

3D print human organs

Klimko Ulyana Vladimirovna,

Belarusian state medical university, Minsk

*Tutor(s) - Menjinskaya-Voitova Alexandra Viktorovna, Belarusian state medical university,
Minsk*

Introduction

Additive manufacturing, otherwise known as three-dimensional (3D) printing, is driving major innovations in many branches of science, such as engineering, manufacturing, art, education and medicine. Recent advances have enabled 3D printing of biocompatible materials, cells and supporting components in 3D complex functional living tissues.

Aim

To study the importance of 3D printing organs in transplantation.

Materials and methods

To analysis global publications of new scientific researches in the field of 3 d printing organs.

Results

As a result scaffolds formed by 3D printed materials must appropriate for cell proliferation physically and chemically. Biodegradability is another important factor, and insures that the artificially formed structure can be broken down upon successful transplantation, in order to be replaced by a completely natural cellular structure. While breakthroughs have been made with regards to producing printable organs, its clinical implementation, namely towardsto complex organs, requires further research. Cell proliferation provided by bioprinting is conducted in an artificial environment, which is devoid of natural biological signaling and processes; the lack of these qualities inhibits the development of appropriate cellular morphology and differentiation. When present, these conditions allow the printed organ to more accurately mimic in vivo conditions and adopt the corresponding structure and function, as opposed to growing as a shaped scaffold of cells. Significant science and discovery is required to develop a tissue therapy, ensure safety and efficacy through controlled clinical trials.

Conclusion

- 1) The development of 3D printing organs is an important direction of medicine
- 2) Tissue therapies can treat the disease, with reduced risk of immune rejection.
- 3) The availability of human organs for the transplantation can be help of 3D printing.