

Product Data Sheet

Product Name: Alagebrium chloride (ALT711)

Cat. No.: GC33761

Chemical Properties

Cas. No. 341028-37-3

SMILES O=C(C1=CC=CC=C1)C[N+]2=CSC(C)=C2C.[Cl-]

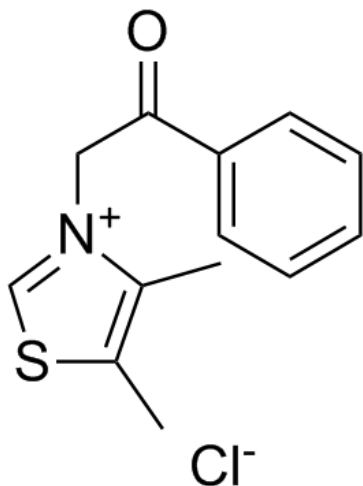
Formula $C_{13}H_{14}ClNOS$ M.Wt 267.77

Solubility Water : 50 mg/mL (186.73 mM); DMSO : ≥ 25 mg/mL (93.36 mM) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines Human breast cancer MDA-MB-231 cells

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com

Address: 10292 Central Ave. #205, Montclair, CA, USA

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MDA-MB-231 cells were embedded in collagen gels glycosylated with glucose or Preparation Method ribose. For Alagebrium chloride treated conditions, samples were treated with 1mM Alagebrium chloride overnight in media for 16h.

Reaction
Conditions 1mM; 16h

Applications Increases in cell spreading, contractility, migration velocity, distance travelled, and motile fraction due to glycation could be inhibited by Alagebrium chloride to disrupt AGEs.

Animal experiment [2]:

Animal models Male Sprague-Dawley rats

Healthy male Sprague-Dawley rats that weighed 200-250g received intraperitoneal injections of streptozotocin (STZ) at a dose of 80mg/kg. The rats, Preparation Method which develop diabetes, then received long-acting insulin (2U/day daily) after the STZ injection. Sixteen weeks later, rats were randomized into two study groups: an Alagebrium chloride (10mg/kg) treatment group and a control group.

Dosage form 10mg/kg; mixed into chow; daily for 4 weeks

Applications Alagebrium chloride treatment in diabetic rats significantly inhibits neointimal hyperplasia and inhibited the increase in formation of connective tissue and extracellular matrix.

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References:

- [1] Rowe M M, Wang W J, Taufalele P V, Reinhart-King C A. AGE-breaker ALT711 reverses glycation-mediated cancer cell migration. *Soft Matter*. 2022 Nov 16;18(44):8504-8513.
- [2] Kim J B, Song B W, Park S H, et al. Alagebrium chloride, a novel advanced glycation end-product cross linkage breaker, inhibits neointimal proliferation in a diabetic rat carotid balloon injury model. *Korean Circ J*. 2010 Oct;40(10):520-6.

Background

Alagebrium chloride (ALT711) is a thiazolium derivative which breaks advanced glycation end products (AGE) crosslinks. Alagebrium chloride has been used to study the treatment of diastolic heart failure, arterial stiffness, diabetic nephropathy, and hypertension^{[1][2]}.

In vitro, human breast cancer MDA-MB-231 cells were embedded in collagen gels glycated with glucose or ribose at different concentrations. Samples were treated with 1mM Alagebrium chloride overnight for about 16h in media. Increases in cell spreading, contractility, migration velocity, distance travelled, and motile fraction due to glycation could be inhibited by Alagebrium chloride to disrupt AGEs^[3]. Rat cardiomyocytes were treated with AGE-bovine serum albumin or Alagebrium chloride (10mg/L) for 48 hours in complete growth medium. Alagebrium chloride exerts protective effect on AGEs-treated cardiomyocytes by inhibiting the increased oxidative stress^[4].

In vivo, the streptozotocin-induced diabetic rats were treated with 10mg/kg Alagebrium chloride for 4 weeks. Alagebrium chloride was mixed with pulverized standard chow to a final Alagebrium chloride concentration of 0.015% (wt/wt). Alagebrium chloride treatment in diabetic rats significantly inhibits neointimal hyperplasia and inhibited the increase in formation of connective tissue and extracellular matrix^[5]. Wide-typed and RAGE^{-/-} C57BL/6J diabetic mice were randomized to receive Alagebrium chloride by oral gavage at 1mg/kg/day for 24 weeks. Alagebrium chloride significantly attenuated diabetes-driven albuminuria, glomerulosclerosis, and tubulointerstitial expansion, restored renal mitochondrial ATP production, and reduced both cytosolic and mitochondrial superoxide generation^[6]. Female non-obese diabetic (NOD) mice were either given no treatment or daily, subcutaneous injections of Alagebrium chloride (1mg/kg/day) for 50 days from day 50 to 100 of life. Alagebrium chloride therapy from modestly delayed the age of diabetes onset, but there were no

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differences in disease incidence. Female NOD^{ShiLt} mice were received subcutaneous injections of Alagebrium chloride (1mg/kg/day) for 28–32 days from day 50 of life. Short-Term Therapy with Alagebrium chloride slightly Increases Insulin Secretion^[7].

References:

- [1] William C Little W C, Zile M R, Kitzman D W, et al. The effect of alagebrium chloride (ALT-711), a novel glucose cross-link breaker, in the treatment of elderly patients with diastolic heart failure. *J Card Fail.* 2005 Apr;11(3):191-5.
- [2] Wang H F, Weihrauch D, Kersten J R, et al. Alagebrium inhibits neointimal hyperplasia and restores distributions of wall shear stress by reducing downstream vascular resistance in obese and diabetic rats. *Am J Physiol Heart Circ Physiol.* 2015 Oct;309(7):H1130-40.
- [3] Rowe M M, Wang W J, Taufalele P V, Reinhart-King C A. AGE-breaker ALT711 reverses glycation-mediated cancer cell migration. *Soft Matter.* 2022 Nov 16;18(44):8504-8513.
- [4] Guo Y, Lu M, Qian J, Cheng Y L. Alagebrium chloride protects the heart against oxidative stress in aging rats. *J Gerontol A Biol Sci Med Sci.* 2009 Jun;64(6):629-35.
- [5] Kim J B, Song B W, Park S H, et al. Alagebrium chloride, a novel advanced glycation end-product cross linkage breaker, inhibits neointimal proliferation in a diabetic rat carotid balloon injury model. *Korean Circ J.* 2010 Oct;40(10):520-6.
- [6] Tan A L Y, Sourris K C, Harcourt B E, et al. Disparate effects on renal and oxidative parameters following RAGE deletion, AGE accumulation inhibition, or dietary AGE control in experimental diabetic nephropathy. *Am J Physiol Renal Physiol.* 2010 Mar;298(3):F763-70.
- [7] Borg D J, Faridi P, Giam K L, et al. Short Duration Alagebrium Chloride Therapy Prediabetes Does Not Inhibit Progression to Autoimmune Diabetes in an Experimental Model. *Metabolites.* 2021 Jun 28;11(7):426.

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