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PRODUCT INFORMATION



Doxycycline (hyclate)

Item No. 14422

CAS Registry No.: 24390-14-5

Formal Name: (4S,4aR,5S,5aR,6R,12aS)-4-(dimethylamino)-1,4,4a,5,5a,6,11,12a-octahydro-3,5,10,12,12a-pentahydroxy-6-methyl-1,11-dioxo-2-naphthacenecarboxamide, hydrochloride, compd. with ethanol, hydrate (2:2:1:1)

MF: $2[C_{22}H_{24}N_2O_8] \cdot 2HCl \cdot H_2O \cdot C_2H_6O$

FW: 1025.9

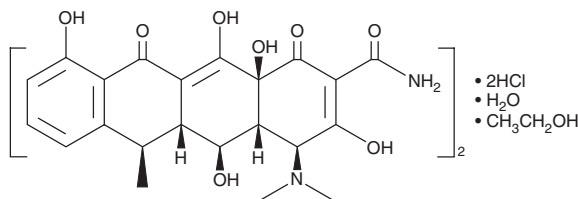
Purity: $\geq 98\%$

UV/Vis.: λ_{max} : 215, 272, 348 nm

Supplied as: A crystalline solid

Storage: $-20^{\circ}C$

Stability: ≥ 2 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Doxycycline (hyclate) is supplied as a crystalline solid. A stock solution may be made by dissolving the doxycycline (hyclate) in the solvent of choice, which should be purged with an inert gas. Doxycycline (hyclate) is soluble in organic solvents such as DMSO and dimethyl formamide. The solubility of doxycycline (hyclate) in these solvents is approximately 1 mg/ml.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of doxycycline (hyclate) can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of doxycycline (hyclate) in PBS (pH 7.2) is approximately 3 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Doxycycline is a broad-spectrum tetracycline antibiotic.^{1,2} It inhibits bacterial protein synthesis by binding to ribosomes.^{2,3} Doxycycline also selectively inhibits human matrix metalloproteinase-8 (MMP-8) and MMP-13 over MMP-1 with 50, 60, and 5% inhibition, respectively, when used at a concentration of 30 μM .⁴ It can be used as a regulator for inducible gene expression systems where expression depends on either the presence (Tet-On) or absence (Tet-Off) of doxycycline.^{5,6} Formulations containing doxycycline have been used in the treatment of bacterial infections and the prevention of malaria.

References

1. Williamson, G.M. The in vitro activity of vibramycin (doxycycline). *Chemotherapia (Basel)* **13**(Suppl. 1), (1968).
2. Griffin, M.O., Ceballos, G., and Villarreal, F.J. Tetracycline compounds with non-antimicrobial organ protective properties: Possible mechanisms of action. *Pharmacol. Res.* **63**(2), 102-107 (2011).
3. Chopra, I. Tetracycline analogs whose primary target is not the bacterial ribosome. *Antimicrob. Agents Chemother.* **38**(4), 637-640 (1994).
4. Smith, G.N., Jr., Mickler, E.A., Hasty, K.A., et al. Specificity of inhibition of matrix metalloproteinase activity by doxycycline: Relationship to structure of the enzyme. *Arthritis Rheum.* **42**(6), 1140-1146 (1999).
5. Gould, D.J., Berenstein, M., Dreja, H., et al. A novel doxycycline inducible autoregulatory plasmid which displays 'on/off' regulation suited to gene therapy applications. *Gene Ther.* **7**(24), 2061-2070 (2000).
6. Li, Z., Michael, I.P., Zhou, D., et al. Simple piggyBac transposon-based mammalian cell expression system for inducible protein production. *Proc. Natl. Acad. Sci. USA* **110**(13), 5004-5009 (2013).

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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