# Product data sheet

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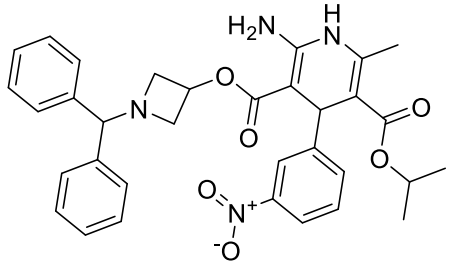
|---|---|
| MedKoo Cat#: 326711<br>Name: Azelnidipine<br>CAS#: 123524-52-7<br>Chemical Formula: $C_{33}H_{34}N_4O_6$<br>Exact Mass: 582.2478<br>Molecular Weight: 582.657 |  |
| Product supplied as: | Powder |
| Purity (by HPLC): | ≥ 98% |
| Shipping conditions | Ambient temperature |
| Storage conditions: | Powder: -20°C 3 years; 4°C 2 years. |
| | In solvent: -80°C 3 months; -20°C 2 weeks. |

**1. Product description:**
Azelnidipine, also known as CS 905 and CCRIS 8650, is a dihydropyridine calcium channel blocker. It is sold in Japan by Daiichi-Sankyo pharmaceuticals, Inc. Unlike nicardipine, it has a gradual onset and has a long-lasting hypotensive effect, with little increase in heart rate.

**2. CoA, QC data, SDS, and handling instruction**
SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

**3. Solubility data**

| Solvent | Max Conc. mg/mL | Max Conc. mM |
|---|---|---|
| DMSO | 82.0 | 140.73 |
| Ethanol | 11.0 | 18.88 |

**4. Stock solution preparation table:**

| Concentration / Solvent Volume / Mass | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 1.72 mL | 8.58 mL | 17.16 mL |
| 5 mM | 0.34 mL | 1.72 mL | 3.43 mL |
| 10 mM | 0.17 mL | 0.86 mL | 1.72 mL |
| 50 mM | 0.03 mL | 0.17 mL | 0.34 mL |

**5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator**
Please refer the product web page under section of "Calculator"

**6. Recommended literature which reported protocols for in vitro and in vivo study**
In vitro study

1. Komoda H, Shiraki A, Oyama JI, Nishikido T, Node K. Azelnidipine Inhibits the Differentiation and Activation of THP-1 Macrophages through the L-Type Calcium Channel. J Atheroscler Thromb. 2018 Aug 1;25(8):690-697. doi: 10.5551/jat.41798. Epub 2018 Feb 3. PMID: 29398679; PMCID: PMC6099069.
2. Teng T, Ridgley DM, Tsoy A, Sun GY, Askarova S, Lee JC. Azelnidipine Attenuates the Oxidative and NFκB Pathways in Amyloid-β-Stimulated Cerebral Endothelial Cells. ACS Chem Neurosci. 2019 Jan 16;10(1):209-215. doi: 10.1021/acschemneuro.8b00368. Epub 2018 Nov 8. PMID: 30399318; PMCID: PMC8091167.

In vivo study

1. Kurobe H, Matsuoka Y, Hirata Y, Sugasawa N, Maxfield MW, Sata M, Kitagawa T. Azelnidipine suppresses the progression of aortic aneurysm in wild mice model through anti-inflammatory effects. J Thorac Cardiovasc Surg. 2013 Dec;146(6):1501-8. doi: 10.1016/j.jtcvs.2013.02.073. Epub 2013 Mar 25. PMID: 23535154.
2. Kain V, Kumar S, Sitasawad SL. Azelnidipine prevents cardiac dysfunction in streptozotocin-diabetic rats by reducing intracellular calcium accumulation, oxidative stress and apoptosis. Cardiovasc Diabetol. 2011 Nov 4;10:97. doi: 10.1186/1475-2840-10-97. PMID: 22054019; PMCID: PMC3234183.

# Product data sheet

**7. Bioactivity**

Biological target:

Azelnidipine(CS 905; Calblock) is a novel dihydropyridine derivative, a L-type calcium channel blocker, and an antihypertensive.

In vitro activity

THP-1 cells were incubated in culture medium in the absence or presence of 10 μM azelnidipine for 24 h (Fig. 1A). In the absence of azelnidipine, most floating THP-1 cells adhered to the culture dish after stimulation with PMA. In contrast, in the presence of azelnidipine, the number of attached THP-1 cells decreased. The ratio of floating cells to total cells increased from 0.24 to 0.49 (Fig. 1B). To investigate the dose dependency and time course, 0, 1, 10, or 30 μM of azelnidipine were used for up to 4 days. The most effective concentration to prevent adherence of PMA treated THP-1 cells was 10 μM; besides treatment of 30 μM azelnidipine and 50 ng/mL PMA caused cell deaths (Fig. 1C). Azelnidipine was still effective for THP-1 differentiation into macrophage-like morphology extended incubation. Those cells treated with azelnidipine remained round shaped even on day 4 compared with the cells not treated with azelnidipine that showed astrocytic or spider shape (Fig. 1D). Although stimulation with PMA increased the expressions of Apo E (A), MMP9 (B), and LOX-1 (C) mRNA, incubation with azelnidipine for 48 h decreased these expressions by PMA significantly in THP-1 cells (Fig. 2). Azelnidipine inhibited the increase in the uptake of acetylated LDL by THP-1 cells 48, 72, and 96 h after stimulation with PMA. Azelnidipine also reduced the expression of the adhesion molecules ICAM-1 (Fig. 4A) and LOX-1 (Fig. 4B). To investigate the signaling pathway, phosphorylation of MAP kinases was investigated (Fig. 4C). The activation of p38 and JNK were decreased by azelnidipine treatment.

Reference: J Atheroscler Thromb. 2018 Aug 1; 25(8): 690–697. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6099069/

In vivo activity

This study was designed to examine the effect of long-acting calcium channel blocker (CCB), Azelnidipine (AZL) on contractile dysfunction, intracellular calcium (Ca2+) cycling proteins, stress-activated signaling molecules and apoptosis on cardiomyocytes in diabetes. Adult male Wistar rats were made diabetic by a single intraperitoneal (IP) injection of streptozotocin (STZ). STZ-induced diabetic animals showed stable signs of diabetes, including hyperglycemia, reduced levels of insulin. Also there was a noted increase heart/body weight ratio (H/BW). Diabetic rats treated with AZL showed improvement in these physiological parameters. AZL treatment completely abolished the diabetes-induced abnormalities of PS, TPS and TR90 (Figure 1A-D). The maximal velocities of shortening (+dl/dt) and relengthening (-dl/dt) were significantly reduced by diabetes and AZL treatment restored the diabetes-induced dysfunction (Figure1A and 1B). Furthermore, 12-weeks of AZL treatment significantly ablated intracellular Ca2+ abnormalities in STZ treated diabetic rats. Consistent with its response in cardiomyocyte shortening, AZL treatment improved diabetes induced changes in Ca2+ homeostasis including elevated resting intracellular Ca2+ levels, depressed intracellular Ca2+ rise in response to electrical stimuli and prolonged intracellular Ca2+ decay (Figure 2 A-C). AZL in this study not only improves cardiac contractile function but also offers protection against oxidative stress, apoptosis and ultimately leading diabetic cardiomyopathy.

Reference: Cardiovasc Diabetol. 2011 Nov 4;10:97. https://pubmed.ncbi.nlm.nih.gov/22054019/