

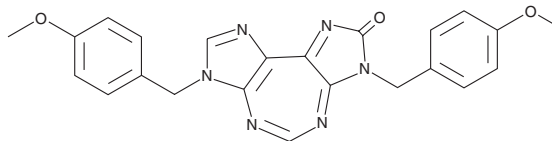
PRODUCT INFORMATION



RK-33

Item No. 20312

CAS Registry No.: 1070773-09-9
Formal Name: 3,7-dihydro-3,7-bis[(4-methoxyphenyl)methyl]-2H-diimidazo[4,5-d:4',5'-f][1,3]diazepin-2-one
MF: C₂₃H₂₀N₆O₃
FW: 428.4
Purity: ≥98%
UV/Vis.: λ_{max}: 226, 258, 383 nm
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

RK-33 is supplied as a crystalline solid. A stock solution may be made by dissolving the RK-33 in the solvent of choice. RK-33 is soluble in organic solvents such as DMSO and dimethyl formamide, which should be purged with an inert gas. The solubility of RK-33 in these solvents is approximately 20 mg/ml.

RK-33 is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, RK-33 should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. RK-33 has a solubility of approximately 0.33 mg/ml in a 1:2 solution of DMSO:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

Description

RK-33 is an inhibitor of DEAD-box helicase 3 (DDX3), an ATP-dependent RNA helicase.¹ It reduces the helicase activity of Ded1p, the yeast homolog of DDX3, when used at concentrations of 50, 100, and 200 nM. RK-33 reduces the viability of lung cancer cells highly expressing DDX3, including A549, H1299, H23, and H460 cells (IC₅₀s = 4.4-8.4 μM), but not those with low expression of DDX3, such as NCI H3255 cells (IC₅₀ = >25 μM). It sensitizes tumors to stereotactic ablative radiation therapy (SABR) in a Twist1/KRAS^{G12D}-inducible mouse model of lung cancer when administered at a dose of 20 mg/kg. RK-33 prevents bone metastasis in an MDA-MB-231-Luc breast cancer mouse xenograft model.² It also reduces replication of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), decreases the levels of SARS-CoV-2 non-structural protein 8 (nsp8) and open reading frame 7a (ORF7a), and inhibits apoptosis in SARS-CoV-2-infected Vero E6 cells when used at a concentration of 10 μM.³

References

1. Bol, G.M., Vesuna, F., Xie, M., et al. Targeting DDX3 with a small molecule inhibitor for lung cancer therapy. *EMBO Mol. Med.* **7**(5), 648-669 (2015).
2. Winnard, P.T., Jr., Vesuna, F., Bol, G.M., et al. Targeting RNA helicase DDX3X with a small molecule inhibitor for breast cancer bone metastasis treatment. *Cancer Lett.* **604**, 217260 (2024).
3. Ciccocanti, F., Di Rienzo, M., Romagnoli, A., et al. Proteomic analysis identifies the RNA helicase DDX3X as a host target against SARS-CoV-2 infection. *Antiviral Res.* **190**, 105064 (2021).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

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