Sorafenib

Sorafenib, also known as Bay 43-9006, is a novel multikinase inhibitor that targets the RAF family of serine/threonine kinases and tyrosine kinase receptors involved in tumor progression and tumor angiogenesis, including: VEGFR-2 (IC$_{50}$ = 90 nM), VEGFR-3 (IC$_{50}$ = 20 nM), PDGFR- (IC$_{50}$ = 57 nM), c-KIT (IC$_{50}$ = 68 nM), and Flt3 (IC$_{50}$ = 58 nM) (1). Research studies have demonstrated that sorafenib induces apoptosis in several tumor cell lines through the down-regulation of the antiapoptotic protein myeloid cell leukemia-1 (Mcl-1). Down-regulation of Mcl-1 by sorafenib is associated with the release of cytochrome c from mitochondria into the cytosol and caspase activation, leading to apoptotic cell death (2). STAT3 inhibition by sorafenib has been observed in multiple cell types (3-5).

Molecular Formula: C$_{21}$H$_{16}$ClF$_{3}$N$_{4}$O$_{3}$$\cdot$C$_{7}$H$_{8}$O$_{3}$S

Molecular Weight: 637.03 g/mol

Solubility: Soluble in DMSO at 200 mg/ml; very poorly soluble in ethanol and water with maximum solubility in water ~10-20 µM.

Purity: >99%.

Directions for Use: Sorafenib is supplied as a lyophilized powder. For a 10 mM stock, reconstitute the 10 mg in 1.57 ml DMSO. Working concentrations and length of treatment can vary depending on the desired effect, but it is typically used as a pretreatment at 0.1-10 µM for 0.5-2 hr prior to treating with a stimulator. It can also be used alone, with varying treatment times lasting up to 24 hr.

Background References: