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LIFE SCIENCES

Les solutions d'impression 3D pour l'ingéniérie tissulaire

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Mardi 30 Mars 2021

ADEBIOTECH
THINK TANK ONE HEALTH

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Est. 2016

60+
COUNTRIES

6
CONTINENTS

12
OFFICES

450+
TEAM

2000+
LABS

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A CELLINK COMPANY

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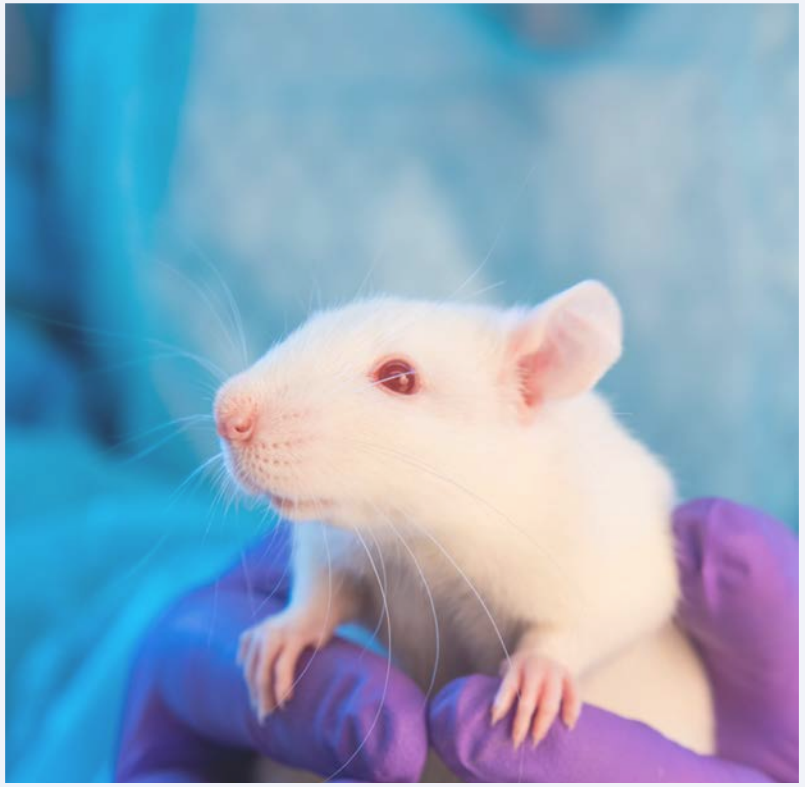
CELLINK

CREATE THE FUTURE OF MEDICINE

TODAYS HEALTHCARE CHALLENGES

The journey of a medicine from lab to shelf takes **over 10 years on average**

21 Patients die everyday from the lack of organ transplants



Researchers can waste **$2 Billion** by using the wrong testing method

BIOPRINTING

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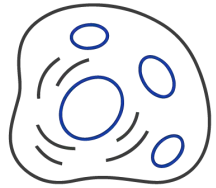
Improving Pharmaceutical Workflows



Assay Development

Preclinical Studies

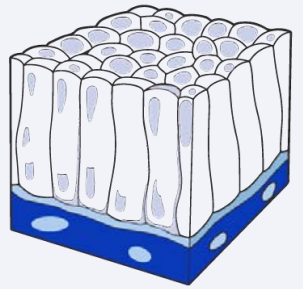
Human Clinical Trials

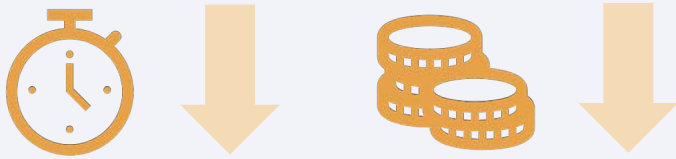
Compound Exploration

Drug Characterization

Clinical Implementation

3D Bio-fabrication





2D

3D

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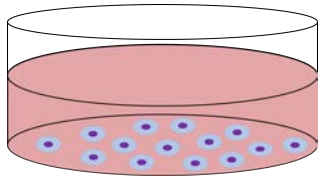
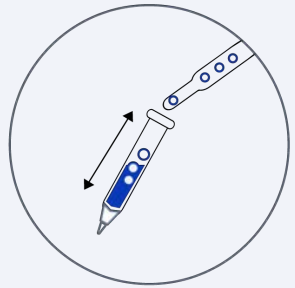
The 3D Revolution



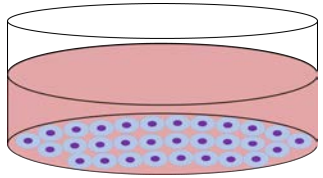
Culture cells in dish

Embed cells



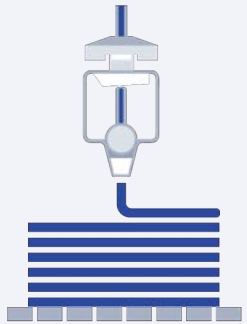
Poor intercellular communication

Negative influence from substrate



Grow cells

Incubate



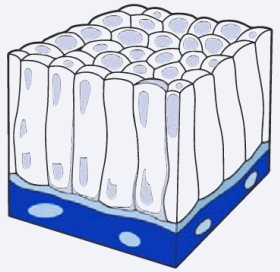
Bioprint

Physiologically relevant

More information

2D cell sheet

Analyze



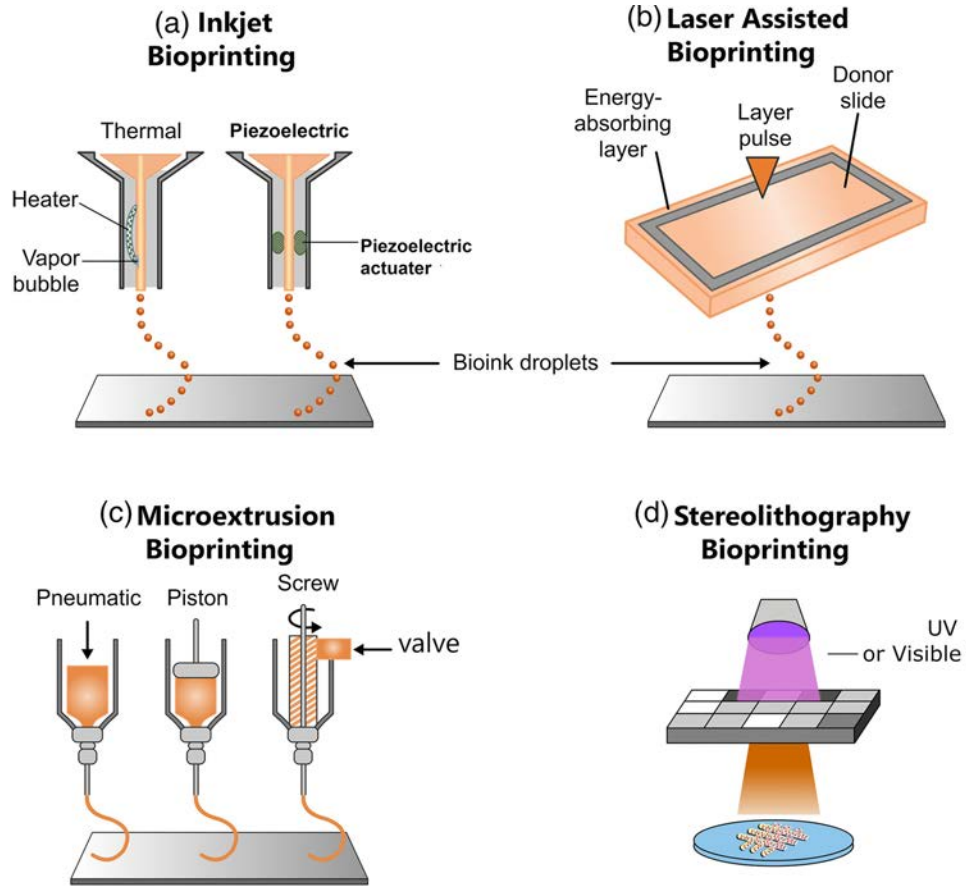
Improved models

2D

3D

CELLINK BIOPRINTING SOLUTION

BIOPRINTERS



Midha S, Dalela M, Sybil D, Patra P, Mohanty S. Advances in three-dimensional bioprinting of bone: Progress and challenges. J Tissue Eng Regen Med. 2019 Jun;13(6):925-945. doi: 10.1002/term.2847. Epub 2019 Apr 24.

EXTRUSION BASED 3D BIOPRINTING WORKFLOW

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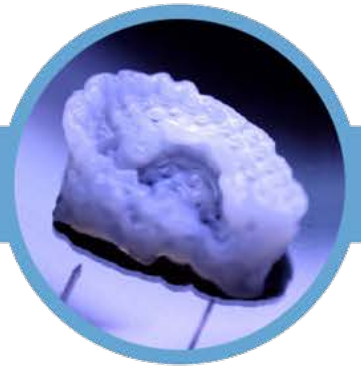
Blueprint

Bioink
Cells

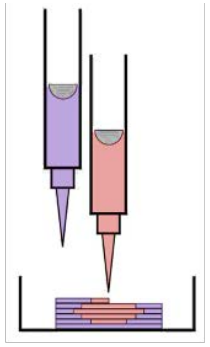
Bioprinter



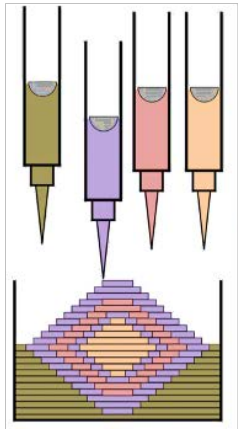
Incubate

Tissue model after

3 weeks in culture



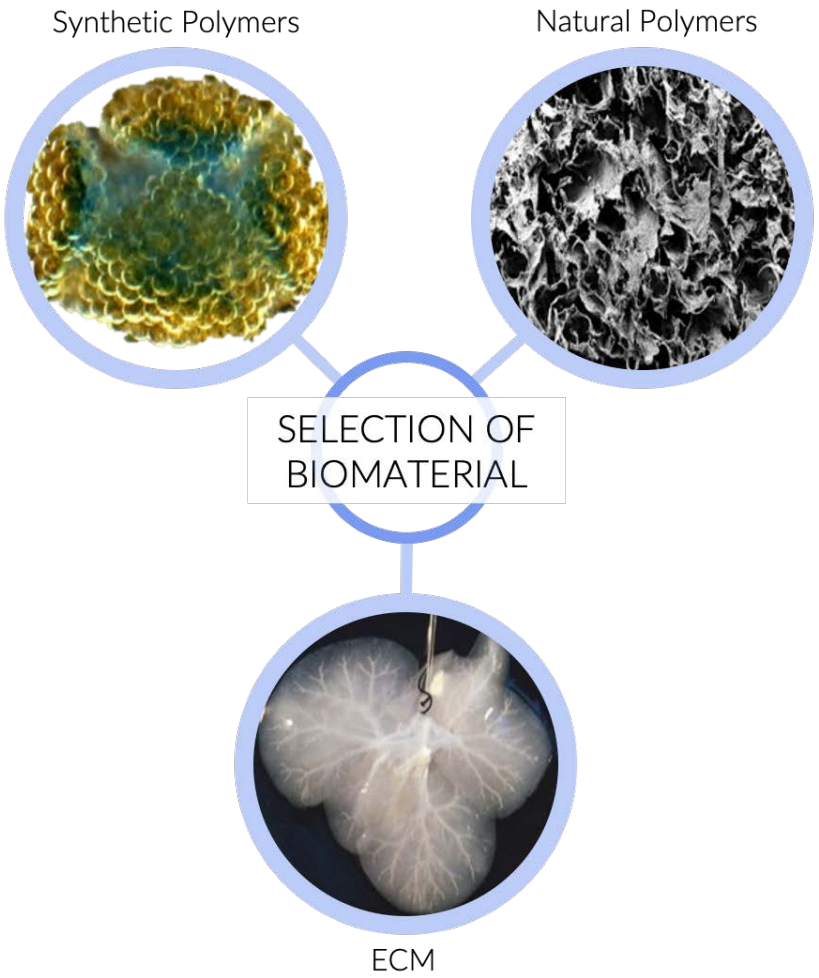
Bioinks were developed with structural and functional components

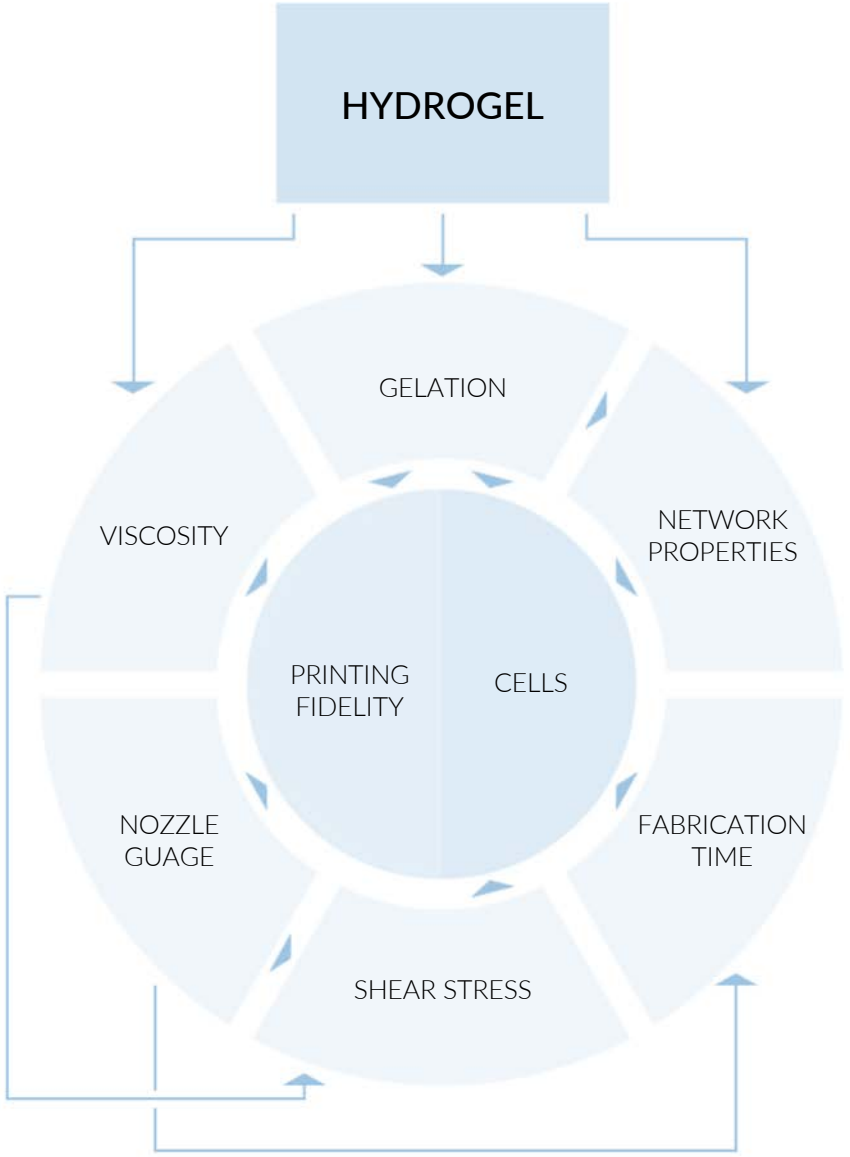


Full structures may also require support and sacrificial materials

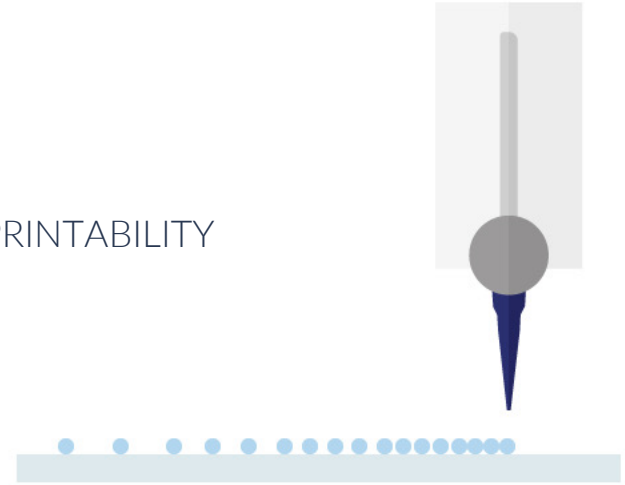
Martínez H et al., 3D bioprinting of human chondrocyte-laden nanocellulose hydrogel for patient-specific auricular cartilage regeneration. Bioprinting 2016

BIOINK DEVELOPMENT

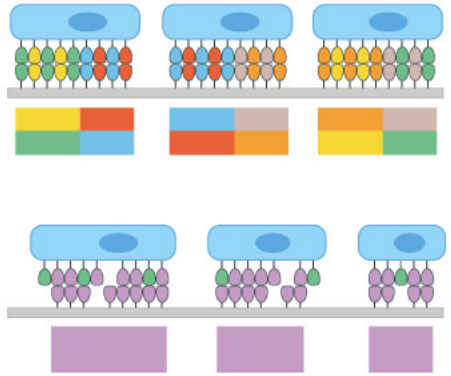




PRINTABILITY

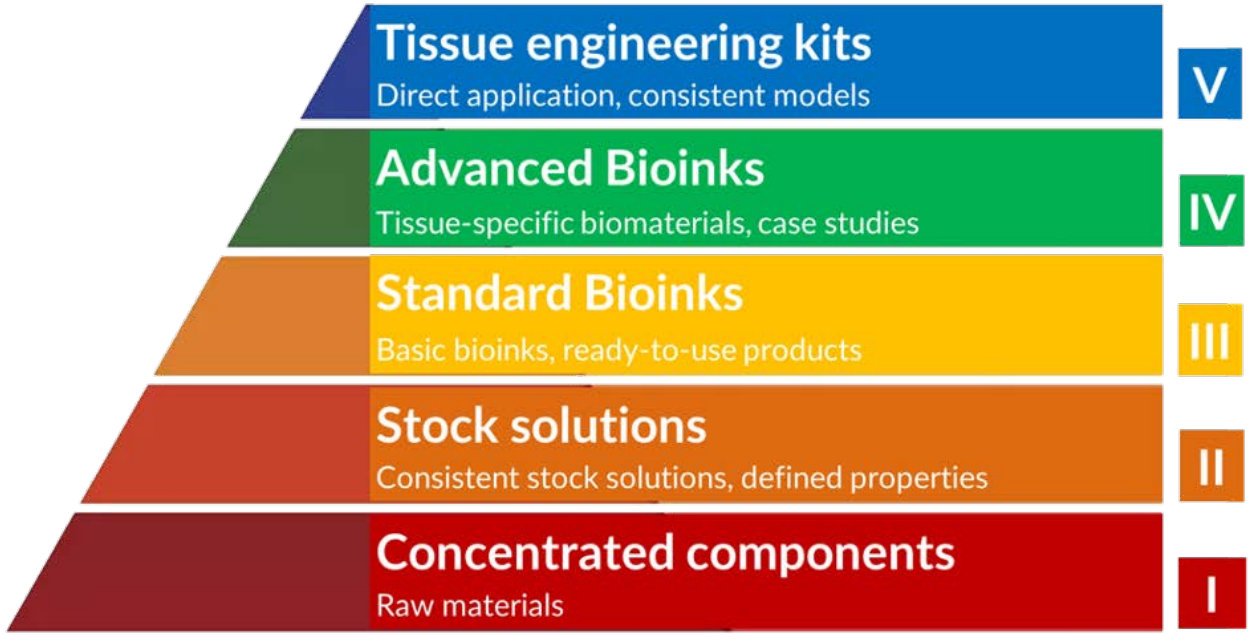


CELL-MATERIAL INTERACTIONS



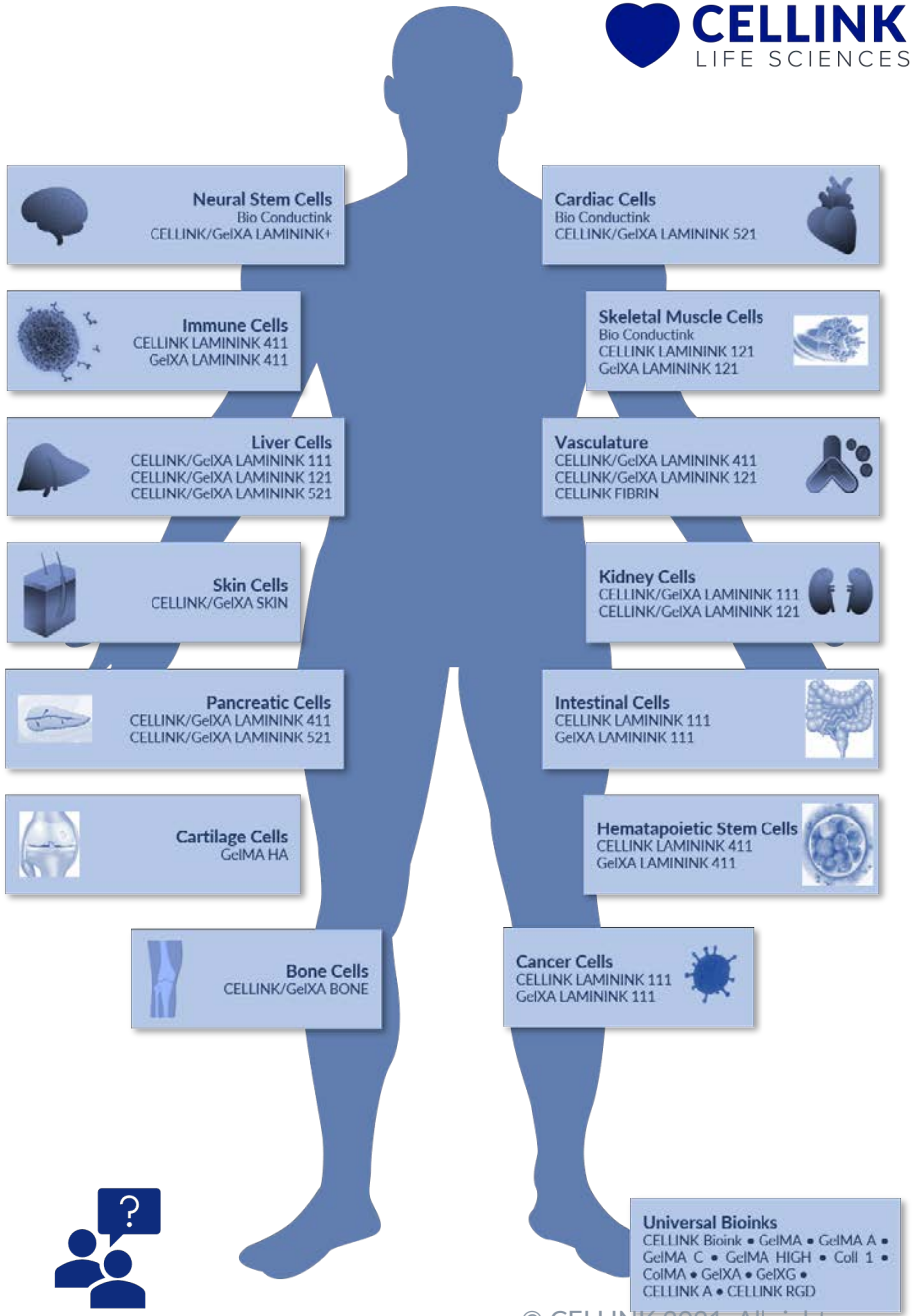
CELLINK BIOPRINTING SOLUTION

BIOINKS



Select from a wide range of CELLINK materials tailored for your research.

Start with materials for bioink development or employ ready to use bioinks for advanced 3D cell culture.




BIOPRINTED
HUMAN SKIN

3D BIOPRINTING SKIN

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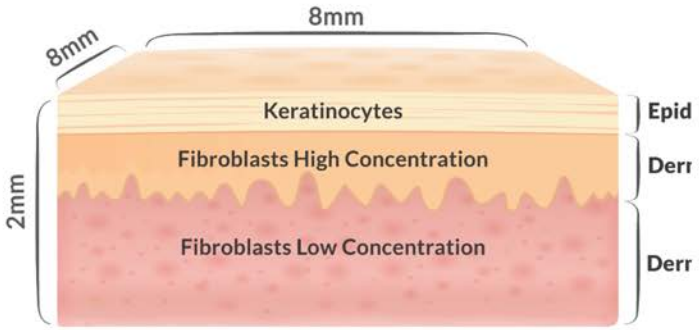
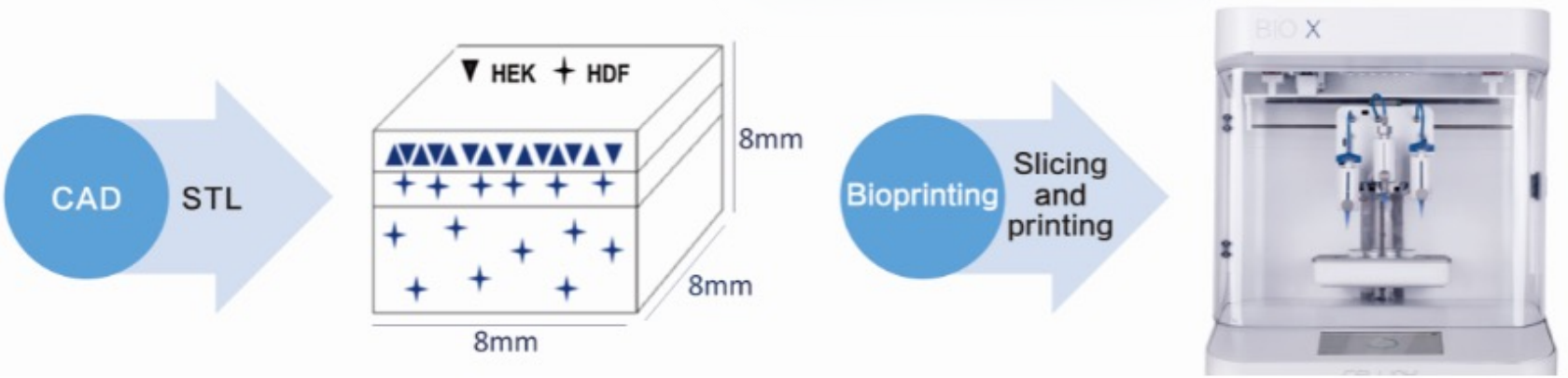
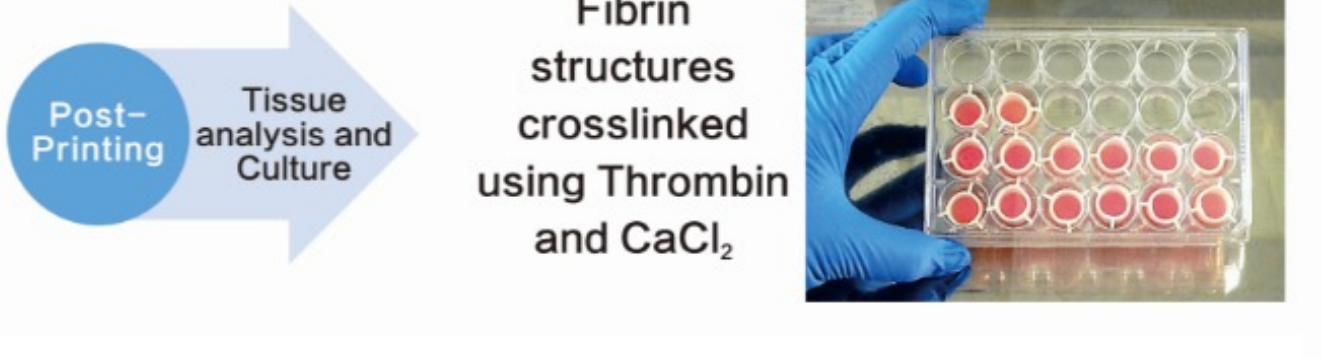
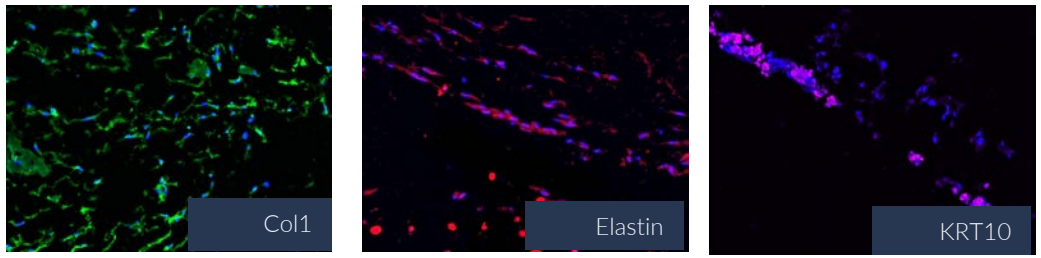
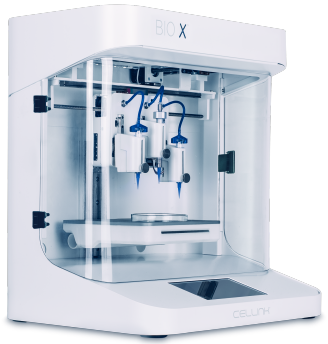






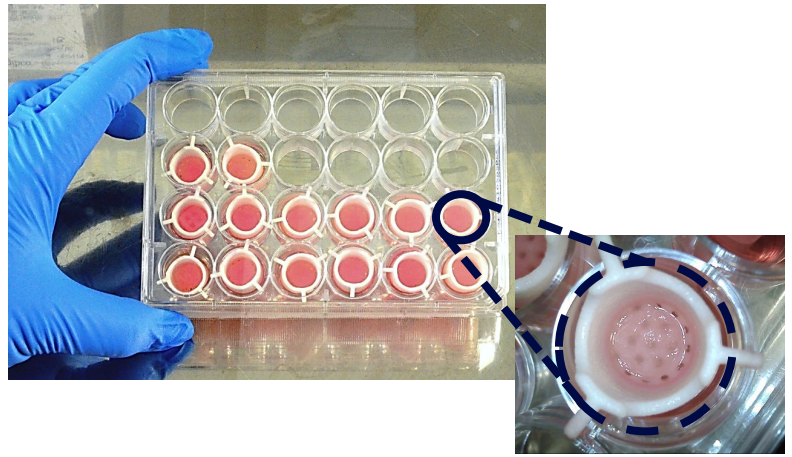


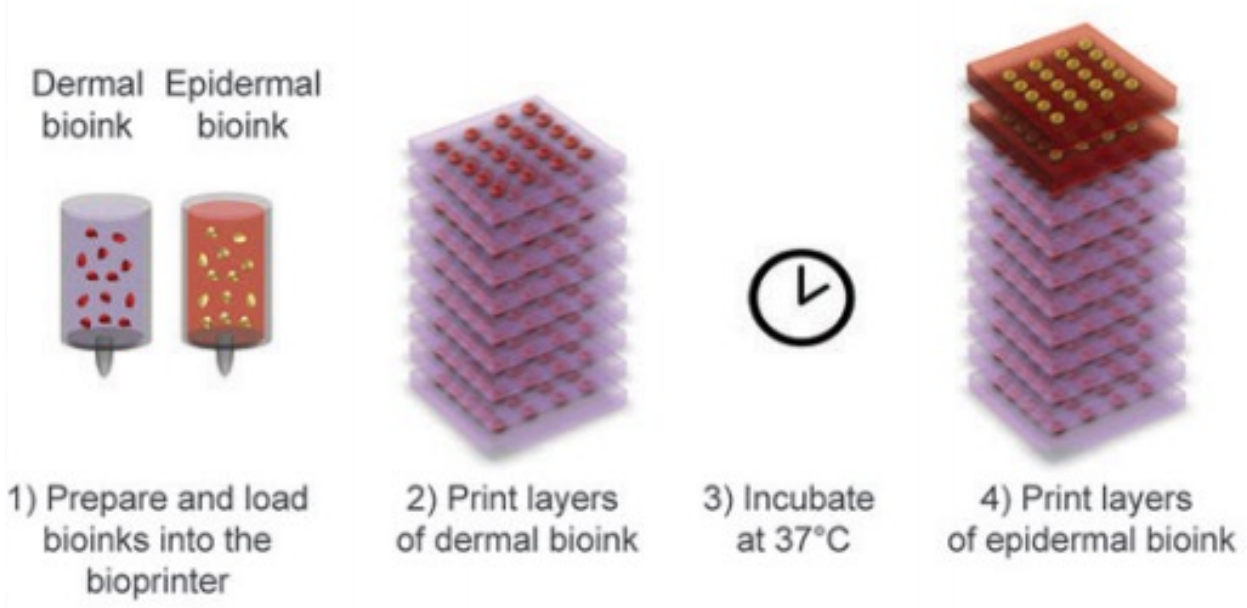
3D BIOPRINTING OF VASCULARIZED SKIN



Three Dimensional Bioprinting of a Vascularized and Perfusable Skin Graft Using Human Keratinocytes, Fibroblasts, Pericytes, and Endothelial Cells

Tânia Baltazar, PhD,[1] Jonathan Merola, MD, PhD,[2] Carolina Catarino, MS,[3,4] Catherine B. Xie, MS,[1] Nancy C. Kirkiles-Smith, PhD,[1] Vivian Lee, PhD,[5] Stephanie Hotta, MS,[6] Guohao Dai, PhD,[5] Xiaowei Xu, MD, PhD,[7] Frederico C. Ferreira, MBA, PhD,[8] W. Mark Saltzman, PhD,[9] Jordan S. Pober, MD, PhD,[1] and Pankaj Karande, PhD[3,4]





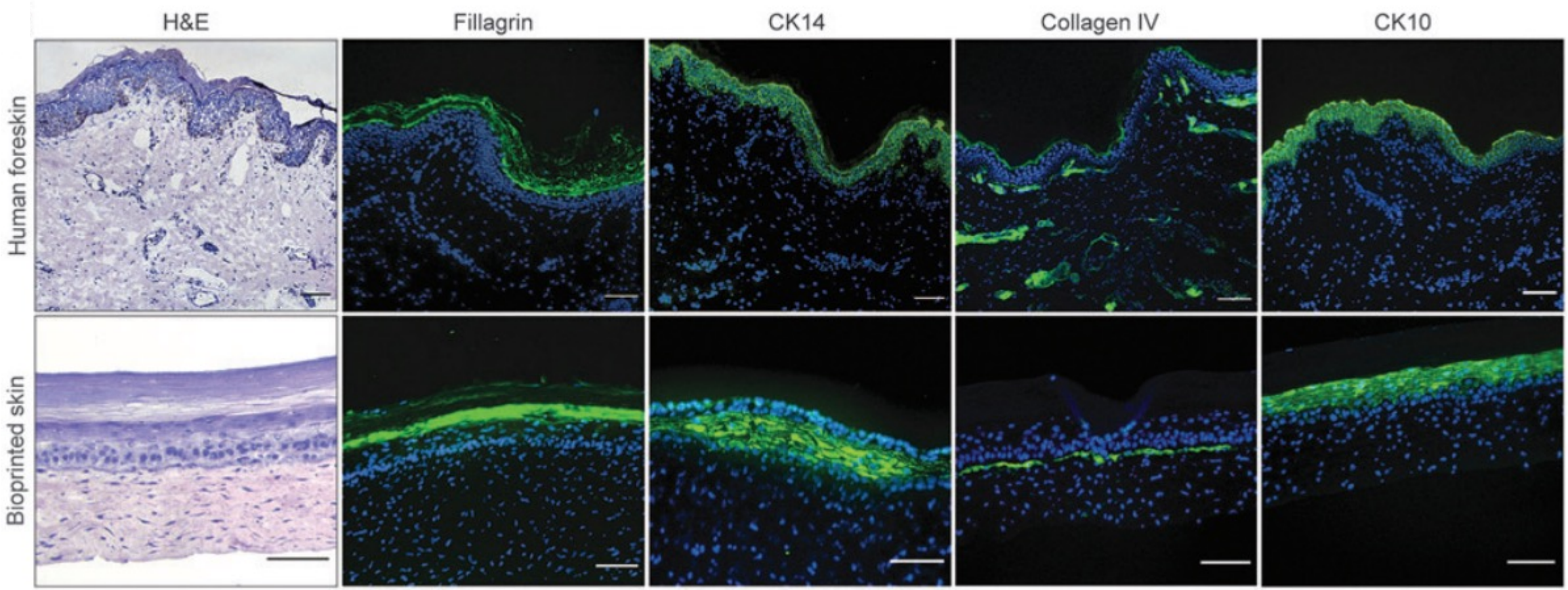
Model 1:
Non-vascularization
Dermis: Fibroblasts (FB)
Epidermis: Keratinocytes (KC)

Model 2: Vascularization
Dermis: FB + Endothelial cells (EC) + Pericytes (PC)
Epidermis: Keratinocytes (KC)

Baltazar. T., et. al., TERMIS TISSUE ENGINEERING: Part A Volume 26, Numbers 5 & 6, (2020) Mary Ann Liebert, Inc.

3D BIOPRINTING OF VASCULARIZED SKIN

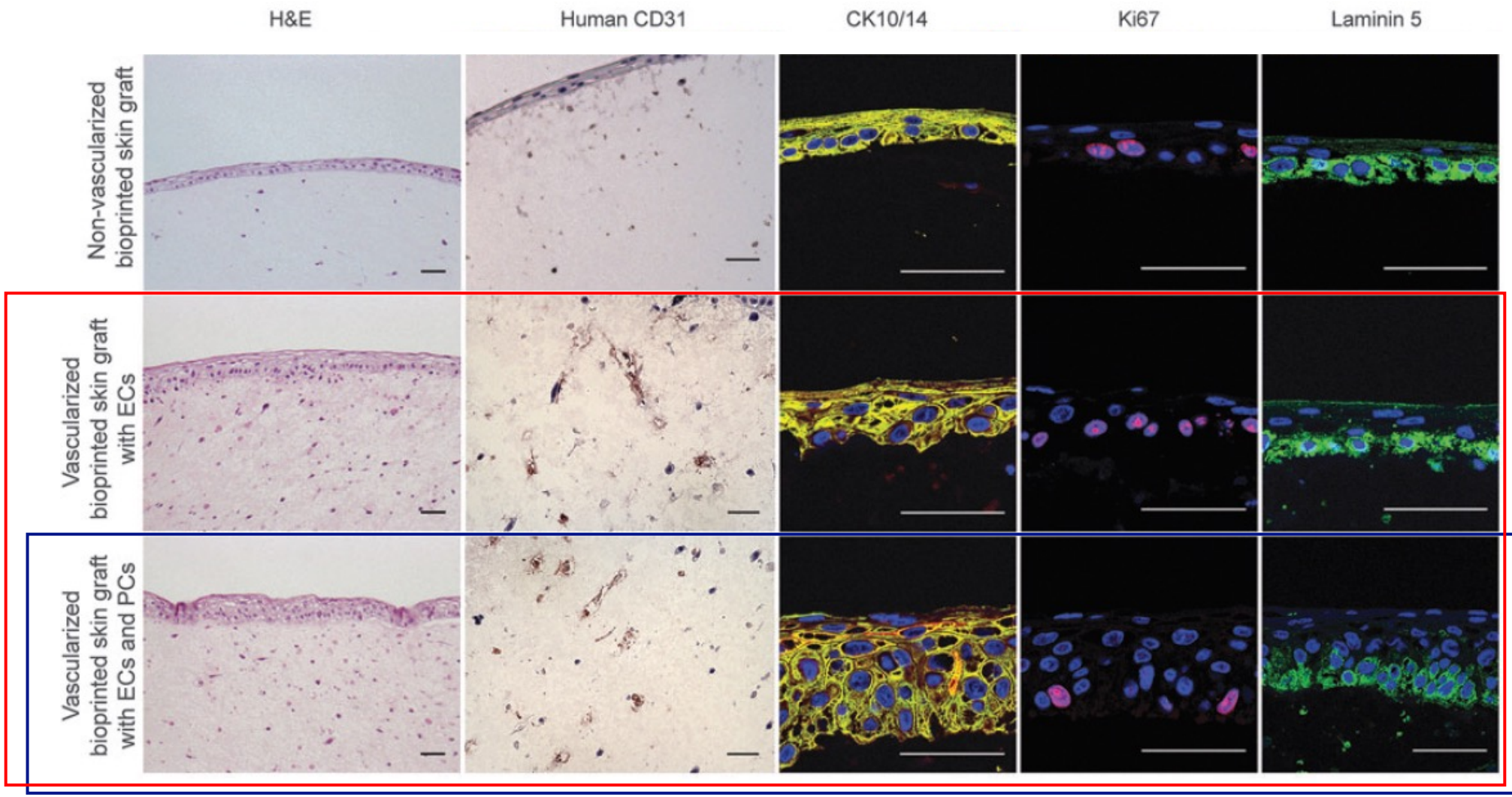
(KC and FB) after 30 days of maturation **Analyzing different staining factors showed a realistic portrait of skin stratification.**



Baltazar. T., et. al., TERMIS TISSUE ENGINEERING: Part A Volume 26, Numbers 5 & 6, (2020) Mary Ann Liebert, Inc.

Vascularized Skin models after 10 of maturation

Mature stratified epidermis in models containing EC et PC



Vessel-like structures within the dermis

Increased epidermal thickness and maturation (Laminin5 and CK10+)

Baltazar. T., et. al., TERMIS TISSUE ENGINEERING: Part A Volume 26, Numbers 5 & 6, (2020) Mary Ann Liebert, Inc.

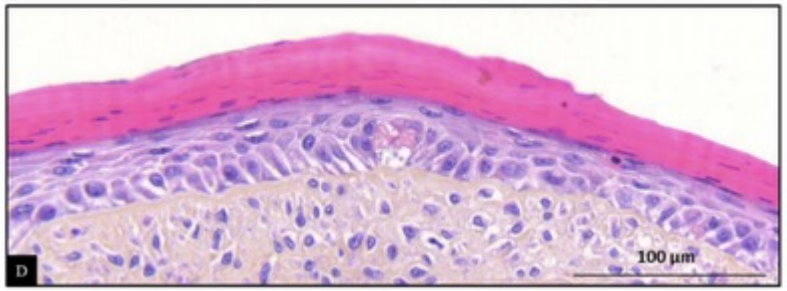
CTI Biotech

Pioneering bioprinted skin models for *in vitro* testing of cosmetics and dermatologics

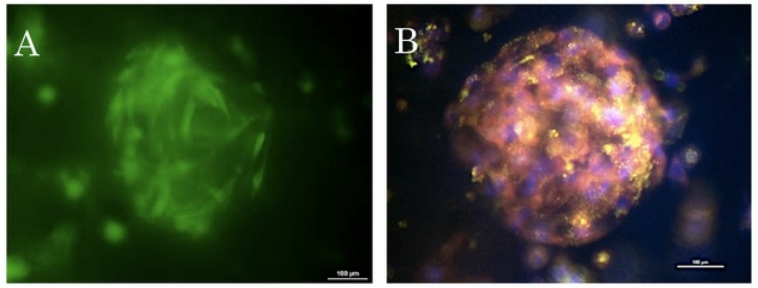
The challenge

The cosmetics industry is worth about $40bn annually but have been under tremendous scrutiny due to their dependency on animals for testing. The need for effective alternatives for testing is at an all time high.

The solution



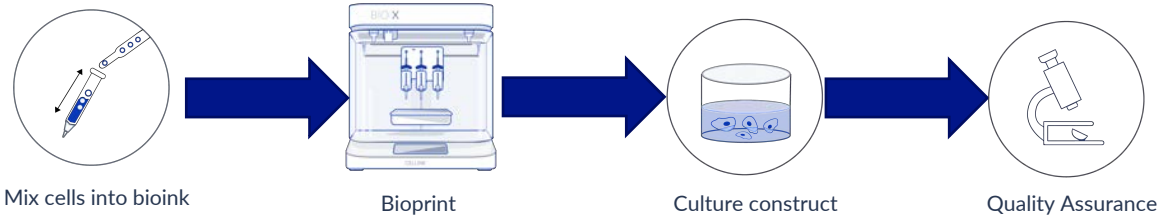
3D Bioprinted skin models after 21 day-maturation. Image courtesy of CTI Biotech



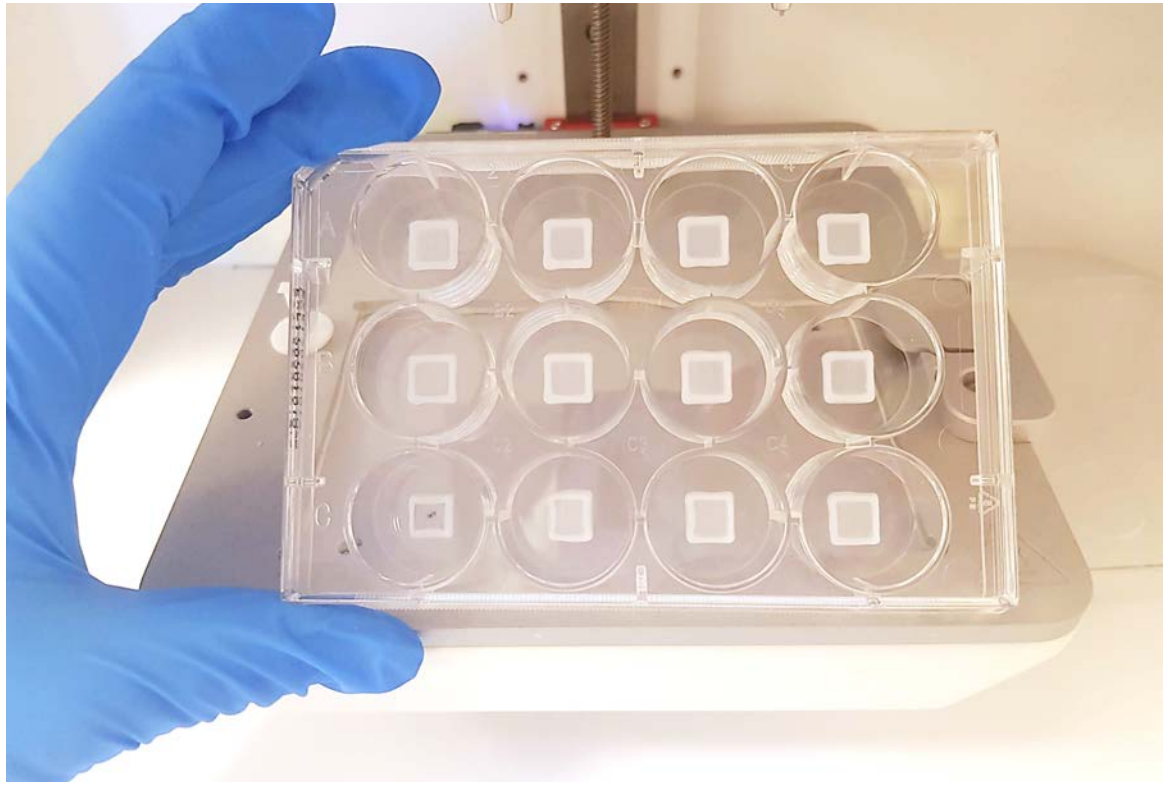
Structure of 3D Bioprinted micro-sebaceous model. Image courtesy of CTI Biotech

The CELLINK Impact

- Develop more realistic models
- Gather greater insights from bioprinted constructs
- Reduce dependency on animal models



WHY 3D BIOPRINTING ?



- ON DEMAND PRODUCTION
- ADJUSTABLE
  - SIZE
  - SAMPLE NUMBER
  - DONOR SPECIFIC
- REPRODUCIBLE
- CUSTOMIZATION

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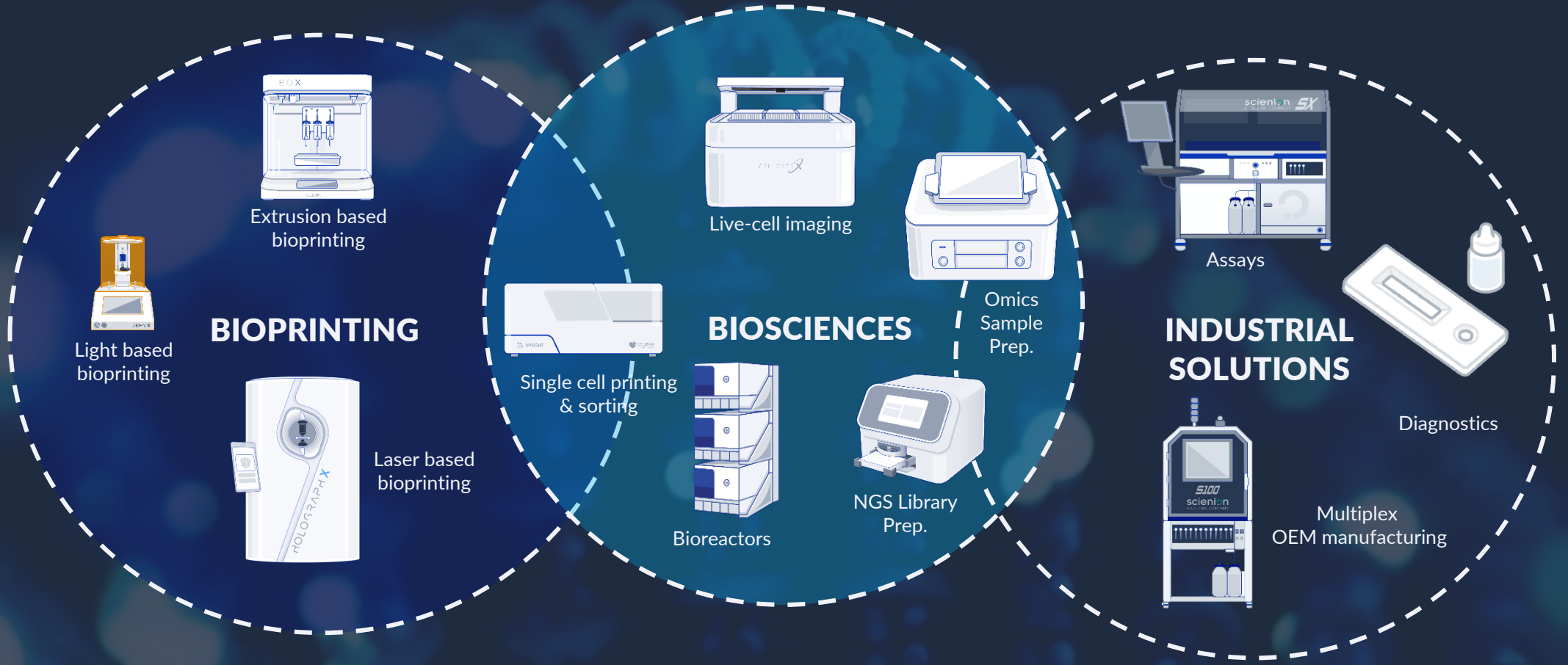
Our unique bioconvergence offering



Disease and tissue modelling **Disease and tissue analysis** **Disease and tissue diagnostics**

THE BIOCONVERGENCE COMPANY

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THANK YOU VERY MUCH

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