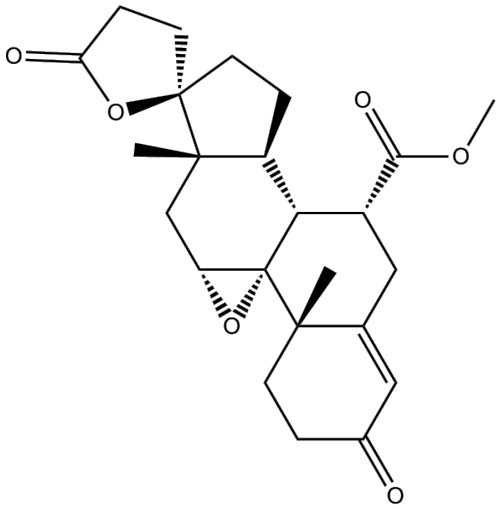
Product Data Sheet

Product Name: Eplerenone
Cat. No.: GC15831

Chemical Properties

Cas. No.	107724-20-9		
Chemical Name	(2'R,6R,6aR,6bS,9aS,10aR,11aR,11bS)-methyl 9a,11b-dimethyl-3,5'-dioxo-2,3,4',5,5',6,6a,6b,7,8,9a,10,10a,11b-tetradecahydro-1H,3'H-spiro[cyclopenta[1,2]phenanthro[4,4a-b]oxirene-9,2'-furan]-6-carboxylate		
SMILES	O=C(C(C1([H])[H])([H])C2([H])C3(C(C([H])([H])C4([H])[H])(C([H])([H])[H])C1=C([H])C4=O)OC3([H])C([H])([H])C5(C([H])([H])[H])C2([H])C([H])([H])C([H])([H])[C@@]5(C([H])([H])C6([H])[H])OC6=O)OC([H])([H])[H]		
Formula	$C_{24}H_{30}O_6$	M.Wt	414.49
Solubility	≥ 4.6mg/mL in DMSO with gentle warming	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

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Cell experiment [1]:

Cell lines	Cardiomyocytes and fibroblasts
Preparation Method	After preparing the cardiomyocyte and fibroblast cultures, both were incubated in a 37°C 5% CO_2 incubator for approximately 36h to allow the cells to fully adhere. 10^4 cells were seeded per well in a 96-well plate and analyzed after treatment with spironolactone (1μM), Eplerenone (1μM), and mifepristone (10μM) for 0, 24, and 48h. In all assays, aldosterone (Sigma-Aldrich) was added to the cell culture medium for 10min only on the day of the assay.
Reaction Conditions	1μM; 24, 48h
Applications	Both spironolactone and Eplerenone were able to promote cardiomyocyte proliferation in the absence and presence of aldosterone and to increase cGMP levels.

Animal experiment [2]:

Animal models	Wistar rats

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Preparation Method	Eplerenone or vehicle was given to male Wistar rats (50mg/kg, twice daily) for 7 days before unilateral ureteral obstruction (UUO) and for an additional 28 days after surgery. Body weight, blood pressure, renal histo-morphology, immune-staining for macrophages, monocyte chemotactic protein-1, proliferating cell nuclear antigen, α-smooth muscle actin, and serum and urine markers of renal function and oxidative stress were determined for both groups on 7, 14, and 28 days after surgery.
Dosage form	50mg/kg; p.o.
Applications	Eplerenone inhibited the development of renal fibrosis, inflammation (macrophage and monocyte infiltration), interstitial cell proliferation, and activation of interstitial cells (α-SMA expression). Epleronone also reduced oxidative stress.

References:

[1]Hermidorff M M, Faria G O, Amâncio G C S, et al. Non-genomic effects of spironolactone and eplerenone in cardiomyocytes of neonatal Wistar rats: do they evoke cardioprotective pathways?[J]. Biochemistry and Cell Biology, 2015, 93(1): 83-93.
[2]Chen H, Sun F, Zhong X, et al. Eplerenone-mediated aldosterone blockade prevents renal fibrosis by reducing renal inflammation, interstitial cell proliferation and oxidative stress[J]. Kidney and Blood Pressure Research, 2013, 37(6): 557-566.

Background

Eplerenone is an orally active mineralocorticoid receptor (MR) antagonist that blocks the effects of aldosterone, with an IC_{50} value of 0.081μM[1, 2]. Eplerenone can be used in the study of hypertension, atherosclerosis, chronic systolic heart failure and cardiovascular diseases[3].

In vitro, Eplerenone (1μM) treatment of cardiomyocytes and fibroblasts for 24-48h promoted

cardiomyocyte proliferation and increased cGMP activity[4]. Eplerenone (2μM) treatment of primary cultures of venous endothelial cells (EAHy 926) and human coronary artery endothelial cells (HCAEC) reversed aldosterone-induced endothelial cell growth and sclerosis in vitro[5].

In vivo, oral administration of Eplerenone (50mg/kg) to rats after unilateral ureteral obstruction (UUO) surgery inhibited the development of renal fibrosis, inflammation (macrophage and monocyte infiltration), interstitial cell proliferation and interstitial cell activation (α-SMA expression), and reduced oxidative stress[6]. Subcutaneous administration of Eplerenone (30mg/kg) to rats after unilateral hindlimb ischemia surgery significantly increased the number, colony formation and migration of endothelial progenitor cells (EPCs) after hindlimb ischemia, and decreased the expression of NAD(P)H oxidase p22 phox, p47 phox, gp91 phox and the expression of serum and glucocorticoid-induced aldosterone responsive kinase 1 (Sgk1)[7].

References:
[1] Coleman C I, Song J C, White C M. Eplerenone[J]. Formulary, 2002, 37(10): 514.
[2] Dhillon S. Eplerenone: a review of its use in patients with chronic systolic heart failure and mild symptoms[J]. Drugs, 2013, 73: 1451-1462.
[3] Funder J W. Eplerenone: hypertension, heart failure and the importance of mineralocorticoid receptor blockade[J]. Future Cardiology, 2006, 2(5): 535-541.
[4] Hermidorff M M, Faria G O, Amâncio G C S, et al. Non-genomic effects of spironolactone and eplerenone in cardiomyocytes of neonatal Wistar rats: do they evoke cardioprotective pathways?[J]. Biochemistry and Cell Biology, 2015, 93(1): 83-93.
[5] Hillebrand U, Schillers H, Riethmüller C, et al. Dose-dependent endothelial cell growth and stiffening by aldosterone: endothelial protection by eplerenone[J]. Journal of hypertension, 2007, 25(3): 639-647.
[6] Chen H, Sun F, Zhong X, et al. Eplerenone-mediated aldosterone blockade prevents renal fibrosis by reducing renal inflammation, interstitial cell proliferation and oxidative stress[J]. Kidney and Blood Pressure Research, 2013, 37(6): 557-566.
[7] Kobayashi N, Fukushima H, Takeshima H, et al. Effect of eplerenone on endothelial progenitor cells and oxidative stress in ischemic hindlimb[J]. American journal of hypertension, 2010, 23(9): 1007-1013.