



**CELLINK**   
A BICO COMPANY

**BIO X**<sup>TM</sup>

WE CREATE THE FUTURE OF HEALTH

# What is Bioink?

A bioink is a biomaterial that is suitable for bioprinting with cells and provides a temporary or permanent support to the cells while they produce their own extracellular matrix. Bioinks based on biopolymers, such as collagen, gelatin, hyaluronan, silk, alginate and nanocellulose, are known for their favorable biocompatible properties and are attractive biomaterials for cell encapsulation and 3D bioprinting. These bioinks provide an aqueous 3D environment with biologically relevant chemical and physical signals, mimicking the natural extracellular matrix environment. Significant advances in 3D bioprinting technology as well as the development of new bioinks have made it possible to bioprint complex 3D tissue structures.

# Why Bioprinting?

The innovative methods for engineering human tissues and organs can have a profound effect on the future of medicine. 3D bioprinting is considered a revolutionizing technology for advancing and accelerating progress in the field of tissue engineering and regenerative medicine, and thus, the future of medicine. We believe that we can create this future through a collaborative spirit and by putting our combined expertise to the service of humanity.

The future is created in the present and it belongs to the doers, those who continue moving forward in order to see their vision come to realization. It's not that we see the future and then move towards it. We move in order to see it.





# We are CELLINK

We are a team of entrepreneurs, scientists, engineers and pioneers, pushing the limits for what's possible, paving the way for the future of regenerative medicine.

With our 3D bioprinters and bioinks, we will open the possibility for more extensive medical research. Together with our collaborators, in hundreds of labs in more than 50 countries, we work side by side to ensure quality and support.

Our compassion for humans and drive to create an impact will pave the way for continued growth.



"There was a clear difference in CELLINK's customer approach, product robustness and confidence in their products, all of which made CELLINK stand alone in the market of 3D bioprinting. We trusted the company and now looking back we think it was not a wrong decision to go with CELLINK."

- Dr. Nath, Harvard Medical School

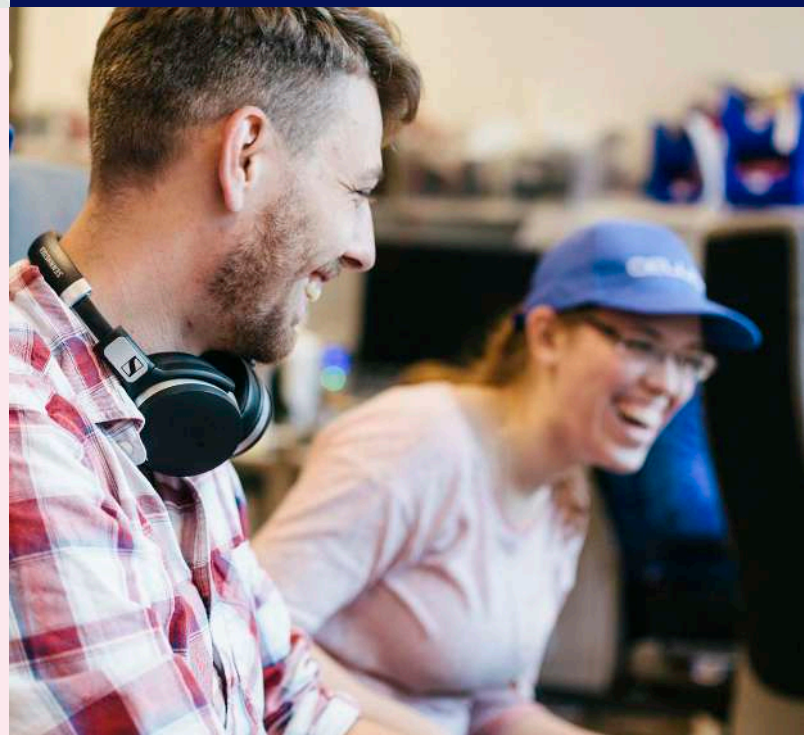


"Thanks CELLINK for engaging the students and holding this successful workshop on bioprinting"

- Ric Levato, UMC Utrecht

"CELLINK has taken our feedback and adapted their system while being actively engaged in the process"

- Dr. Grande, The Feinstein Institute for Medical Research



# Meet the BIO X

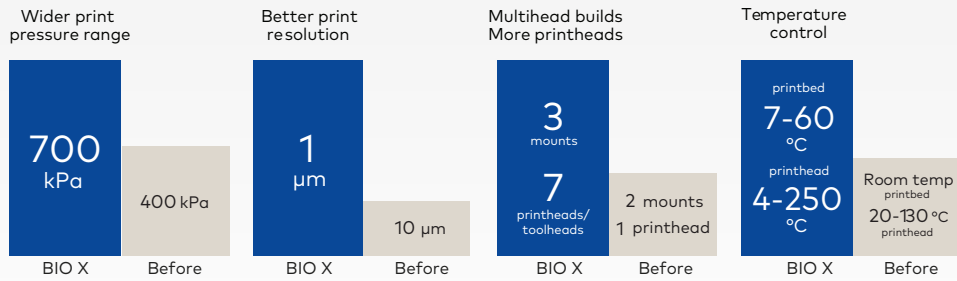
BIO X is the most user-friendly and flexible bioprinter in the world, providing the user with an unparalleled bioprinting experience. The built-in features along with the new BIO X software managed through the large touchscreen display minimize the learning curve and ensure you will receive the results you want.

Bioprinted tissue can be used in drug discovery where researchers can test new potential treatments and evaluate efficacy in very early stages. New drugs and treatments will potentially reach clinical trials faster with a decreased number of failures and reduced need for animal testing.

BIO X is the next-generation bioprinter, bringing scientists closer to the future of medicine.



reddot award 2018  
winner



Wi-Fi data transmission

- Clean Chamber Technology

Triple print mode

- Three exchangeable printheads

Multiple temperature control and pressure sensor

1-micron ultra-fine resolution

Multiple UV curing system (365, 405, 485 and 520 nm UV LED)

- Printbed temperature control (4-60° Celsius)

- 7-inch Touchscreen

- Built-in oil-free air compressor

Standalone unit with small lab footprint

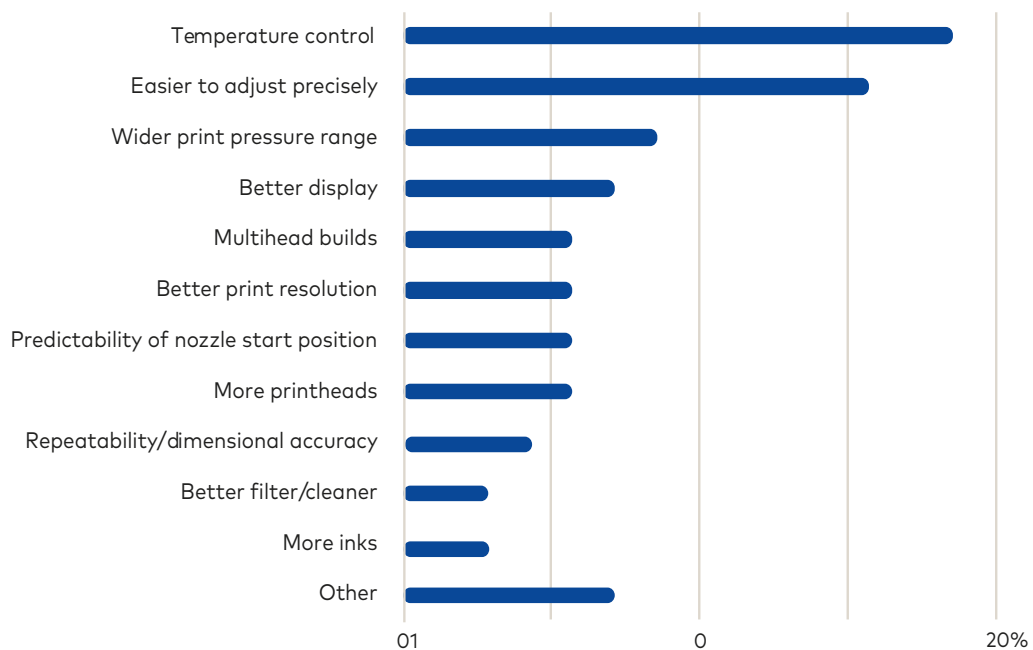


# Designed with scientists in mind

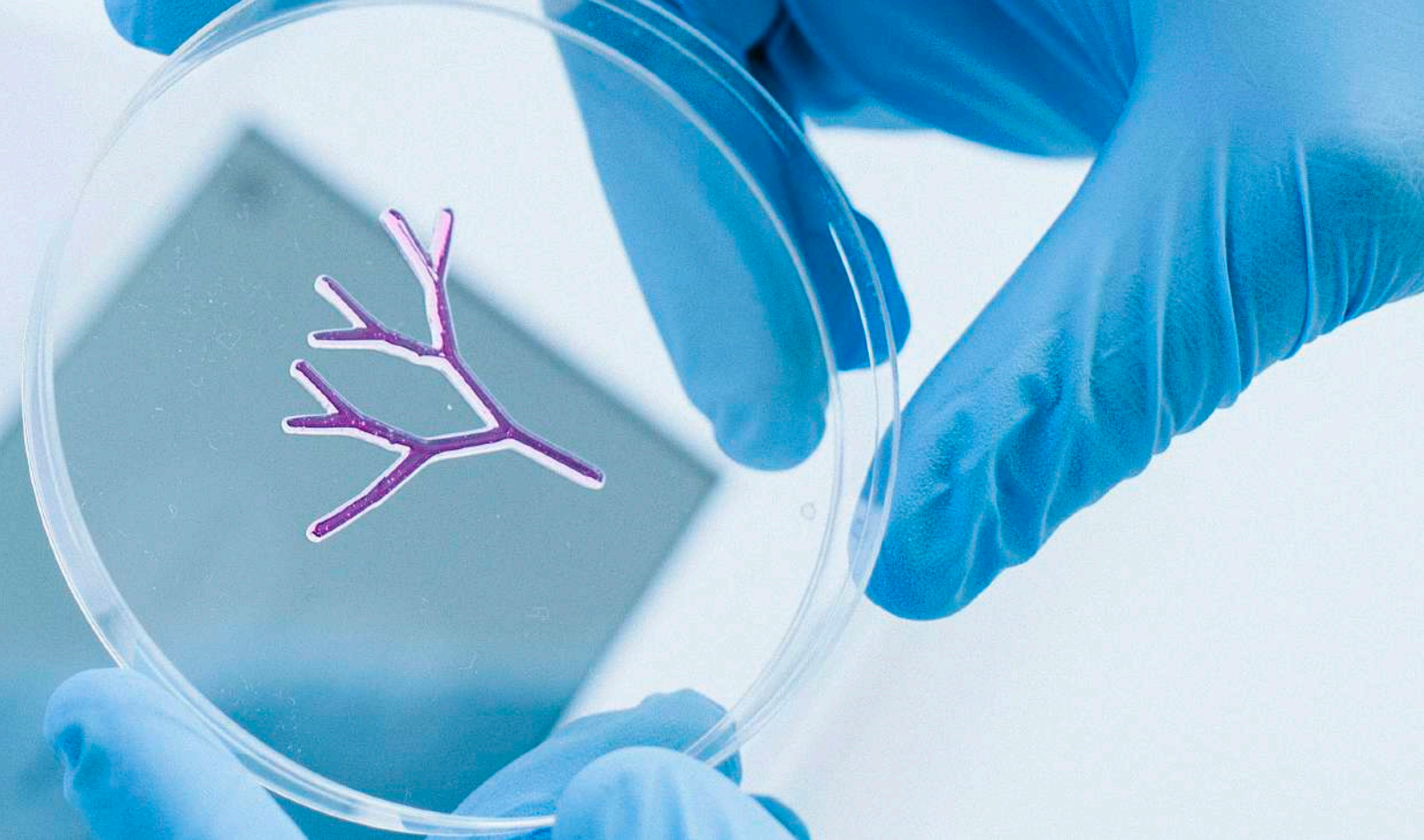
## YOU SPOKE, WE LISTENED!

When developing the BIO X, we at CELLINK reached out to you, our fellow scientists and users, to get your feedback on our INKREDIBLE and INKREDIBLE+ bioprinters, and to better understand your needs in 3D bioprinting.

We asked what current features you would want to improve, and what non-existing features you'd like to see in the next-generation bioprinter. You can find the most common answers in the diagram below.







Human



BIO X

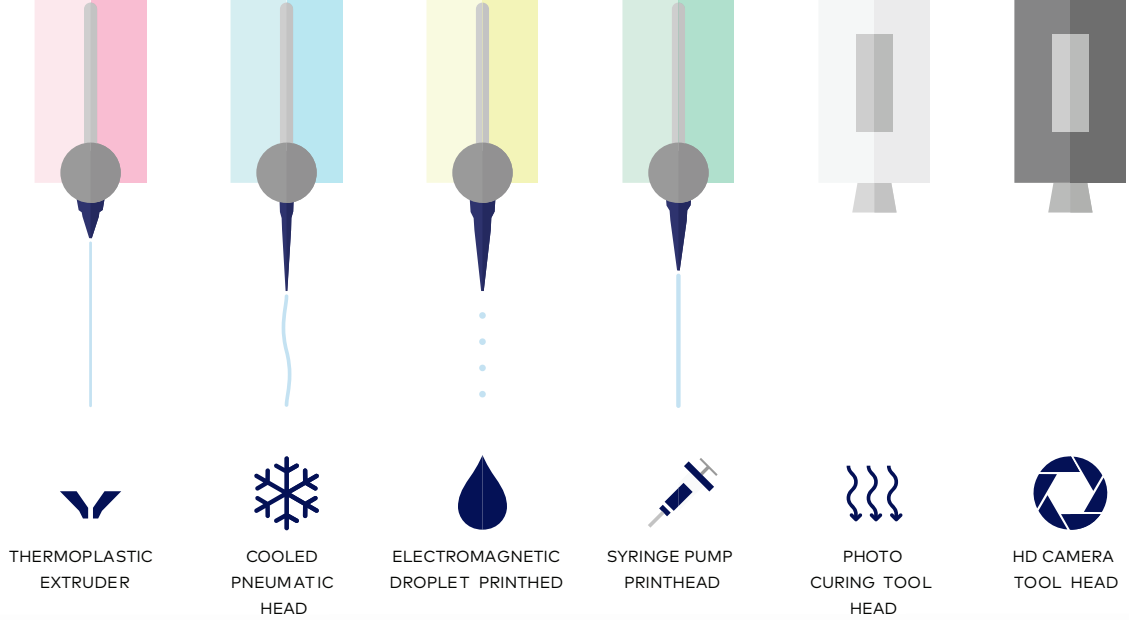


Compressor

## INDEPENDENT AND COMPACT LAB FOOTPRINT

Both a compressor and cooling unit have been integrated into the BIO X, without compromising its size. When printing cells, a sterile environment is key. Working in a laminar flow cabinet is sometimes needed, but impossible to do if your equipment can't fit. BIO X has a small footprint but still contains every component you need to bioprint. It's a complete standalone unit, facilitating work in a laminar flow cabinet without the need for external connections.

Even though the BIO X works perfectly on its own, you might sometimes want to increase performance of different functions. There's a plug in the back of the BIO X where you can connect to your laboratory air supply, if needed. Connecting the external air supply allows you to print with higher pressure than usual, enabling you to print higher viscosity bioinks.



## Intelligent & exchangeable

To make sure that all the necessities for your research are easily available, we supply several of the handiest printheads and tool heads you may need when using BIO X.

BIO X is a versatile bioprinter equipped with intelligent printhead mounts. This means you'll have the opportunity to easily upgrade your system as we develop new printheads to match your evolving bioprinting needs.

The printheads we provide are carefully selected and of the highest quality. We strive to meet your standards and we compromise nothing in the process of supporting your bioprinting projects.



# Compatible materials

The BIO X is capable of fabricating constructs containing any type of cell, enabling the production of any tissue target found in the body. These constructs can be utilized in a wide range of applications through the incorporation of bone marrow stromal cells or mesenchymal stem cells.

The system can use specialized cells like chondrocytes or fibroblasts for cartilage and dermal applications respectively. Build vascular networks within your constructs using.

BIO X can bioprint hepatocytes to rapidly create 3D models for drug screening. You can add stellate cells to quickly make advanced disease models.

## LIST OF BIOINKS AND THEIR PRINTING EXTRUSION METHODS

	Pneumatic-driven Extrusion	Piston-driven Extrusion (syringe)	Inkjet	Thermoplastic Extrusion
Gelatin Methacryloyl	✓	✓	✓	
Collagen methacryloyl (Collagen solution and precipitated)	✓	✓	✓	
Hyaluronan	✓	✓	✓	
Alginate	✓	✓	✓	
Chitosan	✓	✓	✓	
Silk	✓	✓		
Nanocellulose	✓	✓	✓	
PEG/PEGDA	✓	✓	✓	
Fibrinogen/thrombin	✓	✓	✓	
Decellularized ECM	✓	✓	✓	
Pluronic F127	✓	✓	✓	
PropyleneG lycol	✓	✓	✓	
Polycaprolactone	✓ (heated)	✓ (heated)		✓
Polylactic Acid				✓

# Clean. Reinvented

BIO X is equipped with dual high-power fans that create a powerful airflow through its dual-filtration top, creating a positive air pressure inside the chamber. The air first travels downwards through a prefilter, which retains the bigger particles, and then through a HEPA H14 filter, which sorts out even the smallest of particles. The dual- power fans fill the chamber with filtered air at a positive pressure to keep your experiment clear.

The BIO X is made without sharp corners. Its design only uses rounded shapes to ensure that no unwanted particles get trapped inside the chamber. On top of this, there are UV-C germicidal lights that allow you to run sterilization cycles to sterilize the printing environment. Together, these components create a complete system of uncompromised cleanliness.





# Easy printing process 321

# 1

## CELL MIXING

We have developed the easiest and most homogenous way of doing this using our innovative CELLMIXER. Put the bioink in the 3 mL syringe and your cells in suspension media in the 1 mL syringe. Clip each syringe to the dispensing unit, connect the mixing unit to the tip of each syringe and then connect the filling-cartridge. Fill the cartridge by gently injecting the ink and cells through the mixing unit. Your filling-cartridge is now ready for bioprinting and can be disconnected from the mixing unit.

# 2

## BIOPRINTING

When the cell mixing is done and your cartridge is filled, you're ready to start printing. Screw a nozzle onto the cartridge and connect it to the air system. Now place it in the printhead. Continue by choosing the desired printing settings on the touchscreen, like temperature, printing pressure and printing speed. The parameters and the nozzle's diameter are chosen based on your chosen material. Select the design you want and press print. BIO X will calibrate itself and start printing.

# 3

## CROSSLINKING

Depending on the material you are printing, you may need to crosslink the printed construct. For UV crosslinking, you can turn on the built-in LED and the BIO X will do all the work for you. For other types of crosslinking, you can add the crosslinking agent directly on your construct.

# Our bioinks



CELLINK is the first bioink company in the world and the creator of the world's first universal bioink. This opens the opportunity for scientists to bioprint using any type of cells.

Today we provide more than 40 different sterile and ready-to-use bioinks for various applications, from printing cancer models to skin models. Moreover, it is compatible with any 3D bioprinting system.

You can also check out our different kits for special applications and needs. The Support kit will enable the fabrication of your 3D constructs from otherwise unprintable materials and revolutionize your research.

Bioink	Cartilage	Skin	Bone	Muscle	MSCs	Other cell types	Sacrificial material	Thermoplastic Scaffolds
CELLINK A	✓		✓		✓			
CELLINK A - RGD		✓		✓	✓	✓		
CELLINK	✓	✓	✓		✓	✓		
CELLINK BONE			✓		✓			
CELLINK FIBRINOGEN		✓	✓	✓	✓			
CELLINK FIBRIN		✓	✓	✓	✓			
CELLINK RGD		✓	✓	✓	✓			
CELLINK SKIN		✓						
CELLINK SKIN+		✓						
CELLINK LAMININK 111						✓		
CELLINK LAMININK 121				✓		✓		
CELLINK LAMININK 411						✓		
CELLINK LAMININK 521						✓		
CELLINK LAMININK+						✓		
Col1		✓	✓	✓	✓	✓		
Col1MA		✓	✓	✓	✓	✓		
GelMA		✓	✓	✓	✓	✓		
GelMA A		✓	✓	✓	✓	✓		
GelMA C		✓	✓	✓	✓	✓		
GelMA HA	✓	✓	✓			✓		
GelMA high C		✓	✓	✓	✓	✓		
GelXA		✓	✓	✓	✓	✓		
GelXA-Bone			✓		✓			
GelXA-Fibrin		✓	✓	✓	✓			
GelXA-Skin		✓						
GelXA-LN111						✓		
GelXA-LN121				✓		✓		
GelXA-LN411						✓		
GelXA-LN521						✓		
GelXA-LN+						✓		
GelXG		✓	✓	✓	✓	✓		
CELLINK PCL								✓
PLA								✓
PLGA								✓
CELLINK Pluronics							✓	
CELLINK START							✓	
CELLINK START X							✓	
CELLINK Support							✓	
CELLINK Xplore							✓	
HAMA Kit	✓	✓						

# Bioverse.co

## EXTENDING DEVELOPMENT BEYOND YOUR LAB

Join the global open-source 3D bioprinting community online. You'll connect with great minds around the world, streamlining your work and driving innovation.

Bioverse.co also gives you access to CAD models and protocol for all types of organs, tissues and tissue analogues. Register your products to get notified when your warranties are about to expire, if maintenance should be done and when software updates become available.

Bioverse.co is developed and maintained by CELLINK AB.

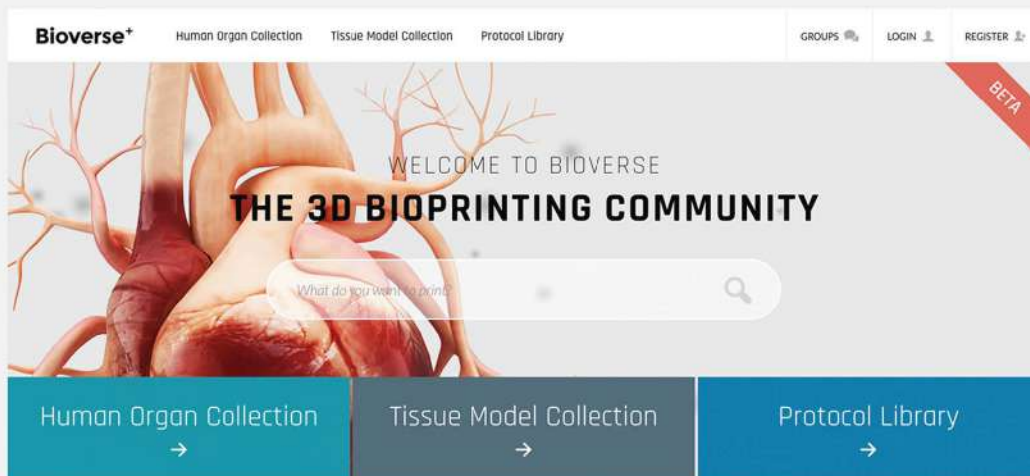
## OWNERSHIP HAS NEVER BEEN MORE CONVENIENT

Bioverse.co is not only a forum for sharing, but also for caring. Use your products' serial numbers and register them under your account at Bioverse. You'll get instant notifications when your warranties are about to expire, if maintenance should be done and when there are new software updates for your BIO X.

Connect your BIO X to the internet and download 3D models from Bioverse directly. If the downloaded project files contain printing protocols, your BIO X will use them to set up automatically.

## COLLABORATE TO ACCELERATE PROGRESS

Search through this online database for human organ models, tissue models or protocols to improve your work. Extend your expertise beyond your lab by collaborating with other great minds around the world.



BIO X



**CELLINK**   
A BICO COMPANY

[www.cellink.com](http://www.cellink.com) | [sales@cellink.com](mailto:sales@cellink.com) | US: +1 (833) CELLINK | EU: +46 31-128 700

**Boston, USA**  
155 Seaport Blvd  
Unit 2B  
Boston, MA 02210

**Gothenburg, Sweden**  
Arvid Wallgrens backe 20  
413 46 Gothenburg

**Virginia, USA**  
2000 Kraft Dr. Suite 2125  
Blacksburg, VA 24060

**Kyoto, Japan**  
Med-Pharm Collaboration Building  
46-29 Yoshida-Shimo Adachi-cho  
Sakyo-ku, Kyoto