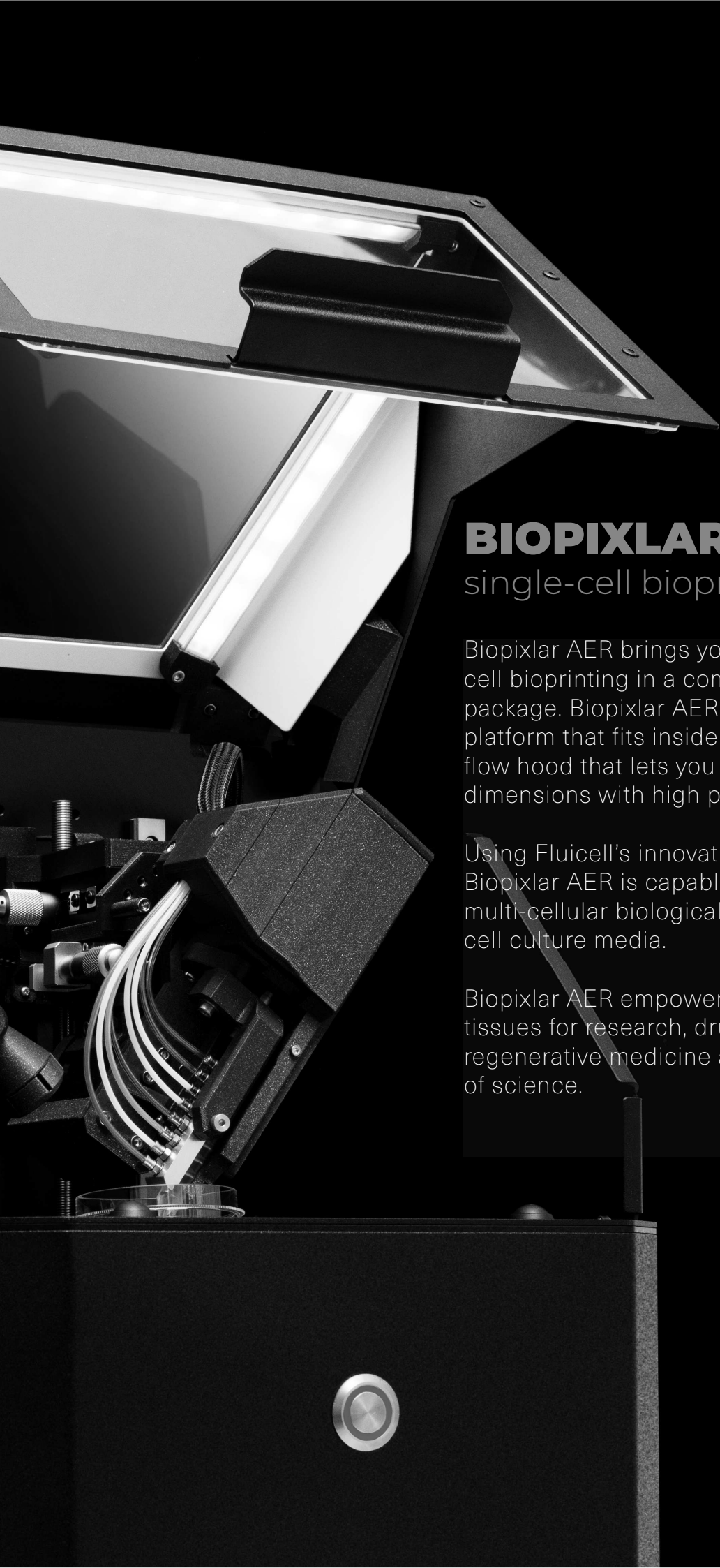


A black and white photograph of a Biopixlar aer microscope. The device is a tall, rectangular unit with a transparent top section revealing internal mechanical and optical components. The main body is black with a circular lens or port near the top and a stylized logo below it. The entire unit is placed on a black, draped pedestal. The background is solid black.

Biopixlar[®] aer



fluicell[®]



BIOPIXLAR AER

single-cell bioprinting unbound

Biopixlar AER brings you the full power of single-cell bioprinting in a compact and portable package. Biopixlar AER is all-in-one discovery platform that fits inside a standard laminar flow hood that lets you position cells in three dimensions with high precision.

Using Fluicell's innovative microfluidic technology, Biopixlar AER is capable of generating detailed, multi-cellular biological tissues, directly in native cell culture media.

Biopixlar AER empowers researchers to create tissues for research, drug development and regenerative medicine and to push the boundaries of science.

“

AER setup was a quick and seamless process; we were printing within 30 minutes of unboxing. Simply connected the cords and do a few quick tests to confirm the fluidics and mechanics are working properly. The new design has a small footprint that fits in most standard biosafety cabinets with sufficient space for preparing cells.

The lighting has also improved making it effortless to locate the tip in relation to the surface, further speeding up the workflow. We are excited to use this system with our ongoing studies in bone tissue engineering and vascularization. This technology enables the precise placement of single cells, getting us one step closer to replicating native tissue microenvironment and cellular organization.

Dr. Luiz E. Bertassoni

Division of Biomaterials and Biomechanics, Department of Restorative Dentistry, Oregon Health and Science University

“

We consider Biopixlar AER to be a truly remarkable innovation, which is easy to install and handle via its multi-modal control system.

This novel platform enables a broad spectrum of new experimental approaches, such as studies of molecular uptake into cells, advanced electrophysiological recordings via calcium-imaging, and studies of cell communication and signaling.

Indeed, the Biopixlar AER is also well adapted for precise or local administration of drugs to cells, enabling advanced pharmacological studies.

Dr. Kent Jardemark

Department of Physiology and Pharmacology
Karolinska Institutet





FULL PLATFORM, COMPACT DESIGN

Biopixlar AER is the first microfluidic, single-cell bioprinting platform on the market that fits inside a standard laminar flow hood. The compact and user-friendly design makes it easy to incorporate Biopixlar AER in most laboratory workflows.

The Biopixlar AER platform is equipped with an automatic printhead holder that enables easy sample loading and printhead positioning.

With the motorized translational stage and integrated microscope, you can control the printing process remotely and follow the printing process in real-time.

BIPIXLAR AER Features



Single-cell resolution

Biopixlar AER is powered by Fluicell's open volume microfluidic technology that gives you full control over the bioprinting process, down to the level of individual cells.



Low sample volume (30 µL)

Biopixlar AER's microfluidic bioprinting technology requires very little sample volumes, making it the ideal choice for uses involving scarce and valuable materials, such as applications with personalized medicine using patient-derived material.



95 % cell viability

Biopixlar AER requires no bioink to print cells. This, combined with the open volume bioprinting technology, creates a cell-friendly environment and ensures a high cell viability inside the bioprinted tissues.



High precision and reproducibility

The exchangeable microfluidic printhead lets you deposit cells right where you want them with µm precision. This makes it possible to create everything from single-cell arrays to detailed tissues containing multiple different cell types.



Built for challenging conditions

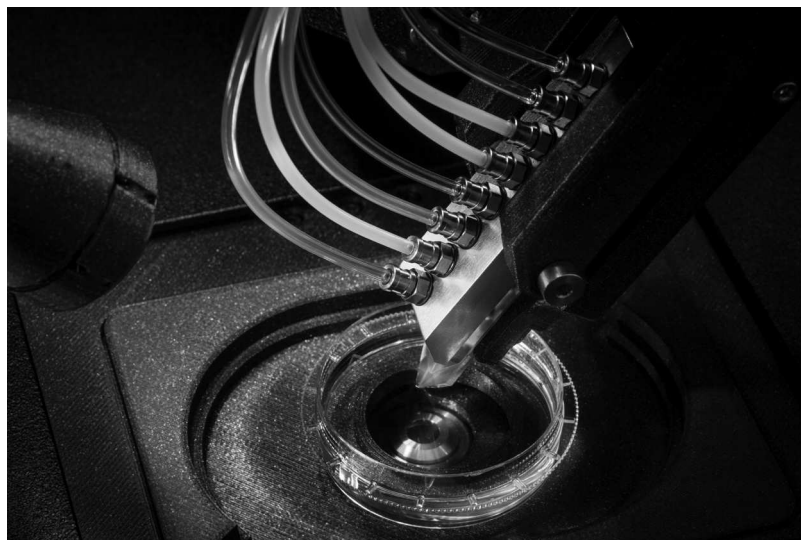
Biopixlar AER's automation and remote control capabilities makes the platform well suited for use in complex and harsh environments and settings where direct access is not possible. The robust yet flexible design makes it even possible to adapt Biopixlar AER for use in space or in deep-sea environments.

HIGH-RESOLUTION PRINTING

Biopixlar AER's automatic printhead holder and translation stage let you precisely position the printhead and deposit cells with micrometer precision.

Printing with Biopixlar is performed directly in culture media using open volume microfluidic technology, minimizing the mechanical stress on the printed cells.

With Biopixlar AER, it is possible to create everything from single-cell arrays to detailed biological tissues.



EASY TO USE

Biopixlar AER gives you multiple ways to control the printing process, all designed with user-friendliness in mind.

The gamepad interface puts full control of the printing process in the palm of your hand. With the gamepad, you have the ability to position the printhead and deposit cells with the press of a button.

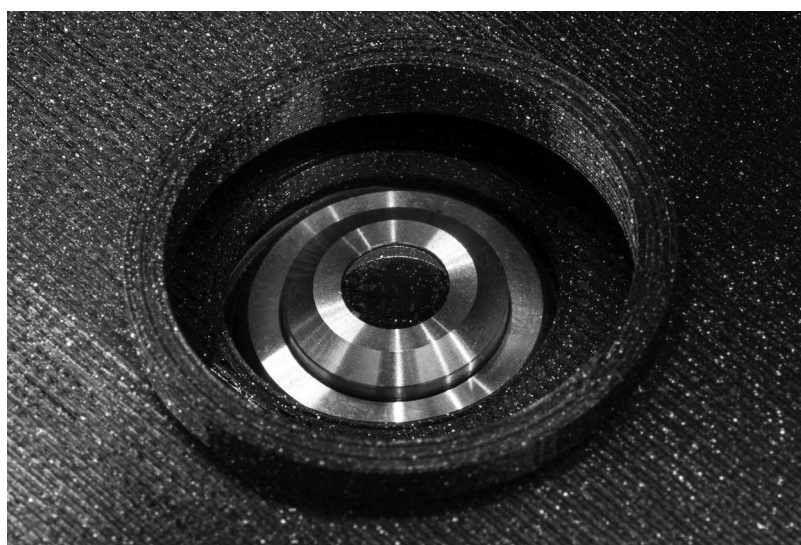
With the gamepad, you can operate the bioprinting platform from outside a biosafety cabinet or laboratory.



INTEGRATED MICROSCOPE

Biopixlar AER comes with an integrated high-quality microscope that lets you follow the printing process in real time, giving you detailed insight into the bioprinting performance.

The Biopixlar AER microscope is equipped with both bright field and fluorescence imaging options, offering multiple ways to visualize and analyze bioprinted tissue constructs.



BIPIXLAR AER Applications

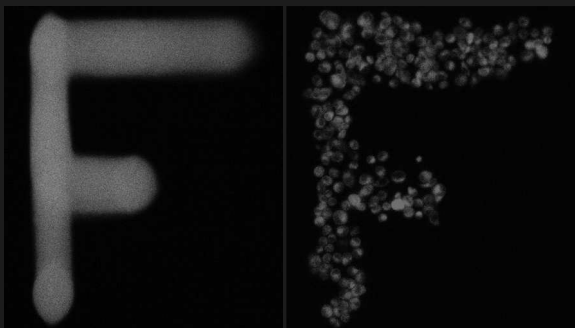
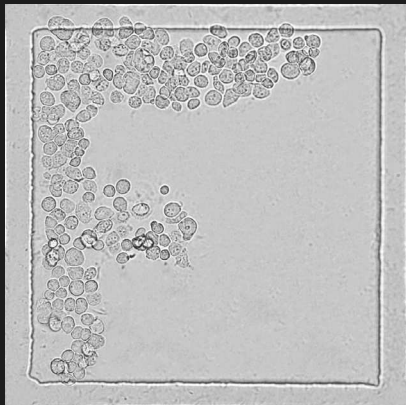
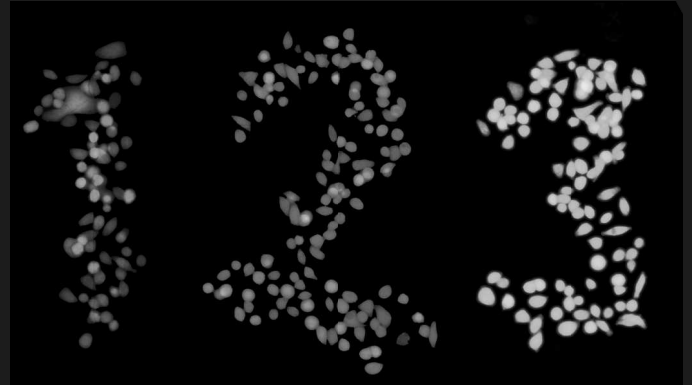
MULTICELLULAR TISSUES

Biopixlar AER's disposable microfluidic printhead lets you print up to three different cell types using a single printhead.

Switching between cell types is quick and is performed either through the Biopixlar Wizard software or using the gamepad interface.

Printheads can be changed during printhead, making it possible to create tissues containing additional cell types.

Biopixlar AER's unique features makes the platform well suited for applications in precision medicine, drug development or regenerative medicine research.



Cells printed in the shape of an F inside a $500 \times 500 \mu\text{m}^2$ square. The cell-adhesive material (blue), deposited using the Biopixlar printhead, gives you precise control of the shape that the printed cells will create.

PRECISION MEDICINE

The microfluidic bioprinting technology and low sample consumption makes Biopixlar AER ideal for applications involving scarce and valuable materials, such as patient-derived samples.

Use Biopixlar AER to develop precision medicine applications such as patient-specific disease models or tailored drug efficacy and toxicity evaluation based on bioprinted patient-derived cells.

RESEARCH MODELS

Whether you want to create detailed organ models, 3D cell cultures or single-cell arrays, Biopixlar AER is the tool for you.

Microfluidic bioprinting in native cell environment ensures high cell viability and creates physiologically relevant conditions, promoting higher data quality.

Use Biopixlar AER to create in vitro liver, kidney, pancreas or cardiac models to take your research to the next level.

BIOPIXLAR WIZARD

High-resolution bioprinting made easy



HANDS-ON CONTROL

The Biopixlar Wizard software gives you full control over the bioprinting process. The user interface is intuitive and easy to use and lets you regulate everything from the printing position and pressure, to the built-in microscope and camera.

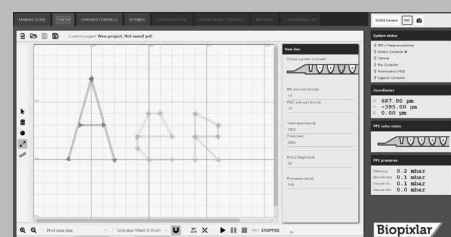
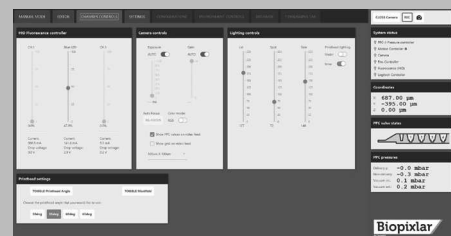
Biopixlar Wizard also comes with multiple options to control printhead and chamber lighting, enabling you to adapt the bioprinting environment to suit your needs.

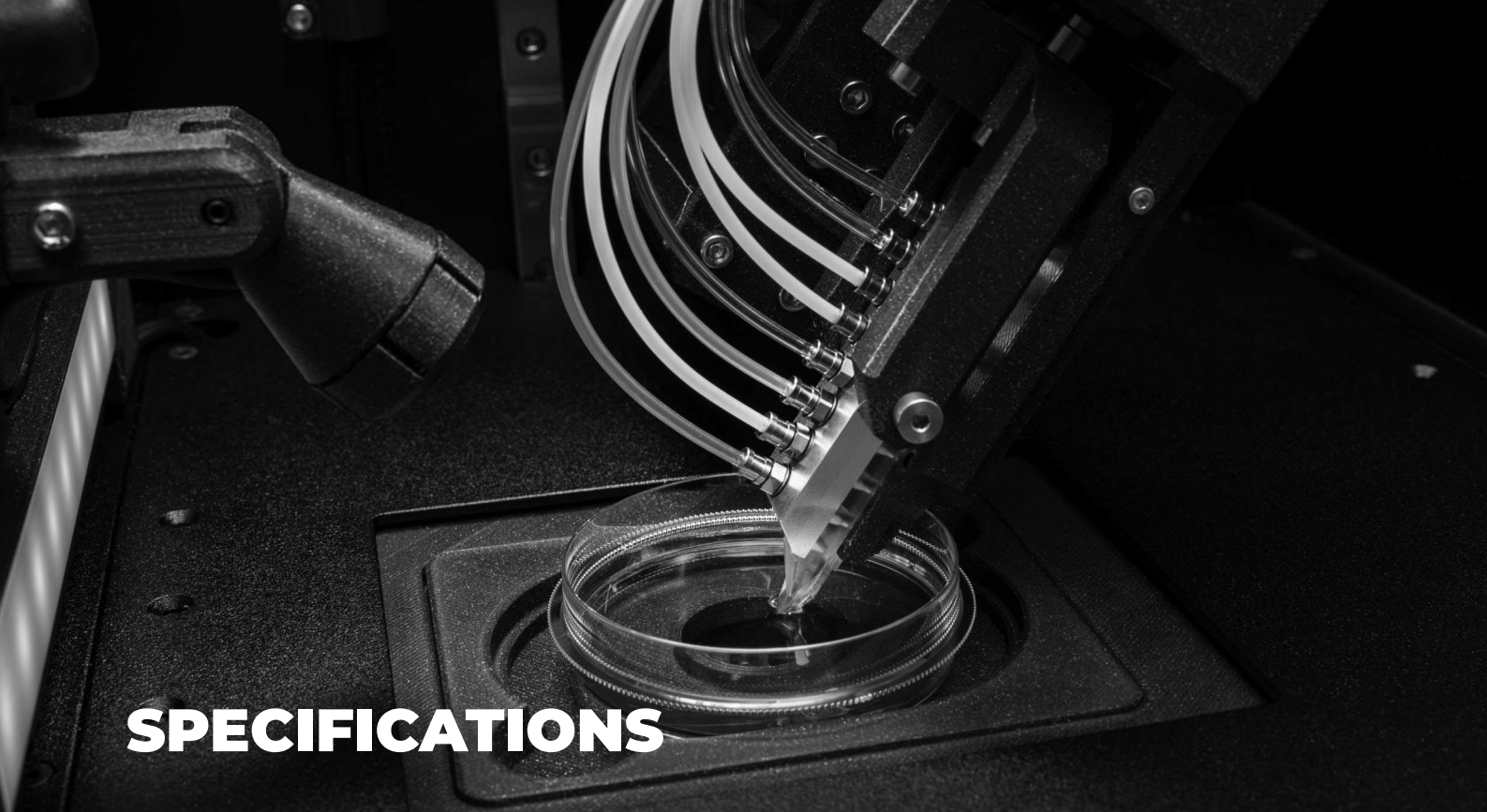
Biopixlar Wizard lets you seamlessly switch between software and gamepad control to give you the best possible bioprinting experience.

CUSTOM TISSUE DESIGNS

With the Biopixlar Wizard Editor, you can create your own custom tissue designs in a versatile graphical user interface. The custom tissue design features, combined with the remote control and automation capabilities, makes Biopixlar AER easy to integrate into most laboratory workflows.

The Biopixlar Wizard Editor lets you store your custom designs and share them between users and projects.





SPECIFICATIONS

Bioprinting performance

Printing technology	Microfluidic hydrodynamic confined flow technology
Printing dimension	2D and 3D
Printing mode	Direct printing of cell suspension without the need for gel matrix
Printing surface	Cell culture dish with culture medium or buffer
Deposition Mode	From individual cells to thousands of cells
Printhead	Exchangeable single-use printhead made from medical grade elastomer with the capacity to hold up to 3 different cell types

Microscope specifications

Illumination	LED fluorescence and bright field illumination
Fluorescence filters	FITC Clinical filter set
Objective	Air 10x
Camera	5 Mpx color CMOS

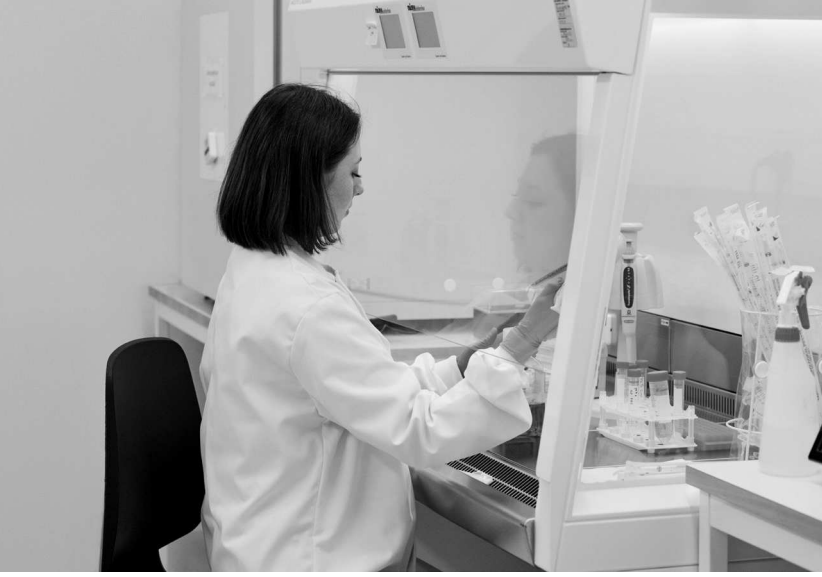
Additional specifications

Outer dimensions, mm (L×W×H)	280 × 270 × 420
Stage travel range	16 × 16 mm
Movement precision	5 µm
Dish holders	For 35 mm ø cell dish For 36.5 mm ø cell dish For 50 mm ø cell dish

Printable cell types*

SH-SY5Y	Neuroblastoma, bone marrow
A-431	Epidermoid carcinoma, epithelial
HaCaT	Keratinocytes, skin
nHEK	Epidermal keratinocytes
SK-MEL-28	Melanoma, skin
HUV-EC-C	Endothelial, skin
3T3-J2	Fibroblasts, mouse
HepG2	Epithelial, liver
Fibroblasts	Primary, human
MCF10A	Fibrocystic, breast
MDA-MB-231	Adenocarcinoma, epithelial
CD8+ T cell	Primary, human
Neuronal tissue digest	Primary, rat
iPSC	Induced pluripotent stem cells. iPSC cardiomyocytes
MSC	Human bone marrow-derived mesenchymal stem cells
iPSC-CM	Human iPSC-derived ventricular cardiomyocytes
MIN6	Pancreatic beta cell line, mouse

*This is not a restrictive nor exhaustive list of Biopixlar compatible cell types, but cells that have been successfully printed by Fluicell so far.



THIS IS FLUICELL

Fluicell is an life science company providing innovative research solutions across single-cell biology, bioprinting and tissue engineering.

We are pioneers in single-cell biology and design discovery platforms based on microfluidic technology that expand the possibilities of cell biology, medical research and regenerative medicine.

Our commitment is to always deliver high-quality products and services that enable our customers to push the boundaries of science and advance human health.



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