36

- years of pure scientific research on Earth and in space
- years of clinical validation in all types of bone and connective tissue surgery
- dissertations to attain the degree of Doctor of Medical Science
- products for use in dentistry, ENT surgery, OMF surgery and oral microsurgery

USER BENEFITS AND CONFIDENCE

1. **Native structure.** The primary natural spatial material structure is preserved during the production process using "Lioplast-C"® technology.

2. **Affinity to the human body.** Maximum conformity with biochemical and physiological parameters while maintaining the patient's homeostasis.

3. **100% substitution.** The bio-implants are replaced by the body's natural tissues within the designated time period, with no adverse effects or side-products from the substition.

4. **Biologically active.** The «visibility» and reaction of the body to the material. The body's own influence on the mechanisms of the cellular and humoral immune systems are unaffected.

5. **Inductive and conductive regeneration.** The pronounced conductivity and inductivity of the material, with no allergic or pathological side effects.

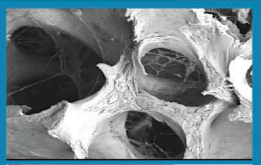
6. **Chemical composition research.** Full disclosure of the entire genomics and proteomics of the material, studies into the material's properties and behaviour in a range of envirnonments within the body and in tissue cultures.

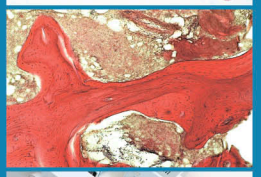
7. **36 years of clinical use.** Application in all fields of bone and connective tissue surgery. Over 2000 state and private medical institutions.

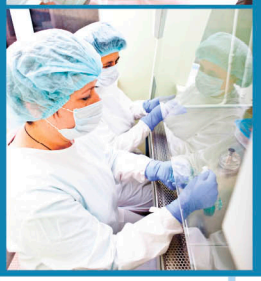
8. **All types of oral surgery.** Tooth-socket preservation, resection, cyst-removal, implants, bone-augmentation, mucogingival and sinus lift surgery.

9. **Personalised medical treatment.** A precise algorithm for the choice of treatment of each patient according to phenotype indicators, the profile and state of the clinical case.

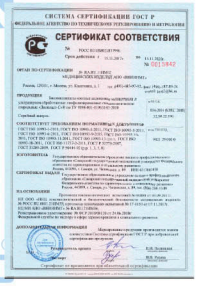
10. **36 years of pure research.** Cellular, laboratory, biochemical, physico-chemical, space and clinical research.







PATENTS AND CERTIFICATES


СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
СЕРТИФИКАТ СООТВЕТСТВИЯ

Certificate «Dental surgery»


СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
СЕРТИФИКАТ СООТВЕТСТВИЯ

Certificate «Traumatology/ Prosthetics»


РОСТЕСТ-МОСКВА
СЕРТИФИКАТ СООТВЕТСТВИЯ

Certificate of factory 13485-2017


РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ

Patent «Customized blocks for bone plastic»


РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ

Patent «Pharmacotherapy for patients»


РОССИЙСКАЯ ФЕДЕРАЦИЯ
ПАТЕНТ

Patent «Multiple gingival recession treatment»

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+7 (964) 342 16 12

MINERALIZED BONE CORTICAL POWDER

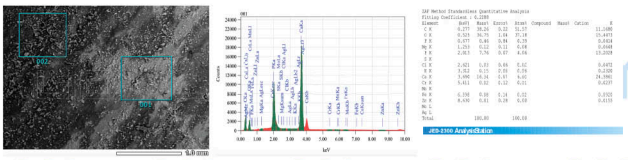
Description and characteristics

Mineralized cortical bone powder. Allogeneic material. Powdered bone product recovered naturally from cadavers.
White-coloured substance with a yellowish tint, particle size 0,5-1mm, uniform and without additives. Appearance reminiscent of fragments of varying size and shape. Sterilized by irradiation. Pack size 0,5ml, 1,0ml or 5,0ml. The substance is packaged in medical-glass phials, sealed with a rubber bung wrapped in an aluminium seal. The phials are packed in cardboard packaging. Properties a biologic activity.The powder is produced using "Lyoplast"® technology (ultrasonically cleaned and freeze-dried) for reconstructive oral surgery: implants, osteoplasty, reconstruction of the alveolar ridge. The material is a residue of the intercellular mass of the cortical bone.Base material.

A slow resorption (5-6 months for complete substitution) sculpting material for the treatment of medium or large defects. High conductive properties, preserves the primary (native) structure, high affinity to the human body, stimulates response from the cellular and humoral immune systems, encourages regeneration, is 100% substituted by new bone in 4-6 months.

Name	Name	Name
0,5 ml	1,0 ml	5,0 ml
LYO-115	LYO-116	LYO-117
0,5-1,0 mm	0,5-1,0 mm	0,5-1,0 mm
50	**100**	**250**

CHEMICAL COMPOSITION



FOR USE IN THE FOLLOWING OPERATIONS

3 4 5 6 9 13 14 15 16 17 18 20 22 23 24 25

MINERALIZED SPONGE BONE POWDER

Description and characteristics

Mineralized cancellous bone powder Powdered bone product recovered naturally from cadavers. White-coloured substance with a yellowish tint, particle size 0,25-0,5mm, uniform and without additives. Appearance reminiscent of spongy fragments of varying size and shape. Sterilized by irradiation. Pack size 0,5ml, 1,0ml or 5,0ml. The substance is packaged in medical-glass phials, sealed with a rubber bung wrapped in an aluminium seal. The phials are packed in cardboard packaging.

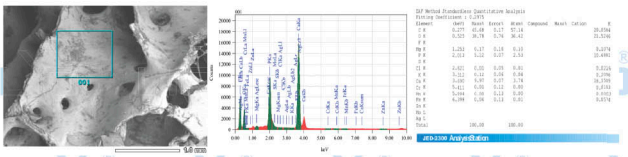
Properties a biologic activity

The powder is produced using "Lyoplast"® technology (ultrasonically cleaned and freeze-dried) for reconstructive oral surgery: implants, osteoplasty, reconstruction of the alveolar ridge. The material is a residue of the intercellular mass of cancellous bone. Base material.

A medium resorption (4-6 months for complete substitution) sculpting material for the treatment of small, medium or large defects. High conductive properties, preserves the primary (native) structure, high affinity to the human body, stimulates response from the cellular and humoral immune systems, encourages regeneration, is 100% substituted by new bone in 4-6 months.

Name	Name	Name
0,5 ml	1,0 ml	5,0 ml
LYO-106	LYO-105	LYO-104
0,5-1,0 mm	0,5-1,0 mm	0,5-1,0 mm
50	**100**	**250**

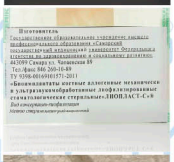
CHEMICAL COMPOSITION



FOR USE IN THE FOLLOWING OPERATIONS

1 2 3 4 5 6 7 8 9 12 13 14 15 16 17 18 20 22 23 24 25

COLLAGEN MEMBRANE (DURA MATER)



Description and characteristics

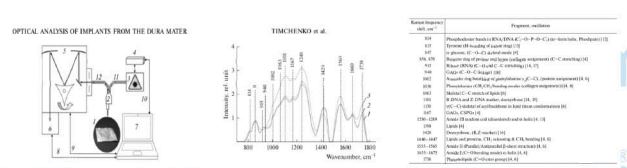
Strip of dura mater. Allogeneic material. Connective tissue fragment recovered naturally from cadavers.
Yellowish-coloured, varying in size from 1cm x 1cm (1cm2) to 4cm x 4cm (16cm2), with a non-uniform structure and uneven surface. Appearance reminiscent of woven material. Sterilized by irradiation. Pack size 1cm x 1cm, 1,5cm x 1,5cm, 2cm x 2cm, 2cm x 3cm, 3cm x 3cm, 3cm x 4cm, 4cm x 4cm. Each fragment is packed in a double-layer sterile polyethelene bag within non-sterile transparent thermally-sealed external packaging.

Properties a biologic activity

The membrane is produced using "Lyoplast"® technology (ultrasonically cleaned and freeze-dried) for reconstructive oral surgery: implants, osteoplasty, reconstruction of the alveolar ridge, muco-gingival surgery, gum contouring. The material is a residue of the collagen cartilage of human dura mater. Base material. Used as a barrier membrane and as an osteo- muco-contouring material.
A variable-resorption (3-4/5-6 months for complete substitution) sculpting material for treatment of small, medium or large defects. High conductive properties, preserves the primary (native) structure, high affinity to the human body, stimulates response from the cellular and humoral immune systems, encourages regeneration, is 100% substituted by new bone or connective tissue in 4-6 months.

Name		Name		Name		
1x1 cm	1.5x1.5 cm	2x2 cm	2x3 cm	3x3 cm	3x4 cm	4x4 cm
LYO-92	LYO-119	LYO-91	LYO-90	LYO-87	LYO-88	LYO-89
1 cm^2	2.25 cm^2	4 cm^2	6 cm^2	9 cm^2	12 cm^2	16 cm^2
40	**45**	**50**	**70**	**100**	**150**	**200**

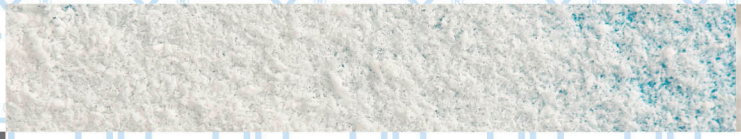
CHEMICAL COMPOSITION

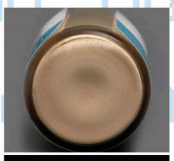


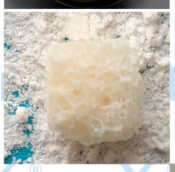
FOR USE IN THE FOLLOWING OPERATIONS

1 2 3 4 5 6 10 13 14 15 16 17 18 19 20 22 23 24 25 26 27 28

LYOPLAST® MIX-MAX COMPLEX COMPONENTS



DEMINERALIZED CORTICAL BONE POWDER

Description and characteristics

Allogeneic material. Powdered bone product recovered naturally from cadavers.
White-coloured substance with a yellowish tint, particle size 0,05-0,1mm, uniform and without additives. Appearance reminiscent of fine, organically-derived powder. Sterilized by irradiation.

Pack size 0,5ml, 1,0ml or packed together with a fragment of demineralized cancellous bone. The substance is packaged either in a medical-glass phial or a double-layer polyethelene bag and external packaging. The phial is sealed with a rubber bung wrapped in a seal, and packed in cardboard packaging.

Properties a biologic activity

The powder is produced using "Lyoplast"® technology, with additional demineralization for use in oral bone and reconstructive surgery. The material is an organic residue of the intercellular mass of cortical bone, primarily non-collagenic in nature. Additional component.

Induces osteogenesis through content of various classes of bone morphogenetic proteins. Stimulates perivascular (adventitial) cells, triggers migration, proliferation and differentiation of mesenchymal cells into bone cells and endothelial cells. Intended for use in the treatment of medium and large defects carrying a risk of low vascularization (paradontitis, complex systemic diseases, etc.) Preserves the native structure, has high affinity to the human body, stimulates the cellular and humoral immune systems, is 100% substituted within 2-3 months.

MINERAL-ORGANIC BONE COMPLEX

Description and characteristics

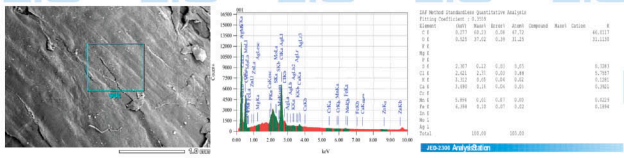
"Allogeneic hydroxylapatite". Allogeneic material. Powdered bone product recovered naturally from cadavers.
White-coloured substance, particle size 0,001 - 0,005mm, uniform and without additives. Hygroscopic.
Contains mineral and organic elements in the same proportions in which they occur in human bone tissue. Precise composition determined by mass-spectrometry.

Inorganic components: Ca - 413-537mg/g; P -167-380mg/g; Mg - 1,30-3,50mg/g; Fe - 0,09-0,026mg/g; Zn - 0,01-0,820mg/g; Co - 0,011-0,024mg/g; Cr - 0,006-0,020mg/g; Ag - 0,009-0,02mg/g. Organic components: Chondroitinsulphate - 0,08-0,140mg/g; Collagen – 336,5mg/g.Pack size 0,5ml. The substance is packaged in glass phials, sealed with a rubber bung wrapped in an aluminium seal, and packed in cardboard packaging. Properties a biologic activity. The product is derived from of the demineralization of cortical bone using "Lioplast®" technology, and is used for oral plasty where there is a risk of vertical loss of plastic material volume during the substitution process. Additional component.

Reduces risk of material volume through surplus concentrations of mineral salts, inhibits migration and reduces osteoclast activity. Contains structural components for intercellular bone material, mechanically retains surface profile.

Name	Name	Name	Name
0,5 ml	1,0 ml	0,5 ml	0,5 ml + 1 pc
LYO-35	LYO-36	LYO-49	LYO-78
0.05-0.1 mm	0.05-0.1 mm	0.001-0.005 mm	0.05-0.1 mm
50	**100**	**50**	**60**

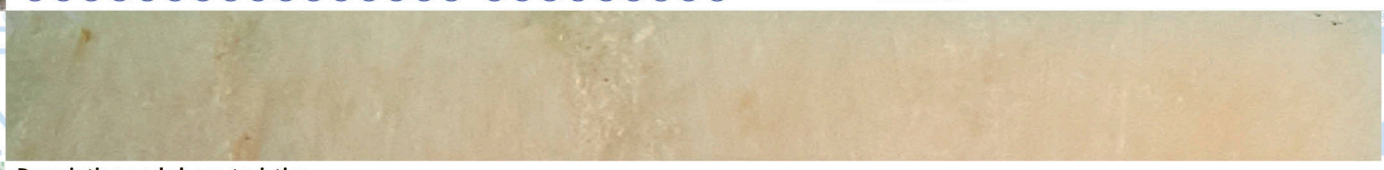
CHEMICAL COMPOSITION

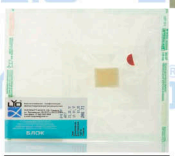
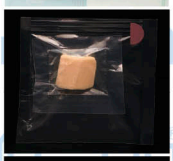
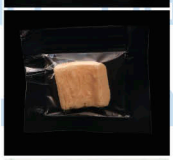


FOR USE IN THE FOLLOWING OPERATIONS

2 3 4 5 6 9 13 14 15 16 17 18 20 23 24 25 6 9 14 15 18 20 22 23 24

(DE-)/ MINERALIZED CORTICAL BONE BLOCKS




Description and characteristics

Pieces of mineralized/demineralized cortical bone. Allogeneic material. Fragments of bone product recovered naturally from cadavers.
Ivory-coloured bone product fragment with a yellowish tint, dimensions 20mm x 20mm x 5mm, 20mm x 20mm x 1mm, 20mm x 20mm x 10mm, 20mm x 10mm x 10mm, 20mm x 10mm x 5mm; irregular surface, primarily without additives. May contain portion of cancellous bone.
The demineralized types have a fibrous structure. Appearance reminiscent of bone pieces of varying size and shape. Sterilized by irradiation.

Packaged individually in a double-layer sterile polyethelene bag within non-sterile transparent thermally-sealed external packaging.

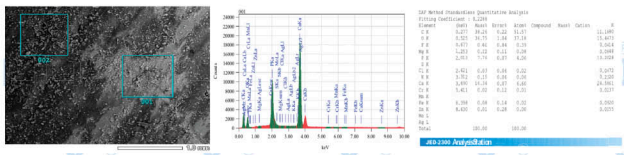
Properties a biologic activity

The pieces are produced using "Lyoplast"® technology (ultrasonically cleaned and freeze-dried) for reconstructive oral surgery: osteoplasty, reconstruction of the alveolar ridge. The material is a residue of the intercellular mass of cortical bone, or with a portion of cancellous bone. Used either whole for augmentation, or in powdered form as a sculpting material.

A slow resorption (5-7 months for complete substitution) sculpting material for the treatment of small or medium defects. High conductive properties, preserves the primary (native) structure, high affinity to the human body, stimulates response from the cellular and humoral immune systems, encourages regeneration, is 100% substituted by new bone in 5-6-7 months.

Name	Name	Name	Name	Name
2x2x0.5 cm	2x2x0.1 cm	2x1x0.5 cm	2x1x0.5 cm	2x2x0.5 cm
LYO-30	LYO-120	LYO-73	LYO-39	LYO-114
Mnrlzd	Mnrlzd	Mnrlzd	Demin	Demin
65	**50**	**100**	**65**	**100**

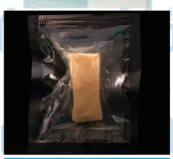
CHEMICAL COMPOSITION



FOR USE IN THE FOLLOWING OPERATIONS

12 13 14 19 23

MINERALIZED SPONGE BONE BLOCKS

Description and characteristics

Pieces/fragments of mineralized cancellous bone. Allogeneic material. Fragments of bone product recovered naturally from cadavers.
Ivory-coloured bone product fragment with a yellowish tint, dimensions 5mm x 5mm x 5mm, 40mm x 20mm x 10mm, 20mm x 20mm x 10mm, 20mm x 10mm x 10mm; uniform surface without additives. Appearance reminiscent of bone pieces of varying size and shape. Sterilized by irradiation.

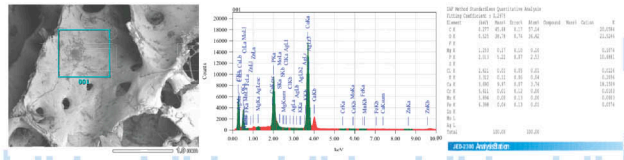
Packaged individually in a double-layer sterile polyethelene bag within non-sterile transparent thermally-sealed external packaging.

Properties a biologic activity

The pieces are produced using "Lyoplast"® technology (ultrasonically cleaned and freeze-dried) for reconstructive oral surgery: osteoplasty, reconstruction of the alveolar ridge. The material is a residue of the intercellular mass of cancellous bone, or with a portion of covering cortical bone. Used either whole or fragmented for augmentation, or in powdered form as a sculpting material.
A slow resorption (5-7 months for complete substitution) sculpting material for the treatment of small or medium defects. High conductive properties, preserves the primary (native) structure, high affinity to the human body, stimulates response from the cellular and humoral immune systems, encourages regeneration, is 100% substituted by new bone in 5-6-7 months.

Name	Name				Name	
0,5X0,5X0,5 cm	0,5X0,5X0,5 cm	0,5X0,5X0,5 cm	4X2X1 cm	4X2X1 cm	2X1X1 cm	2X2X1 cm
LYO-57	LYO-59	LYO-55	LYO-32	LYO-33	LYO-68	LYO-72
2 pcs	4 pcs	5 pcs	1 pc	1 pc	1 pc	1 pc
50	**100**	**250**	**150**	**150**	**65**	**100**

CHEMICAL COMPOSITION



FOR USE IN THE FOLLOWING OPERATIONS

1 2 3 4 6 9 14 16 18 25

LYOPLAST-S ® MATERIALS CAN BE USED IN DIFFERENT OPERATIONS

1. Tooth alveola preservation after root/tooth extraction without bone defect;
2. Tooth alveola preservation after root/tooth extraction with one-wall-bone defect: vestibular or lingual;
3. Tooth alveola preservation after root/tooth extraction with cross-wall-defect: vestibular and lingual together;
4. Preservation of the tooth hole during tooth extraction with a cyst on the root, cystectomy;
5. Preservation of the tooth hole during tooth extraction to the patient with periodontitis;
6. Plastic of the oro-antral fistula formed during tooth extraction;
7. Tooth extraction with implantation in the alveola without a defect;
8. Tooth extraction with implantation into the alveola with a defect of one wall;
9. Tooth extraction with implantation in a large alveola with low stability;
10. Implantation in the first type of bone tissue. Surgical preparation;
11. Implantation in the fourth type of bone tissue. Bone condensation;
12. Sinus lifting with plastic in the area of one tooth to a height of 5 mm;
13. Sinus lifting with the plastic in the area of two teeth to a height of 5 to 8 mm;
14. Sinus lifting with the plastic in the region of two or three teeth to a height of 9 mm;
15. Plastic surgery / prevention of perforation of the Schneider membrane with sinus lift;
16. Alveolar plastics in width splitting with implantation;
17. Alveolar plastics in width by direct tissue regeneration without frame (support) screws;
18. Alveolar plastics in width by direct tissue regeneration with frame screws;
19. Alveolar plastics in width by standard bone block;
20. 3D plastic of the alveolar (in width and height) with a mixture of components by Lyoplast Mix-MAX;
21. 3D plastic of the alveolar (in width and height) with a mixture of components by Lyoplast Mix-MAX;
22. Plastics of a large bone defect of the alveolar with a lack of volume and quality of soft tissues, small vestibule, the presence of cords. Surgical preparation;
23. 3D alveolar plastic (in width and height) in patients with generalized periodontitis by Lyoplast Mix-MAX;
24. Orthodontic treatment of patients with chronic generalized periodontitis with Lyoplast Mix-MAX;
25. Resection of the apex of the tooth. Cystectomy. When the volume of the cyst is more than 1 cm of plastic, using the Lyoplast Mix-MAX method;
26. Surgical treatment of a single gum recession in the area of the tooth or implant;
27. Surgical treatment of multiple gum recession in the teeth;
28. Thickening of the gum biotype before orthodontic treatment with vestibular tooth movement;
29. Creation of the vestibule of the oral cavity, the attachment of the gums and the thickening of the biotype in front of the 3D plasty of the bone atrophy of the alveolar.

PRODUCTION TECHNOLOGY «LYOPLAST-S»®

Selected material samples from donors undergo 6 degrees of purification by physical means (mechanical, ultrasonic, vacuum, radiation, etc.):

1. Ultrasonic treatment of tissues for the removal of bone marrow and fat elements from spongiosa, carrying out the primary sterilization of the material, viral inactivation.

2. Final degreasing with solvents without participation in chemical reactions. The technology excludes 100% of traces of foreign and technological substances and solvents.

3. Lyophilization to remove free and bound moisture and traces of solvents.

4. Sterilization by radiation (fast electrons on Co60).

The production technology allows the recipient to be fully protected from the transmission of any disease, minimizes the risk of infection to personnel and makes the process environmentally safe and economical.

All donors before the tissue sampling are carried out autopsy and serological examination of blood for syphilis and hepatitis B and C viruses, HIV with the help of highly sensitive tests:
Express - analysis for antibodies to pale spirochete;
The reaction of binding complement to a pale spirochete;
Studies on markers of viral infections:
HBsAg; AntiHCV; Antibodies to HIV."

THE HISTORY OF THE TISSUE BANK OF THE CENTRAL RESEARCH LABORATORY

The Samara Tissue Bank is based on the Central Research Laboratory (CSRL) of the Samara State Medical University (SamSMU). In 2018, the Samara Tissue Bank celebrated its 35th anniversary, and the Central Research Laboratory - the 55th anniversary. The urgent need to open a tissue bank in Kuibyshev (now the city of Samara) appeared in the 70s of the last century.

The idea to organize the Tissue Bank at the medical university belongs to the academician of the RAMS Alexander Fedorovich Krasnov, who at that time headed the institute and the department of traumatology and orthopedics. But only after professor Vladimir Nikolaevich Shlyapnikov, the vice-rector of the institute who was in charge of the Central Research Laboratory from 1970 to 1977, the pathologist in his specialty, proposed to deploy a tissue bank on the basis of the Central Research Laboratory of the Kuybyshev Medical Institute.

The tissue bank was established in 1983. At the beginning of its existence, it consisted of a single unit - the Department of tissue conservation. Since 2000, a cell culture laboratory has been organized in the structure of a tissue bank, within which there are two separate laboratories: animal cells and human cells.

On March 6, 2002, the Department of Tissue Preservation was renamed the Samara Tissue Bank (order No. 40 for SamGMU). Kuibyshev Tissue Bank became the only one in the country located in the structure of a higher educational institution. Since 1992, high-tech production of lyophilized bioimplants using the Lioplast® technology has been organized.