



# Engineered tissue Microenvironments for 3D Models

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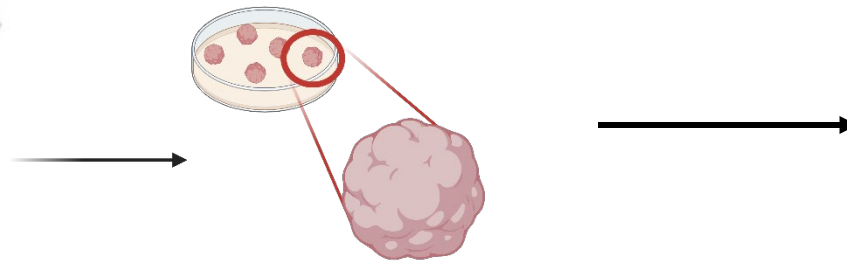


# INFO DAYS 2026 BROKERAGE EVENT CLUSTER | HEALTH

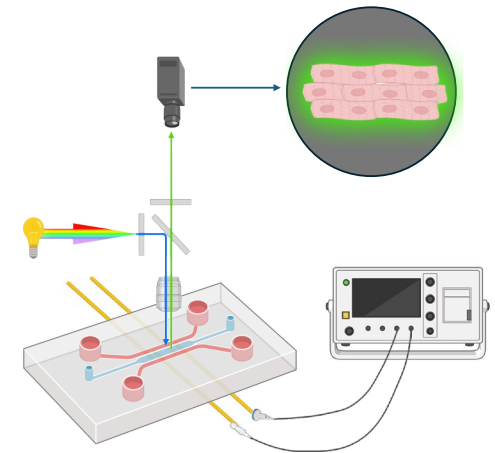
THE EU RESEARCH & INNOVATION PROGRAMME 2021 - 2027

## BIOENGINEERED PLATFORMS

### CURRENT MODELS



HUMAN ORGANOIDS  
Lack of Microenvironment  
Limited/Random organization



### BIOENGINEERED TISSUES

Target system cells  
Cellular organization  
High reproducibility  
Decrease time & costs

**Problem:** There is no effective treatment  
**Reason:** < 5% of preclinical findings from  
animal models moved into clinical trials,  
AND then ALL FAILED

We offer comprehensive capabilities in advanced biomaterials and micro/nanoscale Biofabrication and BioEngineering technologies essential for developing next-generation of multiplexed organ-on-chip platforms and personalized tissue models.

# Core skills

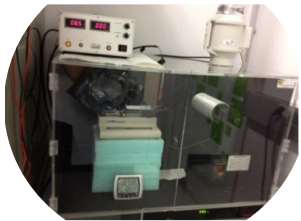
- **Biomaterials & Bioinks Synthesis and characterization**
- **Light-Based Micro and Nanoscale 3D (bio)Printing** (SLA, DLP, 2PP)
- **Biofabrication & Advanced 3D Tissue Humanized Models** mimicking the real environment.
- **Multimodal Organ-on-Chip Development** subordinated to the application
- **Applications:** Disease modeling, drug discovery and screening, toxicology testing, regenerative medicine, precision medicine with patient-derived iPSCs, bioelectronics integration, pediatric rare disease modeling, AI data training.
- **Equipment & Infrastructure:** Two-photon polymerization system with live-cell bioprinting capability. Stereolithography 3D printer. Confocal and super-resolution microscopy systems. Rheological and mechanical characterization equipment. Chemical synthesis laboratories. Microfluidic fabrication facilities. Cell culture and tissue engineering laboratories. Electrode deposition and electronic integration capabilities.
- **Team Expertise:** Expert researchers in biomaterials, tissue engineering, bioengineering, mechanics, and bioelectronics. (Bio)ink synthesis and functionalization. micro/nanoscale biofabrication expertise. Light-based 3D printing. Electronics and sensor integration. Computational modeling and finite element simulation expertise. Clinical and translational research experience.

# Printing facilities for 3D tissue Engineering

## Electrospinning

NanoNC

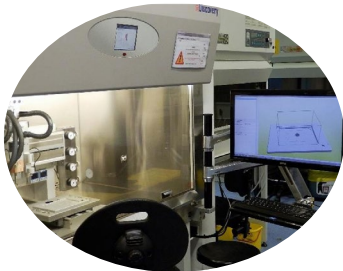
(0,1 – 2  $\mu$ M)



## Extrusion (bio)printing

Cellink Bio-X 3D Discovery)

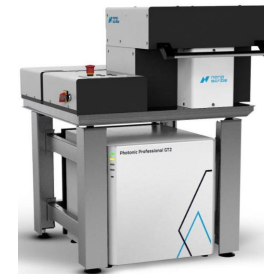
(100-200 $\mu$ m)



(30-50 $\mu$ m)



(0,2-5  $\mu$ m)



## Photo-based 3D (Bio)printing

DLP (Anycubic)

LCD (Anycubic, Phrozen)

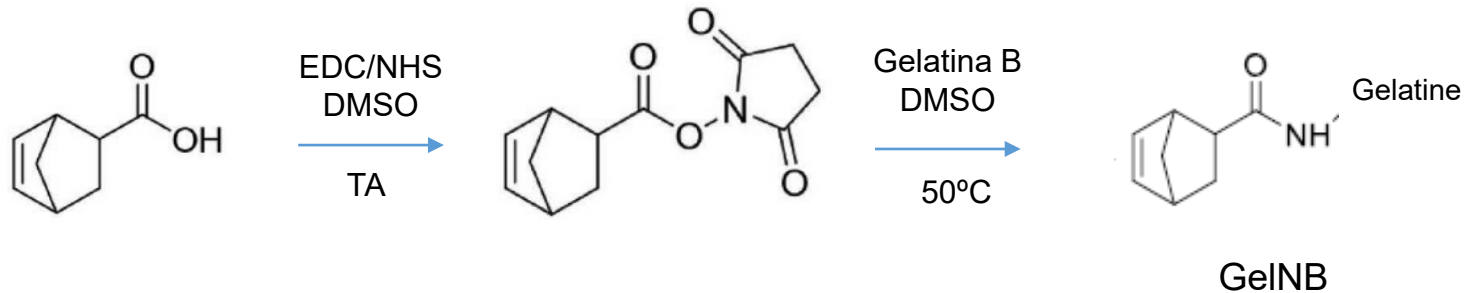
SLA (Formlabs 3+)

2PP (Photonic Professional GT2)

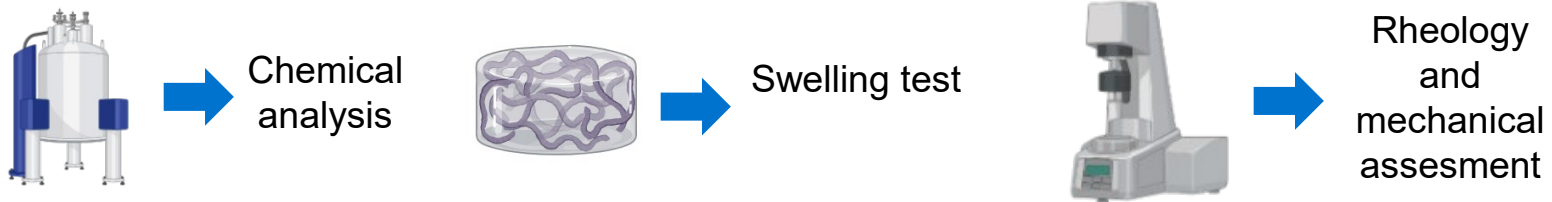
2PP (Nanoscribe Quantum X Bio)

# Fabrication, characterization of Bioinks for tissue Engineering

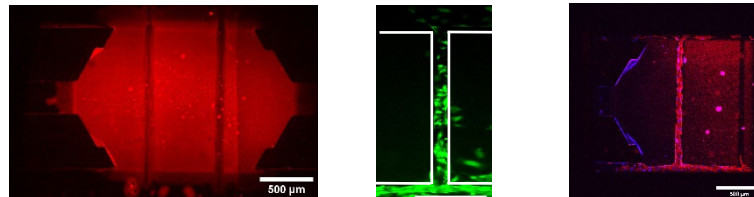
## Synthesis



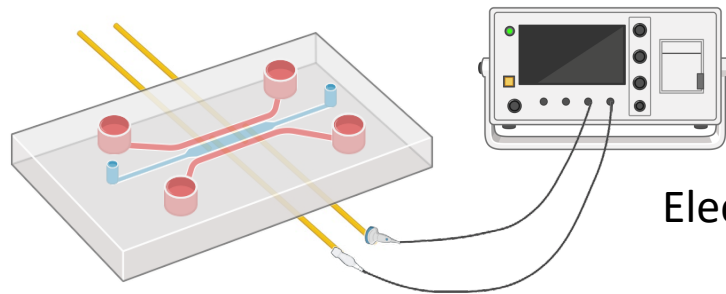
## Characterization



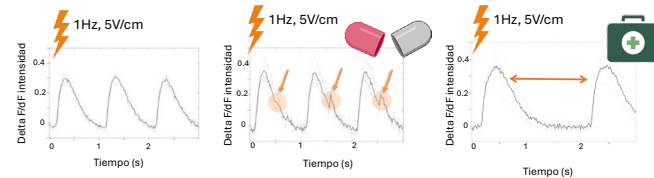
## Printing and Biological validation



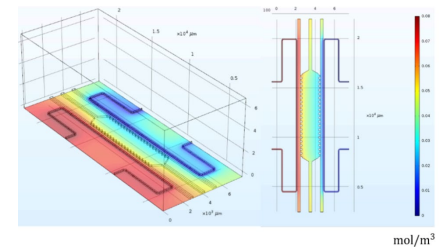
# Microfluidic in silico simulation, design and multiplexing



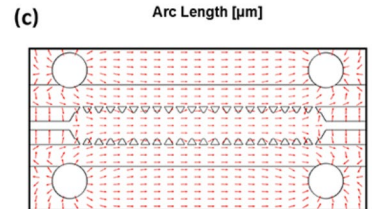
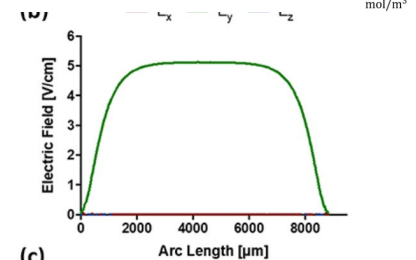
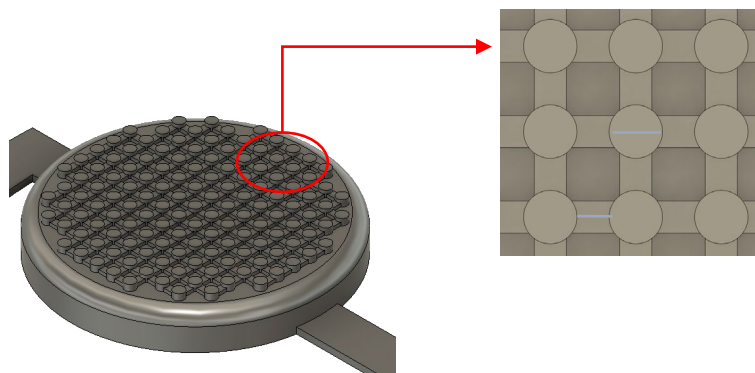
Electrophysiology



Finite Elements Simulation



Multiplexing





# What we seek and provide

- **We Seek Partners For:**

- Clinical researchers with patient cohorts and disease knowledge. Biologists specialized in iPSC differentiation and tissue physiology.
- Pharmaceutical companies for drug screening validation.
- Electrophysiology specialists for cardiac and neural applications.
- AI and machine learning specialists for data analysis and modeling.
- Clinical partners for patient sample collection and longitudinal validation.
- Regulatory affairs and manufacturing scale-up specialists.
- Partners targeting cardiovascular applications (cardiac, vascular, angiogenesis), neuronal, neurodevelopmental, metabolic disease, cancer, rare genetic disorders, and organ-specific applications.

- **What We provide:**

- Technical excellence in advanced biomaterials and micro/nanoscale 3D printing.
- Cutting-edge fabrication and multiplexing enabling physiologically relevant models and reliable close-to-human data.
- Nanoscale control for unprecedented tissue mimicry and biomarker sensitivity.
- Complex biofabrication problem-solving and optimization.
- Regulatory-compliant workflows and quality assurance.
- Strong interdisciplinary collaboration track record.
- Publication and intellectual property support. Scalable, regulatory-standard platforms.



# Thanks!

## Biomaterials and Nanobioengineering (UB)

**Dr. Oscar Castaño**

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