

Product Data Sheet

Product Name: BLU-782

Cat. No.: GC19508

Chemical Properties

Cas. No. 2141955-96-4

Chemical Name 1-Piperazinecarboxylic acid, 4-[6-[5-[4-ethoxy-1-(1-methylethyl)-4-piperidinyl]-2-pyridinyl]pyrrolo[1,2-b]pyridazin-4-yl]-, (3R)-tetrahydro-3-furanyl ester

SMILES O=C(N1CCN(C2=CC=NN3C2=CC(C4=NC=C(C5(OCC)CCN(C(C)C)CC5)C=C4)=C3)C1)O[C@H]6COCC6

Formula $C_{31}H_{42}N_6O_4$

M.Wt 562.715

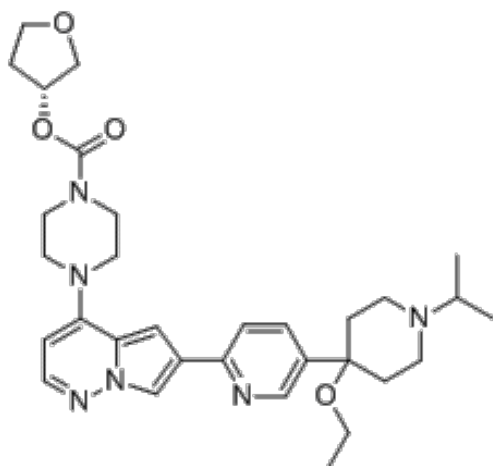
Solubility Soluble in DMSO

Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

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Protocol

Animal experiment [1]:	
Animal models	ALK2 ^{R206H} mice expressing ALK2 ^{R206H} (Acvr1 ^{R206H/+} /Cre- ER ^{+/-})
Preparation Method	ALK2 ^{R206H} mice (11 weeks old) were raised in a standard environment, with free access to food and water. For the pinch injury model, muscle damage was induced in mice on day 0 by applying 5 pounds (2.268kg) of mechanical pressure to the right calf muscles using rongeurs. The pinch was held for 5s and then repeated a second time. Beginning four days before administration of pinch injury or fibular osteotomy, mice were BLU-782 (50mg/kg/day; p.o.) for 4 days. Mineralized heterotopic ossification development was assessed and monitored through the acquisition of high-resolution, hind limb-focused CT images (68µm voxel size).
Dosage form	50mg/kg/day; 4 days; p.o.
Applications	BLU-782 treatment prevented heterotopic ossification in mice.
References: [1] Davis A J, Brooijmans N, Brubaker J D, et al. An ALK2 inhibitor, BLU-782, prevents heterotopic ossification in a mouse model of fibrodysplasia ossificans progressiva[J]. Science Translational Medicine, 2024, 16(749): eabp8334.	

Background

BLU-782 is an orally active inhibitor for Activin receptor-like kinase 2 (ALK2) with IC₅₀ values of 0.2nM, 0.6nM, 3nM, 24nM, 45nM, 65nM, and 155nM for ALK2^{R206H}, ALK2, ALK1, ALK6, ALK3, ALK4, and ALK5, respectively^[1]. BLU-782 selectively targets the mutant ALK2 to inhibit the

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abnormal activation of the Smad1/5/9-dependent BMP signaling pathway, thereby regulating heterotopic ossification^[2]. BLU-782 has been widely used in the research on Fibrodysplasia Ossificans Progressiva to alleviate edema following muscle and bone injuries^[3].

In vivo, BLU-782 treatment via oral administration at a dose of 50mg/kg/day for 4 days prevented heterotopic ossification after muscle injury and fracture, promoted muscle repair and bone healing in mice, without obvious toxicity^[1].

References:

[1] Davis A J, Brooijmans N, Brubaker J D, et al. An ALK2 inhibitor, BLU-782, prevents heterotopic ossification in a mouse model of fibrodysplasia ossificans progressiva[J]. Science Translational Medicine, 2024, 16(749): eabp8334.

[2] Meng X, Wang H, Hao J. Recent progress in drug development for fibrodysplasia ossificans progressiva[J]. Molecular and Cellular Biochemistry, 2022, 477(10): 2327-2334.

[3] Kopylov E D, Yakovlev I A, Limaev I S, et al. Fibrodysplasia ossificans progressiva: molecular genetic causes, clinical and morphological characteristics, and therapeutic approaches to treatment[J]. Genes & Cells, 2025, 20(3): 166-177.

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