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TRANSPLANTOLOGY OF THE FUTURE: POTENTIAL WAYS TO GROW HUMAN ORGANS

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Transplantology is a field of medicine that studies the question and issues of organ transplantation. Nowadays, many kinds of research in this branch are related to the perspectives of growing artificial human organs. Indeed, modern organ transplantation is associated with a long list of issues related to congeniality and natural rejection that might be potentially solved by the mass production of lab-grown organs.

This work represents an overview of the two potential approaches to grow human organs, their current development statuses, and the difficulties associated with the introduction of these methods in medicine.

The first potential way to make mass organ production real is xenotransplantation – transplantation from a non-human donor. The main point of the current studies is to overcome any possible barriers, including immunological rejections and risk of xenozoonosis, by genetically altering animal organs with human genes. Xenotransplantation has already shown satisfying results in NHP (non-human primates) models.

The second, and currently the most perspective approach, is growing organs *in vitro* out of the patient's own stem cells. To date, the greatest success the scientists have had in this field has been the production of lab-grown skin. However, to start creating other organs, researchers have to expand our knowledge about stem cells and find out how lab-grown body parts compare to natural ones.

Overall, we can tell that, despite all the current difficulties, both approaches are promising; and the usage of artificial human organs in clinical applications is approaching.

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