

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ  
КАФЕДРА ІНОЗЕМНИХ МОВ  
ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ ЦЕНТР

МАТЕРІАЛИ ІХ МІЖВУЗІВСЬКОЇ  
НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ  
ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ  
КАФЕДРИ ІНОЗЕМНИХ МОВ

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## A REVOLUTION IN MEDICINE: 3-D PRINTER

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A number of fields formed in the new millennium opened up new possibilities for the use of new information technologies. These include: nanotechnology, biomedical research, combined with mathematical and computer modeling, energy multifactorial influences in diagnostic and therapeutic purposes in the system, organs and tissues, microanalysis of biological fluids and tissues, artificial organs and tissues.

3-D biological printer or three dimensional print of living tissue is a new method in medicine, which is still at the early stages of development.

Scientists of the Institute for Regenerative Medicine in 2012 created a hybrid 3D-printer that was able to produce viable cartilage implants for patients who needed them. The basis of this technology is layered deposition of living cells from hydrogel which plays the role of ink in jet printers. The problem of printed structures durability was solved by the combination of living cell tissue and synthetic polymer to build a frame. This combination resulted in obtaining viable cartilage that had higher mechanical strength than natural materials. The cells precipitated from the traditional hydrogel create favorable environment for proliferation of tissue implanted in the patient.

The experiments conducted on mice showed that after eight weeks of implants being in the body, the new cartilage tissue was created, the structure and the properties did not differ from those of an ordinary elastic cartilage.

Scientists hope that the new technology will produce human tissue of simple structure for toxicological tests. This will allow medical researchers to test drugs on models of liver and other organs and therefore reducing the need for animal testing.