

# BETULIN ANTIOX

(Betulafarm®)

## USER'S

### Scope of application

It is recommended as dietary food supplement — a source of betulin and succinic acid.

### Composition

Succinic acid – 160 mg, birch betulin (birch bark extract) – 40 mg.

**Capsule shell composition** – gelatin, titanium dioxide, ferric oxide.

**Directions for use** – for adults: take 1 capsule per day with food during 3-4 weeks. Repeat the course, if necessary.

Consult your doctor before use.

### Contraindications

Idiosyncratic reactions to product ingredients, pregnancy, breast-feeding.

### Size

200 mg capsules.

**Shelf life:** 2 years from the date of manufacture.

**Storage conditions:** store in dry place, keep out of reach of children, don't store above +25 °C.

TS 9197-001-74779358 -15



It is not a drug product.  
Certificate of State Registration

RU.77.99.88.003.E.006198.05.15 dd. May 06, 2015

"Betulin Antiox" should be sold through specialized stores or pharmacy chain shops.

### Manufacturer

Vitamer LTD., Office III, 1 Orlovo-Davydovskiy Lane, Moscow, 129110

Production address: 11 Sovkhoznyaya Street, Petushki, Vladimir Region

Ordered by Betulafarm LTD.,  
5 Lev Tolstoy Street, St. Petersburg

Claims to be sent to the authorized organization below:  
BetulaFarm LTD.  
5 Lev Tolstoy Street, St. Petersburg  
Phone: 8 800 100 1738.

## ADDITIONAL INFORMATION

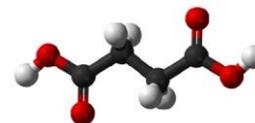
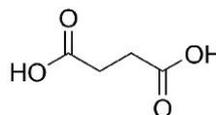
For detailed information visit the company's web-site:

[www.betulin.com](http://www.betulin.com)

## INSTRUCTION

**Betulin** (lup-20(29)-ene-3β, 28-diol) is widespread, natural compound from the triterpenes group produced from upper birch bark.

**Betulin** is white color powder, odorless, with weak astringent taste. It is oxygen- and sunlight-resistant, non-toxic. Water-insoluble. It is very soluble in organic solvents. High melting temperature of betulin (240-260 °C), stable chemical formula and inert properties of the molecule provide extended storage period without changes of properties.



**Succinic acid** is one of the most essential biologically active substances for the resource body system (COOH—CH<sub>2</sub>—CH<sub>2</sub>—COOH). This substance is obtained through treatment of natural amber. It is produced as white crystal powder similar to citric acid to the taste.

### SCOPE OF APPLICATION OF BETULIN AND SUCCINIC ACID

- comprehensive health improvement to remove fatigue;
- to accelerate rehabilitation after injuries and strokes;
- during rehabilitation period after intoxications;
- for reduction of acute alcoholic intoxication and alcohol withdrawal syndrome;
- to increase physical and mental capacity;
- to ensure active life style for elderly people;
- to correct memory impairments related to aggravation of cerebral blood circulation.

### ANTIOXIDANT ACTION OF BETULIN

The injury of plasma membranes and membranes of intracellular organelles (especially mitochondria, lysosomes and the karyon shell) is the basis of all pathological processes. Cell membranes contain high amount of phospholipids, where polyunsaturated fatty acids enter into their composition. They are the main target for active oxygen forms. This process is named the lipid peroxidation. Formation of active oxygen forms results from different pathologies and during tissue respiration process. Antioxidants and, in particular, vitamins and triterpene compounds are intended to neutralize their impact. Antioxidants are an important link of the regulating mechanism of proliferative processes. Acute toxic hepatitis causes betulin inhibition of betulin oxidation of liver lipids. Several reaction centers, which are constituents of the betulin structure, take part in oxidation inhibition. Primary hydroxyl C-28-OH makes the

greatest contribution. It is more than a half of the efficiency of the whole betulin structure. At the same time, the inhibitory action of betulin is associated with involvement of alcohol groups in the oxidation process, where an exchange of active radicals to oxyperoxy radicals take place, in the structure of which there is the intramolecular hydrogen bond, which reduces their activity in reactions of chains continuation. This leads to reduction of entropy at formation of the activated oxidizing complex. Phospholipids (FL) are an objective index of the organism status in the norm and pathology. The dynamics of FL at ischemia and the behavior of phospholipids after preventive introduction of betulin have been studied. Tissues of brain, liver and kidneys have been examined in order to study FL dynamics. It has been established that betulin acts by radical center transfer from the lipoprotein to the hydrocarbon betulin chain with its subsequent transfer in the direction of polar part of an inhibitor molecule. Betulin molecules regenerate the structure of damaged biological membranes on the "patch the holes" principle.

#### **BIOLOGICAL PROPERTIES OF SUCCINIC ACID**

Succinic acid serves as a universal intermediate metabolic product released during interaction of saccharides, proteins and fats in living cells. Activity of succinates (anion or succinic acid salt) in the body is associated with energy generation being consumed for the vital activity of all organs and systems. When the load increases to any body organ or system, the energy for their function is mainly provided as a result of oxidation process of succinates. The energy generation mechanism with the use of succinates is hundreds of times more effective than all other energy generation mechanisms in the body. Just by virtue of this succinic acid has nonspecific health benefit in a large variety of diseases of different etiology. Succinic acid has an anti-virus and antihypoxic effect as well. Studies demonstrated that the succinic acid application caused more intensive oxygen uptake by living cells. The succinic acid oxidation is a necessary stage in the process of diatomic oxygen uptake by cells. The therapeutic effect of succinates is based on the modifying action to the cellular metabolism – cell respiration, transport of microelements and production of proteins. At that, a degree and specific character of modifications depend on the initial state of tissues. Parameters of tissue activities are optimized as a result of such modifications. It has been proved that succinic acid and succinates are adaptogens (they increase the body resistance to unfavorable factors of environment). Succinic acid stimulates the oxygen ingress process in cells, eases the stress, restores energy exchange, normalizes the process of new cell generation and has general health-improving and regenerative properties.

The succinic acid activity in the human body is regulated by the hypothalamus and adrenal glands. Restoring the balance of biochemical reactions in the body, succinates normalize the functions of all organs and tissues. Their influence is especially substantial to the cerebrum, which needs most of all trouble-free oxygen and energy delivery. That is why the succinic acid is used for prevention of brain pathologies being developed in the course of aging. Furthermore, it restores the functions of the whole nervous system and prevents to stresses. The additional consumption of succinic acid promotes the normalization of functioning of other organs and systems. The heart needs the permanent energy delivery, otherwise its contractility reduces and that invariably results in violation of blood circulation, edemata and violation of functions of all organs and systems – i.e. to the heart failure. As a result of liver and kidneys functioning stimulation the body clears itself more effectively from toxic metabolites and other harmful agents. Succinic acid normalizes general metabolism in the body. This favors the immunity strengthening due to more effective synthesis of cells of the immune system. Due to its anti-oxidant action, succinates inhibit the growth and development of tumors and prevent the division of malignant cells. Succinic acid reduces the production of

histamine – the main neurotransmitter of inflammations and allergic reactions, and therefore, symptoms of inflammatory reactions and allergy attacks. Its preparations are often prescribed to neutralize some toxins (for example, ethanol, nicotine etc.). Succinic acid is recognized as a completely harmless substance. It is able to provide therapeutic action even in small quantities. Preparations of succinates prevent peroxidation of lipids, which is dangerous for health, for a short while improve memory and physical stamina, optimize regulating mechanisms and metabolism and suppress insomnia. Hence, they serve as a prophylactic drug against senile diseases. In addition, when intaking other medicinal preparations, succinic acid suppresses their side effects. Succinic acid serves as an energy source at the cellular level taking part in some biological processes. As years go by, the ability of cells to generate energy is lowered; there is the imbalance of the most vitally important systems, which causes the body aging. Regular receipt of succinic acid by the human body from external sources can delay aging substantially. Succinic acid takes also part in the cell respiration assisting in more effective oxygen availability. Free radical oxidation is recognized as one of main factors of aging. That is why the use of succinic acid can accelerate metabolism in the body substantially, that also has a health-improving effect and prevents aging.

#### **PHARMACOKINETICS**

The kinetics of betulin secretion in blood at single oral introduction of betulin suspension was studied during experiments (calculated dose is 200 mg/kg). The curve of betulin detectability in blood has the specific "breaking wave" configuration. The average betulin concentration in blood plasma after the first hour was 55 µg/ml. At that, the preparation entering into the blood took place with appr. 10 minutes delay. The peak of betulin concentration is achieved by the 2<sup>nd</sup> hour and it is equal to 95 µg/ml. Then from the 2<sup>nd</sup> to the 4<sup>th</sup> hour the betulin content in blood is lowered to 75.6 % and by 16 hours the preparation concentration makes 9 % of the maximum.

Succinic acid is a regulator of tissue metabolism, it has antihypoxic and antioxidant properties, it improves appetite, diminishes the toxic action of ethanol. By stimulating oxidation-reduction reactions, breathing processes and ATP synthesis, it activates physiological functions of organs and tissues (it stimulates adaptation and compensatory-protective abilities of the human body); it improves the gastric juice secretion, hydrochloric acid production and appetite; it improves the contractile function of transversal striated and unstrained muscles and physical working capacity, it increases the diastolic blood pressure and accelerates ethanol and acetaldehyde oxidation. Its action makes itself evident in 10-20 minutes after its administration. It is metabolized completely to water and carbon dioxide without cumulating.

#### **INDICATIONS AND USAGE OF BETULIN AND SUCCINIC ACID**

The complex of betulin and succinic acid can be prescribed as a powerful preventive preparation during development of diseases of different pathogenesis following with release of a great quantity of free radicals during peroxidation. The combination of betulin and succinic acid will be especially favorable for retardation of the human body aging. Susceptibility to changes

of atmospheric pressure and weather, feeling of physical and emotional weakness, inability to concentrate and memory impairment is not pathology and not signs of the premature aging, but they are only symptoms of shortage of succinates. The ageing process of the human body is complicated and difficult-to-study. However, aging is conditioned essentially by retardation of energy-supply processes of vitally important processes in the body. Betulin and succinic acid prevent dangerous for health peroxidation of lipids, in the course of a brief period they improve memory and physical stamina, optimize regulating mechanisms and metabolism and suppress insomnia. Hence, they serve as a prophylactic drug against senile diseases. At the cellular level, these natural compounds serve as an energy source taking part in some biological processes.

Betulin and succinic acid can be used:

- general health-improving drug to remove fatigue;
- to accelerate rehabilitation process after injures and strokes;
- during rehabilitation period after intoxications;
- for reduction of acute alcoholic intoxication and alcohol withdrawal syndrome;
- to increase physical and mental capacity;
- to provide active vital activities for the elderly;
- to correct memory impairments related to aggravation of cerebral blood circulation.

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Duly authorized signatory

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