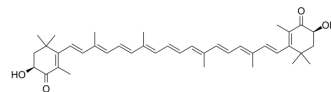


Astaxanthin

| | |
|---------------------------|--|
| Cat. No.: | HY-B2163 |
| CAS No.: | 472-61-7 |
| Molecular Formula: | C ₄₀ H ₅₂ O ₄ |
| Molecular Weight: | 596.84 |
| Target: | PPAR; Reactive Oxygen Species; STAT; NF-κB; Apoptosis |
| Pathway: | Cell Cycle/DNA Damage; Metabolic Enzyme/Protease; Vitamin D Related/Nuclear Receptor; Immunology/Inflammation; NF-κB; JAK/STAT Signaling; Stem Cell/Wnt; Apoptosis |
| Storage: | -20°C, protect from light, stored under nitrogen * The compound is unstable in solutions, freshly prepared is recommended. |



SOLVENT & SOLUBILITY

| | | | | | |
|---|---|--------------------------|--------------|-----------|------------|
| In Vitro | DMSO : 2 mg/mL (3.35 mM; Need ultrasonic) Acetone : < 1 mg/mL (insoluble) | | | | |
| | | Solvent Concentration | Mass 1 mg | 5 mg | 10 mg |
| | Preparing Stock Solutions | 1 mM | 1.6755 mL | 8.3775 mL | 16.7549 mL |
| | | 5 mM | --- | --- | --- |
| | | 10 mM | --- | --- | --- |
| Please refer to the solubility information to select the appropriate solvent. | | | | | |
| In Vivo | 1. Add each solvent one by one: 0.5% CMC-Na/saline water Solubility: 3.33 mg/mL (5.58 mM); Suspended solution; Need ultrasonic and warming 2. Add each solvent one by one: 20% HP-β-CD in saline Solubility: 3.33 mg/mL (5.58 mM); Suspended solution; Need ultrasonic and warming | | | | |

BIOLOGICAL ACTIVITY

| | | |
|-------------------------------------|---|-------|
| Description | Astaxanthin, the red dietary carotenoid, is an orally effective and potent antioxidant. Astaxanthin inhibits NF-κB and down-regulates VEGF in blood glucose. Astaxanthin exerts anti-cancer cell proliferation, increases apoptosis, impairs migration and invasion by activating PPAR γ and reducing the expression of STAT3. Astaxanthin also has neuroprotective and anti-inflammatory activity and can be used in studies of cancer, diabetic retinopathy, cardiovascular disease, and in the coloring of animal feed ^{[1][2][3][4][5]} . | |
| IC₅₀ & Target | PPAR γ | STAT3 |
| In Vitro | Astaxanthin (50, 100, 150, 200 μ M; 48 h) inhibits the proliferation of DU145 cells (IC ₅₀ <200 μ M) ^[1] . | |

Astaxanthin (200 μ M; 24 h) reduces the expression of STAT3 and the related pathway proteins (at both protein and mRNA levels) by inhibiting proliferation, increasing apoptosis and weakening migration and invasion^[1]

Astaxanthin protects RPE cells from abnormal activation and oxidative stress (induced by high glucose) by down-regulating VEGF in high glucose at protein levels^[2].

Astaxanthin (1-50 μ M; 72 h) upregulates protein expression of PPAR γ in time- and dose-dependent manners in K562 cells^[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Apoptosis Analysis^[1]

| | |
|------------------|---|
| Cell Line: | DU145 cells |
| Concentration: | 200 μ M (pre-incubation) |
| Incubation Time: | 24 h |
| Result: | Increased the percentage of apoptotic cells from 8.5% to 13.1% (compared to blank control). |

Cell Migration Assay ^[1]

| | |
|------------------|--|
| Cell Line: | DU145 cells |
| Concentration: | 200 μ M |
| Incubation Time: | 24 h |
| Result: | Decreased the migration and invasion of DU145 cells (about 41% of cells could not pass from one chamber to another, and 36% cells could not pass through the transwell membrane as compared to the control group). |

Cell Proliferation Assay^[2]

| | |
|------------------|---|
| Cell Line: | ARPE-19 cells |
| Concentration: | 50 μ M (pre-incubation) |
| Incubation Time: | 7 days |
| Result: | Significantly decreased cell proliferation exposed to high glucose. |

Western Blot Analysis^[1]

| | |
|------------------|--|
| Cell Line: | DU145 cells |
| Concentration: | 200 μ M |
| Incubation Time: | 24 h |
| Result: | Reduced the expression of STAT3 at both protein and mRNA levels (downregulated the protein expression of JAK2, BCL-2 and NF- κ B and upregulated the protein expression of BAX, Caspase3 and Caspase9). |

Western Blot Analysis^[3]

| | |
|------------------|--------------|
| Cell Line: | K562 cells |
| Concentration: | 1-50 μ M |
| Incubation Time: | 72 h |

| | |
|---------|--|
| Result: | Significantly promoted PPAR γ protein expression in time- and dose-dependent manners. |
|---------|--|

In Vivo

Astaxanthin (200 mg/kg; intragastric administration; once daily for 3 weeks) inhibits the growth of DU145 tumor xenografts in nude mice^[1].

Astaxanthin (125 or 500 mg/kg; in animal feedings; 7 days) provides significant cardioprotection and reduces oxidative stress in rats^[4].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

| | |
|---------------|---|
| Animal Model: | Nude mice (approximately 20 g; DU145 tumor xenografts model) ^[1] . |
|---------------|---|

| | |
|---------|-----------|
| Dosage: | 200 mg/kg |
|---------|-----------|

| | |
|-----------------|--|
| Administration: | Intragastric administration; once daily for 3 weeks. |
|-----------------|--|

| | |
|---------|--|
| Result: | Exerted a significant inhibitory effect on tumor growth. |
|---------|--|

| | |
|---------------|--|
| Animal Model: | Female C57BL/6 mice (7 weeks old) ^[4] . |
|---------------|--|

| | |
|---------|------------------|
| Dosage: | 125 or 500 mg/kg |
|---------|------------------|

| | |
|-----------------|-----------------------------|
| Administration: | In animal feedings; 7 days. |
|-----------------|-----------------------------|

| | |
|---------|---|
| Result: | Significantly reduced mean infarct size in the two treated groups (125 and 500 mg/kg) to 45.1% and 39.1%, respectively. Exhibited myocardial salvage of 26 and 36% for 125 and 500 mg/kg groups, respectively. Significantly reduced level of 9-HETE in a dose-dependent manner. 9-HETE is a regioisomer oxidation product of arachidonic acid believed to be a product of free radical-mediated oxidation. |
|---------|---|

CUSTOMER VALIDATION

- Biomed Pharmacother. 2023 Sep 10;167:115471.
- Chem Biol Interact. 2023 Aug 28;110684.
- Exp Biol Med. 2023 Jan 23;15353702221147568.
- Acta Histochem. 2023 Jun 19;125(6):152069.
- Research Square Preprint. 2022 May.

See more customer validations on www.MedChemExpress.com

REFERENCES

[1]. Sun SQ, et al. Anti-Tumor Effects of Astaxanthin by Inhibition of the Expression of STAT3 in Prostate Cancer. Mar Drugs. 2020 Aug 7;18(8):415.

[2]. Fu D, et al. Effect of astaxanthin on retinal pigment epithelial cells in high glucose: an in-vitro study. Biomed Res, 2017, 28(15): 6839-6843.

[3]. Zhang X, et al. Carotenoids inhibit proliferation and regulate expression of peroxisome proliferators-activated receptor gamma (PPAR γ) in K562 cancer cells. Arch Biochem Biophys. 2011 Aug 1;512(1):96-106.

[4]. Gross GJ, et al. Seven day oral supplementation with Cardax (disodium disuccinate astaxanthin) provides significant cardioprotection and reduces oxidative stress in

rats. Mol Cell Biochem. 2006 Feb;283(1-2):23-30.

[5]. Zhang L, et al. Multiple Mechanisms of Anti-Cancer Effects Exerted by Astaxanthin. Mar Drugs. 2015 Jul 14;13(7):4310-30.

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA