99% Pure Nature-Identical Form of trans-Pterostilbene (tero-STILL-bean)
Introduction

ChromaDex promotes health and well-being through the discovery and development of nutraceutical ingredients - naturally occurring molecules that can be integrated into dietary supplements, nutritional products and functional foods.

pTeroPure is a nature identical form of trans-Pterostilbene. Pterostilbene is a natural analog of resveratrol, which is one of the compounds thought to contribute to the “French Paradox” associated with red wine consumption. Like resveratrol, it belongs to a class of compounds called phytoalexins, which are naturally produced by plants when under attack by pathogens such as bacteria or fungi. And like resveratrol, there are animal studies showing its efficacy at improving heart health, most notably by correcting the dyslipidemia that leads to atherosclerosis and coronary heart disease. Pterostilbene is one of several stilbenes found in certain berries (e.g., blueberries, cranberries, sparkleberries, lingonberries, and grapes), thus, consumption of these small fruits may help improve health.

“The more we study Pterostilbene, the more we see its huge potential in the human health field.”
-Dr. Agnes Rimando, USDA ARS

Pterostilbene is...
The Next Generation Resveratrol™

• A methylated version of resveratrol naturally found in berries
• Superior biological activity
• Better oral bioavailability
• Metabolizes more slowly in the body, allowing more time for its antioxidant activities to act
• Extensive tissue distribution
Pterostilbene and resveratrol have very similar pharmacologic properties, however Pterostilbene has several key advantages over resveratrol. The main difference between Pterostilbene and resveratrol is structural; Pterostilbene contains two methoxy groups and one hydroxyl group while resveratrol has three hydroxyl groups. The two methoxy groups cause Pterostilbene to be more lipophilic (oil-soluble) than resveratrol, which increases oral absorption and gives it a higher potential for cellular uptake.\(^{10}\) Pterostilbene also has a much longer half life in the blood than resveratrol (105 minutes vs. 14 minutes).\(^{2,18}\) A recent paper also demonstrated that when administered orally, Pterostilbene showed 80% bioavailability vs resveratrol’s 20%, and Pterostilbene’s lower total body clearance rates and subsequent \(V_{ss}\) value (measuring apparent volume of distribution) suggested extensive tissue distribution.\(^{15}\)

Several published studies refer to Pterostilbene as having better activity than resveratrol. For example, the result of one study indicates that Pterostilbene is more effective than resveratrol as an inhibitor of DNA synthesis in the human adenocarcinoma HT-29 cell line.\(^{19}\) Additionally, it has been shown that unlike the related stilbenes resveratrol, piceatannol, or resveratrol trimethylether, Pterostilbene is a potent peroxisome proliferator activated receptor alpha (PPAR\(\alpha\)) agonist, lowering lipid levels in the blood stream to reduce cholesterol levels at a higher rate than even pharmaceuticals such as ciprofibrate.\(^2\) Both resveratrol and Pterostilbene have been shown to exhibit beneficial effects in the control of atherosclerosis and heart disease, however the structural modifications to resveratrol that are found in Pterostilbene are needed to increase its bioavailability while preserving the published beneficial activities.\(^{2,11,12,17,20,21}\)
How Pterostilbene and Resveratrol Work Together

Pterostilbene and resveratrol, both stilbene compounds, have very similar pharmacologic properties, but published data suggests that they act very differently. Much of the bioassay and animal data suggests that Pterostilbene is the most potent stilbene, following a different mechanism of action than resveratrol. However, researchers have suggested that these two compounds also work synergistically, supporting the theory that a combination of Pterostilbene and resveratrol in a formulation maybe more effective than using these ingredients separately. For example, a recent publication showed that Pterostilbene and resveratrol act synergistically as anti-oxidants in protecting human erythrocytes from damage due to oxidative stress.22

Potential Health Benefits of Pterostilbene

- Strong antioxidant10,24
- May be a potent anti-aging compound10,25
- Potent anti-inflammatory activity10,26,27
- May alleviate neurodegeneration10,25
- May limit damage caused by oxidative stress10
- Mimics calorie restriction
- Improves heart health2,3,5,28,29
- Can be used to maintain healthy cholesterol levels2,3,5,28
- Orally active and works to decrease plasma glucose levels in some animals2,18
- Identified as an potential antiviral compound with broad target specificity30
Why pTeroPure™?

pTeroPure Pterostilbene is a nature-identical, 99+% pure, all-trans pterostilbene. The pTeroPure brand Pterostilbene is superior to natural extracts due to its high purity and its sustainable source material. The majority of the other Pterostilbene ingredients on the market are extracts made from Pterocarpus marsupium, an endangered tree found in India. The amounts of Pterostilbene found in the Pterocarpus heartwood are low, leading to concentrated extracts typically in 5-25% range. The fact that Pterocarpus is a threatened species further limits its use as a viable and sustainable source of Pterostilbene. Even though Pterostilbene is found in blueberries and other small berries, it is typically in the 25-50ppm range, too small to be commercially viable. pTeroPure is also the only Pterostilbene to be used in sanctioned human clinical trials and the only Pterostilbene to have designated GRAS status.

“Pterostilbene showed strong inhibitory activity - much more than resveratrol - against a particular form of cytochrome P450.”

-Dr. Agnes Rimando, USDA ARS

Potential Areas of Interests for Sirtuins

| SIRT1 | Metabolic, neurological, mitochondrial, carcinogenesis, inflammation |
| SIRT2 | Carcinogenesis, neurological, metabolic |
| SIRT3 | Metabolic, mitochondrial, neurological, cardiovascular |
| SIRT4 | Metabolic, mitochondrial |
| SIRT5 | Metabolic |
| SIRT6 | Inflammation, carcinogenesis, metabolic |
| SIRT7 | Cardiovascular, metabolic |
Sample pTeroPure™
Pterostilbene Certificate of Analysis

Certificate of Analysis

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NAME: Pterostilbene
OTHER NAME: 4-(2-(3,5-Dimethoxyphenyl)ethenyl)phenol; 3,5-Dimethoxy-4'-hydroxy-trans-stilbene; 3',5'-Dimethoxy-4-stilbenol

CHEMICAL FORMULA: C₁₆H₁₆O₃
MOLECULAR WEIGHT (MW): 256.30
PUBLISHED MELTING POINT: 85-86 °C
CAS NUMBER: [537-42-8]
CHEMICAL FAMILY: Stilbenes

MANUFACTURER ASSAY:

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STORAGE CONDITIONS:
STORAGE: Room Temperature in a dry place.
EXPIRATION DATE: 01/20XX under the above conditions.

Intellectual Property

pTeroPure is a licensee of two U.S. patents from the USDA-ARS and the University of Mississippi and is working on the third patent with a strategic partner.

**Patent Pending #1:** “Pterostilbene as a New Agonist for the Peroxisome Proliferator-Activated Receptor Alpha Isoform.”

**Patent Pending #2:** “Method to Ameliorate Oxidative Stress and Improve Working Memory via Pterostilbene Administration.”

**Patent Pending #3:** “A Key Intermediate for the Preparation of Stilbenes”

The pterostilbene products developed by pTeroPure will be based on the technologies licensed from the USDA ARS and the University of Mississippi.
References

Below are the references cited in this brochure. Please contact us for a more complete list of references for Pterostilbene.


5. Pons L. Agricultural Research/November-December 2006. This work is part of Plant Biological and Molecular Processes (#302) and Quality and Utilization of Agricultural Products (#306), two ARS National Programs described on the World Wide Web at www.npsars.usda.gov.


