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Fabricating humans: Ethical, legal and social issues of 3D organ bioprinting



Biofabrication and bioprinting represent an emerging new science promising astonishing progresses in the research and clinical applications. <u>Biofabrication</u> and bioprinting are "cousins" of tissue engineering and regenerative medicines because they use human biological materials to build constructs.

However they raise specific ethical, legal and social issues which are associated with their special technologies. This abstract outlines the ethical, legal and social issues related to 3D tissue and organ bioprinting and the ways to explore them further. While 3D tissue and <u>organ bioprinting</u> seem to offer promising solutions to atavic ethical problems by offering viable alternative to animal testing, xenotransplantations, persistent organ demand, they raises special ethical, legal and social issues which deserve to be considered deeply.

Firstly, 3D organ bioprinting may lead to unethical (?) social stratification. Since the technologies used to create 3D bioprinted biomaterials are highly expenses, 3D bioprinting may create a social discrimination based on the individual richness so that this technology ends to benefit only people who may pay for their own organ fabrication.

Secondly, 3D bioprinting is still a futuristic approach which needs to be extensively validated. While 2D bioprinting

(tissues such as skin) and hollow tube printing (such as blood vessels) are simpler, hollow and solid organ are far more complex and require long- term development and testing. Therefore, 3D bioprinting raises the need for scientists to handle the expectations of patients and their families.

Furthermore, 3D organs bioprinting requires to set out specific regulations. To date, 3D organ bioprinting is not subject to dedicated legislations except for limited countries. Many ethical and regulatory issues are still open. There is currently the urgent need to define 3d bioprinting as a type of profitable machine or a medical treatment. Beyond the nature of bioprinted products, there is also the need to define property rights such as, for example, the patient ownership rights and the right/opportunity to grow their own.

Speaker Biography

Elena Salvaterra is an independent lecturer mostly affiliated to the ICHS-International Campus of Health Science, based in Milano, Italy. She earned a degree in Law and a PhD in Ethics of Science. Recently she completed a MA in Psychology of Disability. She worked as researcher for 20 years publishing articles for indexed and academic journals. She also published two books in the field of bio banking. She gave several lectures at international conferences mostly in the field of human bio banking ethics. She is currently working on projects related to the ethics of <u>3D organ/biomaterial printing</u>.

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