

5,6-DICHLOROBENZIMIDAZOLE RIBOSIDE
Sigma Prod. No. D1916**CAS NO.:** 53-85-0**SYNONYMS:** DRB; 5,6-dichloro-1-β-D-ribofuranosylbenzimidazole**PHYSICAL DESCRIPTION:**

Appearance: white to light yellow powder

Molecular formula: C₁₂H₁₂Cl₂N₂O₄

Molecular weight: 319.1

Melting point: 218-221°C¹Optical rotation: -63.3° (2 g/100 mL pyridine, 25°C)²

Absorbance characteristics:

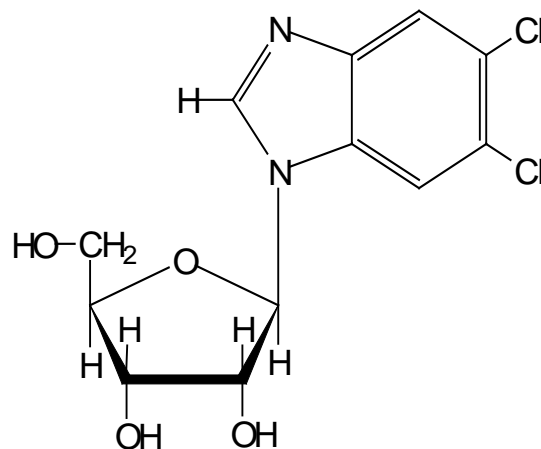
E^{mm}(260nm) = 5.65 (methanol)²E^{mm}(287nm) = 4.60 (methanol)²E^{mm}(296nm) = 4.73 (methanol)²**STORAGE / STABILITY AS SUPPLIED:**

The product should be stored dry at -20°C. At Sigma, DRB lost less than 0.5% in purity in two years, less than 2% in four years, based on HPLC data.

SOLUBILITY / SOLUTION STABILITY:

Sigma tests DRB in ethanol at 20 mg/mL (with heating at 60-65°C) to obtain a clear colorless to pale yellow solution. Material crystallizes on cooling. DRB is soluble in DMSO at least to 75 mM without heating. DRB is also somewhat soluble in methanol and in pyridine.

Since DRB can be crystallized from hot alcohol, it appears to be stable to heating to 80°C. Solutions in ethanol or DMSO should be stored at -20°C for best stability, but should be stable for short times at 2-8°C.

Product Information

5,6-DICHLOROBENZIMIDAZOLE RIBOSIDE
Sigma Prod. No. D1916

GENERAL REMARKS:

5,6-Dichloro-1-β-D-ribofuranosylbenzimidazole riboside (DRB) is an adenosine analogue which has been used to inhibit mRNA synthesis. It has been proposed that DRB blocks the synthesis of heterogeneous nuclear RNA and Ad-2 RNA by accentuation of premature termination at attenuation regions on the DNA.³ The mechanism of inhibition of specific RNA polymerase II transcription was shown to involve casein kinase II; the dibromo analogue was shown to be more potent than the dichloro compound.⁴

Human lymphocytes in culture were treated with DRB (at 40 μM) because it is a reversible inhibitor of RNA transcription.⁵ When tested with HeLa cell extract, it was used at concentrations up to 60 μM.⁴

In a study of rat neurons, the death of nerve growth factor-deprived neurons was entirely prevented by inhibiting protein or RNA synthesis. DRB (at 50 μM), was one of several inhibitors (including cycloheximide, puromycin, anisomycin, actinomycin D), shown to be effective.⁶ (Similar research with neurons from chick embryos tested dosages of cycloheximide and actinomycin D to inhibit protein synthesis.)⁷

REFERENCES:

1. Sigma production data.
2. Kissman, H.M. et al., *J. Am. Chem. Soc.*, 79, 1185 (1957). "Synthesis and Biological Properties of Certain 5,6-Dichlorobenzimidazole Ribosides."
3. Laub, O. et al., *Proc. Natl. Acad. Sci. USA*, 77, 5297-5301 (1980). Premature termination of late transcription of simian virus 40 DNA.
4. Zandomeni, R. et al., *J. Biol. Chem.*, 261, 3414-3419 (1986).
5. Efrat, S. and Kaempfer, R., *Proc. Natl. Acad. Sci. USA*, 81, 2601-2605 (1984). "Control of biologically active interleukin 2 messenger RNA formation in induced human lymphocytes."
6. Martin, D.P. et al., *J. Cell Biology*, 106, 829 (1988). "Inhibitors of Protein Synthesis and RNA Synthesis Prevent Neuronal Death Caused by Nerve Growth Factor Deprivation."
7. Scott, S.A. and Davies, A.M., *J. Neurobiology*, 21, 630 (1991).

Sigma warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.