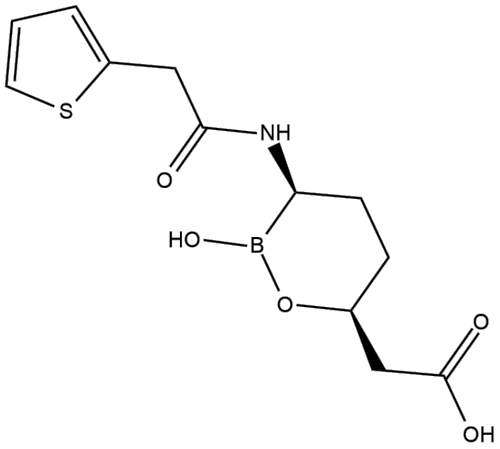
Product Data Sheet

Product Name: Vaborbactam
Cat. No.: GC19369

Chemical Properties

Cas. No.	1360457-46-0		
SMILES	O=C(O)C[C@@H]1CC[C@H](NC(CC2=CC=CS2)=O)B(O)O1		
Formula	$C_{12}H_{16}BNO_5S$	M.Wt	297.14
Solubility	Water : 5.26 mg/mL (17.70 mM)	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



Protocol

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Animal experiment [1]:

Animal models	Female Swiss Webster mice
Preparation Method	A 24-hour thigh infection model was established using Klebsiella pneumoniae KP1094. After infection, mice were treated with 100 or 300 mg/kg meropenem intraperitoneally every 2 hours for 24 hours alone or in combination with Vaborbactam ranging from 6.25 to 100 mg/kg every 2 hours for 24 hours.
Dosage form	6.25 to 100mg/kg; i.p.
Applications	The addition of Vaborbactam to both meropenem regimens produced bacterial killing in a dose-dependent fashion, with a maximum of bacterial killing of 2.50 log CFU/thigh.

References:

[1]Sabet M, Tarazi Z, Nolan T, et al. Activity of meropenem-vaborbactam in mouse models of infection due to KPC-producing carbapenem-resistant Enterobacteriaceae[J]. Antimicrobial Agents and Chemotherapy, 2018, 62(1): 10.1128/aac. 01446-17.

Background

Vaborbactam (RPX7009) is a broad-spectrum β-lactamase inhibitor with particularly potent activity against KPC, CTX-M, SHV, and CMY enzymes[1]. Vaborbactam is a cyclic boronic acid pharmacophore β-lactamase competitive inhibitor used to treat complicated urinary tract infections[2]. Vaborbactam forms a reversible coordination bond with β-lactamases and is not hydrolyzed by β-lactamases[3]. Vaborbactam can enhance the activity of β-lactams against Mycobacterium abscessus[4]. Vaborbactam is often used in combination with Meropenem and has potent in vitro activity against resistant Gram-negative pathogens, especially Klebsiella pneumoniae that produces

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Klebsiella pneumoniae carbapenemase (KPC), with MIC_{50} values typically ≤ 0.06μg/ml[5].

In vivo, vaborbactam (6.25-100mg/kg) was injected intraperitoneally in mice to treat a 24-hour thigh infection model of Klebsiella pneumoniae KP1094. Combining it with two meropenem regimens (100 and 300mg/kg) produced a dose-dependent bactericidal effect, with a maximum bactericidal effect of 2.50 log CFU/thigh[6].

References:

[1] Hamrick J C, Docquier J D, Uehara T, et al. VNRX-5133 (taniborbactam), a broad-spectrum inhibitor of serine-and metallo-β-lactamases, restores activity of cefepime in Enterobacterales and Pseudomonas aeruginosa[J]. Antimicrobial Agents and Chemotherapy, 2020, 64(3): 10.1128/aac. 01963-19.
[2] Iqbal Z, Sun J, Yang H, et al. Recent developments to cope the antibacterial resistance via β-lactamase inhibition[J]. Molecules, 2022, 27(12): 3832.
[3] Bookser B C, Reddy K R, Boyer S H, et al. Vaborbactam (in Combination with Meropenem as Vabomere), a Non-β-Lactam β-Lactamase Inhibitor for Treatment of Complicated Urinary Tract Infections and Pyelonephritis[J]. Current Drug Synthesis, 2022: 17-40.
[4] Sanchez L, Bitar M, Herail Q, et al. In vitro and intracellular activity of vaborbactam combined with β-lactams against Mycobacterium abscessus[J]. Journal of Antimicrobial Chemotherapy, 2024, 79(8): 1914-1918.
[5] Wenzler E, Scoble P J. An appraisal of the pharmacokinetic and pharmacodynamic properties of meropenem-vaborbactam[J]. Infectious Diseases and Therapy, 2020, 9(4): 769-784.
[6] Sabet M, Tarazi Z, Nolan T, et al. Activity of meropenem-vaborbactam in mouse models of infection due to KPC-producing carbapenem-resistant Enterobacteriaceae[J]. Antimicrobial Agents and Chemotherapy, 2018, 62(1): 10.1128/aac. 01446-17.

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