N.N. Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian
Branch of Russian Academy of Sciences

BIOLOGICALLY ACTIVE SUBSTANCES FOR MEDICINE AND COSMETOLOGY

synthesized and extracted from natural raw materials

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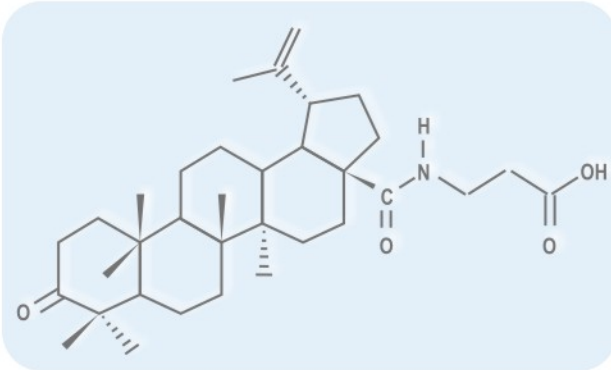
BETAMID

(β-ALANILAMID BETULONIC ACID)

Universal hepatic antioxidant and correction of toxic effects of chemotherapeutic agents



Betamid is high melting crystalline white substance synthesized from available triterpenoid betulin contained in a family of birch trees (*Betula alba, B. pendula, B. pubescent, B. Platyphylla*). The name on the *UPAC* nomenclature: N[3-oxo-20(29)lupen-28-oyl]3-aminopropionic acid.

Betamid is a new adaptation of toxic effects cytotoxic agent recommended for use in the case of comprehensive cancer chemotherapy .

Betamid as a universal hepatoprotector in toxic and methabolic liver damage of various origins reduces excessively marked inflammation, inhibits, fibrogenesis and stimulates the regeneration of the liver.

Advantages:
- low toxicity;
- antifibrotic effect in toxic liver damage;
- a high antioxidant, hepato- and nephroprotective activity;
- potentiation a antitumor antimetastatic effect without damaging healthy tissue;
- obtaining from the available tonnage of domestic materials – betulin from birch roots emitted.

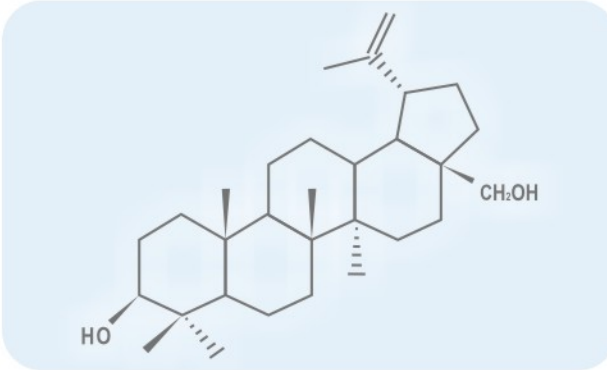
Patent 2353623 (RU)

Development stage:
- the full scope of pharmacological and partially pre-clinical studies;
- the technological regulations for the pilot plant was developed.

Commercial offers:
- search for partners to complete pre-clinical studies and to release medicinal forms;
- release of the active substance on the orders;
- joint organization of industrial production.

BETULIN (90%+)

Betulin refers to the number of triterpenoids of lupine.
Betulin is contained in a family of birch trees (*Betula alba, B. pendula, B. pubescent, B. Platyphylla*). Another type of B**etulin** is a birch. **Betulin** extracted from plants *Ziziphus vulgaris* and *Trochodendron aralioides*.
Betulin is a preparation of natural origin and exhibits different biological activities: anti-inflammatory, antiviral, hepatoprotective, anti-tumor, antioxidant.
Acute toxicity study revealed that **Betulin** is not a toxic substance, and shows no allergenic properties.

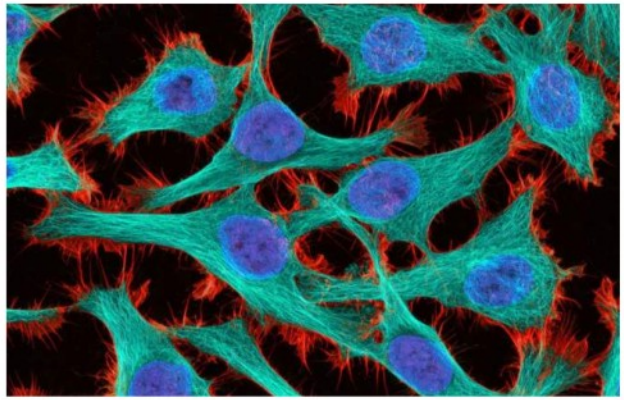


Betulin as natural hepatoprotector can be used in medicine:
- acute and chronic lesions of the liver;
- in chemical and radiation therapy for cancer patients;
- when alcogolic liver damage;
- with trauma, burns, surgical operations.

Betulin used in the synthesis of compounds of interest as pharmaceuticals, in particular for obtaining betulinic and betulonic acids and their derivatives having antiviral activity.

Betulin is used in cosmetics for sensitive and mature skin, suncreens, bleaching agents, protective day cream.

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences a new environmentally friendly and economical way of processing of birch to obtain **Betulin 90+%** was developed.



Appearance: white powder, stable up to *245-247°C*.

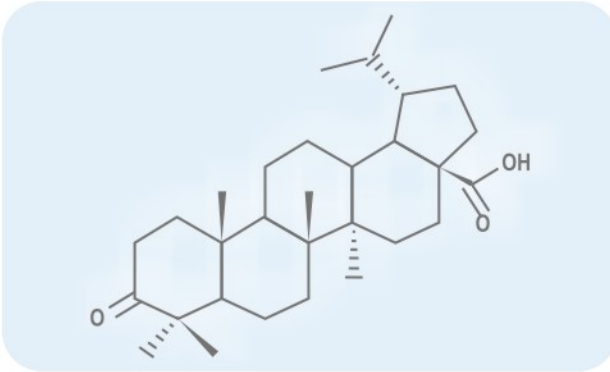
Terms and conditions: at least *24* months, in a dry place, at a temperature not exceeding *30° C*, without direct sunlight.

Patent 24607741 (RU)

Commercial offers:
- search for partners to produce medicinal forms;
- release of the active substance on the orders;
- organization of joint industrial production.

BETULONIC ACID

Betulonic acid is a pentacyclic triterpenoid representative lupine, contained in small quantities in the bark and fruit of some plants.
Betulonic acid is easily obtained by oxidation of Betulin from birch bark extracted.
Proved that **Betulonic acid** and many of its derivatives have a wide variety of biological properties which makes them extremely promising for used in the manufacture of drugs.



Properties of Betulonic acid:
- antiviral and anti-inflammatory activity;
- antioxidative, immunostimulatory, hepato- and phephroprotective, cholesterol-lowering properties;
- selective cytotoxic activity against a number of tumors of neuroectodermal origin;
- prevents the death of the animals from exposure;
- reproduction is a potent inhibitor of HIV-1

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences a new effective way of obtaining of Betulonic acid by oxidation of Betulin was developed.

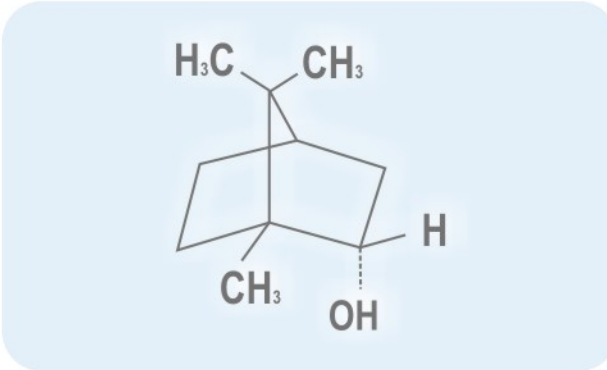
Appearance: white powder, stable up to *246-248* °C.

Terms and conditions: at least *24* months, in a dry place, at a temperature not exceeding *30 °C*, without direct sunlight.

Commercial offers:
- search for partners to produce medicinal forms;
- release of the active substance on the orders;
- organization of joint industrial production.

BORNEOL HIGH PURITY 90-99%

Borneol relates to bicyclic monoterpene alcohols.
Its chemical structure is like camphor, wherein the ketone group reduce to a hydroxyl group, but the latter, is not toxic.
Borneol is used in pharmaceutical, perfumery and cosmetics, wood processing, agriculture and other industries.
Borneol is a part of a large member of drugs, both for internal and for external use, is used in the treatment of a wide range of diseases.
Borneol has the following properties:
- Tonic effect
- Stimulates the adrenal cortex
- Has an antidepressant effect
- Improves blood circulation
- Stimulates digestions used for bronchitis, colds and flu



Borneol and its ethers are used as components of fragrances for soap household chemists.

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences technological process of the production of **Borneol** from renewable plant materials using standard production equipment was developed.
The used method allows to obtain a product containing *90-99%* of the basic substance.

Appearance: colorless or slightly yellow crystals with camphor-pine spent. Few soluble in water, but soluble in the most organic solvents.

Terms and conditions: at least *12* months at room temperature or in refrigerator *(+5 – 10 °C)* in glass or plastic jars with scew-tight plastic lids and gaskets.

Patent 2464035 (RU)

Commercial offers:
- search for partners to produce dosage forms;
- release of the active substance on the orders.

The lipid fraction of an extract of Siberian fir tree green (Abies Sibirica)

The natural source of biologically active substances

The proposed product is prepared from an extract of Siberian fir tree green.
It is a nonvolative waxy mass of dark green color and contains in its composition a mixture polyprenols and their acetates, phytosterines and their esters, triterpene alcohols, carotenoids and chlorophyll and other native compounds.
The presence of these compounds determines the high biological activity of offered product.

Polyprenols are acyclicterpene alcohols having *5* or more isoprenoid units. Polyprenols have a broad spectrum of biological activities, exhibit complex and antiviral effect, stimulate the organism's natural mechanisms of protection from infectious exposure.

Phytosterols are organic compounds steroid structure, which are the building blocks for the formation of steroid hormones, vitamin D, cell-wall components. Phytosterols contribute to the regulation of hormonal systems of male and female organisms.

Carotenoids are precursors of vitamin A, to improve the condition of the skin, improve its elasticity, resistance to irritating and toxic environmental exposure, reduce the risk of cancer, improve vision and reproductive health.

Phospholipids are esters of polyhydric alcohols and higher fatty acids. Phospholipids are commonly used for the treatment of atherosclerosis have antioxidant properties.

Thus, the **lipid fraction of an extract of Siberian** fir wood greens can have the following positive effects on the organism:
- reduces allergic reactions;
- eliminates symptoms accompanyng artrites, psoriasis, multiple sclerosis;
- slowing the growth tumour processes;
- has activity against mycobacterias;
- improves the condition of the organism in type I diabetes;
- reduces the concentration of hazardous compounds cholesterol.

The lipid fraction of an extract of Siberian fir tree green (Abies Sibirica)

The natural source of biologically active substances

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences a effective technology for production of **the lipid fraction of an extract of Siberian fir tree** green was developed.

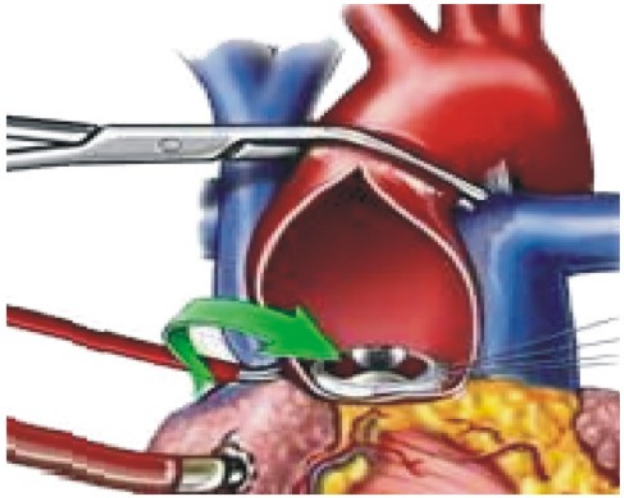
Patent 2336889 (RU)

Commercial offers:
- search for partners to produce dosage forms;
- release of the active substance on the orders;
- organization of joint industrial production.

ETHYLENE GLYCOL DIGLYCIDYL ETHER OF HIGH PURITY 95%+

The main component of a preservative of bioprosthesis

On of the growing areas of cardiac surgery are the technologies that involve the replacement in the human organism from unhealthy heart valves and vascular prostheses of biological material mammals.
Preparing the implant to transplant involves treatment of biomaterial in order to maintain and to improve the product's functionality.
For this purpose, a special solution based on epoxide, is used, the most effective of which is ethylene glycol diglycidyl ether.
Preservative based on **ethylene glycol diglycidyl ether** is widely used in cardiology during manipulating with biological prosthetic heart valves and blood vessels.
High purity of the product obtained according to N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry developed technology allows to keep consumer properties in time in aqueous buffer solutions.



Appearance: transparent, thick viscous colorless liquid, is allowed a yellowish tint.

Terms and conditions: at least *12* months, in a dry place, at a temperature not exceeding *35° C*, without direct sunlight.

Commercial offers: delivery of ethylene glycol diglycidyl ether of high purity *95%+*.

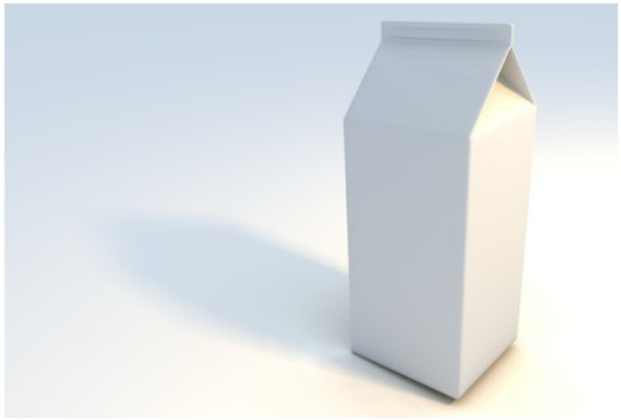
The STABILIZER CO-3

Non-toxic product for the food industry, medicine, cosmetics

The Stabilizer CO-3 is multifunctional antioxidant belonging to the classes simultaneously sulfur and hindered phenolic organic compound. Items supplied exhibits high anti-oxidant for organic materials.
The Stabilizer CO-3 is hypoallergenic, virtually non-toxic.
The Stabilizer CO-3 is recommended for use as an food antioxidant: vegetable oil and butter, margarine, milk, canned food.
Products containing **Stabilizer CO-3** may be subjected to heat treatment.
Stabilizer CO-3 can be used as an antioxidant in pharmaceutical and cosmetic products based on fat.

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences a synthesis method and technology of **Stabilizer CO-3** was developed.

Commercial offers:
- search for partners to produce medicinal forms and cosmetic compositions;
- release of the active substance on the orders;
- organization of joint industrial production.



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CONCENTATE TRITERPENE ACIDS

The potential component of medicines and cosmetics

Pentacyclic triterpene acids (ursolic acid – the main content of the concentrate – *70%*, its isomer oleanolic acid, etc.) are contained in various plants: cranberry, blueberry, chokeberry, sea buckthorn, bearberry, hawthorn, wild rose, etc.
These acids have a diverse range of physiological activity:
- increase blood circulation in the vessels of the heart and brain;
- lowers blood pressure;
- increase the sensitivity of the heart to the action of glycosides;
- exhibit anti-inflammatory and anti-microbial properties.

Ursolic and oleanolic acids have been recommended for the treatment and prevention of skin cancer. These acids found to demonstrate activity against the development of tumors.
Triterpene acids are recommended for use in pharmacology as an antioxidant in cosmetic composition for dry skin.

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences a effective technology for production of the a **concentrate of triterpene acids** from natural plant materials was developed.

Patent 2394587 (RU)

Commercial offers:
- search for partners to produce medicinal forms;
- release of the active substance on the orders;
- organization of joint industrial production.

NATIVE URSOLIC ACID OF HIGH PURITY (90-99%)

The potential component of medicines and cosmetics

Ursolic acid is a triterpene compound of several alpha-amyrin. It is one of the most common teriterpene acids.
Ursolic acid founds herbaceous and shrubby plants (cranberry, blueberry, chokeberry, sea buckthorn, bearberry, hawthorn, wild rose, etc.)
For **Ursolic acid** revealed a wide spectrum of biological activity:
- has anti-inflammatory, healing and anti-microbial properties;
- has a diuretic effect and prevents the formation of kidney stones;
- has hepatoprotective properties;
- promotes coronary vessels of the heart and lower blood pressure;
- possesses antitumor effect;
- repairs damaged collagen fibers.

In N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences a effective production technology for purity **Ursolic acid** from natural plant materials was developed.
On the basis of **Ursolic acid** was developed technology for a number of its derivatives.

Ursolic acid and its native compositions are recommended for use as components in pharmaceutical preparations for the prevention of various diseases and cosmetics to create a new cosmetic compositions.

Patents 1816346, 2329048 (RU)

Commercial offers:
- search for partners to produce medicinal forms;
- release of the active substance on the orders;
- organization of joint industrial production.

Commercial offer

N.N.Vorozhtsov Novosibirsk Institute of Organic Chemistry of Siberian Branch of Russian Academy of Sciences offers:

- the manufacture of products on orders;
- search for partners for production of medicines;
- organization of joint industrial production;
- license agreement;
- development of effective and the best formulations for producers of dietary supplements

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