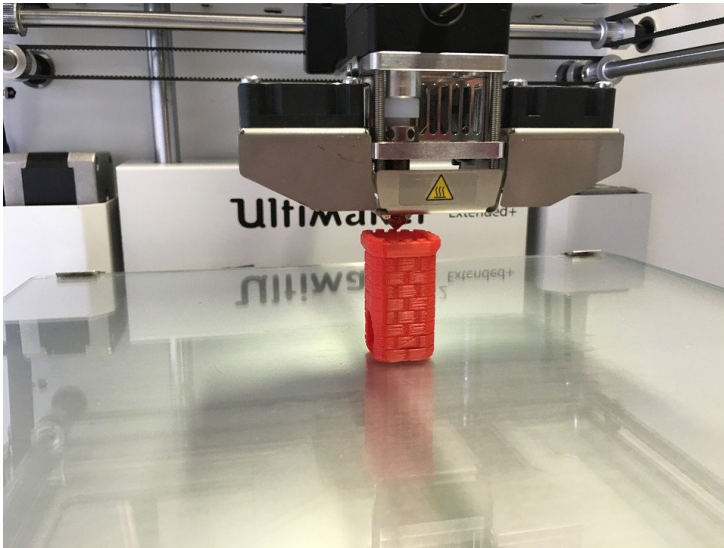


Success in 3-D bioprinting of cartilage

02 May 2017 | News

A team of researchers at Sahlgrenska Academy has managed to generate cartilage tissue by printing stem cells using a 3D-bioprinter



A team of researchers at Sahlgrenska Academy has managed to generate cartilage tissue by printing stem cells using a 3D-bioprinter. The fact that the stem cells survived being printed in this manner is a success in itself. In addition, the research team was able to influence the cells to multiply and differentiate to form chondrocytes or cartilage cells in the printed structure.

The research project is being conducted in collaboration with a team of researchers at the Chalmers University of Technology who are experts in the 3D printing of biological materials. Orthopedic researchers from Kungsbäck are also involved in the research collaboration.

The team used cartilage cells harvested from patients who underwent knee surgery, and these cells were then manipulated in a laboratory, causing them to rejuvenate and revert into "pluripotent" stem cells, i.e. stem cells that have the potential to develop into many different types of cells. The stem cells were then expanded and encapsulated in a composition of nanofibrillated cellulose and printed into a structure using a 3D bioprinter. Following printing, the stem cells were treated with growth factors that caused them to differentiate correctly, so that they formed cartilage tissue.

The cartilage formed by the stem cells in the 3D bioprinted structure is extremely similar to human cartilage. Experienced surgeons who examined the artificial cartilage saw no difference when they compared the bioprinted tissue to real cartilage, and have stated that the material has properties similar to their patients' natural cartilage.