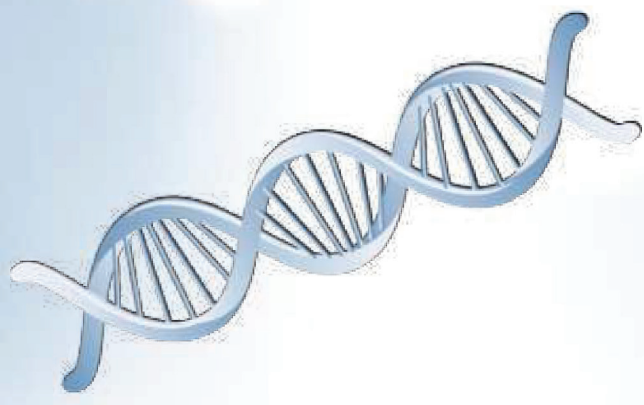
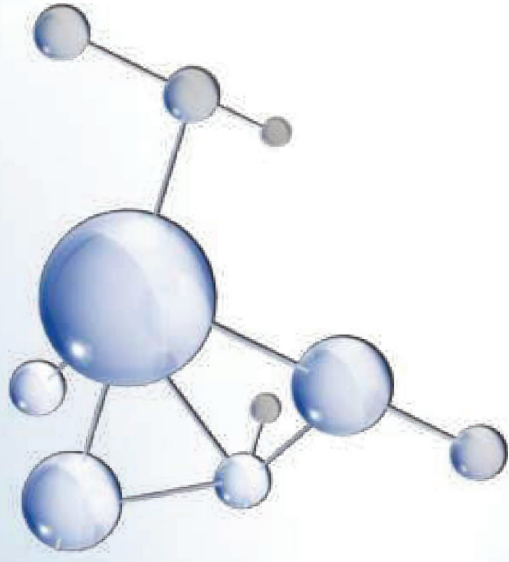




BeriCos® Thiotaurine

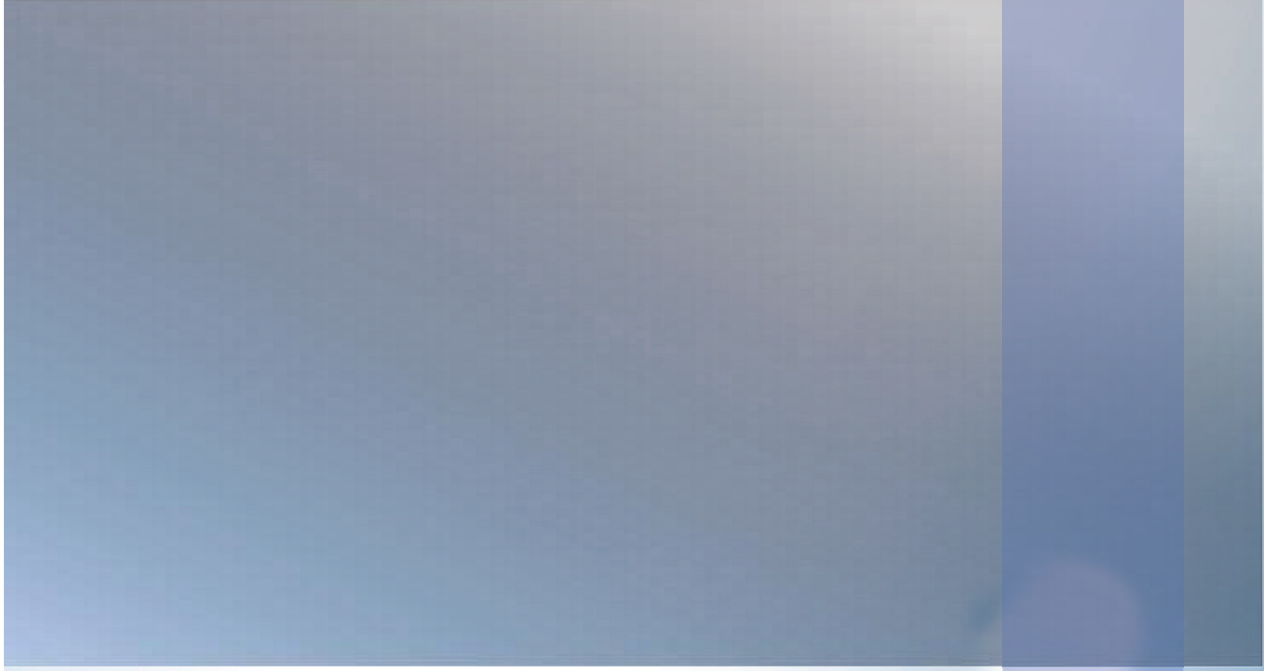


BERI PHARMA CO., LTD

- Effective Ingredient Explorer -
- Dedicated to Providing Customers with Professional Enabling Solutions -



PART 01



Company Profile

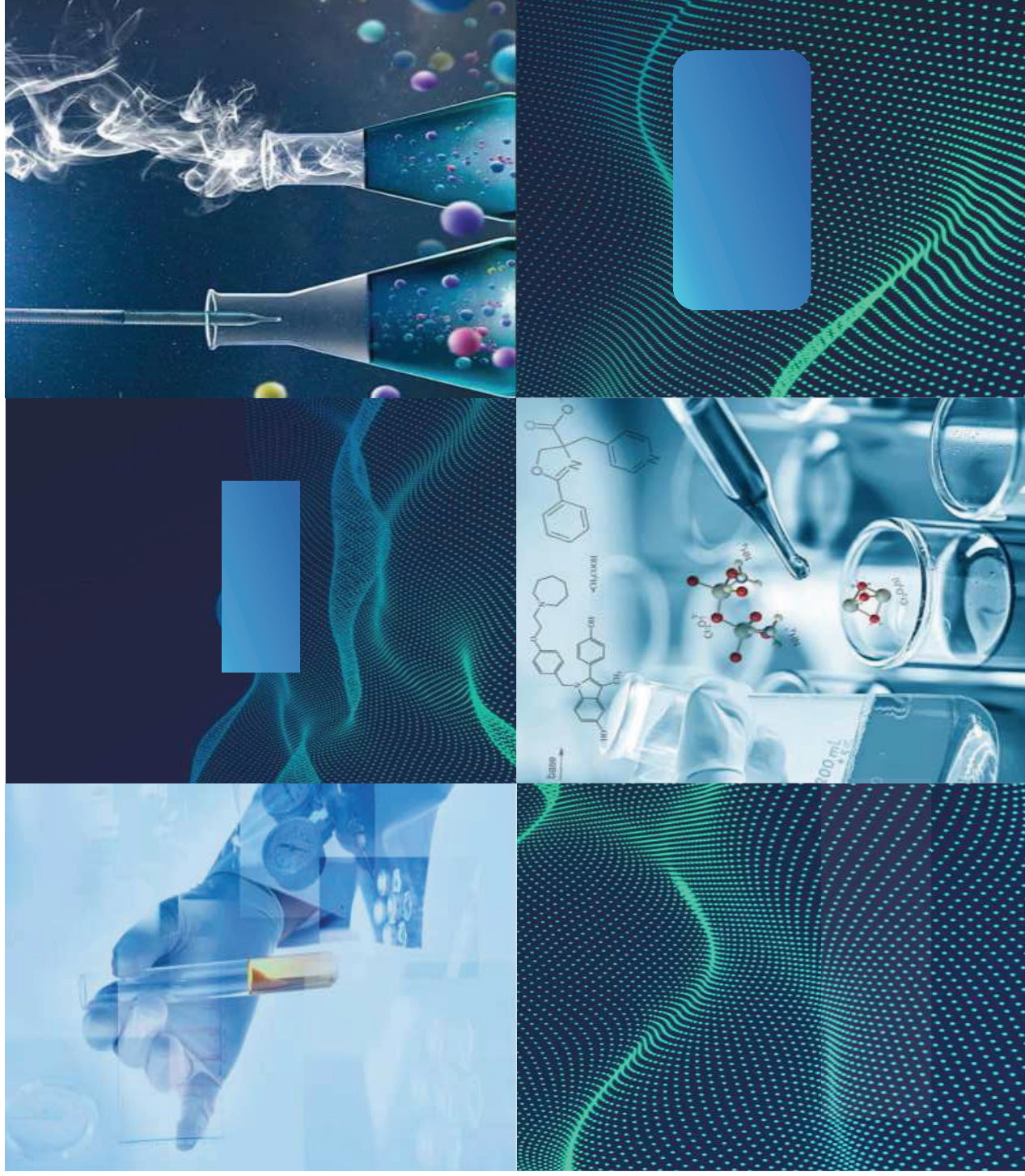
BERI PHARMA CO., LTD. was established in 2015 with a registered capital of 10.889 million RMB. It is an innovation-driven enterprise focusing on the R&D and manufacturing of raw materials & preparations for general health (pharmaceutical, cosmetic, health-care).

Adhering to the concept that health and beauty should shine from the inside out, the company is committed to caring for people's health and beauty from the inside out through three directions: pharmaceutical, functional skin care, and nutraceutical additives.



Research Fields

Focus on Cosmetic



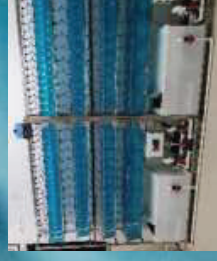
Research & Development

2200m²

R&D Center

The R & D center has chemical synthesis laboratory, molecular biology laboratory, biochemistry laboratory, inoculation room, fermentation laboratory, separation and purification room, preparation room, nano and supramolecular laboratory, quality analysis room, safety and efficacy evaluation laboratory, etc.

R & D Platform



Equipments

Equipped with liquid phase, gas phase, mass spectrometry, electrospray detector, differential detector, preparative chromatography, microplate reader, polarimetry and other analytical instruments, as well as 3D facial imager, zebrafish system, stereo microscope, skin elasticity meter, cuticle Efficacy testing instruments such as layer hydration meter, skin sebum meter, transepidermal water loss meter, etc., including nucleic acid/protein electrophoresis instrument, ordinary/fluorescence quantitative PCR instrument, magnetic bead extraction and purification system, full-wavelength microplate reader, micro ultrasonic centrifugation Xinyi, protein chromatograph and other research and development, analysis and testing instruments and efficacy testing instruments provide strong data support for product research and development.

R & D Team

The R&D team is led by scientists who have been selected into the list of the world's top biological and biochemical scientists, and consists of chemical synthesis R&D engineers, synthetic biology engineers, preparation delivery engineers, formulation engineers, analytical testing engineers, safety and toxicology researchers, regulatory researchers, efficacy evaluation researchers, etc. Composed of more than fifty team members.

Chief Scientist Xu Baojun Professor / Ph.D.

From 2020 to 2023, he has been selected into the "**Lifetime Scientific Influence**" and "**Annual Scientific Influence**" lists of the top **2% of the world's top scientists for four consecutive years** . Selected into **the world's top 100,000 scientists in 2022** , selected into **the world's top biological and biochemical scientists** in 2023 , and a fellow of the Royal Society of Chemistry. He has published more than 260 papers in SCI international journals, 8 ESI highly cited papers, and 2 ESI hot papers.

Honors & Qualifications



- National High-tech Enterprise
- Specialized Innovation Enterprise of Guangdong Province
- Technical Enterprise of Guangdong Province
- Innovative Enterprise of Guangdong ProvinceZhuhai
- TOP 100 of Innovation Enterprises in Zhuhai
- Innovation-driven Enterprise of Zhuhai City
- Engineering Research Center of Cosmetic Ingredient Preparation

[illegible][illegible]


**OCCUPATIONAL HEALTH AND SAFETY
MANAGEMENT SYSTEM CERTIFICATE**
Certificate No. CQC23N000380M1484

We hereby verify that
BEIJI PHARMA CO., LTD.
Beijing Pharmaceutical Co., Ltd.
Beijing Pharmaceutical Co., Ltd.

ISO 45001:2018

The Occupational Health and Safety Management applies to the following area:
Production and related management activities of pharmaceutical products, chemical raw materials and non-pharmaceutical intermediates (7 types of dangerous goods)

Has been awarded this certificate with compliance with the standard

Certified since: April 16, 2023 Valid from: April 16, 2023 Valid until: April 16, 2024

China Quality Certification Centre
Address: 6, 10, 18, Zhongguamen Road, Beijing 100045, China
Tel: 86-10-64416611 Fax: 86-10-64416612 E-mail: cqc@ccq.com.cn

谢肇熙
Signed by: Mr. Zhixi

CHINA QUALITY CERTIFICATION CENTRE
Address: 6, 10, 18, Zhongguamen Road, Beijing 100045, China
Tel: 86-10-64416611 Fax: 86-10-64416612 E-mail: cqc@ccq.com.cn

ISO 45001

Single Ingredient

Whitening & Anti-oxidation

- BeriCos® VCIP | Ascorbyl Tetraispalmitate (VC-IP)
- BeriCos® EAA | Ethyl Ascorbic Acid (EAA)
- BeriCos® VCG | Ascorbyl Glucoside (VCG/AA2G)
- BeriCos® W-37 | Phenylethyl Resorcinol (377)
- BeriCos® W-47 | 4-Butylresorcinol
- BeriCos® 4MSK | Potassium Methoxysalicylate
- BeriCos® Pterostilbene | Pterostilbene
- BeriCos® GSH | Glutathione (GSH)
- BeriCos® FerAC | Ferulic Acid
- BeriCos® TA | Tranexamic Acid
- BeriCos® EUK 134 | EUK 134
- BeriCos® Peptidomidex | Peptidomidex
- BeriCos® Ergothioneine | Ergothioneine
- BeriCos® Monobenzone | Monobenzone

Anti-inflammatory & Repair

- BeriCos® Ectoin | Ectoin
- BeriCos® Ceramide | Ceramide NP
- BeriCos® BeCalmin | Hydroxyphenyl Propamidobenzoic Acid

Moisturizing & Anti-aging

- BeriCos® GG | Glyceryl Glucoside (50%)
- BeriCos® Proxylane-POW | Hydroxypropyl Terrahydropy Rantriol

- BeriCos® HPR | Hydroxyphenacolone Retinoate
- BeriCos® Chromanol | Dimethylmethoxy Chromanol
- BeriCos® DCP | Dimethylmethoxy Chromanyl Palmitate
- BeriCos® IDBN | Hydroxydecyl Ubiquinone (Idebenone)
- BeriCos® Thiotaureine | Thiotaureine

Sterilization & Acne Treatment & Anti-dandruff

- BeriCos® OCT | Piroctone Olamine (PO; OCT)
- BeriCos® HD-100 | 2-hydroxyethanesulphonic Acid
- BeriCos® PQ73 | Quaternium-73 (Pionin)
- BeriCos® VB₆-Trip | Pyridoxine Tripalmitate
- BeriCos® Azelamide MEA | Azelamide MEA

Anti Hair Loss & Hair-growth

- BeriCos® Copyrral | Pyrrolidinyl Diaminopyrimidine Oxide
- BeriCos® Copexil | Diaminopyrimidine Oxide
- BeriCos® Minoxidil | Minoxidil
- BeriCos® BM | Bimatoprost

Heat Sensitive Agent

- BeriCos® VBE | Vanillyl butyl ether (VBE)

Nano-encapsulated

Nano-encapsulated Products

- BeriCos® VCIP-Nano | Sub-nano emulsion of VC-IP
- BeriCos® Nano-ACE | Sub-nano emulsion of HPR, VC-IP, Tocopheryl Acetate
- BeriCos® 477-Nano | Nano liposome of 4-Butylresorcinol
- BeriCos® GSH-Nano | Nano liposome of Glutathione
- BeriCos® NanoWhite | Multi whitening nano liposome
- BeriCos® AzA-Nano | Nano inclusion complex of Azelaic acid
- BeriCos® ALA-Nano | Nano inclusion complex of Thioctic Acid
- BeriCos® Pterostilbene-Nano | Nano inclusion complex of Pterostilbene

Nano Solid Dispersant

- BeriCos® CoQ 10-Nano | Coenzyme Q10 Nano Solid Dispersant
- BeriCos® HPR-Nano | HPR Nano Solid Dispersant

PART 02



Product information

Product Name : **BeriCos® Thiotaurine**

Alias: 2- Aminoethanethiosulfonic acid

INCI name : Thiotaurine

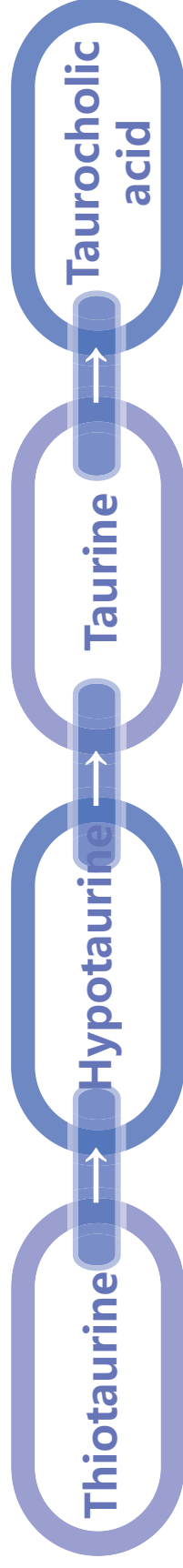
CAS No.: 2937-54-4

Molecular formula: C₂H₇NO₂S₂

Molecular weight: 141.21

Chemical structure :

Mechanism of Action



Thiotaurine

After thiotaurine exerts its powerful antioxidant effect, it is activated and converted into sulfinic acid, and then converted into taurine to continue to exert anti-glycation and anti-inflammatory effects, and taurine will continue to be released further. Produce taurocholic acid to enhance anti-inflammatory and antioxidant effects.

hypotaurine

Hypotaurine is the precursor of taurine. Its chemical structure is similar to that of taurine, and its reducibility is stronger. It has a strong antioxidant

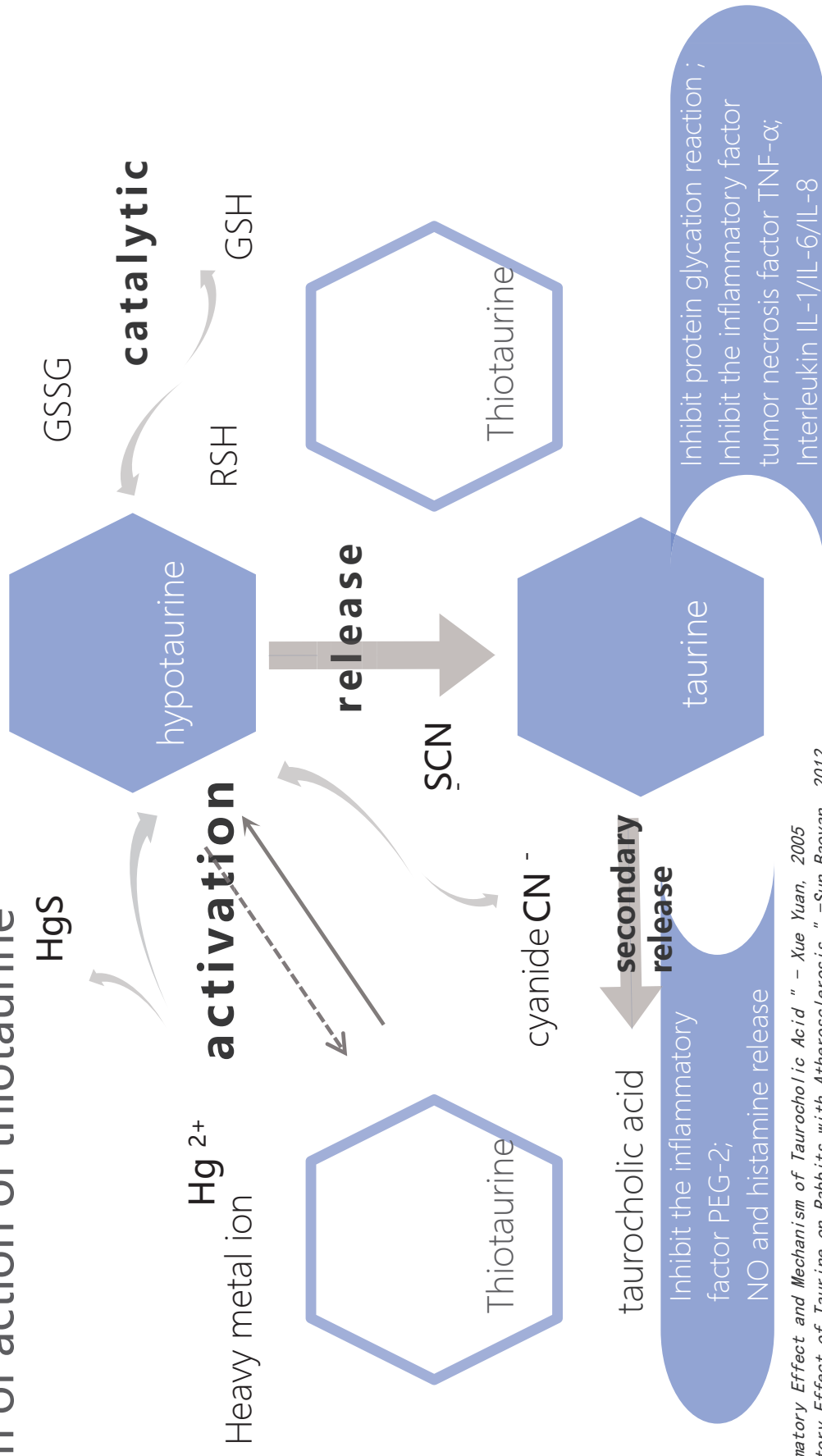
taurine

Taurine is a substance that regulates the normal physiological activities of the body. It has anti-inflammatory, analgesic, maintenance of body osmotic pressure balance, maintenance of normal visual function, regulation of cell calcium balance, hypoglycemia, regulation of nerve conduction, participation in endocrine activities, regulation of lipid digestion and it has a wide range of biological functions such as absorption, increasing cardiac contractility, improving the body's immunity, enhancing the antioxidant capacity of cell membranes, and protecting cardiomyocytes.

taurocholic acid

Taurocholic acid exerts anti-inflammatory effect, and its anti-inflammatory effect is mainly realized by inhibiting the production of inflammatory mediators. It can reduce the permeability of capillaries in inflammatory tissues, inhibit inflammatory swelling. Swelling, inhibit the production of inflammatory mediators such as nitric oxide (NO), prostaglandin E2 (PGE2), and histamine.

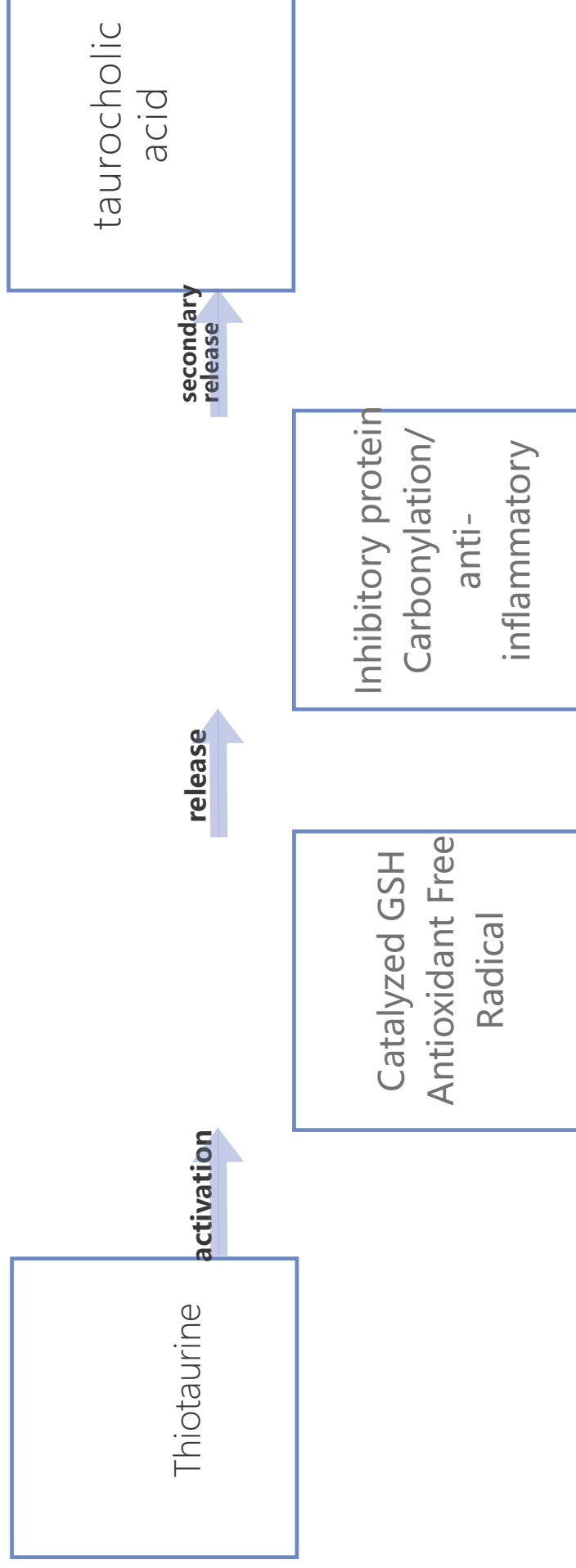
● Mechanism of action of thiotaurine



" Studies on the Anti-inflammatory Effect and Mechanism of Taurocholic Acid " - Xue Yuan, 2005
 " Study on the Anti-inflammatory Effect of Taurine on Rabbits with Atherosclerosis " -Sun Baoyan, 2012
 " Protective effect of hypotauroine on myocardial ischemia-reperfusion injury in isolated rats " - Journal of Bengbu Medical College, 2008

● Mechanism of Action

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● Features

Air Pollution Accelerates Skin Aging



With the rapid development of my country's economy and the acceleration of urbanization, the ensuing environmental pollution problems, especially air pollution problems, have become increasingly prominent; especially in recent years, haze weather has appeared in many areas of my country, and the atmosphere Public health problems caused by pollution have also received attention. Air pollutants mainly include sulfur oxides, nitrogen oxides, atmospheric particulate matter (PM), ozone, etc., which will directly or indirectly affect human health.



More and more evidence shows that air pollution seriously affects skin aging, accelerates skin aging, and destroys skin barrier function, leading to eczema, atopic dermatitis, acne, psoriasis and other debilitating skin diseases. skin disease.

● Features

Effective removal of $\text{OH}^\cdot$, $\text{O}_2^{\cdot-}$ -free radical

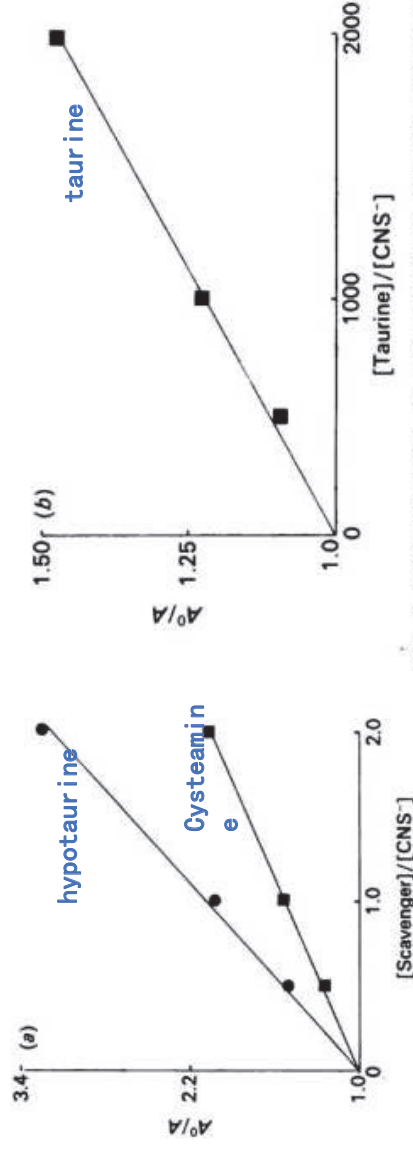


Fig. 1. Determination of rate constants for the reactions of taurine, hypotaurine and cysteamine with $\cdot\text{OH}$ by competition with CNS^-

Rate constants for the reactions of taurine, hypotaurine and cysteamine with $\text{OH}^\cdot$

From the test results of Fig. 1 and Fig. 3, hypotaurine shows a more advantageous effect of scavenging $\cdot\text{OH}$.

In addition, in addition to the scavenging of $\text{OH}^\cdot$, hypotaurine is also very powerful in the scavenging of $\text{O}_2^{\cdot-}$. (Please refer to the content of this document for details)

Sulfuric acid inhibits the effect of $\text{OH}^\cdot$ on the degradation of deoxyribose

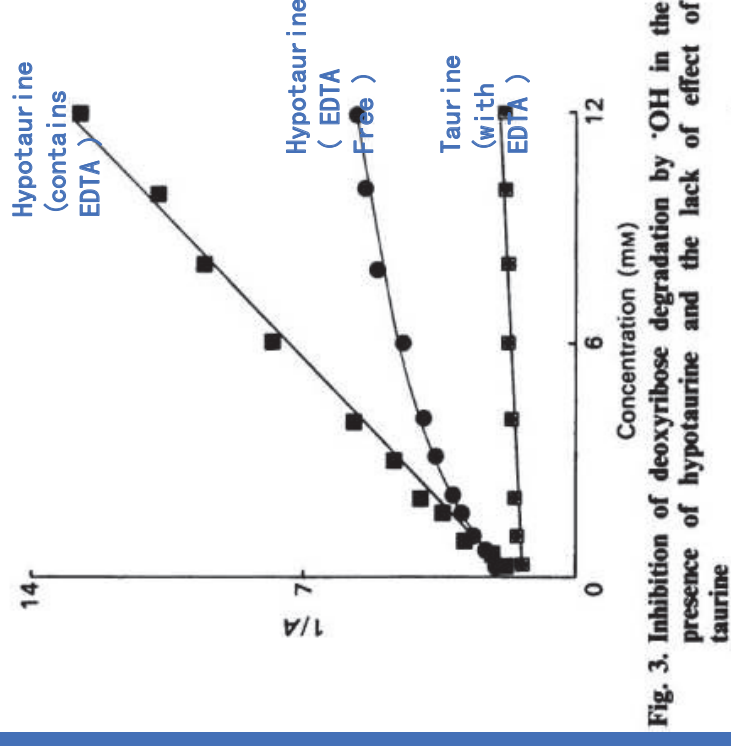


Fig. 3. Inhibition of deoxyribose degradation by $\cdot\text{OH}$ in the presence of hypotaurine and the lack of effect of taurine

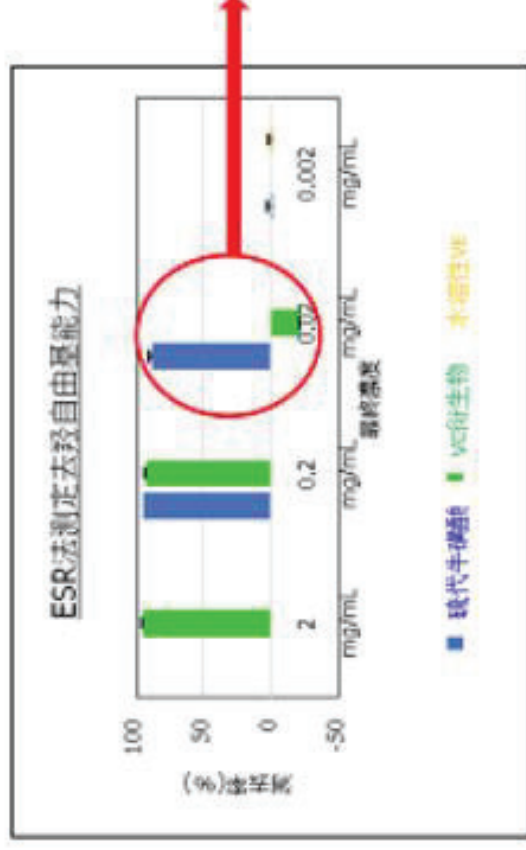
"The antioxidant action of taurine, hypotaurine and their metabolic precursors"-1988

● Features

Effectively removes hydroxyl radicals caused by UV

The research results show that thiotaurine (0.02mg/ml) at an ultra-low concentration can still achieve 100% scavenging of free radicals, and vitamin C has basically no effect at this time.

通过紫外线照射过氧化氢后产生的羟自由基反应。



The results of the research show that thiotaurine can show high-efficiency ability to remove hydroxyl radicals at a concentration of 0.02mg/ml, a vitamin C derivative that cannot obtain data. It can be confirmed that thiotaurine can be added **at** low concentrations After that, a very significant ability to remove hydroxyl radicals was obtained.

● Features

Inhibit blue light or UVA-induced peroxidation

"Blue light-induced lipid oxidation and the antioxidant property of hypotaurine : evaluation via measuring ultraweak photon emission" -2022

Studies have shown that thiotaurine and sulfinic acid have obvious inhibitory effects on peroxidation induced by blue light and UVA.



Features

Inflammatory response of skin by lipid peroxidation

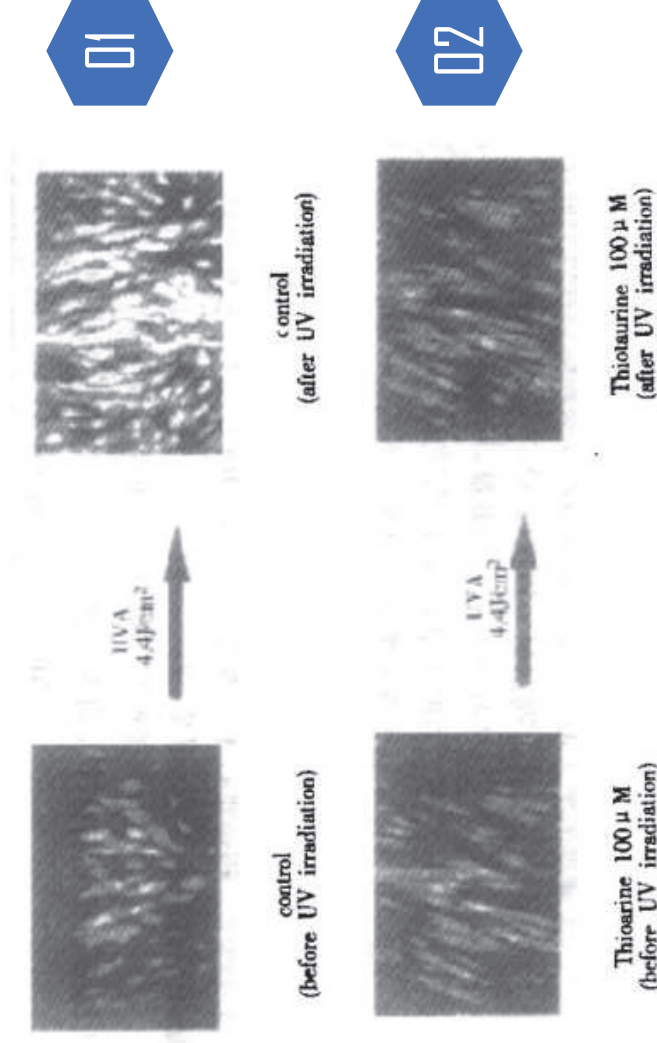
According to the clinical data provided by dermatologists, it has a correlation with the SQ conversion rate, and found that the dryness of the skin has a certain relationship with the SQ conversion rate. According to the above results, it can be verified that the epidermal antioxidant capacity of patients with allergic dermatitis is lower than that of healthy people, and it is suggested that the state of the skin affects the response degree of epidermal lipid peroxidation.

Since SQHPO was detected in all the analyzed samples, it is considered that SQ is the first lipid substance in the epidermis to undergo peroxidation reaction. Therefore, quantitative analysis of the SQ content in the skin can determine the antioxidant capacity of the skin. and skin condition.

As shown in Figure 3, the conversion rate of SQ in the epidermis of patients with atopic dermatitis is higher than that of normal people, especially in the forehead that is often exposed to sunlight. Observation of lipid peroxides in the back epidermis of patients with atopic dermatitis. As shown in FIG. 4 , taking the atopic dermatitis patient group as an example, lipid compounds other than SQ in the epidermis were also obviously peroxidized.

● Features

Defense against lipid peroxidation on the skin surface



Inhibits oxidation of fibroblasts

The researchers observed an increase in the fluorescence intensity of fibroblast cell specimens when exposed to ultraviolet (UVA) light, which is an indicator of the oxidation response. However, when thiotaurine coexists in the system, the oxidation of fibroblasts is inhibited (see left figure).

Prevent intracellular oxidation

However, studies have confirmed that after adding thiotaurine and hypotaurine, the intracellular oxidation reaction caused by ultraviolet radiation is prevented.

As shown in the figure above – Observation and preventive effect on cells damaged by oxidation (fibroblasts)

" Effect of Thiotaurine in Defense against Lipid Peroxidation on Skin Surface " - Yoshiyuki Kono, Shiseido Basic Research Center



Features

Defense against lipid peroxidation on the skin surface

Antioxidant effect is associated with the concentration of thiotaurine used

The experimental results on the anti-oxidant free radical activity of thiotaurine showed that:

The oxidation of sebum was significantly inhibited in the thiotaurine cream-coated site compared with the uncoated site and blank cream-coated site. It can prevent the initial stage of skin oxidation and replenish the deficiencies of the "antioxidant system" of incomplete skin.

硫代牛磺酸防御皮肤表面脂质过氧化反应的效果
Peroxidation in the skin surface and its prevention by thiotaurine

河野善行 (株) 資生堂基礎研究中心 薬劑開発研究所		
名 称		$K_0 [M^{-1}s^{-1}]$
角鲨烯		5.62×10^6
硫代牛磺酸		2.45×10^7
亚牛磺酸		6.97×10^6
丁基化羟基甲苯		4.91×10^6
d- α -维生素乙酸钠		1.60×10^6
抗坏血酸		8.30×10^6

The reaction rate constant of oxygen free radicals and antioxidants

The table above shows the reaction rate constants of oxygen free radicals and antioxidants. Compared with antioxidants commonly used in cosmetics, thiotaurine and hypotaurine have higher antioxidant free radical activity.

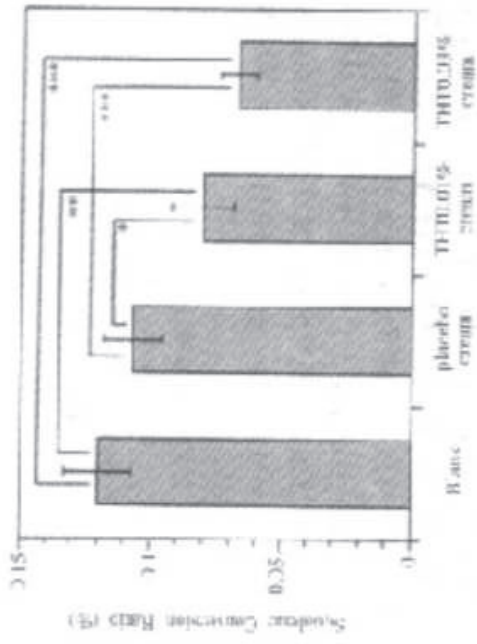


图 7 对表皮脂质过氧化反应的预防效果
(Mean $\pm$ SE) * ; $p < 0.01$
(n = 45) ** ; $p < 0.005$
*** ; $p < 0.0001$

THT; Thiotaurine

"Effect of Thiotaurine in Defense against Lipid Peroxidation on Skin Surface" - Yoshiyuki Kono, Shiseido Basic Research Center



Features

Activated human neutrophils

In experiments, scientists found that thiotaurine effectively activated human neutrophils, while effectively reducing the stimulation-induced GAPDH production.

Neutrophils are the most abundant immune cells in humans and are the body's first line of defense against external microorganisms. In addition, they also contribute to various physiological functions, including angiogenesis, coagulation, and tissue repair. Recent studies have found that neutrophils, especially the extracellular traps released by neutrophil activation, play a central role in the development and persistence of systemic autoimmune diseases.

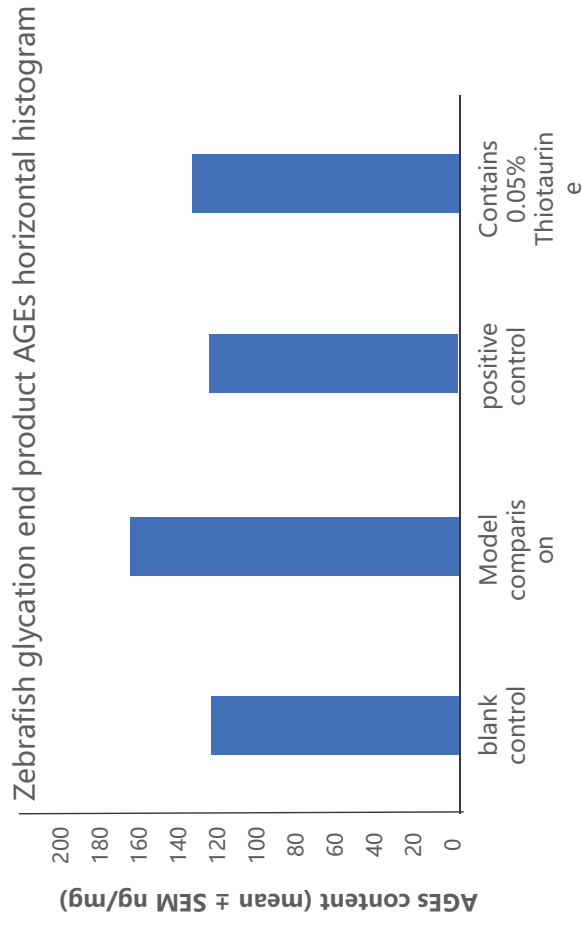
GAPDH (glyceraldehyde 3- phosphate dehydrogenase) is an enzyme in the glycolysis reaction, which is an important link in glucose metabolism. When this index decreases, it means that the glycation reaction is effectively inhibited.

● Features

Significant anti-glycation effect

The results of the study showed that 0.05% thiotaurine inhibited zebrafish glycation end products (AGEs) by 76% ($P = 0.0095$), which had a significant anti-glycation effect.

Zebrafish Glycation End Products (AGEs) Inhibition Rate Test



● Efficacy Test

Anti-wrinkle effect test

The research results show that with 0.005% thiotaurine products, skin wrinkles can be significantly improved in about 30 days.

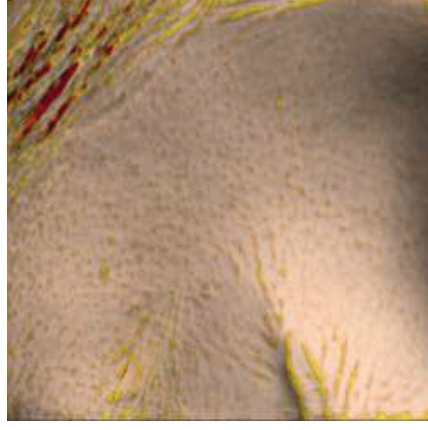
Trialr1 Day0



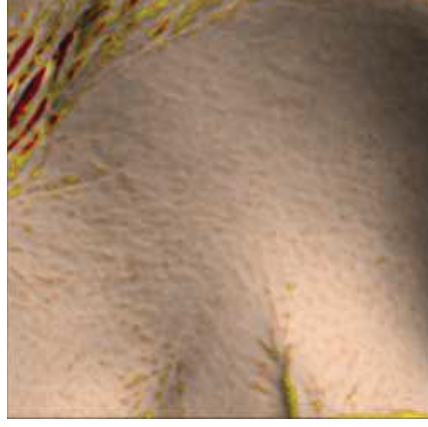
Trialr1 Day30



Trialr2 Day0



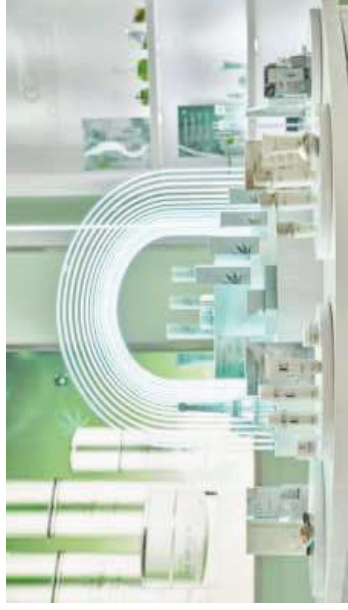
Trialr2 Day30



Data source: Beri Pharma Efficacy Lab

● safety regulations

Safety Data & Laws and Regulations



Safety data:

- ✓ Skin sensitization test: pass
- ✓ Eye irritation test: pass
- ✓ 3T3 phototoxicity test: pass
- ✓ AEMS test: pass
- ✓ Human skin patch test: pass

National regulations:

- Europe: Allowed for use in personal care products
- United States: Allowed to be used in personal care products
- Japan: Allowed to be used in personal care products
- China: Allowed in personal care products

● application guide

02

Recommended dosage

Suggestion:
0.02~0.07% .

03

Instructions

After dissolving in water,
add it below 50°C.

01

scope of application

Applicable to various functional cosmetics, recommended for anti-aging, anti-wrinkle, sunscreen repair, redness reduction, brightening and other products .

04

Precautions

It is recommended not to use high temperature and light for too long; if iron ions are contained in the system, it may cause yellowish turbidity, so attention should be paid; PH applicable range: 5.0-9.0 .

application
guide

● Basic product info

BeriCos® – Thiotaurine

Thiotaurine

technical indicators	Product Standards
Apperance	white to off-white powder
odor	slight characteristic odor
purity	≥ 98%
pH value (1% aqueous solution)	4.5~6.5
Storage conditions	Avoid light, keep sealed in a cool condition
shelf life	3 years

PART 03



● Hot Products



Shiseido
New Sunshine
Water Power
Moisturizing
Sunscreen

Lotion



Shiseido
Men's Vitality
Balancing Water
men's moisturizer



Hot Products



—
Opa l

Zhenyuan essence base cream



—
Proya

Brightening Youth Essence



—
Infusa
Moisturizing Suncscreen Day
Milk

● Hot Products



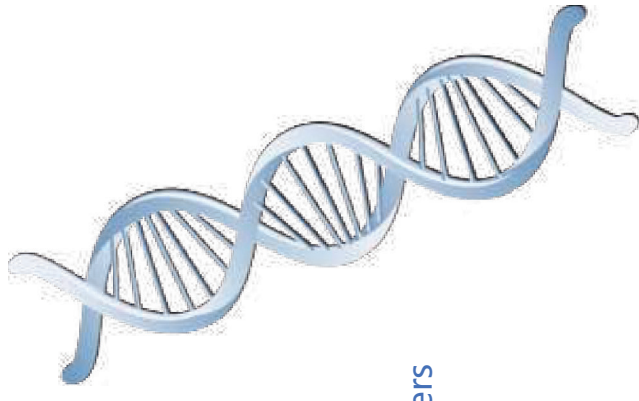
PURID
Urban Repair Gel
Cream



Proya
Luxury long-lasting
liquid foundation



key to skin
Polygonatum Rejuvenating
Rejuvenating Mask



Explorers of Effective Ingredients

Committed to providing professional empowerment solutions for customers



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Guangzhou Branch: Room 1305, Tower B, Jiada Plaza, Guangzhou

www.zhberi.com Tel: 86-756-8699456 Email: sales@zhberi.com

