered as minimum concentrations usually obtainable, however, slight batch-to-batch variations cannot be ruled out. 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>250</td>
</tr>
<tr>
<td>II</td>
<td>DMSO</td>
<td>250</td>
</tr>
<tr>
<td>III</td>
<td>DMF</td>
<td>250</td>
</tr>
<tr>
<td>IV</td>
<td>Ethanol 96%</td>
<td>10</td>
</tr>
<tr>
<td>V</td>
<td>Methanol</td>
<td>100</td>
</tr>
<tr>
<td>VI</td>
<td>PBS, pH 7.4</td>
<td>250</td>
</tr>
<tr>
<td>VII</td>
<td>100 mM Na₂HPO₄, pH 7.0</td>
<td>250</td>
</tr>
<tr>
<td>VIII</td>
<td>25 mM Hepes/NaOH, pH 7.2</td>
<td>250</td>
</tr>
<tr>
<td>IX</td>
<td>25 mM Tris/HCl, pH 7.4</td>
<td>250</td>
</tr>
</tbody>
</table>

Selected References for 6-Phe-cAMP:


Muhonen, W. W.; Shabb, J. B., Protein Sci., 9, 2446 - 2456 (2000): "Resonant Mirror Biosensor Analysis of Type I(α) cAMP-dependent Protein Kinase B Domain-Cyclic Nucleotide Interactions"


Qi, Z.; Hao, C.M.; Salter, K.; Redha, R.; Breyer, M.D., Amer. J. Physiol., 276, F622 - F628 (1999): "Type II cAMP-Dependent Protein Kinase Regulates Electronic Ion Transport in Rabbit Collecting Duct"


Connolly, B.J.; Willits, P.B.; Warrington, B.H.; Murray, K.J., Biochem. Pharmacol., 44, 2303 - 2306 (1992): “8-(4-Chlorophenyl)thio-cyclic AMP is a Potent Inhibitor of the cyclic GMP-specific Phosphodiesterase (PDEV)”


Øgreid, D.; Ekanger, R.; Suva, R.H.; Miller, J.P.; Sturm, P.; Corbin, J.D; Døskeland, S.O., Eur. J. Biochem., 150, 219 - 227 (1985): “Activation of Protein Kinase Isozymes by Cyclic Nucleotide Analogs Used Singly or in Combination”

References cited in this Technical Information:
