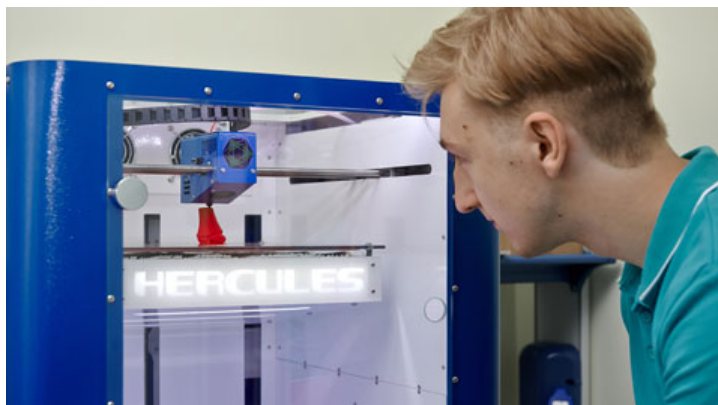


SibFU biologists have learned to type bones

The team of scientists of Siberian Federal University is working to create bone structures from polyhydroxybutyrate — fully biodegradable material, synthesized by microorganisms with the use of 3D-prototyping and computer tomography. These products can be used for the high-tech treatments.



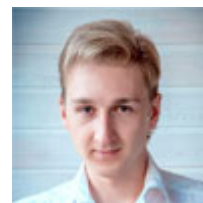
As **Yekaterina Shishatskaya**, Professor, D.Sc. (Biology), and the Head of the Chair of Medical Biology of SibFU, explained, obtaining the synthetic bone from biocompatible materials considering individual anatomical, morphological and functional characteristics of the patients today is the topical direction. In the near future, it will be the "gold standard" of Orthopedics and will allow avoiding the use of alien materials to treat

disorders.

"The additive prototyping allows obtaining products of almost any shape and size. Given that the modern equipment allows you to take pictures with the accuracy up to 0,625 mm, and software systems which isolate the types of tissues, individual objects and store the data in the form of models, the method is ideal for the manufacture of the single-piece, individual structures. All we need is a technology of processing of the biopolymer material for the print", — said Yekaterina.

According to the scientists, in addition to the use of computer tomography data of the patient, the model for printing can be obtained by focusing on the average statistical data about the size of a bone in a particular age and height group.

*"The layering fusing of the material is used for the printing. This makes it possible to apply the polymer without changing the chemical structure and using of the adhesive. The wire from the reel goes through the teflon tube into the mini-extruder nozzle and prints a layer with the predetermined thickness by moving along the X-axis and Y-axis. At the same time, the platform while producing a new layer for printing is shifted in the axis Z. The print requires the wire with the diameter 1,75 mm produced by different technologies. Currently, we are trying different approaches, based on the physical and mechanical properties of the polymer material called "Bioplastotan", — said **Konstantin Kistersky**, the member of the research team, whose term project won a prize at the International Youth Innovation Forum "Lomonosov " in Moscow.*



"Bioplastotan" is a biodegradable polymer created by the Krasnoyarsk biologists. In 2010, Yekaterina Shishatskaya was awarded the Prize of the President of the Russian Federation for the research on the development of the production technologies of "Bioplastotan" and creating the scientific basis for their application in medical practice.

During the next stage of work scientists intend to conduct a comprehensive evaluation of the experimental implants for compliance with Russian and international standards for implantable medical products with high individual risk and designed for the long-term and constant use.

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