

## **Towards artificial tissue models: past, present, and future of 3D bioprinting**

### **Datenbank**

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### **Deskriptoren**

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### **Abstract**

Regenerative medicine and tissue engineering have seen unprecedented growth in the past decade, driving the field of artificial tissue models towards a revolution in future medicine. Major progress has been achieved through the development of innovative biomanufacturing strategies to pattern and assemble cells and extracellular matrix (ECM) in three-dimensions (3D) to create functional tissue constructs. Bioprinting has emerged as a promising 3D biomanufacturing technology, enabling precise control over spatial and temporal distribution of cells and ECM. Bioprinting technology can be used to engineer artificial tissues and organs by producing scaffolds with controlled spatial heterogeneity of physical properties, cellular composition, and ECM organization. This innovative approach is increasingly utilized in biomedicine, and has potential to create artificial functional constructs for drug screening and toxicology research, as well as tissue and organ transplantation. Herein, we review the recent advances in bioprinting technologies and discuss current markets, approaches, and biomedical applications. We also present current challenges and provide future directions for bioprinting research.

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### **Autor**

Arslan-Yildiz, Ahu; Assal, Rami El; Chen, Pu; Guven, Sinan; Inci, Fatih; Demirci, Utkan

### **Institution**

School of Medicine, Stanford University, Palo Alto, CA, US

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