logos biosystems

X-CLARITY™

SYSTEMS AND REAGENTS FOR TISSUE CLEARING

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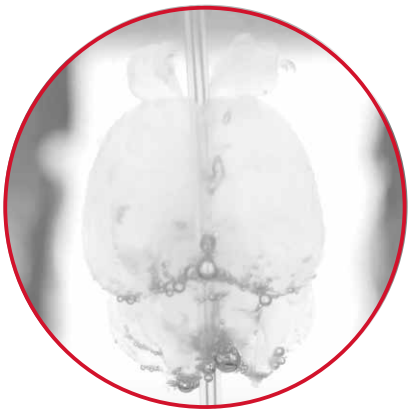
SECTIONING IS TIME. WE CUT THE TIME.

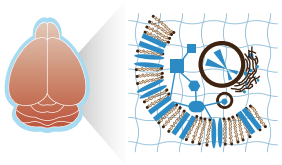


Tissues are inherently three dimensional in nature, which makes imaging intact tissues a necessity for a more complete study into the relationship between structure and function and the system-level study of cellular mechanisms. Tissue clearing has become an important step for imaging tissues in 3D at single-cell resolution.

The X-CLARITY™ is a collection of systems and ready-to-use reagents to standardize, simplify, and accelerate each step of the tissueclearing process. X-CLARITY™ is based on the CLARITY (Clear Lipid-exchanged Acrylamide-hybridized Rigid Imaging / Immunostaining /in situ-hybridization-compatible Tissue hYdrogel) method. With CLARITY, preserved tissues are embedded in a hydrogel matrix and lipids are actively extracted through electrophoresis to create a stable and optically transparent tissue-hydrogel hybrid that is chemically accessible for multiple rounds of antibody labeling and imaging.

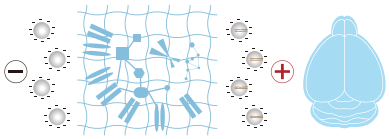
ACCELERATE YOUR 3D IMAGING WORKFLOW

STEP 1
Tissue-hydrogel Hybridization



A fixed tissue sample is incubated in the X-CLARITY™ Hydrogel Solution Kit to allow hydrogel monomers to diffuse uniformly throughout the sample. Once the solution has permeated the tissue, the sample is placed in the X-CLARITY™ Polymerization System. Monomers polymerize in the anaerobic environment, linking the biomolecules to a hydrogel network, which preserves molecular information and structural integrity.

STEP 2
Tissue Clearing

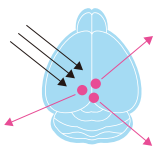


Once the tissue-hydrogel hybrid has been formed, the hybrid is cleared in the X-CLARITY™ Tissue Clearing System II using the ready-to-use Electrophoretic Tissue Clearing Solution. Lipids are extracted actively through electrophoresis or passively, leaving behind a stable and transparent tissue-hydrogel hybrid that is chemically accessible for molecular phenotyping.

STEP 3
Antibody Labeling

The transparent sample is then labled with antibodies using the DeepLabel™ Antibody Staining Kit, which enhances antibody penetration into clarified tissues. Optimized for clarified tissue samples, DeepLabel™ can be used with tissues cleared with various clearing methods such as passive or active CLARITY, iDISCO, 3DISCO, uDISCO, Visikol, or CUBIC.

STEP 4
Imaging



Prior to imaging, the tissue-hydrogel hybrid is placed in X-CLARITY™ Mounting Solution, a refractive index matching solution (RIMS), to homogenize the environment within the tissue to the solution. This reduces light scatter, which in turn increases optical transparency and consequently increases image quality and imaging depth.

X-CLARITY™ Hydrogel Solution Kit C1310X – 1 kit

The X-CLARITY™ Hydrogel Solution Kit is a pre-tested hydrogel solution for uniform and consistent tissue-hydrogel hybridization. The kit is composed of X-CLARITY™ Hydrogel Solution and X-CLARITY™ Polymerization Initiator .

X-CLARITY™ Hydrogel Solution

C13103 – 1 x 1 L

The X-CLARITY™ Hydrogel Solution is a ready-to-use acrylamide-based solution used to create polyacrylamide. X-CLARITY™ Hydrogel Solution contains no bis-acrylamide or paraformaldehyde.

X-CLARITY™ Polymerization Initiator

C13104 – 1 x 2.5 g

The X-CLARITY™ Polymerization Initiator is a thermal free radical initiator that releases free radicals when heated in solution to initiate the polymerization of hydrogel monomers.

X-CLARITY™ Polymerization System C20001

The X-CLARITY™ Polymerization System is a standalone, automated system developed to simplify tissue-hydrogel hybridization, a crucial step for optimal tissue clearing. Multiple samples can be placed in multi-well plates or conical tubes for rapid and efficient high-throughput sample processing. Users can control polymerization by adjusting vacuum strength, temperature, and a timer through a simple touchscreen interface.

- High throughput (up to 768 samples/run)
- Compatible with various vessels
- Fully automated vacuum and temperature control
- Rapid and consistent polymerization

Comes with your choice of two heat blocks

X-CLARITY™ Heat Block for 6 x 50 mL tubes C20002

92 x 134 x 75 mm / 1.9 kg

X-CLARITY™ Heat Block for flat-bottom plates C20003

92 x 134 x 78 mm / 2.5 kg

Touchscreen interface. The simple touchscreen interfaces gives users precise control over vacuum pressure, temperature, and polymerization time.

Compatible with multiwell plates and conical tubes. Users can select the combination of heat blocks to use with the system.

X-CLARITY™ Polymerization System Specifications

Display	5"TFT LCD
Temperature Range	RT - 60°C
Temperature Accuracy	±0.3°C
Vacuum Range	-90 - 0 kPa
Power Consumption	312 W
Applicable Power	AC 100-240 V, 50/60 Hz
Dimensions (W x D x H)	Exterior: 332 x 430 x 222 mm Interior: 307 x 137 x 140 mm
Weight	28 kg

X-CLARITY™ Tissue Clearing System II C130001

The X-CLARITY™ Tissue Clearing System II is an all-in-one, easy-to-use solution for electrophoretic tissue clearing. Its unique design accelerates the removal of lipids from tissues while preserving the structural integrity of the sample.
Users can set tissue clearing conditions through a simple and intuitive touchscreen interface. In ETC (electrophoretic tissue clearing) mode, platinum-plated electrodes generate an electric field to accelerate the removal of lipids from tissues in a highly efficient manner. A built-in temperature control system actively cools and heats buffer to maintain consistent buffer temperatures during clearing. Buffer is constantly circulated to ensure consistent buffering capacity, temperature control, and elimination of tissue clearing byproducts. This advanced system ensures efficient, rapid, and consistent tissue clearing.

X-CLARITY™ ETC Control Tower
X-CLARITY™ ETC Chamber
X-CLARITY™ Buffer Reservoir
X-CLARITY™ Tray
1 Container Holder for 1 Tissue Container
Tissue Containers
12 L Electrophoretic Tissue Clearing Solution

Electrophoretic Tissue Clearing Solution

C13001 – 12 x 1 L

Electrophoretic Tissue Clearing Solution is a premixed SDS-based buffer optimized for use with the system.

Precise temperature control

- Active buffer cooling and heating capacity
- Sensitive and accurate temperature sensor

Uniform electric field

- Platinum-plated electrodes
- Constant current and constant voltage modes

Compatible with multiple tissue types and sizes

- Electrophoretic and passive clearing
- Holders of various sizes available

User-friendly setup

- Simple touchscreen interface
- Ready-to-use clearing solution

Compatible sample holders

Container for 1 Tissue Container
C12002 use with C12001

Tissue Container
C12001 use with C12002

Mouse Brain Slice Holder
C12004

Whole Rat Brain Holder
C12007

Holder for 36 Mouse Brain Slices
C12010 1.5 Φ C12020 0.6 Φ

Holder for 6 Slices
C12011 1.5 Φ C12021 0.6 Φ

Holder or 1 Sample
C12012 1.5 Φ C12022 0.6 Φ

Holder for 6 Mouse Brains
C12013 1.5 Φ C12023 0.6 Φ

Holder for 48 Samples
C12014 1.5 Φ C12024 0.6 Φ

Holder for 192 Samples
C12015 1.5 Φ C12025 0.6 Φ

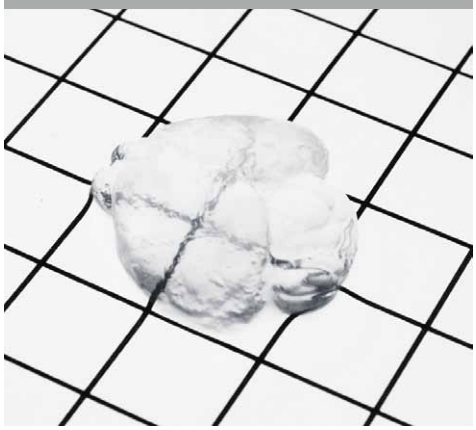
X-CLARITY™ ETC Chamber Specifications

Instrument type	Electrophoretic chamber
External dimensions (W x D x H)	176 mm x 128 mm x 154 mm
Internal dimensions (W x D x H)	57 mm x 30 mm x 93 mm
Weight	2.8 kg

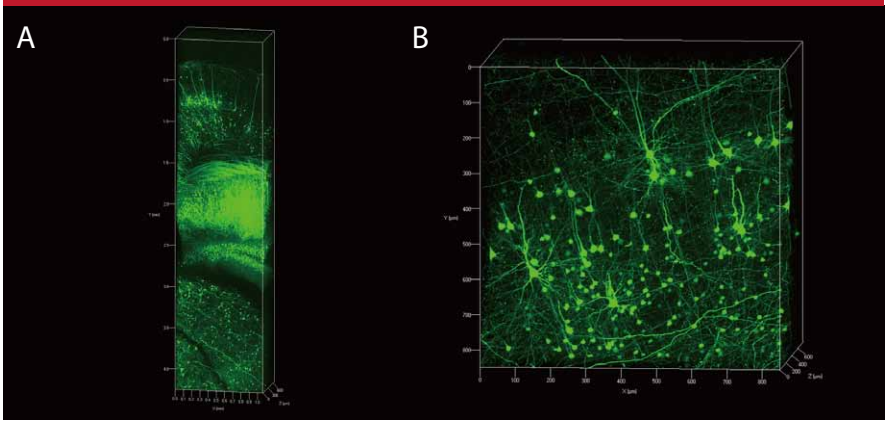
X-CLARITY™ ETC Control Tower Specifications

Instrument type	Power supply, temperature control, and buffer circulation device
User interface	5 inch TFT LCD touchscreen
Power supply modes	Constant current or constant voltage
Current & voltage range	0.2-1.5 A, 5-70 V
Temperature range	30-60° C
Pump speed range	50-200 rpm
Electrical requirements	AC 100-240 V, 50/60 Hz
Power consumption	500 W (including the X-CLARITY™ ETC Chamber)
Dimensions (W x D x H)	205 mm x 430 mm x 370 mm
Weight	20 kg

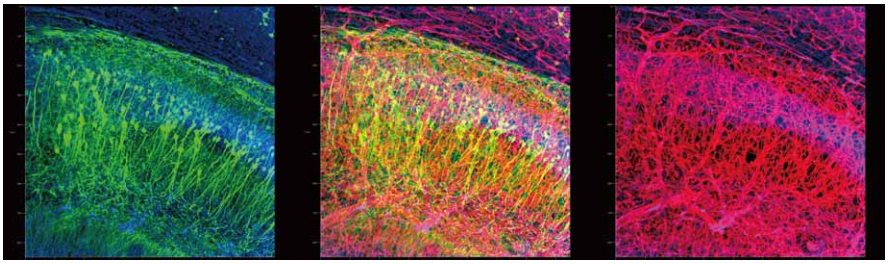
Rapid, consistent, and reproducible clearing for thick tissues



Long-term preservation of endogenous fluorescence proteins

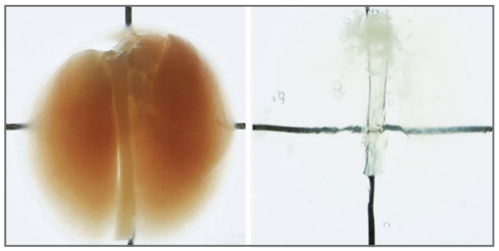


Long-term preservation of the Thy1-YFP signal in tissues cleared with the X-CLARITY™ systems and reagents. (A) Thy1-YFP signal immediately after clearing. (B) Thy1-YFP signal one month after clearing.

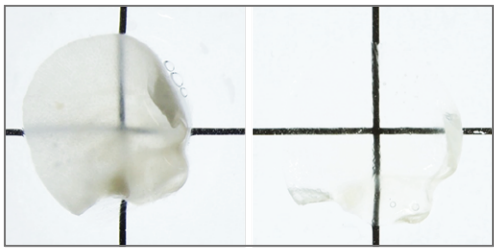


Thy1-YFP mouse brain slices cleared with the X-CLARITY™ systems and reagents. Thy1-YFP (green), Anti-Collagen IV (red), TO-PRO-3 (blue).

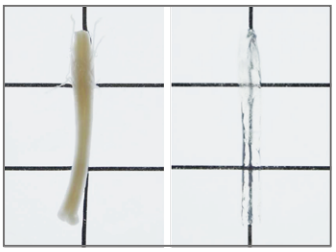
Verified with multiple tissue types



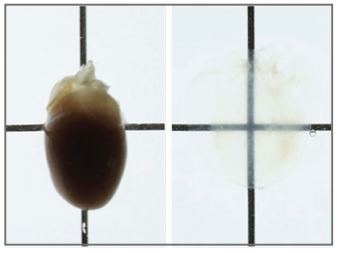
Mouse lungs and trachea cleared with the X-CLARITY™



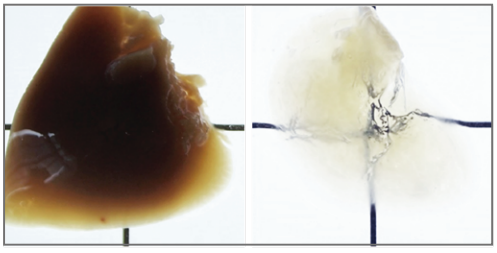
Mouse outer ear cleared with the X-CLARITY™



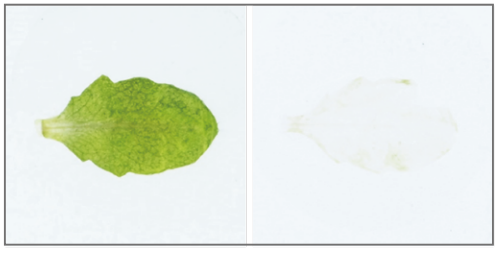
Mouse spinal cord cleared with the X-CLARITY™



Mouse heart cleared with the X-CLARITY™



Mouse liver cleared with the X-CLARITY™



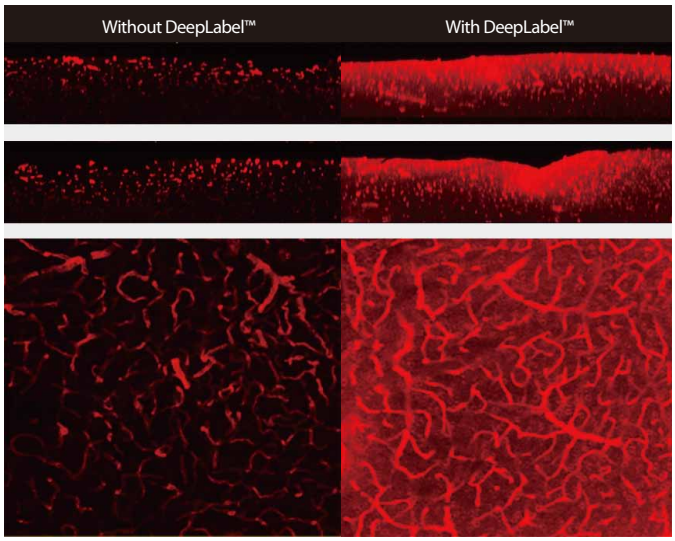
Arabidopsis thaliana Cleared with the X-CLARITY™

DeepLabel™ Antibody Staining Kit C33001 – 1 kit *COMING SOON !*

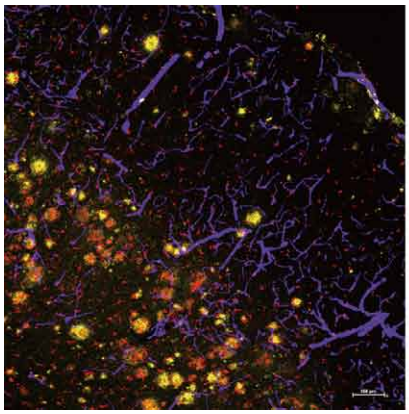
The DeepLabel™ Antibody Staining Kit enhances antibody penetration into large clarified tissues for vibrant fluorescence 3D imaging. DeepLabel™ facilitates the diffusion of molecular probes deep into thick, protein-dense tissues for robust and efficient antibody labeling. DeepLabel™ has been optimized for the antibody labeling of clarified tissues.

DeepLabel™ Solution A	C33002 – 1 x 25 mL
DeepLabel™ Solution B	C33003 – 1 x 25 mL
DeepLabel™ Washing Buffer	C33004 – 1 x 300 mL
X-CLARITY™ Mounting Solution	C13101 – 1 x 25 mL

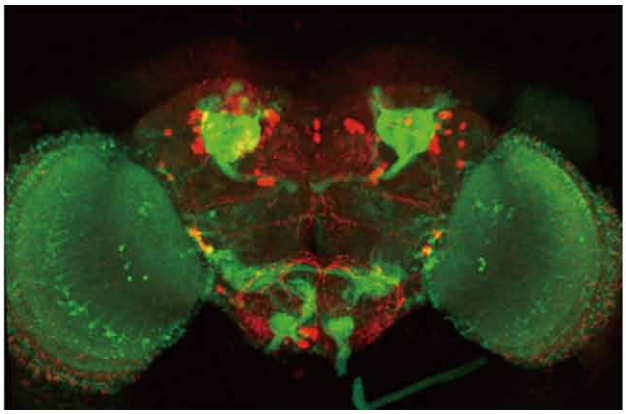
- Efficient antibody penetration
- Site-specific labeling
- Deep permeation into thick tissues
- Simple protocol with ready-to-use reagents
- Vibrant imaging at subcellular resolution



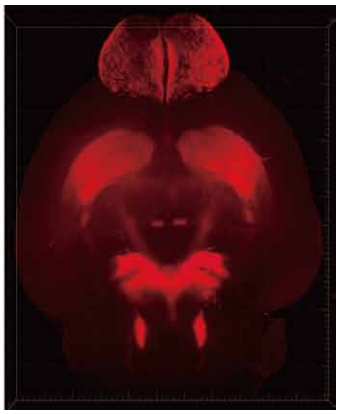
DeepLabel™ enhances anti-Collagen IV penetration into clarified mouse brain tissues.



Adult mouse brain stained using DeepLabel™ with anti-β-Amyloid (yellow), anti-Iba1 (red), and anti-SMA (purple).



Whole adult *Drosophila* brain stained using DeepLabel™ with anti-GFP (green) and anti-TH (red).



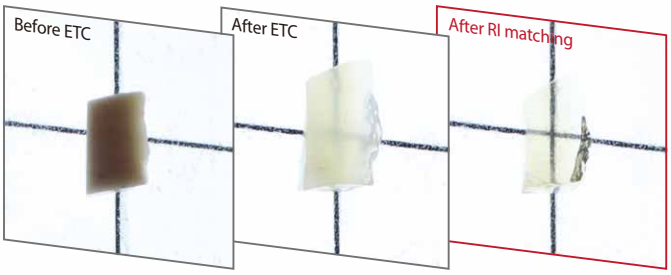
Whole adult mouse brain stained using DeepLabel™ with anti-TH (red).

X-CLARITY™ Mounting Solution

C13101 – 1 x 25 mL | C13102 – 10 x 25 mL | C13107 – 20 x 25 mL

X-CLARITY™ Mounting Solution is a refractive index matching solution (RIMS). The RI of the solution is 1.460 at 25°C and is stable over a wide temperature range. X-CLARITY™ Mounting Solution minimizes photobleaching and preserves fluorescence signals, making it an ideal solution for mounting clarified and labeled tissue samples.

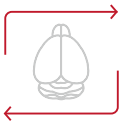
- RI = 1.460 at 25°C
- Minimizes photobleaching
- Preserves fluorescence signals



PFA-fixed human cerebral cortex sample cleared with the X-CLARITY™ systems and reagents

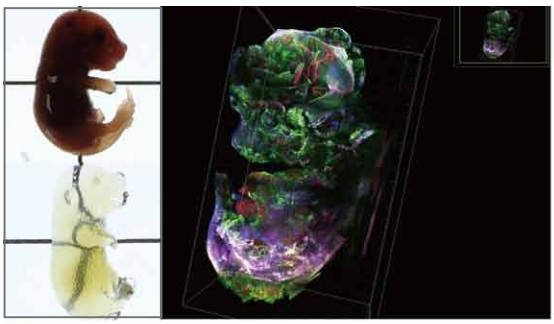
Courtesy of Dr. Hyung Jin Choi, Seoul National University College of Medicine

X-CLARITY™ cleared tissues are compatible for imaging with the following imaging systems:



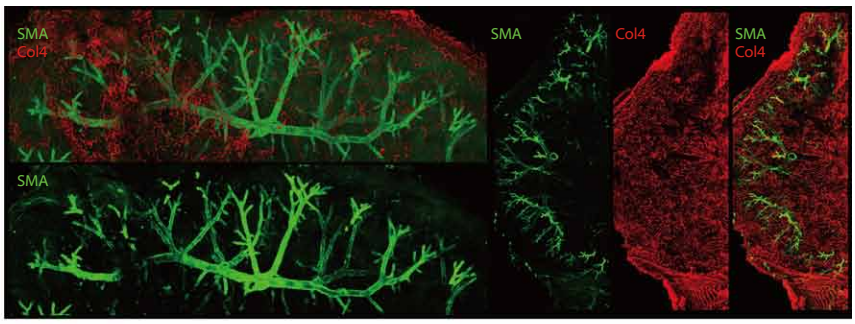
- Zeiss Lightsheet Z1
- OpenSPIM
- Lavision Ultramicroscope
- Confocal microscope (inverted)
- Confocal microscope (upright)

Refractive Index (value±0.001)	Temperature
1.461	20°C
1.460	25°C
1.459	30°C
1.458	35°C
1.457	40°C
1.455	45°C
1.454	50°C
1.453	55°C
1.451	60°C

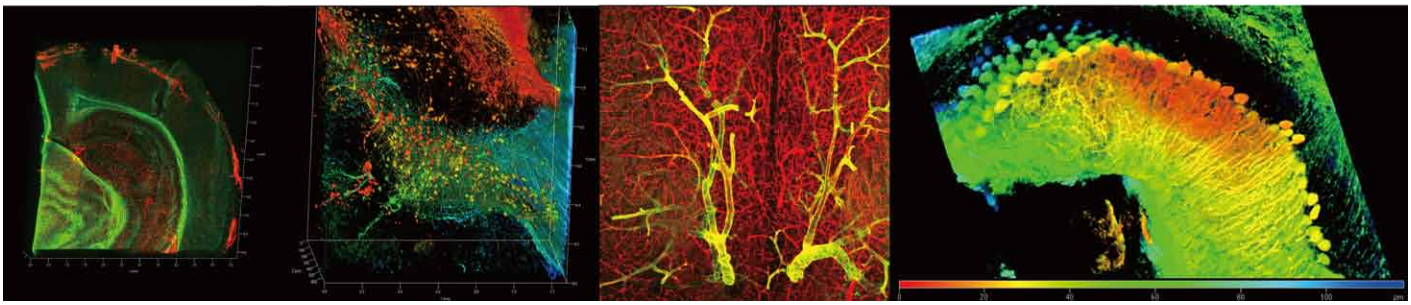


Mouse embryo (E 21.5) cleared with the X-CLARITY™

Courtesy of Michal Shoshkes-Carmel, PhD and Andrea Stout, PhD, University of Pennsylvania



Mouse kidney cleared with the X-CLARITY™



Mouse brain cleared with the X-CLARITY™

What our customers are saying

Pisa, Italy

"The [X-CLARITY] has actually been fundamental to the Data Brain Project because without being able to clear tissues … we wouldn't be able to extract that structural information that is so important to understand the function of mammalian brains. It's been a huge advantage and a great leap forward in imaging."

Arti Ahluwalia, PhD
Director, Centro E. Piaggio

Cambridge, MA, USA

"We purchased the X-CLARITY for our facility and have been very satisfied with its easy-to-use design and consistent results. The X-CLARITY Tissue Clearing System has now allowed many more researchers to enter the field of tissue clearing.."

Doug Richardson, PhD
Director, Harvard Center for Biological Imaging

Paris, France

"The X-CLARITY allows us to perform rapid, efficient, and standardized clearing of mouse and human brain tissues. Access to the X-CLARITY technology will undoubtedly help the ICM research teams to better understand the 3D organization of protein assemblies and organelles in tissues."

Annick Prigent and Benoît Delatour, PhD
Operational Manager and Scientific Manager, ICM Histomics

San Diego, CA, USA

"The X-CLARITY system is a delight to use and significantly lowers the barrier to tissue clearing imaging applications. With better clearing, and faster turnaround time, we were able to generate many more samples and images than would otherwise have been possible. Highly recommended!"

Uri Manor, PhD
Director, Salk Institute for Biological Studies
Biophotonics Core

Lyon, France

"Thanks to X-CLARITY, we now have access to the three dimensions of the whole heart organ."

Gabriel Bidaux, PhD
Principal Investigator, INSERM

Lausanne, Switzerland

"The X-CLARITY saves a lot of time. We were able to image an entire set of brain and spinal cords in a relatively short amount of time. This allowed us to clearly see the benefit of the approaches we're having on spinal cord networks following an injury. It's a great device to save time for your research."

Quentin Barraud, PhD
Lab Manager & Scientific Coordinator, EPFL

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