UNIVERSITÀ DEGLI STUDI FIRENZE

Tecniche di rigenerazione di tessuti e organi

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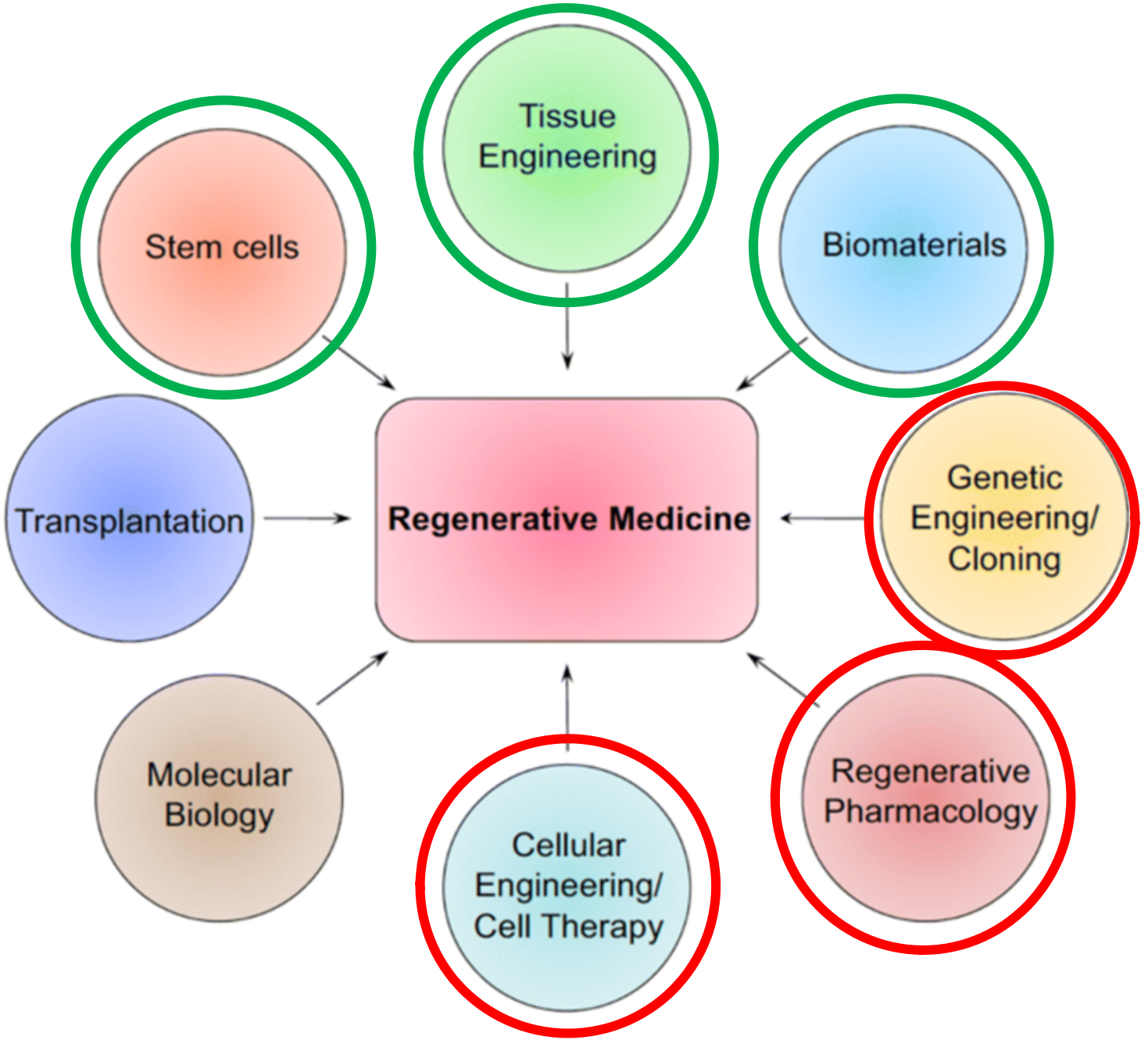
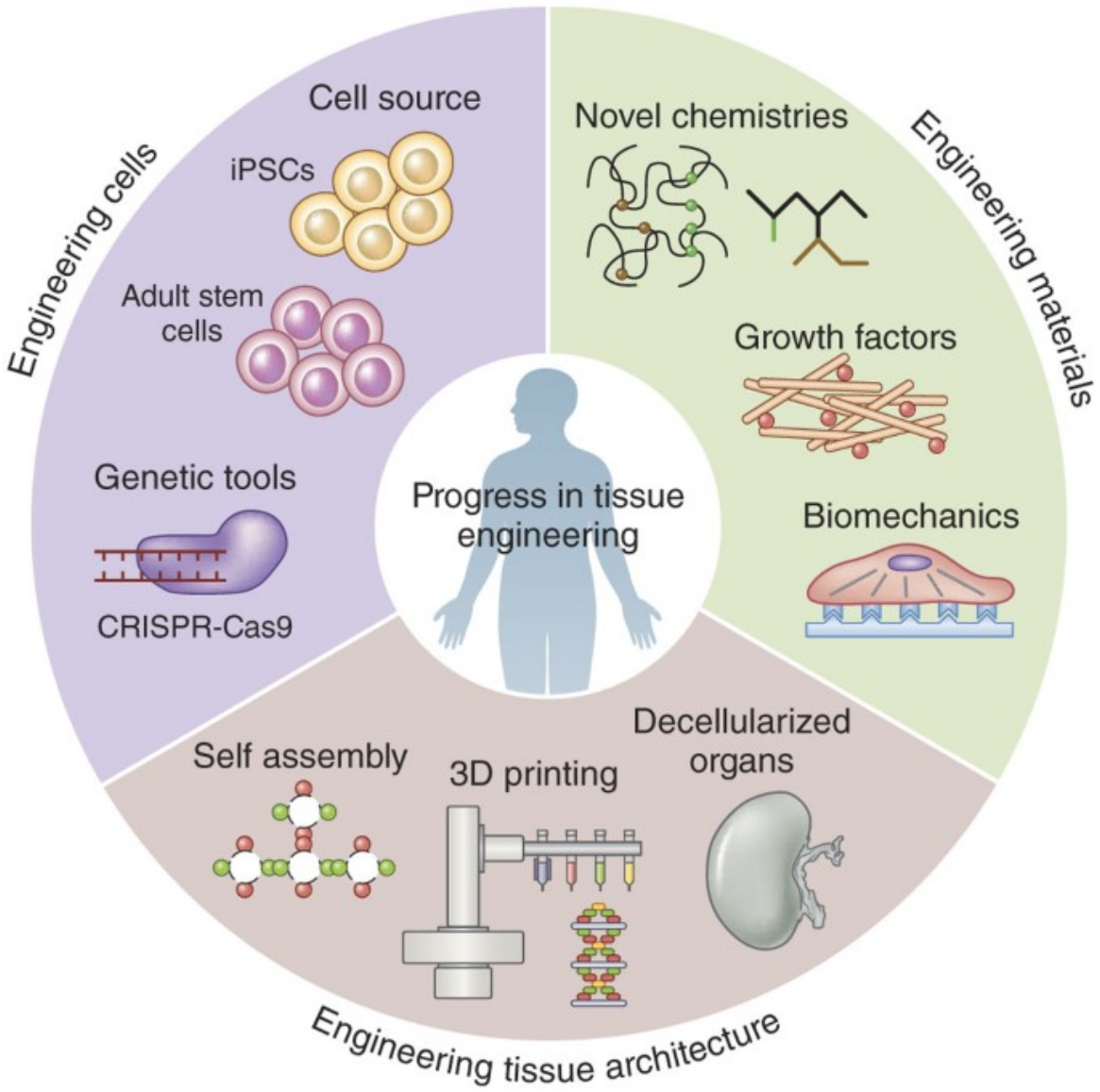
Obiettivi formativi

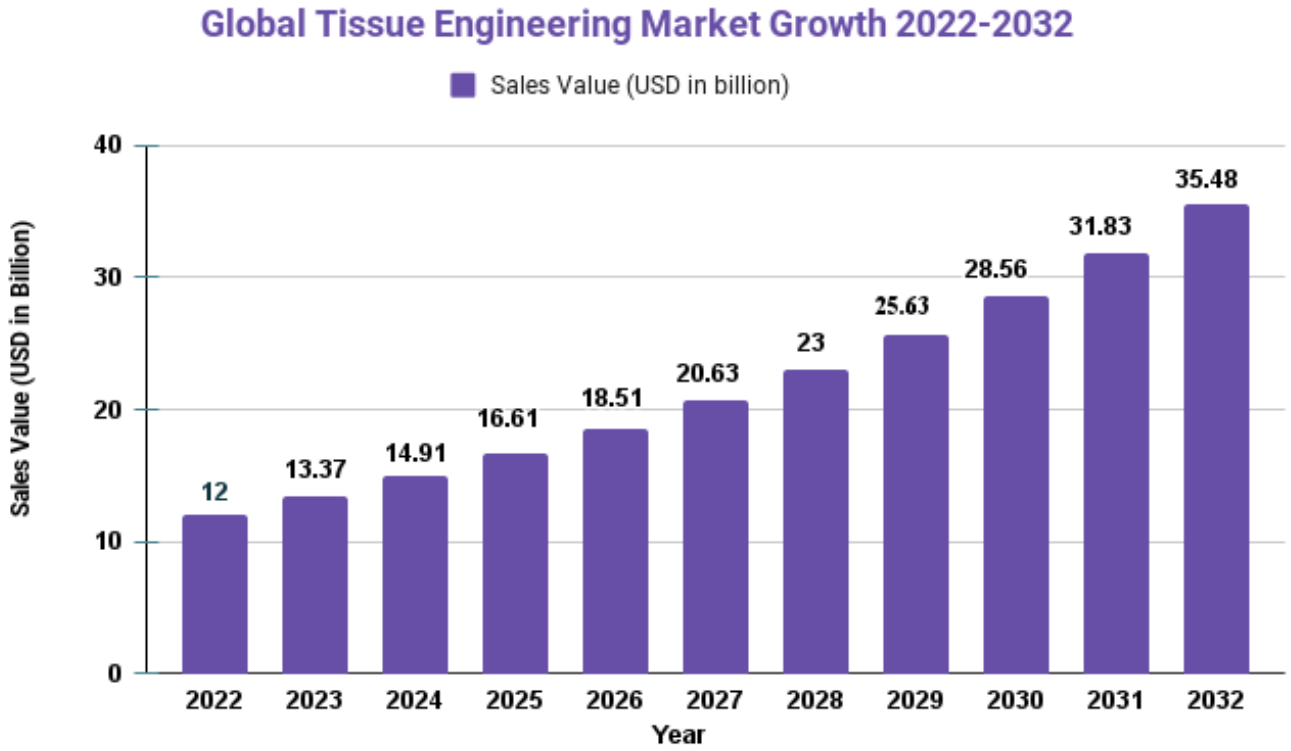
Il corso si propone di fornire allo studente conoscenze delle strategie e delle tecniche utili alla **ingegnerizzazione** di cellule, tessuti, organi e alla creazione di **organoidi** e tessuti *in vitro* con una particolare attenzione alle loro applicazioni nell'ambito della **medicina rigenerativa**.



Regenerative medicine: tissue engineering

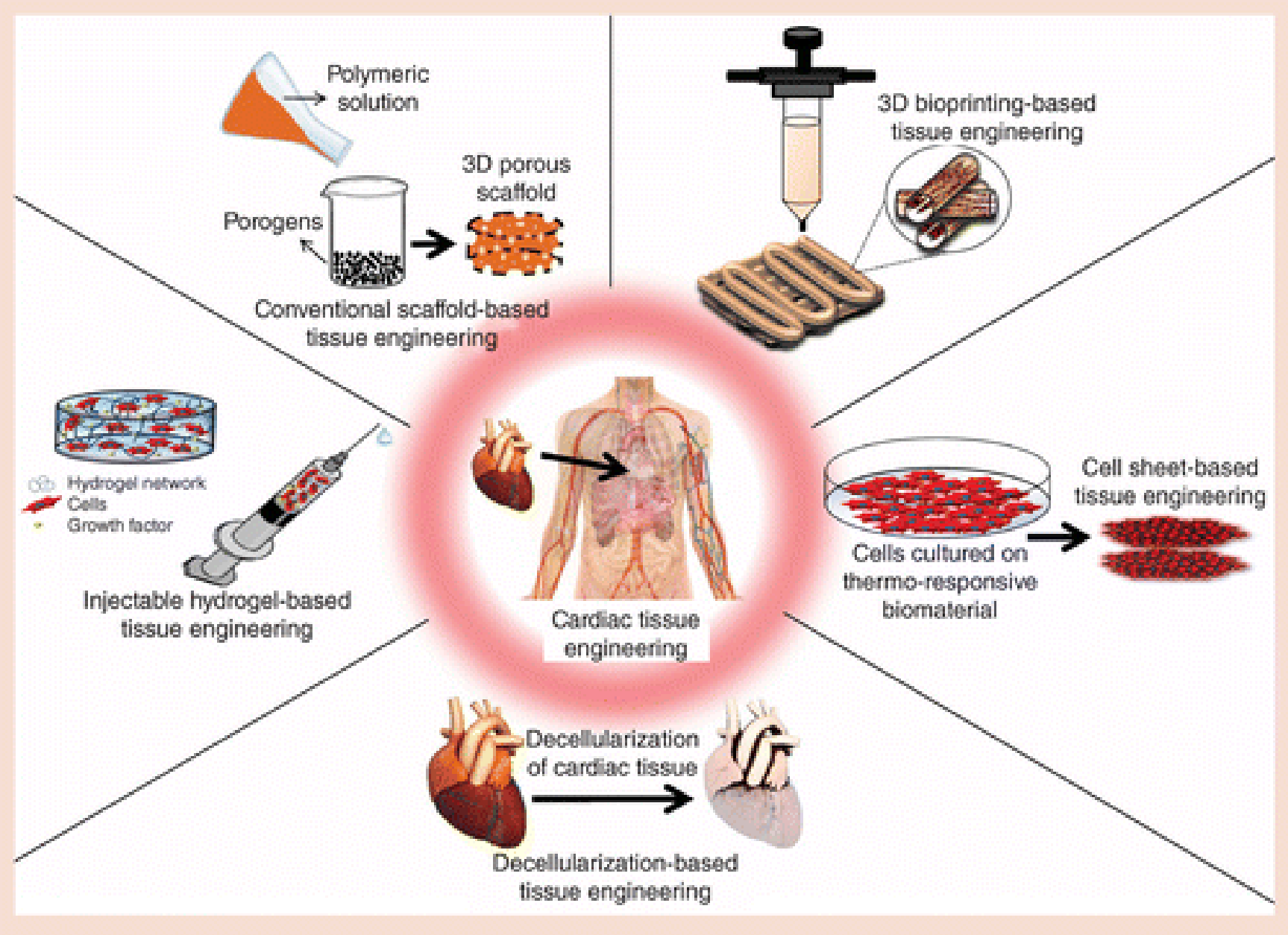


Nature Protocols, 11, 1775–1781 (2016)



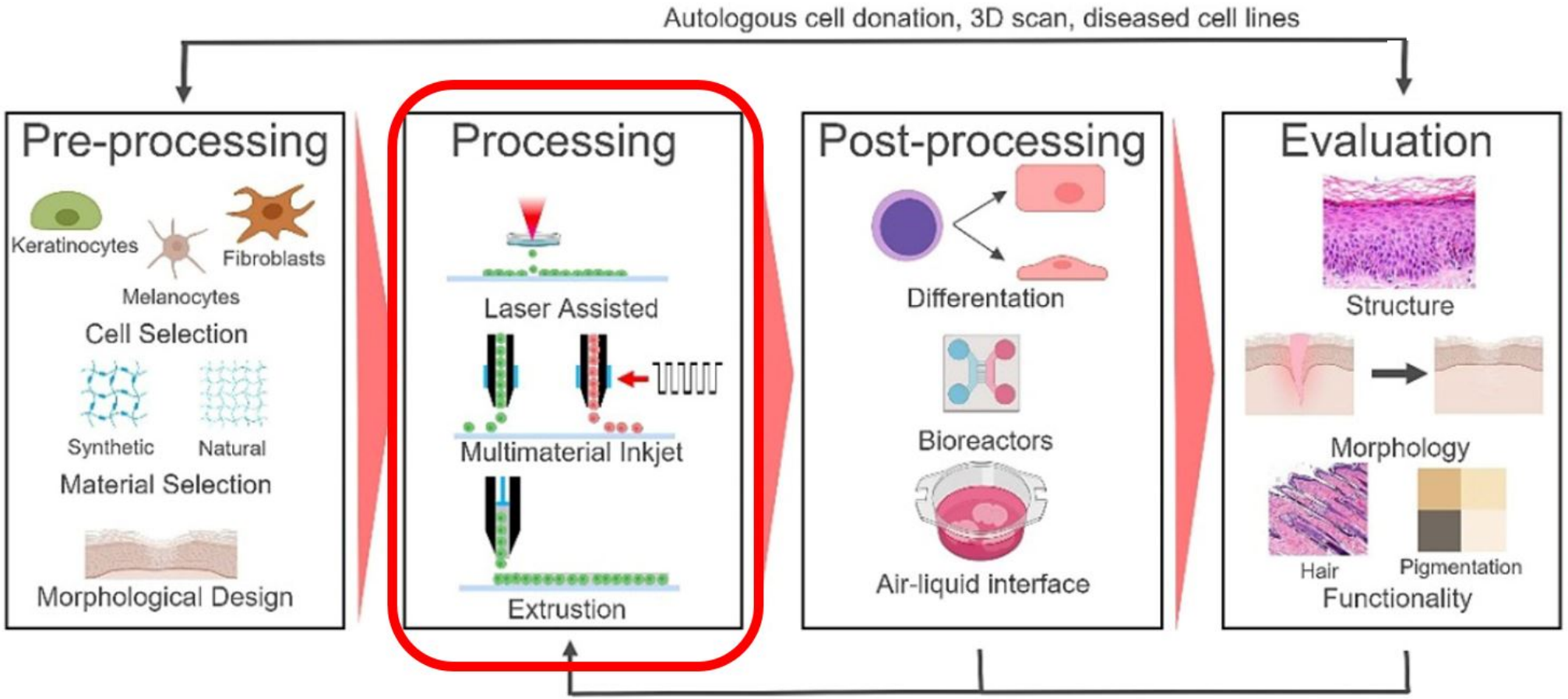
(Source: www.grandviewresearch.com)

How to obtain scaffolds and biomaterials: 3D bioprinting, tissue decellularization



Journal of 3D Printing in Medicine, 2, 2018

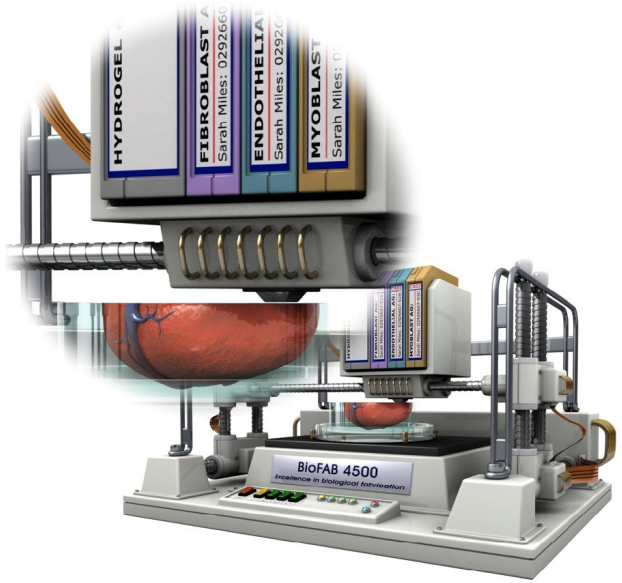
The bioprinting process

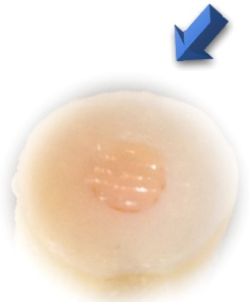


Modified from https://brinter.com

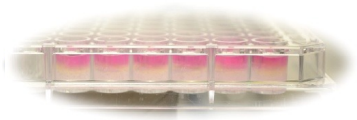
Application of 3D bioprinting techniques

From the laboratory….

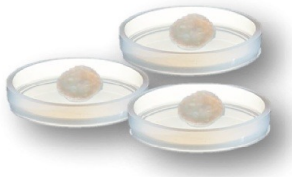




Disease modeling

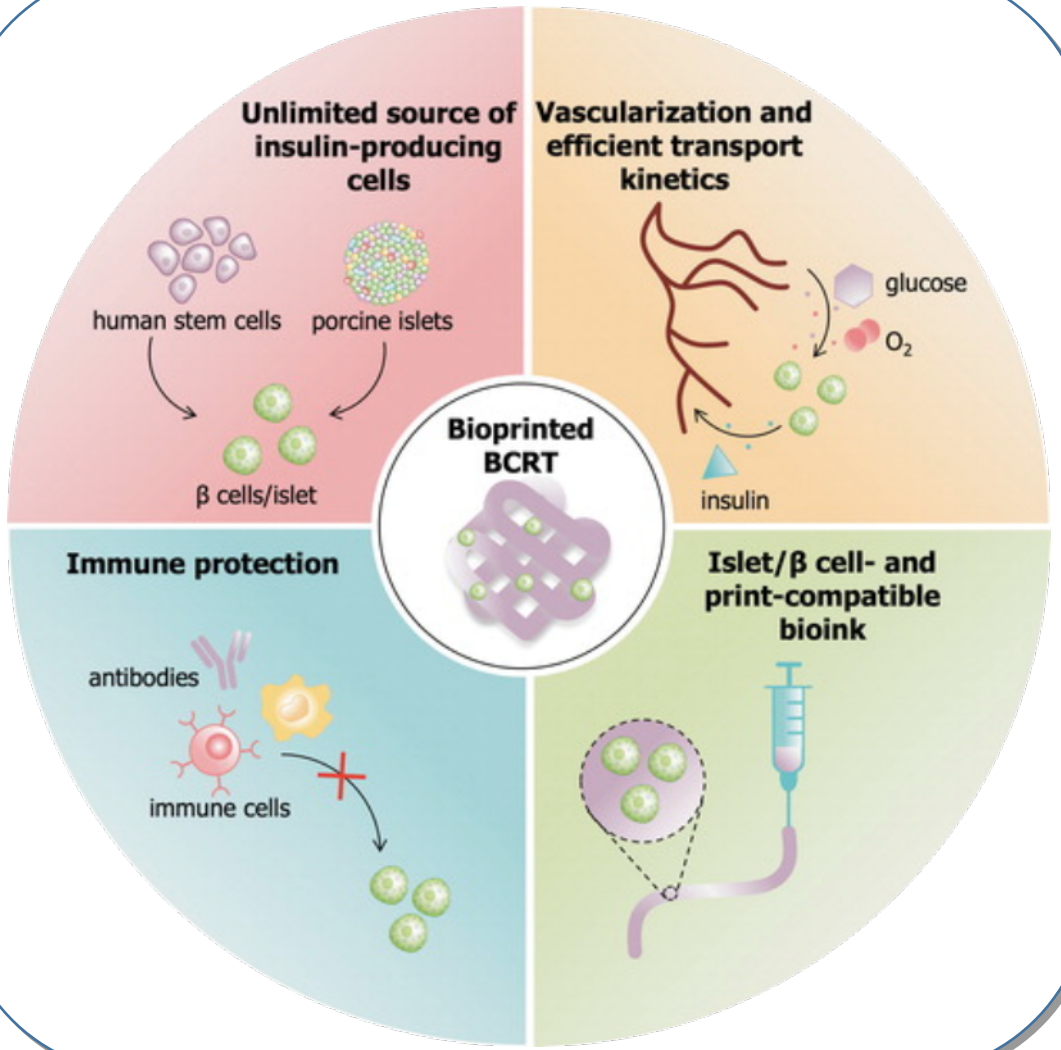


Drug screening



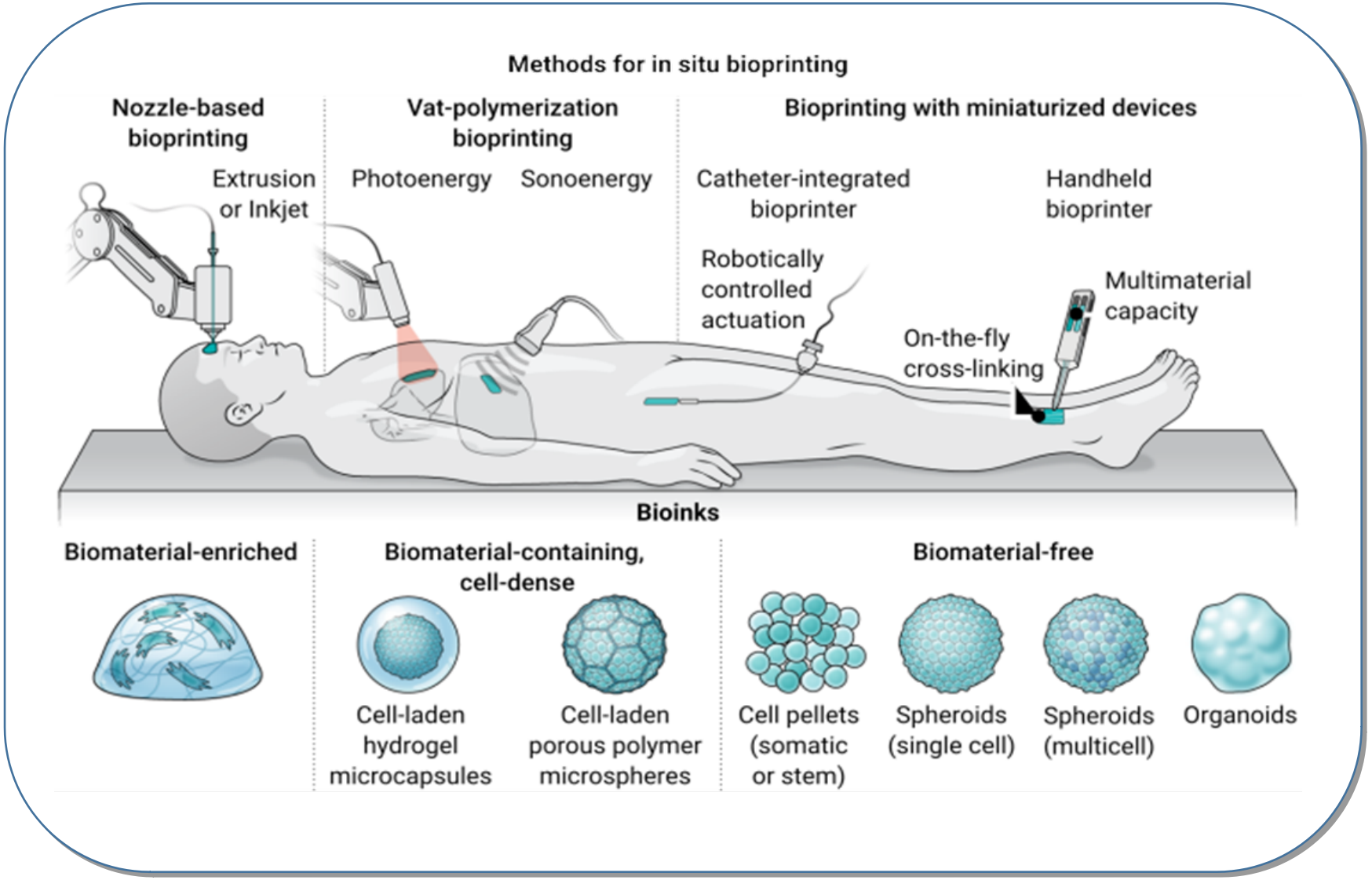
Cosmetic testing

….to the clinic



BCRT: beta cell replacement therapy

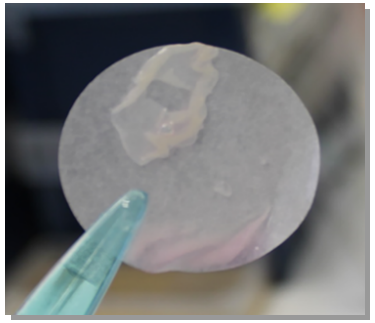
Future directions of 3D bioprinting techniques: in situ, intraoperative bioprinting (IOB)

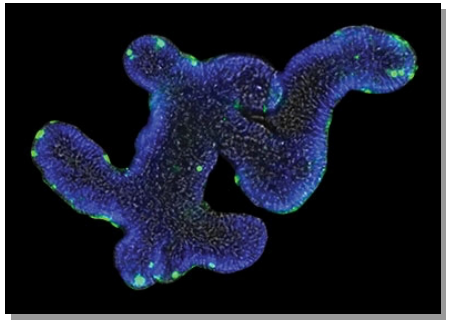


Science, Aug 2024, Vol 385, pp. 604-606

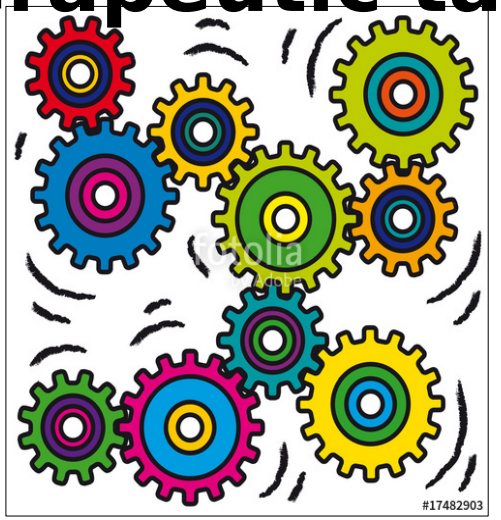
Stem cells in regenerative medicine

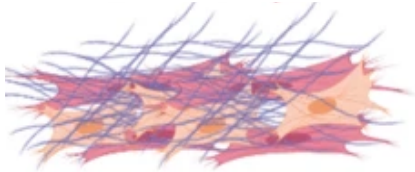
Stem cells as drugs





Stem cells as therapeutic target



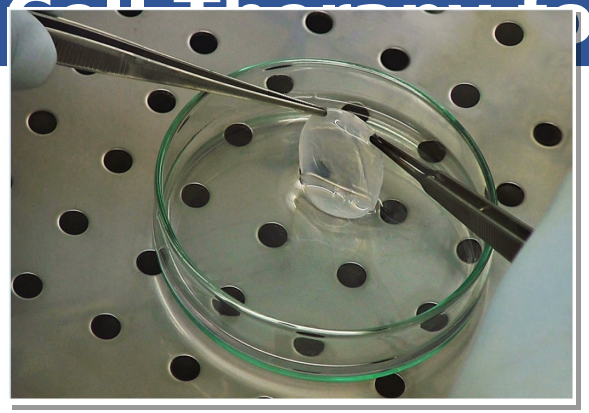


Fibrosis

Ageing

Cancer

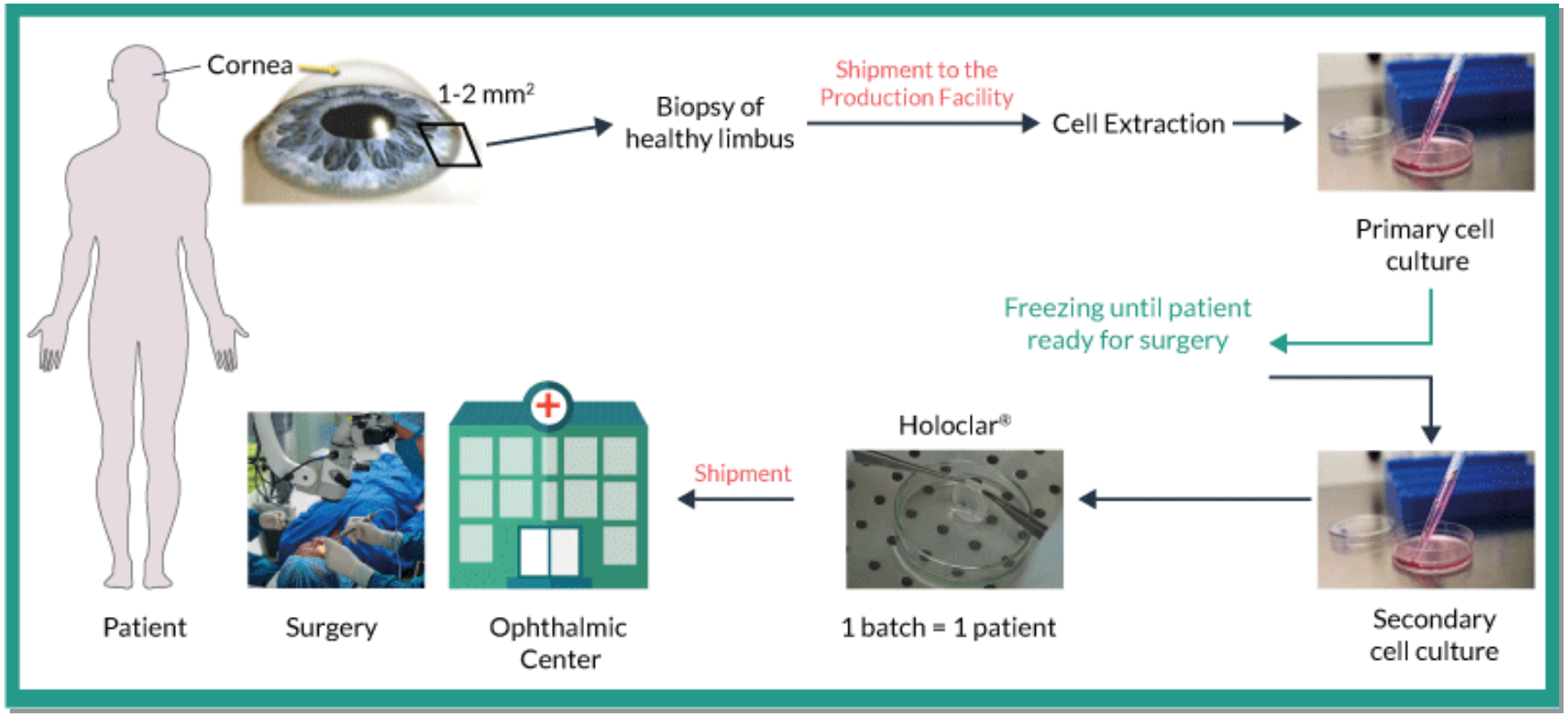
Bioengineering Approaches to Tissue Regeneration and Stem Cell Therapy for the Eye



HOLOCLAR

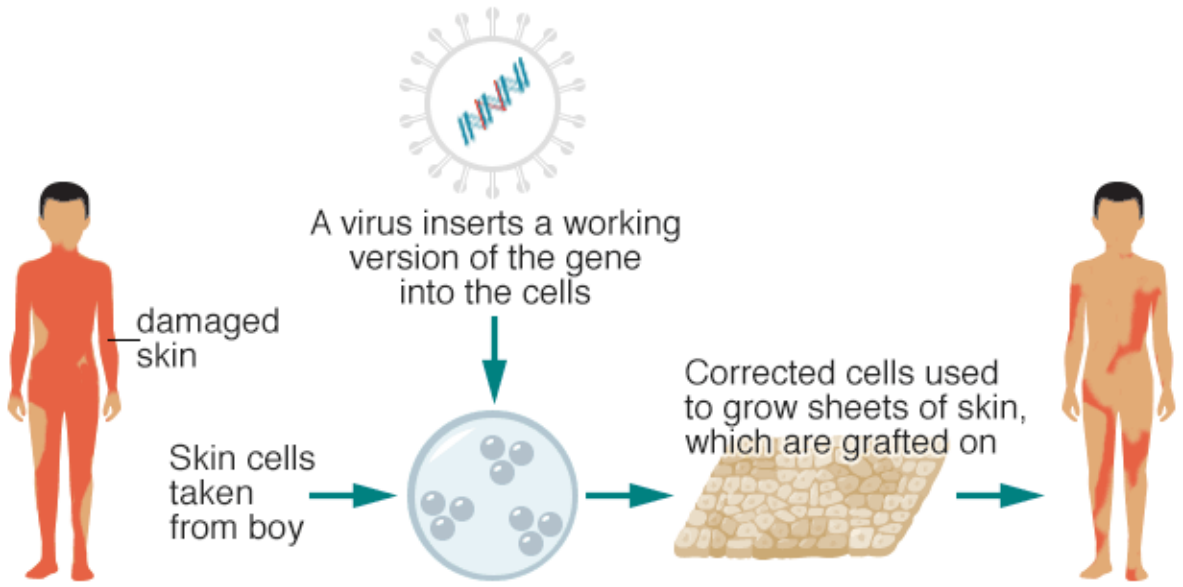
the first stem cell—based medicinal product

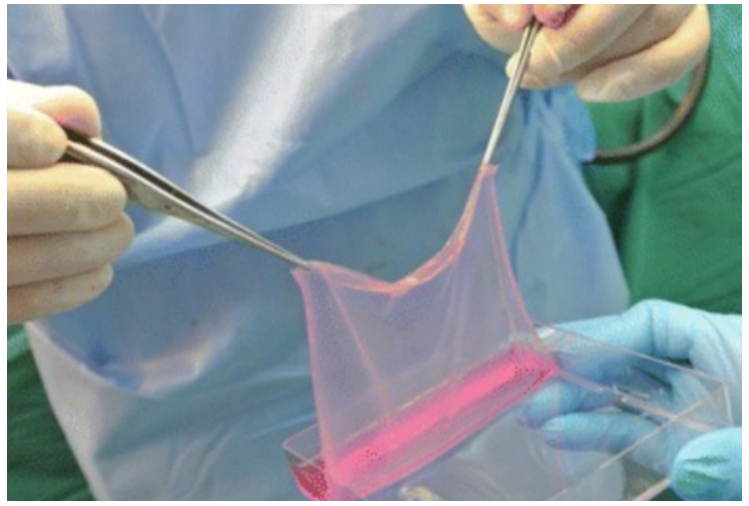
HOLOSTEM



Modified from https://www.holostem.com

Regenerative medicine: from bench to bedside!





HOLOSTEM

Terapia genica ex vivo per la forma Laminina 332-dipendente dell'EB Giunzionale (JEB) mediante trapianto autologo di lembi di pelle ottenuti in laboratorio dalla coltivazione di cellule staminali epidermiche geneticamente corrette.

Hologene 5: A Phase II/III Clinical Trial of Ex vivo combined cell and gene therapy of Junctional Epidermolysis Bullosa

Stem cells: from bench to bedside!

HOLOSTEM

“If you asked me 30 years ago if it was realistic to replace the whole skin with transgenic epidermis, I would have said no, but we have done it.

The final aim of my career is to make this gene therapy a real treatment for children — not a clinical trial or a demonstration of what we might do, but something that is used to treat everyone who needs it.”

Michele De Luca