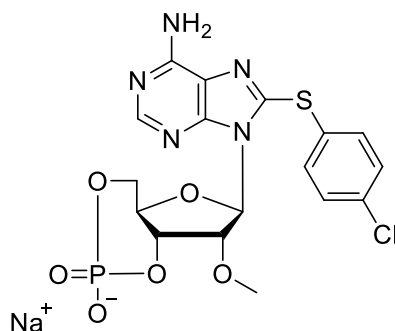


## Technical Information about 8-(4-Chlorophenylthio)-2'-O-methyl-cAMP

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

Update: January 08, 2021 HU



**Abbreviation:** **8-pCPT-2'-O-Me-cAMP / 8-CPT-2'-O-Me-cAMP**

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
C <sub>17</sub> H <sub>16</sub> ClN <sub>5</sub> O <sub>6</sub> PS·Na	[634207-53-7]	507.8	λ <sub>max</sub> 282 nm / ε 16000 / pH 7	C 041

**Name:** *para*-Chlorophenylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate (8-pCPT-2'-O-Me-cAMP) or 8-(4-chlorophenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate (8-CPT-2'-O-Me-cAMP)

**Description:** 8-pCPT-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-chlorophenylthio moiety. In addition, the ribose 2'-hydroxy group has been methylated.

**Properties:** 8-pCPT-2'-O-Me-cAMP is a potent stimulator of exchange factors directly activated by cAMP (Epac or cAMP-GEF), a 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-pCPT-2'-O-Me-cAMP is an extremely poor PKA activator and allows for specific discrimination between both signalling pathways. On the other hand, potent activators of PKA carrying a modified 6 position at the adenine nucleobase can be used as Epac-negative controls. N<sup>6</sup>-modified cyclic AMP analogues such as N<sup>6</sup>-Benzoyl-cAMP (Cat. No. B 009) or N<sup>6</sup>-Phenyl-cAMP (Cat. No. P 006) are specific PKA agonists, but show only neglectable agonistic properties on Epac.

The high lipophilicity of 8-pCPT-2'-O-Me-cAMP (> dibutyl-cAMP) allows for good membrane permeability in most biosystems, and its increased resistance towards phosphodiesterases prevents from rapid hydrolysis.

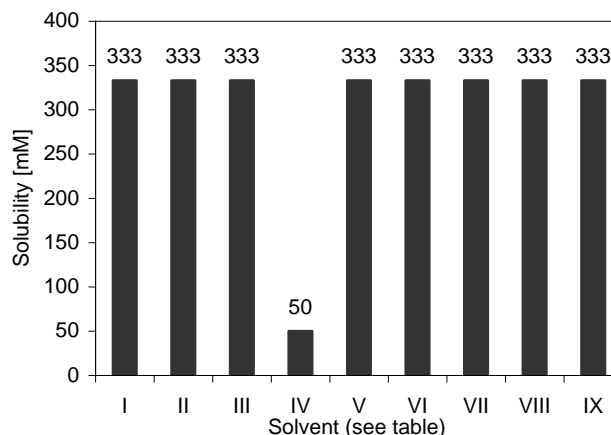
**Specification:** Lyophilized or crystallized sodium salt. The free acid or other salts of 8-pCPT-2'-O-Me-cAMP are available upon request. **Equal concentrations of 8-pCPT-2'-O-Me-cAMP can appear very different in volume due to sensitivity of the lyophilized form to humidity. The compound can even contract to small volume droplets.** Normally the product is located in the conical bottom of the tube. Micromolar quantities are determined by UV at λ<sub>max</sub>.

**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-pCPT-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.

**Solubility:** Detailed information on the solubility of 8-pCPT-2'-O-Me-cAMP in water and various buffers are 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.

No.	Solvent	Solubility [mM]
I	H <sub>2</sub> O	333
II	DMSO	333
III	DMF	333
IV	Ethanol 96%	50
V	Methanol	333
VI	PBS, pH 7.4	333
VII	100 mM Na <sub>2</sub> HPO <sub>4</sub> , pH 7.0	333
VIII	25 mM Hepes/NaOH, pH 7.2	333
IX	25 mM Tris/HCl, pH 7.4	333



**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!**

**Selected References for 8-pCPT-2'-O-Me-cAMP:** For a detailed list please inquire or visit our website ([www.biolog.de](http://www.biolog.de)).

Enserink J.M.; Christensen, A.E.; de Rooij, J.; van Triest, M.; Schwede, F.; Genieser, H.-G.; Doeskeland, S.O.; Blank, J.L.; Bos, J.L., *Nature Cell Biol.*, **4**, 901 - 906 (2002): "A novel Epac-specific cAMP Analog Demonstrates Independent Regulation of Rap1 and ERK"

Kang, G.; Joseph, J.W.; Chepurny, O.G.; Monaco, M.; Wheeler, M.B.; Bos, J.L.; Schwede, F.; Genieser, H.-G.; Holz, G.G., *J. Biol. Chem.*, **278**, 8279 - 8285 (2003): "Epac-selective cAMP Analog 8-pCPT-2'-O-Me-cAMP as a Stimulus for Ca<sup>2+</sup>-induced Ca<sup>2+</sup> Release and Exocytosis in Pancreatic  $\beta$ -Cells"

Rangarajan, S.; Enserink J.M.; Kuiperij, H.B.; de Rooij, J.; Price, L.S.; Schwede, F.; Bos, J.L., *J. Cell Biol.*, **160**, 487 - 493 (2003): "Cyclic AMP Induces Integrin-mediated Cell Adhesion Through Epac and Rap1 Upon Stimulation of the  $\beta_2$ -Adrenergic Receptor"

Eliasson, L.; Ma, X.S.; Renström, E.; Barg, S.; Berggren, P.O.; Galvanovskis, J.; Gromada, J.; Jing, X.J.; Lundquist, I.; Salehi, A.; Sewing, S.; Rorsman, P., *J. Gen. Physiol.*, **121**, 181 - 197 (2003): "SUR1 Regulates PKA-independent cAMP-induced Granule Priming in Mouse Pancreatic B-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.; Doeskeland, 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"

Kamio, K.; Liu, X.; Sugiura, H.; Togo, S.; Kobayashi, T.; Kawasaki, S.; Wang, X.Q.; Mao, L.; Ahn, Y.; Hogaboam, C.; Toews, M.L.; Rennard, S.I., *Am. J. Respir. Cell. Mol. Biol.*, **37**, 113 - 120 (2007): "Prostacyclin Analogues Inhibit Fibroblast Contraction of Collagen Gels Through the cAMP-PKA Pathway"

Lyle, K.S.; Raaijmakers, J.H.; Bruinsma, W.; Bos, J.L.; de Rooij, J., *Cell. Signal.*, **20**, 1104 - 1116 (2008): "cAMP-induced Epac-Rap Activation Inhibits Epithelial Cell Migration by Modulating Focal Adhesion and Leading Edge Dynamics"

Yokoyama, U.; Patel, H.H.; Lai, N.C.; Aroonsakool, N.; Roth, D.M.; Insel, P.A., *PNAS*, **105**, 6386 - 6391 (2008): "The cyclic AMP Effector Epac Integrates Pro- and Anti-fibrotic Signals"

Baumer, Y.; Drenckhahn, D.; Waschke, J., *Histochem. Cell Biol.*, **129**, 765 - 778 (2008): "cAMP-induced Rac 1-mediated Cytoskeletal Reorganization in Microvascular Endothelium"

Harper, S.M.; Wienk, H.; Wechselberger, R.W.; Barrere-Lemaire, S.; Boelens, R.; Rehmann, H., *J. Biol. Chem.*, **283**, 6501 - 6508 (2008): "Structural Dynamics in the Activation of EPAC"

Misra, U.K.; Kaczowka, S.J.; Pizzo, S.V., *Cell Signal.*, **20**, 130 - 138 (2008): "Interaction between TCL1 and Epac1 in the Activation of Akt Kinases in Plasma Membranes and Nucleic of 8-CPT-2'-O-Me-cAMP-stimulated Macrophages"

Baumer, Y.; Spindler, V.; Werthmann, R.C.; Bünemann, M.; Waschke, J., *J. Cell. Physiol.*, **220**, 716 - 726 (2009): "Role of Rac 1 and cAMP in Endothelial Barrier Stabilization and Thrombin-Induced Barrier Breakdown"

- Chepurny, O.G.; Leech, C.A.; Kelley, G.G.; Dzhura, I.; Dzhura, E.; Li, X.; Rindler, M.J.; Schwede, F.; Genieser, H.-G.; Holz, G.G., *J. Biol. Chem.*, **284**, 10728 – 10736 (2009): "Enhanced Rap1 Activation and Insulin Secretagogue Properties of an Acetoxymethyl Ester of an Epac-selective cyclic AMP Analog in Rat INS-1 Cells: Studies with 8-pCPT-2'-O-Me-cAMP-AM"
- Bastian, P.; Balcarek, A.; Altanis, C.; Strell, C.; Niggemann, B.; Zänker, K.S.; Entschladen, F., *Cancer Lett.*, **274**, 1218 - 1234 (2009): "The Inhibitory Effect of Norepinephrine on the Migration of ES-2 Ovarian Carcinoma Cells Involves a Rap1-dependent Pathway"
- Enyeart, J.A.; Enyeart, J.J., *PLoS One*, **4**, 1 (2009): "Metabolites of an Epac-Selective cAMP Analog Induce Cortisol Synthesis by Adrenocortical Cells through a cAMP-Independent Pathway"
- Kojima, F.; Kapoor, M.; Kawai, S.; Yang, L.; Aronoff, D.M.; Crofford, L.J., *Prostaglandins Other Lipid Mediat.*, **89**, 26 - 33 (2009): "Prostaglandin E (2) Activates Rap1 via EP2/EP4 Receptors and cAMP-signaling in Rheumatoid Synovial Fibroblasts: Involvement of Epac1 and PKA"
- Kelly, M.P.; Stein, J.M.; Vecsey, C.G.; Favilla, C.; Yang, X.; Bizily, S.F.; Esposito, M.F.; Wand, G.; Kanos, S.J.; Abel, T., *Molecular Psychiatry*, **14**, 398 - 415 (2009): "Developmental Etiology for Neuroanatomical and Cognitive Deficits in Mice Overexpressing G Alpha S, a G-protein Subunit Genetically Linked to Schizophrenia"
- Grandoch, M.; de Jesús, M.L.; Oude Weernink, P.A.; Weber, A.A.; Jakobs, K.H.; Schmidt, M., *Cell Signal*, **4**, 609 - 621 (2009): "B Cell Receptor-induced Growth Arrest and Apoptosis in WEHI-231 Immature B Lymphoma Cells Involve Cyclic AMP And Epac Proteins"
- Omar, B.; Zmuda-Trzebiatowska, E.; Manganiello, V.; Göransson, O.; Degerman, E., *Cell Signal*, **5**, 760 - 766 (2009): "Regulation of AMP-activated Protein Kinase by cAMP in Adipocytes: Roles for Phosphodiesterases, Protein Kinase B, Protein Kinase A, Epac and Lipolysis"
- Ster, J.; De Bock, F.; Bertaso, F.; Abitbol, K.; Daniel, H.; Bockaert, J.; Fagni, L., *J. Physiol.*, **587**, 101 - 113 (2009): "Epac Mediates Pacap-dependent Long-term Depression in the Hippocampus"
- Banales, J.M.; Masyuk, T.V.; Gradilone, S.A.; Masyuk, A.I.; Larusso, N.F., *Hepatology*, **49**, 160 - 174 (2009): "The cAMP Effectors Epac and Protein Kinase A (PKA) are Involved in the Hepatic Cystogenesis of an Animal Model of Autosomal Recessive Polycystic Kidney Disease (ARPKD)"
- Choi, J.H.; Chen, C.L.; Poon, S.L.; Wang, H.S.; Leung, P. C., *Endocr. Relat. Cancer*, **16**, 179 - 188 (2009): "Gonadotropin-stimulated EGFR Expression in Human Ovarian Surface Epithelial Cells: Involvement of cyclic AMP-dependent Epac Pathway"
- Scheibner, K.A.; Boodoo, S.; Collins, S.; Black, K.E.; Chan-Li, Y.; Zarek, P.; Powell, J.D.; Horton, M.R., *Am. J. Respir. Cell Mol. Biol.*, **40**, 251 - 259 (2009): "The Adenosine A2a Receptor Inhibits Matrix Induced Inflammation in a Novel Fashion"
- Sarkar, D.; Ravikumar, B.; Floto, R.A.; Rubinsztein, D.C., *Cell Death Differ.*, **16**, 46 - 56 (2009): "Rapamycin and mTOR-independent Autophagy Inducers Ameliorate Toxicity of Polyglutamine-expanded Huntingtin and Related Proteinopathies"
- Goonasekera, A.; Oestreich, E.A.; Malik, S.; Blaxall, B.C.; Kelley, G.G.; Dirksen, R.T.; Smrcka, A.V., *J.Bio.Chem.*, **284**, 1514 - 1522 (2009): "Epac and Phospholipase C-etheno Regulate CA2+ Release in the Heart by Activation of Protein Kinase C-etheno and Calcium-calmodulin-Kinase II"
- Ostroveanu, A.; van der Zee, E.A.; Eisel, U.L.; Schmidt, M.; Nijholt, I.M., *Hippocampus [Epub ahead of print]* (2009): "Exchange Protein Activated by cyclic AMP 2 (Epac2) Plays a Specific and Time-limited Role in Memory Retrieval"
- Spindler, V.; Werthmann, R.C.; Baumer, Y.; Bunemann, M.; Waschke, J., *J. Cell. Physiol.*, **220**, 716 - 726 (2009): "Role of Rac 1 and cAMP in Endothelial Barrier Stabilization and Thrombin-induced Barrier Breakdown"
- Tcivileva, I.E.; Tan, K.S.; Gambarian, M.; Nackley, A.G.; Medvedev, A.V.; Romanov, S.; Flood, P.M.; Maixner, W.; Makarov, S.S.; Diatchenko, L., *Mol. Immunol.*, **46**, 2256 - 2266 (2009): "Signaling Pathway Mediating beta(3)-adrenergic Receptor-induced Production of Interleukin-6 in Adipocytes"
- Hernandez, P.J.; Ma, N.; Abel, T., *Learn. Mem.*, **16**, 367 - 370 (2009): "Exchange Protein Activated by cAMP Enhances Long-term Memory Formation Independent of Protein Kinase A"
- Purves, G.I.; Kamishima, T.; Davies, L.A.; Quayle, J.M.; Dart, C., *J. Physiol.*, **587**, 3639 - 3650 (2009): "Exchange Protein Activated by cAMP (Epac) Mediates cAMP-dependent but Protein Kinase A Insensitive Modulation of Vascular ATP-sensitive Potassium Channels"
- Lissitzky, J.C.; Parriaux, D.; Ristorcelli, E.; Vérine, A.; Lombardo, D.; Verrando, P., *Cancer Res.*, **69**, 802 - 809 (2009): "Cyclic AMP Signaling as a Mediator of Vasculogenic Mimicry in Aggressive Human Melanoma Cells in Vitro"
- 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"
- Kelley, G.G.; Chepurny, O.G.; Schwede, F.; Genieser, H.-G.; Leech, C.A.; Roe, M.W.; Li, X.; Dzhura, I.; Dzhura, E.; Afshari, P.; Holz, G.G., *Islets*, **1**, 260 - 265 (2009): "Glucose-dependent Potentiation of Mouse Islet Insulin Secretion by Epac Activator 8-pCPT-2'-O-Me-cAMP-AM"
- Borland, G.; Smith, B.O.; Yarwood, S.J., *Brit. J. Pharmacol.*, **158**, 70 - 86 (2009): "Epac Proteins Transduce Diverse Cellular Actions of cAMP"

- Grandoch, M.; de Jesus, B.M.; Oude Weernink, P.A.; Weber, A.A.; Jakobs, K.H.; Schmidt, M., *Cell Signal*, **4**, 609 - 621 (2009): "B Cell Receptor-induced Growth Arrest and Apoptosis in WEHI-231 Immature B Lymphoma Cells Involve Cyclic AMP and Epac Proteins"
- Dzhura, I.; Chepurny, O.G.; Kelley, G.G.; Leech, C.A.; Roe, M.W.; Dzhura, E.; Afshari, P.; Malik, S.; Rindler, M.J.; Xu, X.; Lu, Y.; Smrcka, A.V.; Holz, G.G., *J. Physiol.*, **588**, 4871 - 4889 (2010): "EPAC2-dependent Mobilization of Intracellular Ca<sup>2+</sup> by Glucagon-like Peptide-1 Receptor Agonist Exendin-4 is Disrupted in Beta-Cells of Phospholipase C-Epsilon Knockout Mice"
- Gerlo, S.; Verdood, P.; Kooijman, R., *J. Interferon Cytokine Res.*, **30**, 883 - 891 (2010): "Modulation of Cytokine Production by Cyclic Adenosine Monophosphate Analogs in Human Leukocytes"
- Spaeth, C.S.; Boydston, E.A.; Figard, L.R.; Zuzek, A.; Bittner, G.D., *J. Neurosci.*, **30**, 15790 - 15800 (2010): "A Model for Sealing Plasmalemmal Damage in Neurons and Other Eukaryotic Cells"
- Idevall-Hagren, O.; Barg, S.; Gylfe, E.; Tengholm, A., *J. Biol. Chem.*, **285**, 23007 - 23018 (2010): "cAMP Mediators of Pulsatile Insulin Secretion from Glucose-stimulated Single Beta-cells"
- Rah, S.-Y.; Mushtaq, M.; Nam, T.-S.; Kim, S.H.; Kim, U.-H., *J. Biol. Chem.*, **285**, 21877 - 21887 (2010): "Generation of Cyclic ADP-ribose and Nicotinic Acid Adenine Dinucleotide Phosphate by CD38 for Ca<sup>2+</sup> Signaling in Interleukin-8-treated Lymphokine-activated Killer Cells"
- Lim, J.-G.; Lee, J.-J.; Park, S.-H.; Park, J.-H.; Kim, S.-J.; Cho, H.-C.; Baek, W.-K.; Kim, D.-K.; Song, D.-K., *Neurosci. Lett.*, **479**, 13 - 17 (2010): "Glucagon-like Peptide-1 Protects NSC-34 Motor Neurons against Glucosamine through Epac-mediated Uptake Enhancement"
- Eijkelkamp, N.; Wang, H.J.; Garza-Carbajal, A.; Willemen, H.L.D.M.; Zwartkruis, F.J.; Wood, J.N.; Dantzer, R.; Kelley, K.W.; Heijnen, C.J.; Kavelaars, A., *J. Neurosci.*, **30**, 12806 - 12815 (2010): "Low Nociceptor GRK2 Prolongs Prostaglandin E-2 Hyperalgesia via Biased cAMP Signaling to epac/Rap1, Protein Kinase C Epsilon, and MEK/ERK"
- Enyeart, J.A.; Liu, H.; Enyeart, J.J., *Am. J. Physiol. Endocrinol. Metab.*, **301**, 941 - 954 (2011): "8-Phenylthio-adenines Stimulate the Expression of Steroid Hydroxylases, Cav3.2 Ca<sup>2+</sup> Channels, and Cortisol Synthesis by a cAMP-independent Mechanism"
- Tsalkova, T.; Mei, F.C.; Cheng, X., *PLoS One*, **7**(1), e30441 (2011): "A Fluorescence-Based High-Throughput Assay for the Discovery of Exchange Protein Directly Activated by Cyclic AMP (EPAC) Antagonists"
- Fukuda, M.; Williams, K.W.; Gautron, L.; Elmquist, J.K., *Cell Metab.*, **13**, 331 - 339 (2011): "Induction of Leptin Resistance by Activation of cAMP-Epac Signaling"
- Roscioni, S.S.; Maarsingh, H.; Elzinga, C.R.S.; Schuur, J.; Menzen, M.; Halayko, A.J.; Meurs, H.; Schmidt, M., *J. Cell. Mol. Med.*, **15**, 1551 - 1563 (2011): "Epac as a Novel Effector of Airway Smooth Muscle Relaxation"
- Roscioni, S.S.; Dekkers, B.G.J.; Prins, A.G.; Menzen, M.H.; Meurs, H.; Schmidt, M.; Maarsingh, H., *Br. J. Pharmacol.*, **162**, 193 - 209 (2011): "cAMP inhibits Modulation of Airway Smooth Muscle Phenotype via the Exchange Protein Activated by cAMP (EPAC) and Protein Kinase A"
- Roscioni, S.S.; Prins, A.G.; Elzinga, C.R.S.; Menzen, M.H.; Dekkers, B.G.J.; Halayko, A.J.; Meurs, H.; Maarsingh, H.; Schmidt, M., *Br. J. Pharmacol.*, **164**, 958 - 969 (2011): "Protein Kinase A and the Exchange Protein Directly Activated by cAMP (EPAC) Modulate Phenotype Plasticity in Human Airway Smooth Muscle"
- Zieba, B.J.; Artamonov, M.V.; Jin, L.; Momotani, K.; Ho, R.; Franke, A.S.; Neppl, R.L.; Stevenson, A.S.; Khromov, A.S.; Chrzanowska-Wodnicka, M.; Somlyo, A.V., *J. Biol. Chem.*, **286**, 16681 - 16692 (2011): "The cAMP-Responsive Rap1 Guanine Nucleotide Exchange Factor, EPAC, Induces Smooth Muscle Relaxation by Down Regulation of RhoA Activity"
- Menon, J.; Doebele, R.C.; Gomes, S.; Bevilacqua, E.; Reindl, K.M.; Rosner, M.R., *PLoS One*, **e49893**, **7** (2012): "A Novel Interplay between Rap1 and PKA Regulates Induction of Angiogenesis in Prostate Cancer"
- Chepurny, O.G.; Bertinetti, D.; Diskar, M.; Leech, C.A.; Afshari, P.; Tsalkova, T.; Cheng, X.; Schwede, F.; Genieser, H.-G.; Herberg, F.W.; Holz, G.G., *Mol. Endocrinol.*, **27**, 1267-1282 (2013): "Stimulation of Proglucagon Gene Expression by Human GPR119 Enteroendocrine L-Cell Line GLUTag"
- Lee, T.-M.; Lin, S.-Z.; Chang, N.-C., *PLoS ONE*, **8**, e71878 (2013): "Both PKA and Epac Pathways Mediate N-Acetylcysteine-Induced Connexin43, Preservation in Rats with Myocardial Infarction"
- Gausdal, G.; Wergeland, A.; Skavland, J.; Nguyen, E.; Pendino, F.; Rouhee, N.; McCormack, E.; Herfindal, L.; Kleppe, R.; Havemann, U.; Schwede, F.; Bruserud, Ø; Gjertsen, B.T.; Lanotte, M.; Ségal-Bendirdjian; Døskeland, S.O., *Cell Death Dis.*, **4**, e516, (2013): "Cyclic AMP Can Promote APL Progression and Protect Myeloid Leukemia Cells Against Anthracycline-Induced Apoptosis"
- Herfindal, L.; Nygaard, G.; Kopperud, R.; Krakstad, C.; Døskeland, S.O.; Selheim, F., *Biochem. Biophys. Res. Commun.*, **437**, 603 - 608 (2013): "Off-target Effect of the Epac Agonist 8-pCPT-2'-O-Me-cAMP on P2Y<sub>12</sub> Receptors in Blood Platelets"
- Wolter, S.; Kloth, C.; Golombek, M.; Dittmar, F.; Försterling, L.; Seifert, R., *Biochem. Pharmacol.*, **98**, 119 - 131 (2015): "cAMP Causes Caspase-dependent Apoptosis in Mouse Lymphoma Cell Lines"
- Parnell, E.; Palmer, T.M.; Yarwood, S.J., *Trends Pharmacol. Sci.*, **36**, 203 - 214 (2015): "The Future of EPAC-targeted Therapies: Agonism versus Antagonism"