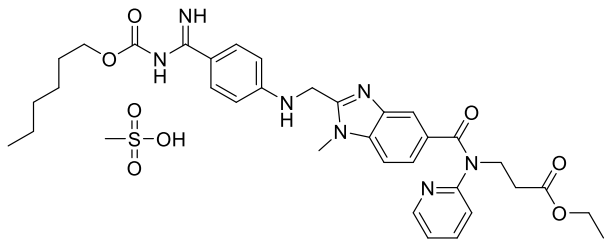
Product data sheet

MedKoo Cat#: 329452 Name: Dabigatran etexilate mesylate CAS#: 872728-81-9 (mesylate) Chemical Formula: $C_{35}H_{45}N_7O_8S$ Molecular Weight: 723.846	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:

Dabigatran etexilate, also known as BIBR 1048MS, is a direct thrombin inhibitor. Dabigatran is used to prevent strokes in those with atrial fibrillation not caused by heart valve issues, as well as deep vein thrombosis and pulmonary embolism in persons who have been treated for 5–10 days with parenteral anticoagulant (usually low molecular weight heparin), and to prevent deep vein thrombosis and pulmonary embolism in some circumstances. It appears to be as effective as warfarin in preventing nonhemorrhagic strokes and embolic events in those with atrial fibrillation not due to valve problems.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	75.0	103.61

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.38 mL	6.91 mL	13.82 mL
5 mM	0.28 mL	1.38 mL	2.76 mL
10 mM	0.14 mL	0.69 mL	1.38 mL
50 mM	0.03 mL	0.14 mL	0.28 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Noguchi D, Kuriyama N, Hibi T, Maeda K, Shinkai T, Gyoten K, Hayasaki A, Fujii T, Iizawa Y, Tanemura A, Murata Y, Kishiwada M, Sakurai H, Mizuno S. The Impact of Dabigatran Treatment on Sinusoidal Protection Against Hepatic Ischemia/Reperfusion Injury in Mice. Liver Transpl. 2021 Feb;27(3):363-384. doi: 10.1002/lt.25929. Epub 2020 Dec 9. PMID: 33108682; PMCID: PMC7984054. 2. Bastiaans J, Mulder VC, van Meurs JC, Smits-Te Nijenhuis M, van Holten-Neelen C, van Hagen PM, Dik WA. Dabigatran inhibits intravitreal thrombin activity. Acta Ophthalmol. 2018 Aug;96(5):452-458. doi: 10.1111/aos.13630. Epub 2017 Nov 30. PMID: 29193875.

In vivo study

1. Noguchi D, Kuriyama N, Hibi T, Maeda K, Shinkai T, Gyoten K, Hayasaki A, Fujii T, Iizawa Y, Tanemura A, Murata Y, Kishiwada M, Sakurai H, Mizuno S. The Impact of Dabigatran Treatment on Sinusoidal Protection Against Hepatic Ischemia/Reperfusion Injury in Mice. Liver Transpl. 2021 Feb;27(3):363-384. doi: 10.1002/lt.25929. Epub 2020 Dec 9. PMID: 33108682; PMCID: PMC7984054.
2. Bogatkevich GS, Ludwicka-Bradley A, Nietert PJ, Akter T, van Ryn J, Silver RM. Antiinflammatory and antifibrotic effects of the oral direct thrombin inhibitor dabigatran etexilate in a murine model of interstitial lung disease. Arthritis Rheum. 2011 May;63(5):1416-25. doi: 10.1002/art.30255. PMID: 21312187; PMCID: PMC3086970.

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7. Bioactivity

Biological target:

Dabigatran etexilate mesylate (BIBR 1048MS) is an active prodrug of Dabigatran that has anticoagulant effects and is used for the prophylaxis of venousthromboembolism and stroke due to atrial fibrillation.

In vitro activity

Apoptosis of liver specimens after IRI was evaluated by TUNEL staining in the IRI + vehicle (Fig. 3A-a) and IRI + dabigatran groups (Fig. 3A-b). Dabigatran treatment markedly reduced the number of TUNEL-positive cells compared with vehicle (84.20 [IQR, 69.00101.57] in IRI + vehicle, 5.15 [IQR, 3.85-9.67] in IRI + dabigatran, P = 0.004; Fig. 3B). In addition, compared with vehicle, dabigatran treatment attenuated activation of caspase 9, one of the proapoptotic mediators evaluated by Western blot analysis (cleaved-caspase 9/pro-caspase 9: 1.04 [IQR, 0.96-1.09] in IRI + vehicle, 0.69 [IQR, 0.54-0.86] in IRI + dabigatran, P = 0.01; Fig. 3C), and upregulated generation of bcl-2, an antiapoptotic gene evaluated by real-time PCR (bcl-2/β-actin: 0.97 [IQR, 0.87-1.01] in IRI + vehicle, 1.61 [IQR, 1.45-1.79] in IRI + dabigatran, P = 0.006; Fig. 3D).The number of Ly6G-positive cells was significantly lower in the IRI + dabigatran group than in the IRI + vehicle group (5.80 [IQR, 5.40-7.10] in IRI + dabigatran, 38.30 [IQR, 24.6042.55] in IRI + vehicle, P = 0.004; Fig. 3F). Gene expression evaluated by real-time PCR showed that dabigatran treatment significantly reduced VCAM-1 compared with vehicle (VCAM-1/β-actin: 0.35 [IQR, 0.32-0.39] in IRI + dabigatran, 1.10 [IQR, 0.561.32] in IRI + vehicle, P = 0.01; Fig. 3G). As shown in Fig. 3H,I, dabigatran treatment markedly reduced generation of inflammatory cytokines such as TNF-α and IL6 compared with vehicle (TNF-α/β-actin: 0.21 [IQR, 0.10-0.29] in IRI + dabigatran, 0.96 [IQR, 0.441.51] in IRI + vehicle, P = 0.02; IL6/β-actin: 0.02 [IQR, 0.01-0.03] in IRI + dabigatran, 0.24 [IQR, 0.18-1.90] in IRI + vehicle, P = 0.006).

Reference: Liver Transpl. 2021 Mar; 27(3): 363–384. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7984054/

In vivo activity

This study was undertaken to test whether dabigatran etexilate attenuates lung injury in a murine model of interstitial lung disease. Lung injury was induced in female C57BL/6 mice by a single intratracheal instillation of bleomycin. Dabigatran etexilate was given as supplemented chow beginning on day 1 of bleomycin instillation (early treatment, study of antiinflammatory effect) or on day 8 following bleomycin instillation (late treatment, study of antifibrotic effect). Both early treatment and late treatment with dabigatran etexilate attenuated the development of bleomycin-induced pulmonary fibrosis. Dabigatran etexilate significantly reduced thrombin activity and levels of transforming growth factor β1 in BAL fluid, while simultaneously reducing the number of inflammatory cells and protein concentrations. Histologically evident lung inflammation and fibrosis were significantly decreased in dabigatran etexilatetreated mice. Additionally, dabigatran etexilate reduced collagen, connective tissue growth factor, and α-smooth muscle actin expression in mice with bleomycin-induced lung fibrosis, whereas it had no effect on basal levels of these proteins. This data provides preclinical information about the feasibility and efficacy of dabigatran etexilate as a new therapeutic approach for the treatment of interstitial lung disease.

Reference: Arthritis Rheum. 2011 May;63(5):1416-25. https://pubmed.ncbi.nlm.nih.gov/21312187/