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Chloroquine

150 mg

For Research Use Only. Not for Use in Diagnostic Procedures.

Background

Chloroquine (CQ) is a lysosomotropic agent with an extensive range of biological effects (1). Historically known for its anti-malarial activity, chloroquine is a widely used biological research tool for studying autophagy inhibition. Research studies demonstrate that chloroquine accumulates in acidic lysosomes and increases the lysosomal pH. This inhibits lysosomal hydrolases and prevents autophagosomal fusion and degradation, which can result in apoptotic or necrotic cell death (1-4). Inhibition of chloroquine-induced apoptosis with the V-ATPase inhibitor bafilomycin A1 has been observed in several cell types (4). Chloroquine also enhances the anti-neoplastic effects of the histone deacetylase inhibitor vorinostat (SAHA) (5).

Chloroquine treatment of cells leads to accumulation of light chain 3-II (LC3-II) (1-3). This autophagy marker resides within autophagosomal membranes during the autophagic process and is degraded upon fusion with lysosomes. Chloroquine inhibition of these fusion events effectively blocks LC3-II degradation.

This product has applications to SARS-CoV-2 research into the mechanisms of the Novel Coronavirus, which has caused the COVID-19 pandemic.

Molecular Formula

$C_{18}H_{26}ClN_3 \cdot 2H_3PO_4$

Molecular Weight

515.9 g/mol

Purity

>98%

CAS

50-63-5

Solubility

Soluble in H₂O at 25mg/ml.

Storage

Store lyophilized at room temperature or in solution at -20°C, desiccated. Protect from light. In lyophilized form, the chemical is stable for 24 months. Once in solution, use within 3 months to prevent loss of potency. Aliquot to avoid multiple freeze/thaw cycles.

Directions for Use

Chloroquine is supplied as a lyophilized powder. For a 50 mM stock, reconstitute the 150 mg in 5.82 ml sterile dH₂O. First add 1 ml dH₂O to the tube containing the chemical, vortex, and dispense into a new, larger tube. Repeat this action two or three more times to transfer any residual material. Add additional dH₂O to the new tube to bring the volume up to 5.82 ml. Filter sterilize into sterile tube. Utilize a syringe and 0.2 µm syringe filter to minimize sample loss.

Working concentrations and length of treatment can vary depending on the desired effect, but it is typically used at 25-100 µM for 12-48 hr.

Background References

1. Liang, X. et al. (2012) *Cancer Res* 72, 2791-801.
2. Liang, X. et al. (2014) *Cell Biosci* 4, 10.
3. Kung, C.P. et al. (2011) *Crit Rev Eukaryot Gene Expr* 21, 71-100.
4. Shacka, J.J. et al. (2006) *Mol Pharmacol* 69, 1125-36.
5. Carew, J.S. et al. (2007) *Blood* 110, 313-22.

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