FK-506
Item No. 10007965

CAS Registry No.: 104987-11-3
Formal Name: (3S,4R,5S,8R,9E,12S,14S,15R,16S,18R,19R,26aS)-5,6,8,11,12,13,14,15,16,17,18,19,24,25,26,26a-hexadecahydro-5,19-dihydroxy-3-[(1E)-2-[(1R,3R,4R)-4-hydroxy-3-methoxycyclohexyl]-1-methylidenyl]-14,16-dimethoxy-4,10,12,18-tetramethyl-8-(2-propen-1-yl)-15,19-epoxy-3H-pyrido[2,1-c][1,4]oxazacyclotricosine-1,7,20,21(4H,23H)-tetrone
Synonym: Tacrolimus
MF: C_{44}H_{69}NO_{12}
FW: 804.0
Purity: ≥99%
Supplied as: A crystalline solid
Storage: -20°C
Stability: ≥4 years

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

FK-506 is supplied as a crystalline solid. A stock solution may be made by dissolving the FK-506 in an organic solvent purged with an inert gas. FK-506 is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of FK-506 in ethanol and DMF is approximately 30 mg/ml, and in DMSO it is approximately 20 mg/ml.

FK-506 is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, FK-506 should first be dissolved in ethanol and then diluted with the aqueous buffer of choice. FK-506 has a solubility of approximately 0.15 mg/ml in a 1:5 solution of ethanol:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

Description

FK-506 is a potent immunosuppressant in the same molecular class as cyclosporin A (Item No. 12088) and rapamycin (Item No. 13346). Its mechanism of action involves the formation of a high affinity complex (K_i = 0.2 nM) with FK-506 binding protein 12 (FKBP12). This complex then inhibits the activity of the calcium/calmodulin-dependent protein phosphatase, calcineurin, leading to disruption of T cell activation.

The physiological effects of FK-506 also include regulation of nitric oxide neurotoxicity, neurotransmitter release, and regulation of Ca^{2+} release via the ryanodine and inositol-(1,4,5)-trisphosphate (IP_3) receptors. In the latter case, FKBP12 forms a tight complex with both ryanodine and IP_3 receptors which can be disrupted by FK-506, thereby rendering the receptors leaky to Ca^{2+}.

References