# Small Molecules

**STO-609**

Calcium signaling inhibitor; Inhibits calcium/calmodulin-dependent kinase kinases (CaMKKs)

Catalog # 73862

10 mg

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## Product Description

STO-609 is a cell-permeable, selective inhibitor of ATP-competitive calcium/calmodulin-dependent kinase kinases (CaMKK). STO-609 inhibits the activities of recombinant isoforms CaMKKα (Ki = 80 ng/mL) and CaMKKβ (Ki = 15 ng/mL) and also inhibits their autophosphorylation (Kukimoto-Niino et al.; Tokumitsu et al.). STO-609 reduces thrombin-induced nuclear localization of NF-κB activation in endothelial cells (Bair et al.). This product is supplied as the acetate salt form of the molecule.

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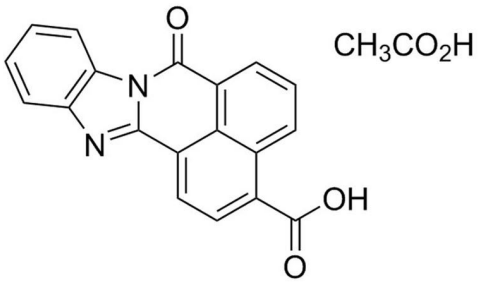
| Molecular Name: | STO-609 (Acetate) |
| Alternative Names: | Not applicable |
| CAS Number: | 1173022-21-3 |
| Chemical Formula: | $C_{19}H_{10}N_2O_3 \cdot C_2H_4O_2$ |
| Molecular Weight: | 374.4 g/mol |
| Purity: | ≥ 98% |
| Chemical Name: | 7-oxo-7H-benzimidazo[2,1-a]benz[de]isoquinoline-3-carboxylic acid, monoacetate |
| Structure: |  |



## Properties

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| Physical Appearance: | A crystalline solid |
| Storage: | Product stable at -20°C as supplied. Protect product from prolonged exposure to light. For long-term storage store with a desiccant.<br>Stable as supplied for 12 months from date of receipt. |
| Solubility: | · DMSO ≤ 2.7 mM<br>· NaOH (100 mM) ≤ 25 mM<br>For example, to prepare a 10 mM stock solution in 100 mM NaOH, resuspend 10 mg in 2.67 mL of 100 mM NaOH.<br><br>Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.<br><br>Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity. |

## Published Applications

DIFFERENTIATION
· Stimulates osteoblast formation and inhibits osteoclast differentiation in mouse mesenchymal stem cells, and reverses age-associated decline in bone mass (Cary et al.; Pritchard et al.).
CANCER RESEARCH
· Decreases in vitro growth of human hepatic cancer cell lines, and decreases tumor burden in a mouse hepatic tumor model (Lin et al.).

## References

Bair AM et al. (2009) Ca2+ entry via TRPC channels is necessary for thrombin-induced NF-kappaB activation in endothelial cells through AMP-activated protein kinase and protein kinase Cdelta. J Biol Chem 284(1): 563–74.
Cary RL et al. (2013) Inhibition of Ca2+/calmodulin-dependent protein kinase kinase 2 stimulates osteoblast formation and inhibits osteoclast differentiation. J Bone Miner Res 28(7): 1599–610.
Kukimoto-Niino M et al. (2011) Crystal structure of the Ca2+/calmodulin-dependent protein kinase kinase in complex with the inhibitor STO-609. J Biol Chem 286(25): 22570–9.
Lin F et al. (2015) The camKK2/camKIV relay is an essential regulator of hepatic cancer. Hepatology 62(2): 505–20.
Pritchard ZJ et al. (2015) Inhibition of CaMKK2 reverses age-associated decline in bone mass. Bone 75: 120–7.
Tokumitsu H et al. (2002) STO-609, a specific inhibitor of the Ca(2+)/calmodulin-dependent protein kinase kinase. J Biol Chem 277(18): 15813–8.

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