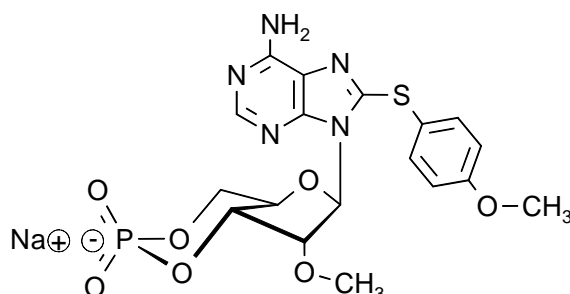


Technical Information about 8-(4-Methoxyphenylthio)-2'-O-methyl-cAMP

Potent, specific and membrane-permeant activator of the Epac cAMP receptor

Update: February 02, 2012 HU



Abbreviation: 8-pMeOPT-2'-O-Me-cAMP

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
C ₁₈ H ₁₉ N ₅ O ₇ PS·Na	[612513-16-3]	503.4	λ _{max} 282 nm / ε 16000 / pH 7	M 034

Name: *para*-Methoxyphenylthio- 2'- O- methyladenosine- 3', 5'- cyclic monophosphate (8-pMeOPT-2'-O-Me-cAMP) or 8- (4- methoxyphenylthio)- 2'- O- methyladenosine- 3', 5'- cyclic monophosphate

Legal information: The Reagent is subject to patent application n° EP 02077219.0 and foreign equivalents. The Reagent and any improvements are owned and licensed by The UMCU/ UMCU Holding Pharmaceuticals. The Reagent is sold under limited, non transferable and non exclusive licence from The UMCU/ UMCU Holding for research purposes only, to the exclusion of any commercial use, transfer or otherwise sale of this Reagent or its components or derivatives to a third party. Use or sale of Reagent for any commercial purposes requires a commercial license from The UMCU - Universiteitsweg 100, Utrecht, The Netherlands / UMCU Holding - Yalelaan 40, Utrecht, The Netherlands.

Description: 8-pMeOPT-2'-O-Me-cAMP is an analogue of the natural signal molecule cyclic AMP in which the hydrogen in position 8 of the heterocyclic nucleobase is replaced by the lipophilic 4-methoxyphenylthio moiety. In addition, the ribose 2'-hydroxy group has been methylated.

Properties: 8-pMeOPT-2'-O-Me-cAMP is a potent stimulator of exchange factors directly activated by cAMP (Epac or cAMP-GEF), a newly discovered receptor for cyclic AMP.

Since a free 2'-ribose hydroxyl group in cyclic AMP is essential for stimulation of cAMP-dependent protein kinase (PKA), the methylated structure of 8-pMeOPT-2'-O-Me-cAMP is an extremely poor PKA activator and allows for specific discrimination between both signalling pathways.

Its high lipophilicity (> dibutyryl-cAMP), allows for good membrane permeability in most biosystems, and its increased resistance towards phosphodiesterases prevents from rapid hydrolysis.

Specification: Lyophilized or crystallized sodium salt. The free acid or other salt forms are available upon request. Equal concentrations of 8-pMeOPT-2'-O-Me-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 λ_{max}.

Purity: Typical analysis is better than 98% (HPLC / UV / 282 nm). The product is not sterile and has not been tested for endotoxins.

Stability and Storage: 8-pMeOPT-2'-O-Me-cAMP is chemically rather stable. Nevertheless, we recommend that the compound should be stored in the freezer, for longer storage periods preferably in freeze-dried form. Since UV radiation develops a fluorescent impurity, which can disturb in fluorescence assays, avoid bright light during handling and experiments.

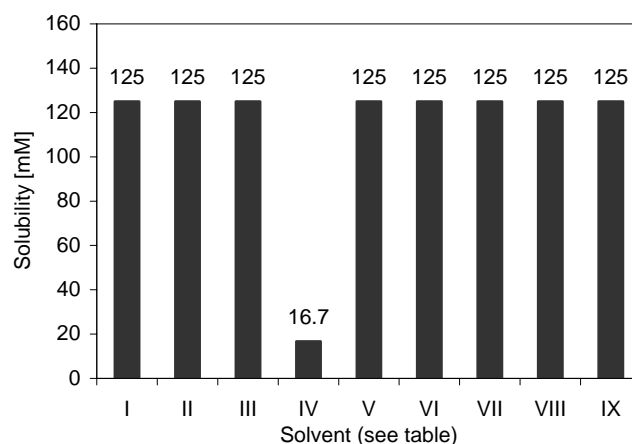
Toxicity and Safety: Since cyclic AMP has multiple tasks in every organism it is very likely that lipophilic cAMP analogues will interfere with many cell regulation processes *in vivo*. However, due to the rather small quantities to work with no health hazards have been reported. Nevertheless please 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 8-pMeOPT-2'-O-Me-cAMP 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.

No.	Solvent	Solubility [mM]
I	H ₂ O	125
II	DMSO	125
III	DMF	125
IV	Ethanol 96%	16.7
V	Methanol	125
VI	PBS, pH 7.4	125
VII	100 mM Na ₂ HPO ₄ , pH 7.0	125
VIII	25 mM Hepes/NaOH, pH 7.2	125
IX	25 mM Tris/HCl, pH 7.4	125



Selected References for 8-pMeOPT-2'-O-Me-cAMP:

- Waidmann, O.; Pleli, T.; Dvorak, K.; Baehr, C.; Mondorf, U.; Plotz, G.; Biondi, R.M.; Zeuzem, S.; Piiper, A., *J.Biol.Chem.*, **284**, 32256 - 32263 (2009): "Inhibition of the Equilibrative Nucleoside Transporter 1 and Activation of A2A Adenosine Receptors by 8-(4-Chlorophenylthio)-modified cAMP Analogs and their Hydrolytic Products"
- Hochbaum, D.; Hong, K.; Barila, G.; Ribeiro-Neto, F.; Altschuler, D., *J. Biol. Chem.*, **283**, 4464 - 4468 (2008): "Epac, in Synergy with PKA, is Required for cAMP-mediated Mitogenesis"
- Hong, K.; Lou, L.; Gupta, S.; Ribeiro-Neto, F.; Altschuler, D.L., *J. Biol. Chem.*, **283**, 23129 - 23138 (2008): "A Novel Epac-Rap-PP2A Signaling Module Controls cAMP-dependent Akt Regulation"
- Li, J.; O'Connor, K.L.; Cheng, X.; Mei, F.C.; Uchida, T.; Townsend, C.M.; Evers, B.M., *Mol. Endocrinol.*, **21**, 159 - 171 (2007): "Cyclic AMP-stimulated Neurotensin Secretion is Mediated Through Rap1 Downstream of Both Epac and PKA Signaling Pathways"
- Schmidt, M.; Sand, C.; Jakobs, K.H.; Michel, M.C.; Weernink, P.A., *Curr. Opin. Pharmacol.*, **7**, 193 - 200 (2007): "Epac and the Cardiovascular System"
- Amano, R.; Lee, J.; Goto, N.; Harayama, H., *J. Reprod. Develop.*, **53**, 127 - 133 (2007): "Evidence for Existence of cAMP-Epac Signaling in the Heads of Mouse Epididymal Spermatozoa"
- Holz, G.G.; Kang, G.; Harbeck, M.; Roe, M.W.; Chepurny, O.G., *J. Physiol.- London*, **577**, 5 - 15 (2006): "Cell Physiology of cAMP Sensor Epac"
- Kang, G.X.; Chepurny, O.G.; Malester, B.; Rindler, M.J.; Rehmann, H.; Bos, J.L.; Schwede, F.; Coetzee, W.A.; Holz, G.G., *J. Physiol.-London*, **573**, 595 - 609 (2006): "cAMP Sensor Epac as a Determinant of ATP-sensitive Potassium Channel Activity in Human Pancreatic Beta Cells and Rat INS-1 Cells"
- Lotfi, S.; Li, Z.; Sun, J.; Zuo, Y.; Lamm, P.P.; Kang, Y.; Rahimi, M.; Islam, D.; Wang, P., *Endocrinology*, **147**, 3727 - 3736 (2006): "Role of Exchange Protein Directly Activated by cyclic Adenosine 5'-monophosphate (Epac) Pathway in Regulating Proglucagon Gene Expression in Intestinal Endocrine L Cells"
- Chen, L.; Wang, P.; Andrade, C.F.; Zhao, I.Y.; Dube, P.E.; Brubaker, P.L.; Liu, M.; Jin, T., *FEBS J.*, **272**, 2746 - 2759 (2005): "PKA Independent and Cell Type Specific Activation of the Expression of Caudal Homeobox Gene Cdx-2 by cyclic AMP"
- Kiermayer, S.; Biondi, R.M.; Imig, J.; Plotz, G.; Haupenthal, J.; Zeuzem, S.; Piiper, A., *Mol. Biol. Cell.*, **16**, 5639 - 5648 (2005): "Epac Activation Converts cAMP from a Proliferative into a Differentiation Signal in PC12 Cells"
- Delghandi, M.P.; Johannessen, M.; Moens, U., *Cell. Signal.*, **17**, 1343 - 1351 (2005): "The cAMP Signalling Pathway Activates CREB through PKA, p38 and MSK1 in NIH 3T3 Cells"
- Dyachok, O.; Gylfe, E., *J. Biol. Chem.*, **279**, 45455 - 45461 (2004): "Ca²⁺-induced Ca²⁺ Release via Inositol 1,4,5-triphosphate Receptors Is Amplified by Protein Kinase A and Triggers Exocytosis in Pancreatic Beta-cells"

Christensen, A.E.; Selheim, F.; de Rooij, J.; Dremier, S.; Schwede, F.; Dao, K.K.; Martinez, A., Maenhaut, C.; Bos, J.L.; Genieser, H.-G.; Døskeland, S.O., *J. Biol. Chem.*, **278**, 35394 - 35402 (2003): "cAMP analog mapping of Epac1 and cAMP-kinase. Discriminating analogs demonstrate that Epac and cAMP-kinase act synergistically to promote PC-12 cell neurite extension"