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Original Research Article

NANOBIOTECHNOLOGY IN MODERN MEDICINE

Peredkov K.Ya.

National Medical University,
Ukraine, Kyiv

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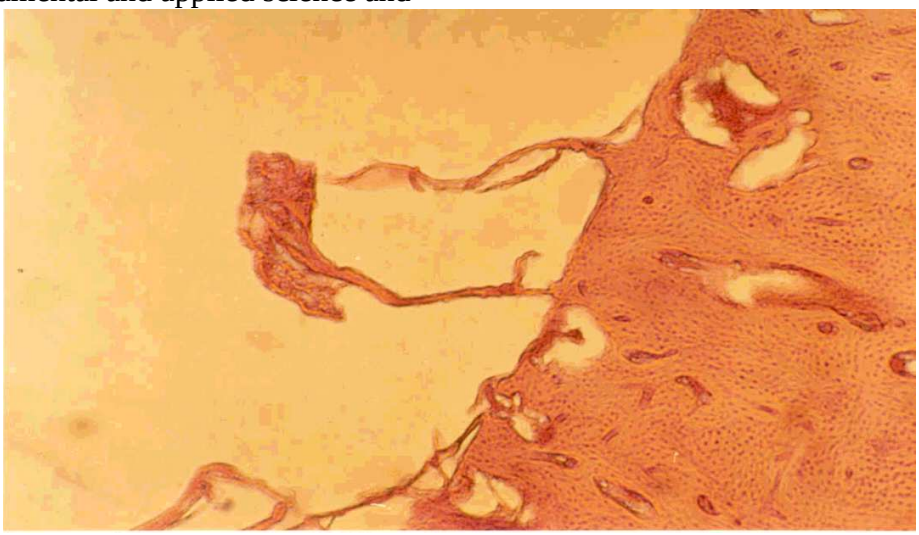
Email:
cosma@ua.fm

Nanomedicine-trend in modern medicine, based on the use of the unique capabilities of nanomaterials and nano-objects for the selection, design, and changes in biological systems on the human low-molecular level.

Nanotechnology- an interdisciplinary field of fundamental and applied science and technology, which consists of a combination of theoretical study and practical research methods, analysis and synthesis, as well as methods of production and application products with a given atomic structure by controlled manipulation of individual atoms and molecules.



Cooperation of biocomposite with bone-osteointegration, dense fitting closely of bone.

Artificial bone (biocomposites), bioactive inorganic multiphase composite material (synthesized on the basis of nanocrystals gidroksilappatit, tricalcium-phosphate, bioactive glass, mixed oxides of metals and nonmetals), similar in composition to natural bone mineral and intended to restore it with different pathologies.

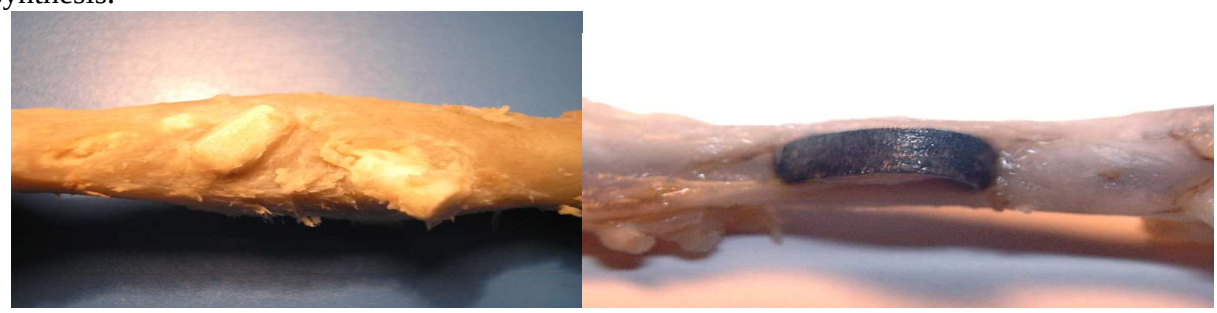
Possible forms of bioceramics.

The system of artificial bone is multifunctional materials, as they have the ability to osseointegration, osteoconduction, osteoinduction, osteostimulation, and osteogenesis.

In the complement of biocomposite to be a possibility to add antiseptic preparations.

After the occurrence of the bone-ceramic complex in the body, the material is partially or completely resorbed at the planned time-from 1,5-2 months- to several years, being replaced by bone tissue, which consists of products of resorption and synthesis.

The mechanism, the nature, and rate of resorption is planned and managed composition and structure of complex artificial bone.



Osteointegration plates in a bone with bioceramics covering and without.

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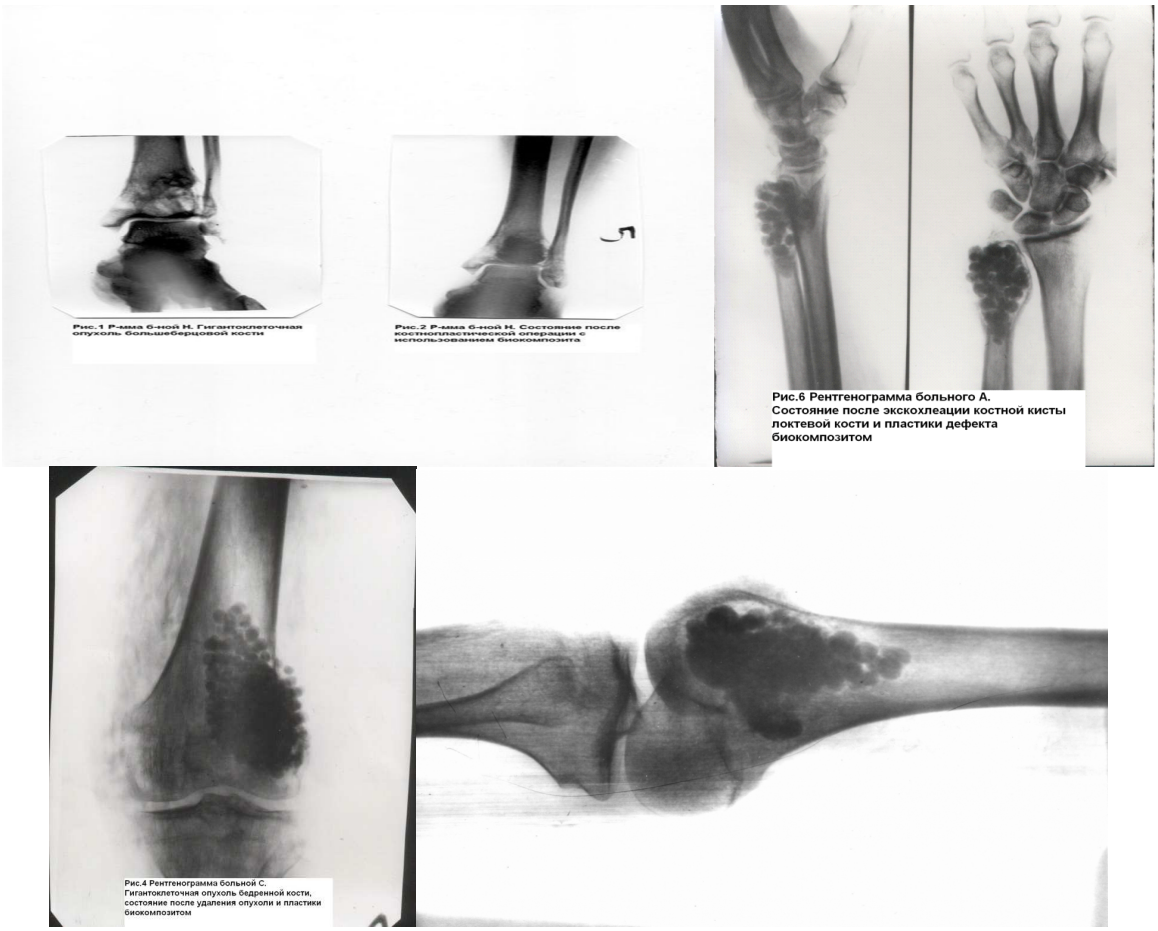
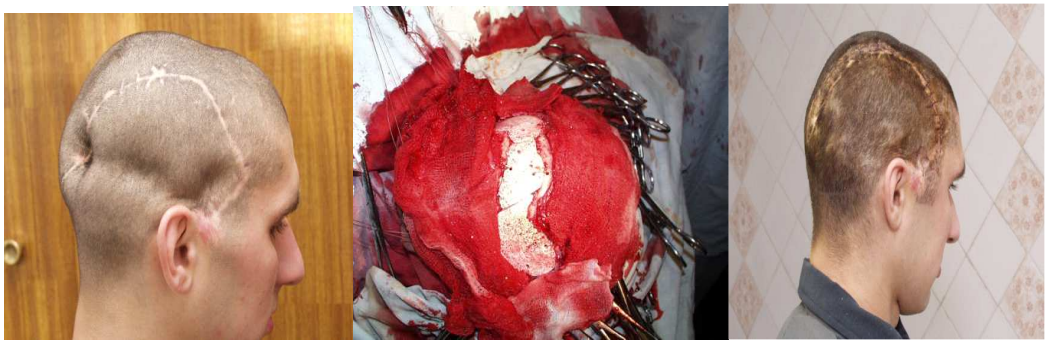
Selection of nonresolution of the complex, which firmly holds the specified shape and volume, such as alveolar jaw.

Biocomposite contains only the highest biocompatibility of inorganic constituents, which do not cause abnormal immune reactions, and inorganic bactericidal supplements, obstruction inflammatory complications. Due to the absence of organic components is possible multi sterilization of reusable material.



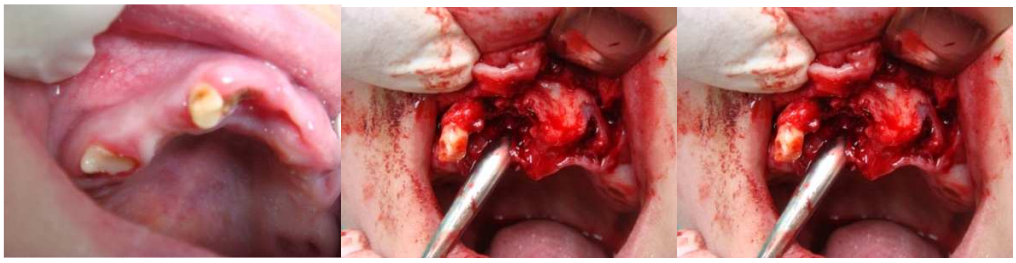
Experimental application of bioceramics in the defects of different bones.

The using of autologous bone-may be replaced and supplemented by using modern bioactive ceramics with the planned biological properties. Using biocomposites in oral and maxillofacial surgery is possible:
-For replacement elements maxillo-facial bones and joints.



-To fill the bone cavities after capsulotomy and cystectomy, treatment of osteomyelitis.
-To form the bone wall with perforated sinusitis.

- For bone grafting in plastic surgery.
-To fill bone defects.



-For a sinus-lift.
-At chronic sinusitis

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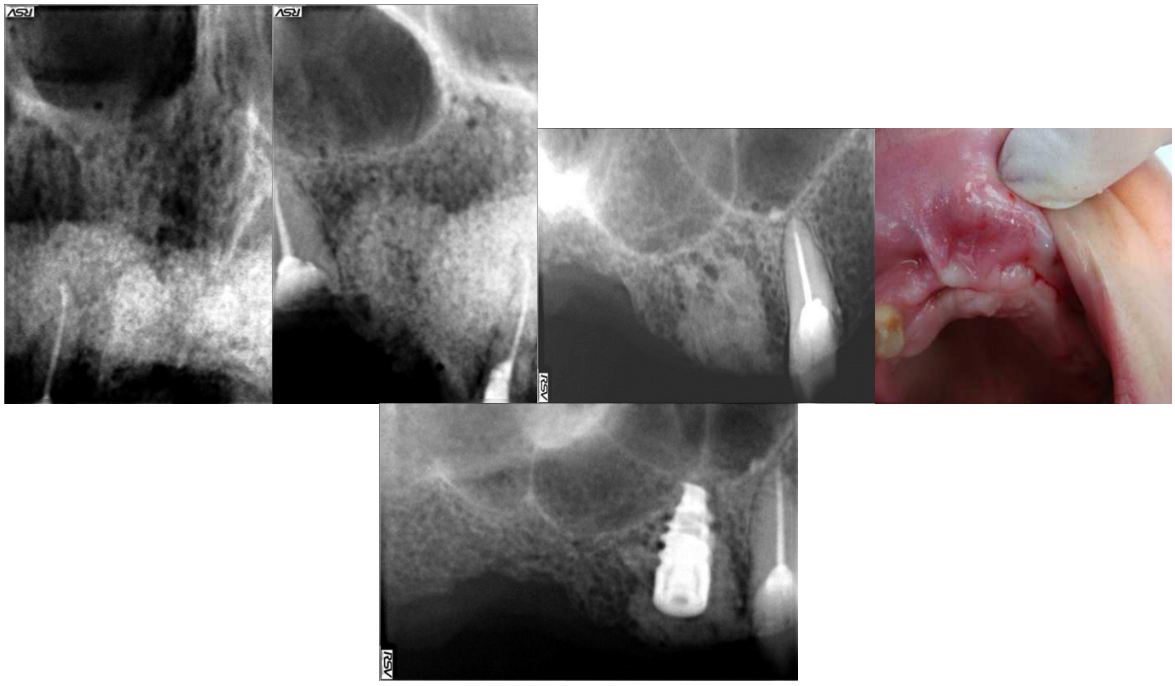

In stomatology:
-For the filling of periodontal defects.
-To fill the holes removed teeth.
-When you atrophy of alveolar bone in the jaw bone for augmentation.
-For obturating dentinal canals.
-In a deep root canal fillings, including extra pix therapy.

Thus, modern biocomposites represent the latest concept in the development of bioactive inorganic materials for reconstruction of bone tissue.

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