Title: 3D Bioprinting: Technologies and Materials

Abstract:

Three-dimensional (3D) printing is already routinely used in the clinic, e.g. for pre-operative models or intra-operative guides. However, this does not involve the generation of living 3D structures, i.e., biofabrication of tissues and organs. This automated approach holds potential to advance the field of regenerative medicine as outer shapes can be personalised and organised constructs can be produced when printing with multiple bio-inks. Recent developments have now resulted in the availability of a plethora of bioinks, new printing approaches, and the technological advancement of established techniques. Nevertheless, mimicking the functional properties of the tissues and clinical translation of the technology are two important remaining challenges. In order to achieve this, we urge that the field now shifts its focus from materials and technologies towards the biological development of the resulting constructs. Moreover, there is an urgent need for more specialized production facilities to move this technology towards the patient.