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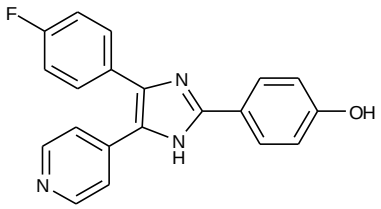
Product Information

SB 202190

Product Number **S7067**
Storage Temperature 2–8 °C

CAS RN 152121-30-7
Synonym: 4-(4-Fluorophenyl)-2-(4-hydroxyphenyl)-5-(4-pyridyl)-1H-imidazole



Product Description
Molecular Formula: $C_{20}H_{14}FN_3O$
Molecular Weight: 331.34
Appearance: faintly yellow, to beige
Purity: ≥98% (HPLC)

The p38 subfamily of MAP kinases consists of p38α, p38β, p38γ, and p38δ. It regulates gene expression in response to various extracellular stimuli including growth factors, hormones, ligands for G protein coupled receptors, inflammatory cytokines (IL-1, IL-8, TNFα), and stresses (heat, osmotic shock). p38 is activated by dual specificity MAP kinase kinases, including MKK3, MKK6, and JNKK1, that phosphorylate p38 on Thr^{180} and Tyr^{182}. p38 stimulates the activity of protein kinases MAPKAPK 2, MAPKAPK 3, and MNK1, which in turn activate several transcription factors including ATF2, CHOP, and MEF-2C.[1-3] Because of its critical role in inflammation and stress response, p38 MAPK is of great interest in both basic and therapeutic research, including such human conditions as asthma and autoimmunity.[1]

SB 202190 is a highly selective, potent, and cell permeable inhibitor of p38 MAP kinase. It binds to both the inactive and the active forms of the enzyme. In the active form of p38, SB 202190 competes with ATP for the same binding site with a K_d value of 38 nM for recombinant p38 and 30–50 nM for the native protein.[3] SB 202190 selectively inhibits p38α and β isoforms (IC_{50} = 50 and 100 nM at SAPK2a/p38 and SAPK2b/p38b2, respectively).[3] SB 202190 is highly selective and has no effect on JNK, $p42/44^{MAPK}$, or other multiple related protein kinases at concentrations up to 100 μM.[4]

SB 202190 has been utilized in multiple studies of p38 MAP kinase function. In human mesangial cells, SB 202190 (1 μmole/L) inhibited p38-MAPK and reduced hexosamine-induced TGFβ1 expression implicating the p38 pathway in the pathophysiology of diabetic glomerulopathy.[5] To evaluate the role of the MKK6-p38 MAPK signaling cascade in the regulation of myocardial COX-2 gene expression, cardiac myocytes were infected with adenoviruses encoding wild-type or constitutively activated MKK6 or p38beta2 MAPK. In the absence of interleukin-1β, SB 202190 blocked increased cellular p38 MAPK activity, COX-2 mRNA expression, and COX-2 protein synthesis.[6]

SB 202190 induces cell death in Jurkat and HeLa cells *in vitro* with typical apoptotic features including nucleus condensation and DNA fragmentation. The cell death is due to apoptosis, rather than nonspecific cytotoxicity, which is supported by the evidence that SB 202190-induced cell death is mediated by activation of CPP32-like caspases and is blocked by expression of bcl-2. Therefore, SB 202190 may function as an apoptotic inducer.[7]

SB 202190 is an important tool for the study of p38 MAP kinase function both *in vivo* and *in vitro*.

Preparation Instructions
SB 202190 is soluble in DMSO at 10 mg/mL.

Storage/Stability
Store the product at 2–8 °C for up to 12 months.

References

1. Johnson, G.L. et al., Science, **298**, 1911-1912 (2002).
2. Wilson, K.P. et al., Chem. Biol., **4**, 423-431 (1997).
3. Frantz, B. et al., Biochemistry, **37**, 13846-13853 (1998).
4. Davies, S.P. et al., Biochem. J., **351**, 95-105 (2000).
5. Burt, D.J. et al., Diabetologia, **46,** 531-537 (2003).
6. Degousee, N. et al., Circ Res., **92**, 757-764 (2003).
7. Nemoto, S. et al., J. Biol. Chem., **273**, 16415–16420 (1998).

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