

# LIGHTSYN Health



杭州合碳创物科技有限公司

Hangzhou LightSyn Technology Co., LTD

LIGHTSYN Health

[lightsyntech.com](http://lightsyntech.com)

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HMBrighten® HT Hydroxytyrosol

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LipoCee™ L-AP

Docosahexaenoic Acid

Salidroside

Hydroxytyrosol

D-Chiro-Inositol

Ascorbyl Palmitate

# C COMPANY PROFILE



## Global Innovation Leader of Synthetic Bio-Economy

Hangzhou LightSyn Technology Co., Ltd.



Hangzhou LightSyn Technology (LightSyn Biotechnology) was established by a Ph.D. team from renowned overseas universities. The core members have years of academic and professional experience at leading research institutions such as Wageningen University & Research (Netherlands), the University of Tokyo, Tsinghua University, China Agricultural University, the Chinese Academy of Sciences, as well as Fortune 500 companies. They also possess experience in leading new business initiatives at frontline startups, combining industry-academia-research collaboration for successful commercial implementation. The company headquarters features an R&D center spanning over 1,000 square meters and has established two core technology platforms: the Microalgae-Discovery-Platform (Innovative Microalgae High-Density Heterotrophic Fermentation) and the Flexibility-Program-Cellfactory (Flexible Programmed Cell Manufacturing Factory). It has also set up four major R&D support centers: a Rich Germplasm Resource Screening Center, an AI-Based Highly Automated Experimental Transformation Center, a Globally Leading High-Density Fermentation Scale-Up Center, and a Professional Efficacy Evaluation and Science Communication Center. The company has established the Shandong University Research Institute in Qingdao and is constructing a Marine Microbial Synthetic Biology Manufacturing Center in Lianyungang, Jiangsu. Additionally, it collaborates with industry leaders to implement flexible production platforms, vigorously promoting the commercialization of innovative pipelines at various scales.

As the only enterprise globally dedicated to developing green manufacturing platforms for both marine microalgae and industrial microorganisms, LightSyn leverages rich marine microbial resources and unique bioactive compounds to develop multiple innovative pipelines. It also deploys green raw materials of varying market scales by employing synthetic biology techniques to construct cell factories, demonstrating significant application potential in downstream sectors such as cosmetics and personal care, food and health, and green agriculture. Pipeline development focuses on a product selection strategy centered on innovative sugars, functional lipids, active small molecules, and a "2+X" portfolio. The company has been successfully selected for the Hangzhou High-Tech Zone High-Level Talent Entrepreneurship "5050" Plan, shortlisted for the 2023 "Science and Technology Innovation China" Zhejiang Province Finals, awarded the Third Prize in the 3rd China Shaoxing "Wanzhou Qianyi" New Industry Platform Global Entrepreneurship Competition, included in the Jiangsu Province 2023 Haimen "Dongzhou Elite" Talent Introduction Plan, and listed on the 2024 China Synthetic Biology Outstanding Brands Ranking.

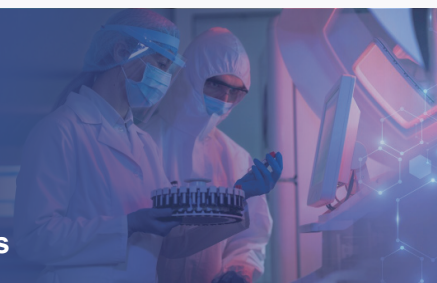


# 2 Major Technology Platforms

## Flexibility-Program-Cellfactory

The Flexibility-Program-Cellfactory focuses on biocatalysis and synthetic biology fermentation, deeply researching the flexible design of synthetic biological chassis. It leverages the tool-based attributes of synthetic biology to replace chemicals in existing markets and develop bio-based products for emerging markets.

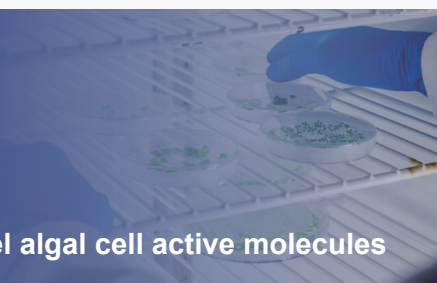
>>> Whole-cell catalysis / Non-model chassis cell factories



## Microalgae-Discovery-Platform

The Microalgae-Discovery-Platform focuses on microalgae raw material development, dedicated to exploring the metabolic diversity of direct microalgae and unlocking the innovative potential of marine microbial chassis.

>>> Algal strain library / High-density / Heterotrophic novel algal cell active molecules



# 4 Major R&D Support Centers

Rich Germplasm  
Resource Bank  
Screening Center

Globally  
Leading High-Density  
Fermentation  
Scale-Up Center



AI-Driven and Highly  
Automated  
Experimental  
Transformation Center

Professional Efficacy  
Evaluation and Science  
Communication Center

# Intellectual Property & Patents



More than 27 invention patents related to R&D and application have been applied for, with 8 granted.



Developed heterotrophic ultra-high-density cultivation technology for several functional microalgae strains, and published 8 SCI papers.

# Enterprise Honors



## ENTERPRISE

# HONORS

- > Selected for the Hangzhou High-tech Zone "5050" Program for High-level Entrepreneurial Talent.
- > Shortlisted as a Finalist for the 2023 "Science and Technology Innovation China" Competition in Zhejiang Province.
- > Awarded Third Prize in the 3rd China Shaoxing "Ten-Thousand-Mu Thousand-Billion" New Industrial Platform Global Entrepreneurship Competition.
- > Selected for the 2023 Haimen "Dongzhou Elite" Introduction Plan in Jiangsu Province.
- > Recognized as an "Innovative Technology in the Cosmetics Industry".
- > Named to the 2024 China Synthetic Biology Top Brands List





| PRODUCT NAME                                                            | PRODUCT FORM                                                                    | PRODUCT HIGHLIGHTS                                                                                                                                                                                                                                                                                                           | BENEFITS                                                                                                                                                                                    |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LightDHA™ Algal DHA Oil</b><br><i>Docosahexaenoic Acid</i>           | <b>Oil-soluble Liquid</b><br>Pale yellow to orange-yellow, characteristic odor. | An Omega-3 polyunsaturated fatty acid oil synthesized via fermentation using a superior strain of marine-sourced <i>Schizochytrium</i> sp. Characterized by high DHA content, this product was jointly developed by LightSyn and top Chinese research institutes, ensuring sustainability, safety, and controllable quality. | <ul style="list-style-type: none"><li>• Eye &amp; Brain Development</li><li>• Cardiovascular Health</li><li>• Cognitive Improvement</li><li>• Antioxidant &amp; Anti-inflammatory</li></ul> |
| <b>ChlorellaGold® Chlorella Powder</b><br><i>Chlorella vulgaris/sp.</i> | <b>Fine Powder</b><br>Human Grade: Vivid green<br>Feed Grade: Dark green        | A single-cell green algae from freshwater environments, known as a "Complete Nutritional Package." Cultivated in advanced closed photobioreactors. Rich in 50-60% high-quality complete protein, vitamins, minerals, chlorophyll, and CGF.                                                                                   | <ul style="list-style-type: none"><li>• <b>Human:</b> Immune Support, Detoxification</li><li>• <b>Feed:</b> Growth Performance, Enhanced Immunity, Improved Meat/Egg/Milk Quality</li></ul> |
| <b>HT</b><br><i>Hydroxytyrosol</i>                                      | <b>Liquid or Powder</b><br>Characteristic odor.                                 | A natural, highly effective antioxidant component derived from olives. Activates longevity pathways and delays aging. LightSyn utilized cutting-edge micro-encapsulation technology to develop a powder form, overcoming low stability and discoloration issues.                                                             | <ul style="list-style-type: none"><li>• Antioxidant &amp; Anti-inflammatory</li><li>• Anti-aging</li><li>• Cardiovascular Health</li><li>• Joint Health</li></ul>                           |

| PRODUCT NAME                                                 | PRODUCT FORM                                                                        | PRODUCT HIGHLIGHTS                                                                                                                                                                                                                                     | BENEFITS                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SAL</b><br><i>Salidroside</i>                             | <b>Crystalline Powder</b><br>White to off-white.                                    | Primary active component of Rhodiola rosea, manufactured via synthetic biology. Features high antioxidant efficacy, eco-friendly safety, and high purity. As a cosmetic ingredient, it provides whitening, anti-inflammatory, and anti-aging benefits. | <ul style="list-style-type: none"> <li>• Cardiopulmonary Protection</li> <li>• Neuroprotection</li> <li>• Cardiovascular Health</li> <li>• Antioxidant &amp; Whitening</li> </ul>                                                                                                                                                          |
| <b>NouraDCI® D-Chiro-Inositol</b><br><i>D-Chiro-Inositol</i> | <b>Powder</b><br>White to off-white.                                                | A core component from carob extract, manufactured via synthetic biology. High yield, superior purity. Unique biological activities for women's health, particularly in regulating blood sugar and improving metabolic syndrome.                        | <ul style="list-style-type: none"> <li>• Blood Sugar Regulation</li> <li>• PCOS Improvement</li> <li>• Antioxidant &amp; Anti-inflammatory</li> </ul>                                                                                                                                                                                      |
| <b>Vitamin C</b><br><i>Ascorbic Acid</i>                     | <b>White crystals or powder</b><br>Odorless, sour-tasting, highly soluble in water. | A potent and natural antioxidant, an essential vitamin for the human body, and extremely safe.                                                                                                                                                         | <ul style="list-style-type: none"> <li>• <b>Health:</b> Strengthens the immune system, promotes collagen synthesis, and effectively neutralizes free radicals.</li> <li>• <b>Food:</b> Widely used in fruit juices, baked goods, and meat products as an antioxidant to preserve color and flavor.</li> </ul>                              |
| <b>Inositol</b><br><i>Cyclohexanehexol</i>                   | <b>White crystalline powder</b><br>Odorless, slightly sweet taste, stable in air.   | Belongs to the vitamin-like group (B-complex vitamins), with good biocompatibility and high affinity.                                                                                                                                                  | <ul style="list-style-type: none"> <li>• <b>Health:</b> Helps lower blood lipids and prevent fatty liver; plays a positive role in improving sleep and relieving mental stress.</li> <li>• <b>Food:</b> Commonly used in sports energy drinks, high-end health supplements, and infant formula as a key nutritional supplement.</li> </ul> |

| PRODUCT NAME                                             | PRODUCT FORM                                                                                                                | PRODUCT HIGHLIGHTS                                                                                                                                                                                     | BENEFITS                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ascorbyl Palmitate</b><br><i>L-Ascorbyl Palmitate</i> | <b>White to off-white powder</b><br>Citrus odor; sparingly soluble in water, readily soluble in ethanol and vegetable oils. | Overcomes the limitation of ordinary vitamin C being insoluble in oil, offers excellent stability, and is the natural preservative and synergistic agent of choice for fats, oils, and high-fat foods. | <ul style="list-style-type: none"> <li>• <b>Health:</b> Penetrates more effectively into cell membranes to protect them from oxidative damage, making it a highly effective anti-aging and nutritional fortification ingredient.</li> <li>• <b>Food:</b> Specifically designed to prevent oxidative rancidity in cooking oils, nuts, instant noodles, and oil-containing baked goods, extending shelf life while preserving natural flavor.</li> </ul> |
| <b>Chitosan</b><br><i>Poly-D-glucosamine</i>             | <b>Off-white to pale yellow powder</b><br>With a slight pearlescent luster, odorless and tasteless.                         | <b>Non-animal-derived/Vegan:</b> Extracted from fungi such as mushrooms or rhizobia, it completely avoids seafood allergens and meets the demands of the high-end plant-based market.                  | <ul style="list-style-type: none"> <li>• <b>Health:</b> Known as the “fat catcher,” it adsorbs fats to aid in weight management and promotes gut microbiome health.</li> <li>• <b>Food:</b> Used as a natural, vegan antimicrobial preservative to form a protective film on fruits and vegetables or as a clarifying agent in alcoholic beverages.</li> </ul>                                                                                         |
| <b>Spirulina</b><br><i>Spirulina Powder</i>              | <b>Deep green to dark green powder</b><br>Possesses a distinctive algal aroma.                                              | <b>All-around superfood:</b> Contains up to 60%-70% protein and is rich in gamma-linolenic acid, carotenoids, and minerals.                                                                            | <ul style="list-style-type: none"> <li>• <b>Health:</b> Provides comprehensive nutrition, significantly boosts immunity, combats fatigue, and improves anemia.</li> <li>• <b>Food:</b> Used as a natural nutritional fortifier in pasta and functional snacks, while also serving as a natural green pigment.</li> </ul>                                                                                                                               |



| PRODUCT NAME                                                              | PRODUCT FORM                                                                                                                                                           | PRODUCT HIGHLIGHTS                                                                                                                                                                                                                                                                                                                           | BENEFITS                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LightDHA™ 50% DHA Crude Oil</b><br><i>Docosahexaenoic Acid Oil</i>     | <b>Golden-yellow to orange-yellow oily liquid</b><br>Maintains good fluidity at low temperatures; no fishy smell; possesses a characteristic fermented algal oil odor. | Produced via fully closed fermentation technology, ensuring a pure source free from marine pollution risks (e.g., heavy metals, DDT). As a "vegetarian fish oil," it features high DHA purity (≥50%), extremely low EPA content, and good oxidative stability. It is an ideal oil source for fortifying Omega-3 nutrition in high-end feeds. | <ul style="list-style-type: none"> <li>• <b>Promotes Neurodevelopment:</b> Critical brain/retinal nutrition for fry and piglets.</li> <li>• <b>Functional Enrichment:</b> Enables production of "DHA Eggs/Milk/Pork."</li> <li>• <b>Anti-stress:</b> Improves overwintering survival and transport stress resistance.</li> <li>• <b>Reproductive Performance:</b> Improves fertilization and hatching rates.</li> </ul>    |
| <b>LightDHA™ 18% DHA Powder</b><br><i>Whole Cell Schizochytrium</i>       | <b>Light yellow to golden-yellow powder</b><br>Good fluidity. Retains complete algal cell structure; excellent attractant odor.                                        | "Micro-encapsulated" natural protection—DHA oil is naturally encapsulated within the algal cell wall, offering excellent antioxidant performance. As a complex of bacterial protein and functional oil, it offers the dual value of protein and energy. Easy to use in premixes.                                                             | <ul style="list-style-type: none"> <li>• <b>Excellent Attractant:</b> Rich in glutamate, improves feed intake for picky eaters.</li> <li>• <b>Full-Nutrition Synergy:</b> Rich in protein/vitamins, improves FCR.</li> <li>• <b>Meat Quality:</b> Improves water-holding capacity, tenderness, and flavor.</li> <li>• <b>Immunity:</b> Glucans act as immune stimulants to enhance disease resistance.</li> </ul>          |
| <b>ChlorellaGold® Chlorella Powder</b><br><i>Chlorella vulgaris / sp.</i> | <b>Dark green fine powder</b><br>Rich algal scent. High protein, fine texture, good suspension.                                                                        | A "Natural Nutrition Bank" rich in protein, chlorophyll, and Chlorella Growth Factor (CGF). Using advanced cell-wall breaking technology, nutrients are easily absorbed. A premium green additive for replacing fish meal and antibiotics.                                                                                                   | <ul style="list-style-type: none"> <li>• <b>Growth &amp; Repair:</b> CGF accelerates growth and tissue repair in fry/piglets.</li> <li>• <b>Immune Regulation:</b> Activates macrophages; chlorophyll detoxifies mycotoxins.</li> <li>• <b>Gut Microecology:</b> Acts as a prebiotic to promote beneficial bacteria.</li> <li>• <b>Appearance:</b> Improves egg yolk color, skin color, and aquatic body color.</li> </ul> |



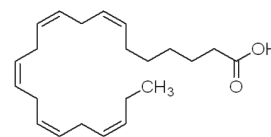
**LightDHA™**  
**Algal Oil DHA**

# LightDHA™ Algal Oil DHA



## Product Profile

Docosahexaenoic Acid (DHA) is an essential Omega-3 polyunsaturated fatty acid for organisms. It promotes eye and brain development, supports cardiovascular health, provides antioxidant effects, and offers immune regulation, among other benefits. LightSyn's LightDHA™ Algal Oil DHA is an Omega-3 polyunsaturated fatty acid oil synthesized using marine-derived single-celled algae through a fermentation process. The entire production takes place in a sealed and clean environment. The product was jointly developed by LightSyn and top Chinese research institutes, utilizing selected superior Schizochytrium sp. strains, which fall under the scope of China's new food ingredients, US FDA GRAS, and EU EFSA approved algal species. Food safety and quality are controllable and traceable. The content and ratio of LightSyn's LightDHA™ Algal Oil comply with regulatory requirements.



## Application Scope



Dietary  
Supplements



Infant and  
toddler food



Food & Health



Pet Nutrition

## Product Description

|               |                                           |
|---------------|-------------------------------------------|
| Chemical Name | Algal Oil DHA                             |
|               | DHA 50%-55%                               |
| Specification | DHA 40% (Low DPA)                         |
|               | Algal Oil DHA                             |
| Appearance    | Light yellow to orange-yellow oily liquid |
| Source        | Bio-fermentation                          |

## Product Efficacy



Brain  
development



Vision  
protection



Cognitive  
improvement



Cardiovascular  
health



Anti-inflammatory  
& Antioxidant



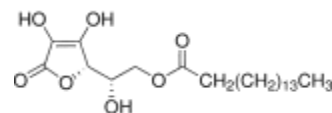
Lipocee™  
**L-Ascorbyl Palmitate**



# LipoCee™ L-AP

## Introduction

L-Ascorbyl Palmitate (L-AP) is a stable, fat-soluble form of vitamin C. Recognized as a highly effective oxygen scavenger and synergist, it is approved by the WHO as a safe and nutritious food additive. It is the only antioxidant permitted in infant foods in China. Using its proprietary "Synthesis Technology Platform," Lightsyn leads in enzymatic AP production globally. Its product, LipoCee™ L-AP, is used widely in food, cosmetics, and pharmaceuticals. In food, it serves as a nutritional supplement and antioxidant. In cosmetics, it offers stability and permeability, making it suitable for antioxidant, whitening, and anti-aging skincare products.



## Application



Food Additives



Baby's Food



Medicine/Health



Beauty/Skincare

## Description

|                  |                                                |
|------------------|------------------------------------------------|
| Chemical name    | L-Ascorbyl Palmitate                           |
| Chemical Formula | C <sub>22</sub> H <sub>38</sub> O <sub>7</sub> |
| CAS No           | 137-66-6                                       |
| Specification    | 99%                                            |
| Appearance       | White to off-white powder                      |
| Source           | Biological Fermentation                        |

## Efficacy



Antioxidant



Nutritional Fortification



Whitening & brightening



Anti-inflammatory



Anti-Aging



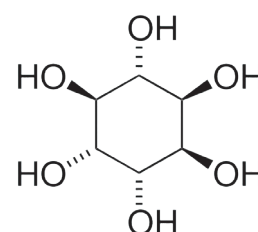
**NouraDCI <sup>TM</sup>**  
**D-Chiro-Inositol**

# NouraDCI™

## D-Chiro-Inositol

### Product Profile

D-chiro-inositol (DCI) is an optically active stereoisomer among the nine inositol isomers and belongs to the vitamin B family. DCI is readily soluble in water and occurs naturally in free or galactosyl-derived forms in plants such as carob and buckwheat. Widely used in medical and food health fields, DCI has garnered significant attention for its safe, unique bioactivity and benefits for women's health, particularly in regulating blood glucose levels and improving metabolic syndrome, helping maintain physiological balance in women with polycystic ovary syndrome (PCOS). LightSyn delves deeply into the specific needs of female consumers, driving technological innovation through scientific research strength to provide truly suitable product solutions for women, enabling them to enjoy a healthy life. NouraDCI™ D-Chiro-Inositol is green, natural, safe, stable, reliable in quality, and scientifically endorsed. Additionally, D-chiro-inositol can support reproductive health and weight management in pets.



### Application Scope



Dietary  
Supplements



Pet Nutrition



Food & Health

### Product Description

|                   |                                               |
|-------------------|-----------------------------------------------|
| Chemical Name     | D-Chiro-Inositol                              |
| Molecular Formula | C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> |
| CAS No.           | 643-12-9                                      |
| Specification     | 99%                                           |
| Appearance        | White powder                                  |
| Source            | Bio-fermentation                              |

### Product Efficacy



Blood Glucose  
Regulation



Improvement of  
PCOS



Liver Protection



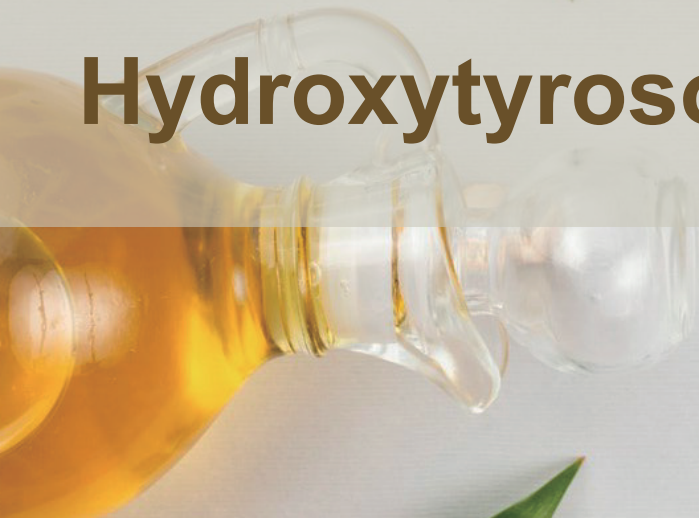
Antioxidant &  
Anti-inflammatory





**LIGHTSYN<sup>®</sup>**

**Hydroxytyrosol**



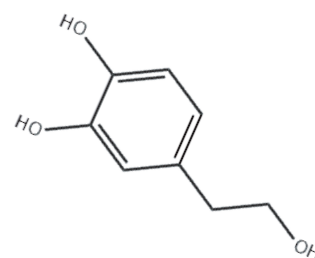


# LIGHTSYN<sup>®</sup> Hydroxytyrosol



## Product Profile

Hydroxytyrosol, renowned as the "Health Gift from the Longevity Zone", primarily exists in ester form in the fruits, leaves, and branches of the olive tree (*Olea europaea*). As the main antioxidant component of olive polyphenols, it is one of the strongest natural antioxidants discovered to date, possessing diverse biological and pharmacological activities. Hydroxytyrosol enhances the body's antioxidant capacity through multiple mechanisms: efficiently scavenging free radicals, boosting the activity of key antioxidant enzymes, and ameliorating chronic inflammation. Beyond its exceptional antioxidant and anti-inflammatory efficacy, hydroxytyrosol also promotes autophagy and activates the AMPK longevity pathway. Owing to its unique functional and nutritional value, hydroxytyrosol has garnered significant attention in the food, pet nutrition, and cosmetic industries. LightSyn delivers high-purity, high-quality hydroxytyrosol via biosynthetic technology, ensuring a green, safe, and reliable solution for multi-domain health protection.



## Application Scope



Food Additives



Cosmetics & Skincare



Food & Health



Pet Nutrition

## Product Description

|                   |                                               |
|-------------------|-----------------------------------------------|
| Chemical Name     | Hydroxytyrosol                                |
| Molecular Formula | C <sub>8</sub> H <sub>10</sub> O <sub>3</sub> |
| CAS No.           | 10597-60-1                                    |
| Specification     | 99%                                           |
| Appearance        | Light yellow to yellow liquid                 |
| Source            | Bio-fermentation                              |

## Product Efficacy



Joint Health



Healthy Aging



Brain & Cognitive Health



Cardiovascular Health



Antioxidant & Anti-inflammatory



Immune Health

全球合成生物经济的创新引领者  
Nature Give Us Answers

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