

# urobionics

Beyond Bioprinting.

# The Big Bio-printing Promise Lie within regenerative medicine since 2015!



The need for donated organs can be addressed using a novel 3D-printing technique. (Shutterstock)

**3D-printed organs could save lives by addressing the transplant shortage**

**nature** Search Login

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Published: 15 April 2015

**The printed organs coming to a body near you**

[Heidi Ledford](#)

[Nature](#) 520, 273 (2015) | [Cite this article](#)

425 Accesses | 10 Citations |  
898 Altmetric | [Metrics](#)

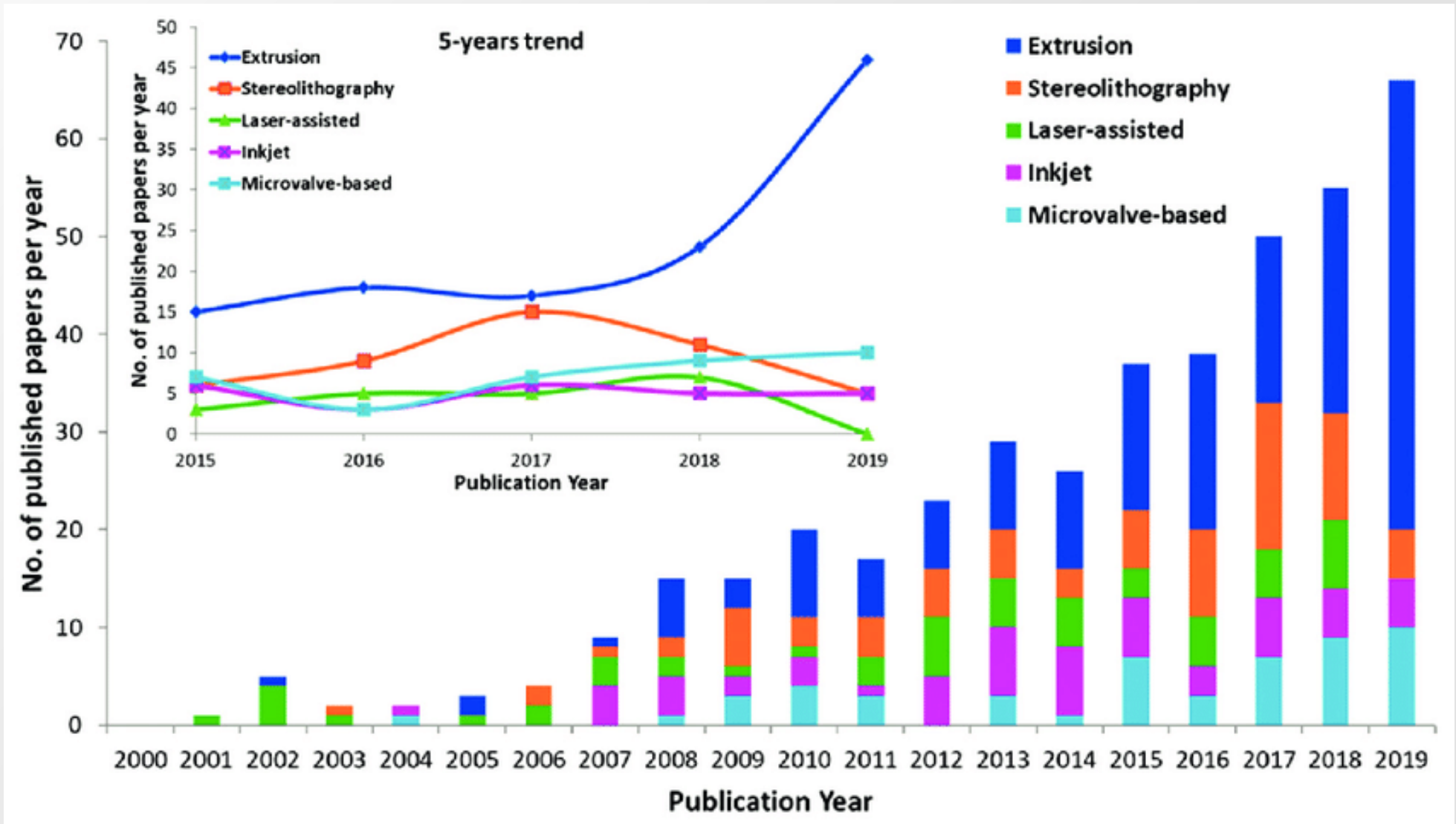
**From kidneys to hands, 3D printers are churning out made-to-order bones and rudimentary organs.**



SCIENCE X  
**Biorprinting human tissues for drug testing**  
Printed tissues can replace animal experiments



# The Big Bio-printing Promise Lie within regenerative medicine since 2015!



# Basic bioprinting technology does not work for regenerative medicine!



## No Functionality

**Low cell viability (40–70%), cell deformation, and limited complexity or realistic functionality** of a 3D printed tissue are consequences of existing **technological limitations**.

These underlying drivers are stopping us from generating fully functional 3D human tissues



## Low throughput

**Time- and cost-intensive 3D biofabrication**

results in a **low number** of functional and reproducible human models.

This significantly impacts the pace of research and potential application in larger industries



## Limited Compatibility

Use of **animal materials** in 3D biofabrication imposes

**histocompatibility** as the major challenge.

**Synthetic alternatives** lack the necessary **requirements** for regenerative medicine applications.



# Why now?

Replacing animal trials needs to happen yesterday!!



- 90% of drugs tested during animal trials fail during clinical trials
- (New) drugs to market slow (10+years) & high costs (~\$2B) due to lack of animal alternative tests
- EPA, FDA, EMA all have set the target to disband animal testing before 2035.\*

1. <https://www.science.org/content/article/us-epa-eliminate-all-mammal-testing-2035>

2. <https://sciencebusiness.net/news/parliament-votes-through-demand-faster-phase-out-animal-testing-research>

3. <https://www.npr.org/2023/01/12/1148529799/fda-animal-testing-pharmaceuticals-drug-development>



# What make us Unique?

## BIO-ELECTROFIELD Technology

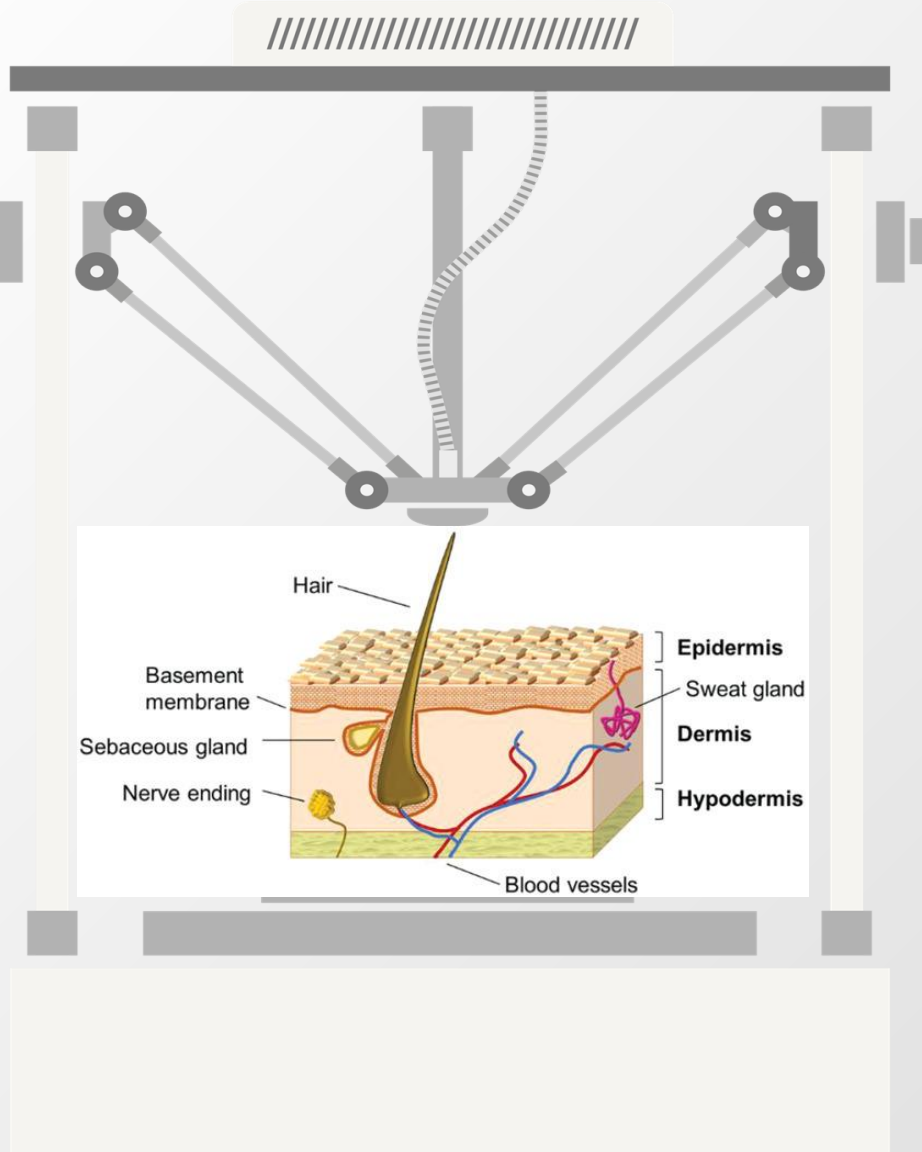
- Nanoscale resolution
- High Cell Viability (94%)
- Proven to make complex tissue (over 150 publications)
- Fast & Scalable (30x faster than any other 3D technology)
- Can incorporate any biomaterials (genes, proteins, disease markers, biosensors)



### Other Applications

- Scaffold based Med Device / Drug Delivery
- Futurelight Northface

# Bioengineered Skin Tissue



- Full thickness skin model
  - Hair follicles
  - Sweat glands
  - Vascularization
- Healthy and diseased
- Standard / Tailored



Better translation from trial to clinic



Improving R&D productivity with more than \$ 24B per year\*.



Drugs faster to market at lower cost.

\* <https://www.nature.com/articles/s43856-022-00209-1>

# Our Team

Ourobionics co-founding team formed in 2021 with 50+ years of combined experience in research and corporate environment



**John Zandbergen**  
**Chief Executive Officer**  
Serial Entrepreneur with 20+ years experience in Corporate Environment (IVD, MedTech, Lifescience)



**Doris Zoric, MSc**  
**Sales & Marketing**  
Pursuing a PhD in Structural Biology with a strong skillset in Sales and Marketing Strategies



**Professor Suwan Jayasinghe**  
**Scientific Advisor**  
Expert in 3D Tissue Engineering with 20+ years experience  
Inventor of BES/CE/EHD  
**University College London**



**Dr. Alireza Dolatshahi-Pirouz**  
**Scientific Advisor**  
Inventor of Cyborganics and tissues with embedded sensor technology  
**DTU Denmark**



**Dr. Stephen G. Gray**  
**Co-founder / Director**  
10+ years experience in regenerative medicine & start-up building. Inventor of Ourobionics technology  
**Imperial College London**  
**PhD Alumni**



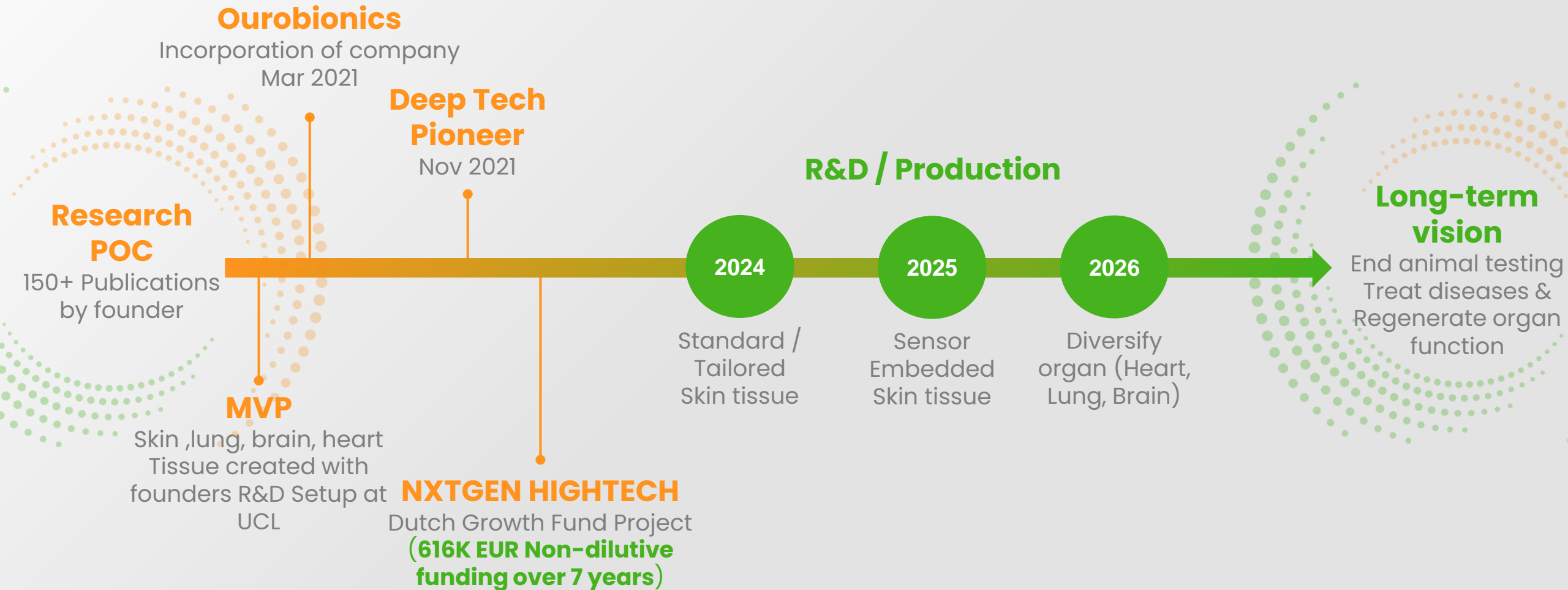
**Professor Alvaro Mata**  
**Scientific Advisor**  
Expert in 3D Bioprinting, Bioengineering.  
Inventor: 4D self-assembly bioinks  
**Nottingham University**



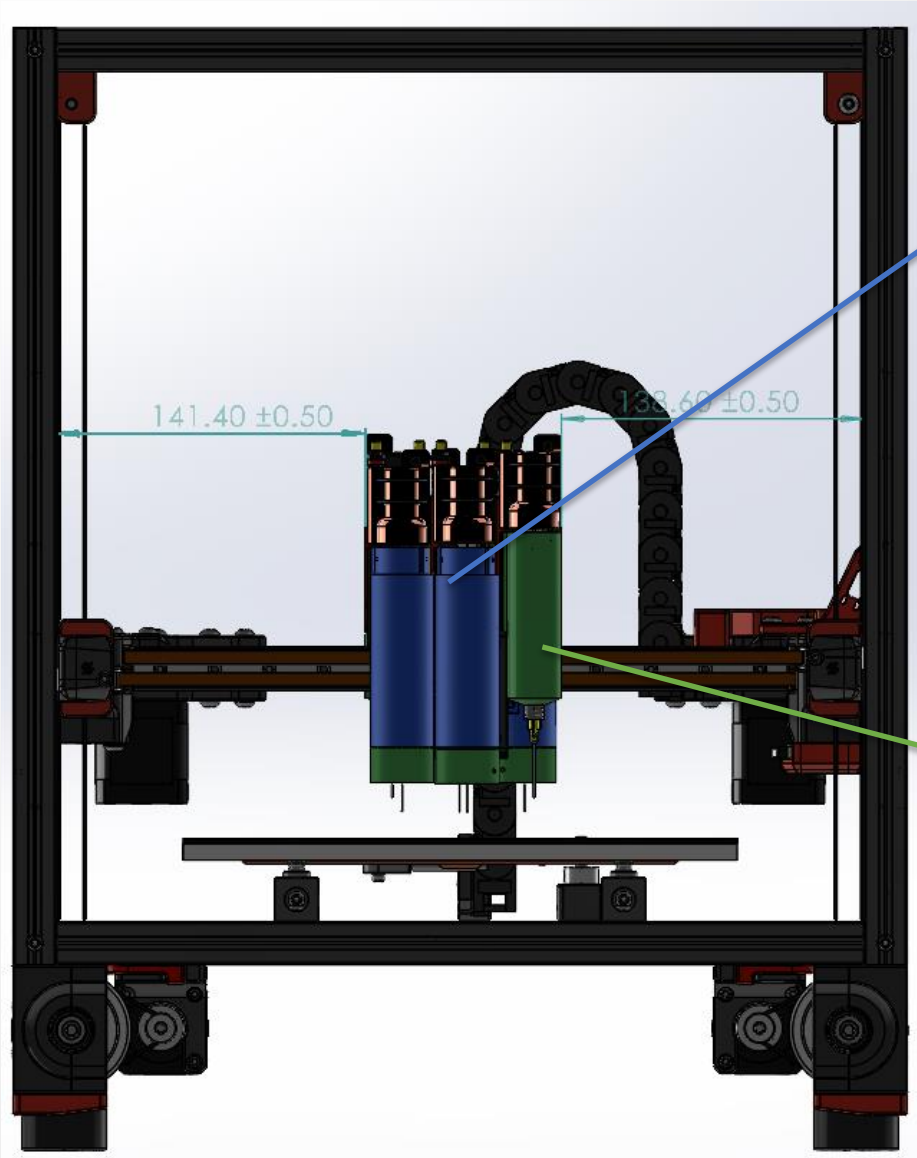


# Roadmap

## Current status and coming years



# CHIMERA



## CORE-BIO

Temperature controlled

Mechanical piston driven  
extrusion

High voltage (0-35KV)

Bio-Electrospraying  
Cell-Electrospinning  
Melt-Electrowriting

## CORE-EXTRUDE

Temperature controlled

Mechanical piston driven  
extrusion



Modular system

Voxel Based

Functional model  
ready end of  
November

# Other Technology

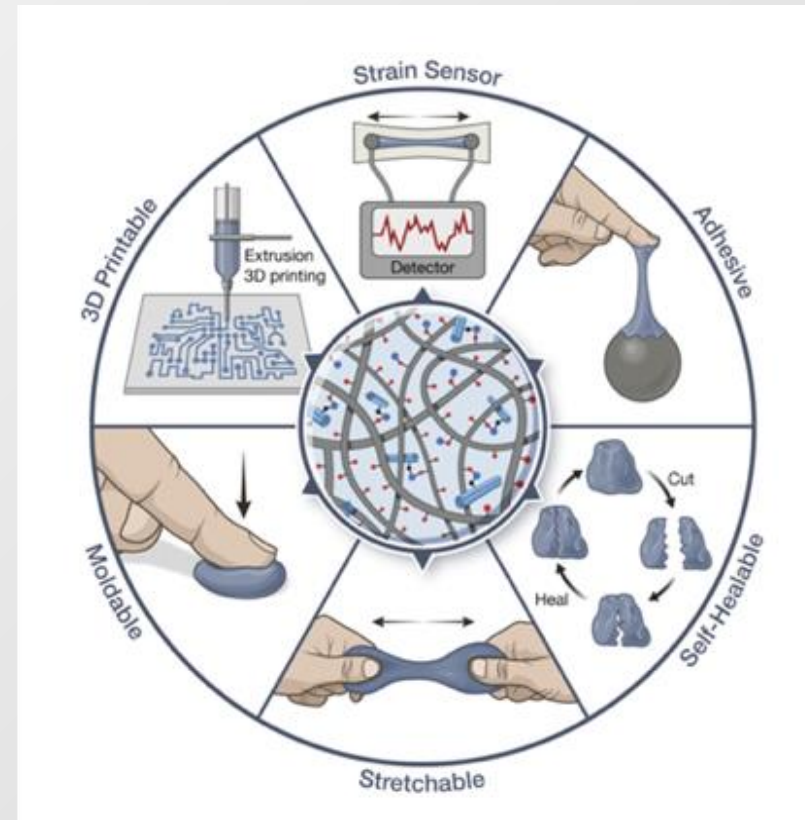
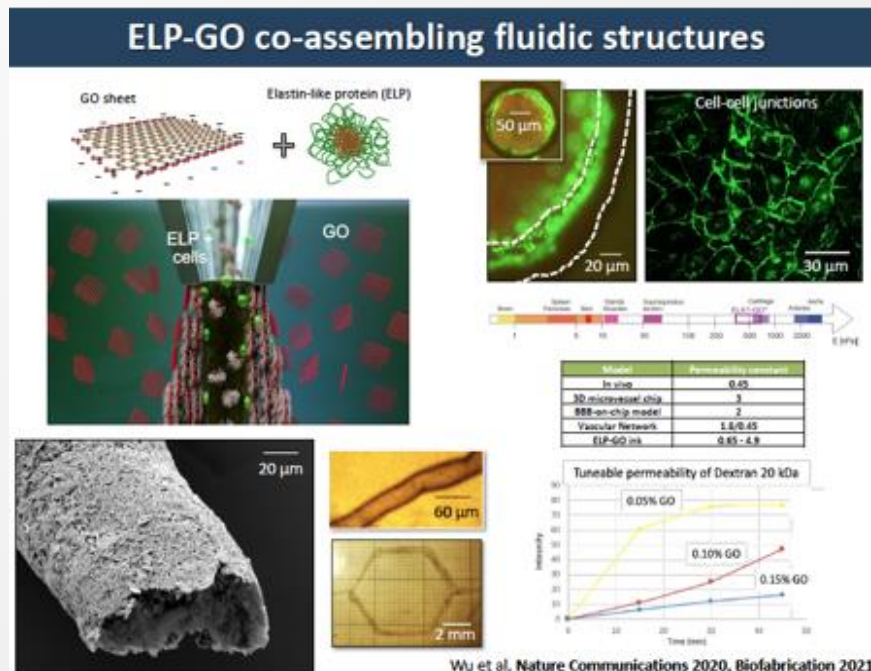


Professor Alvaro  
Matta

Self Assembling  
Bio-INK

Cybosense

CAREGUM:  
Adaptable  
properties for  
sensing.



# Client interest



**Thick Skin Tissue.** Looking at co-development of tailored skin tissue

**Diseased Skin Tissue.** Co-development of tailored skin tissue for testing molecule



**Enhanced skin tissue model on chip.** Interest in complex skin enhancing OOC model

**Complex Skin Tissue.** Interest in complex skin.  
(requested proof of concept)

L'ORÉAL

# Partners



Pre-seed

Manufacturing  
Ready  
Prototype  
CHIMERA

POC- Sensor  
embedded  
Skin tissue



# Have you ever imagined

## 4D biofabricated cyborganic human tissues?

### Ouroboros

A symbol for eternal cyclic  
renewal,  
regenerative medicine



### Bionics

Biologically inspired engineering,  
innovation

Contact John Zandbergen - CEO [jzandbergen@ourobionics.com](mailto:jzandbergen@ourobionics.com)