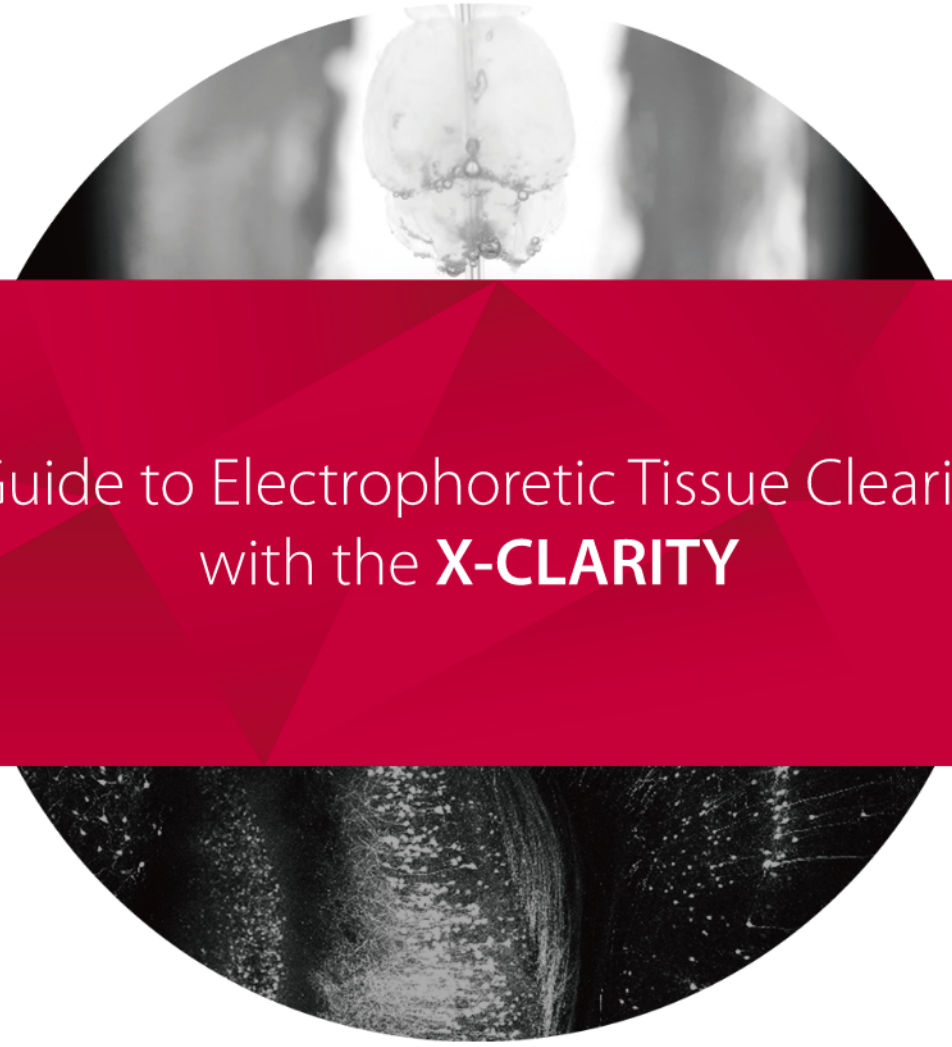


A Guide to Electrophoretic Tissue Clearing with the **X-CLARITY**

logos biosystems

INTRODUCTION

CLARITY is now a well-known tissue clearing method that has opened up a world of possibilities, from tracing neural circuitry to exploring the relationship between structure and function. With CLARITY, preserved biological tissue samples are embedded in a hydrogel matrix to create a tissue-hydrogel hybrid. The native cytoarchitecture remains intact as macromolecules are linked together and incorporated into a porous hydrogel mesh. Lipids are actively extracted through electrophoresis by placing the hybrid in an ionic detergent solution and applying an electric current. What is left is a stable and optically transparent tissue-hydrogel hybrid that is chemically accessible for molecular phenotyping. The X-CLARITY systems and reagents are a fast, efficient, and reliable solution for electrophoretic tissue clearing. This protocol, a variation of the original CLARITY method, provides a step-by-step guide through the tissue clearing process.

Materials Needed

	Instruments	Reagents
STEP 1 **Tissue Preparation**	Surgical instruments Perfusion system	(cold) 1X PBS (cold) 4% PFA
STEP 2 **Hydrogel Infusion and Polymerization**	X-CLARITY™ Polymerization System, C20001	X-CLARITY™ Hydrogel Solution Kit, C1310X - X-CLARITY™ Hydrogel Solution - X-CLARITY™ Polymerization Initiator
STEP 3 **Tissue Clearing**	X-CLARITY™ Tissue Clearing System, C10001	Electrophoretic Tissue Clearing Solution, C13001
STEP 4 **Antibody Labeling and Imaging**	Rocker or shaker Confocal or light sheet microscope	Primary and secondary antibodies Anti-Collagen IV antibody **Antibody dilution solution** (1X PBS, 6% BSA, 0.1% Triton X-100, 0.01% sodium azide) **PBST** (1X PBS, 0.1 % Triton X-100) X-CLARITY™ Mounting Solution, C13102

Note: PFA is an irritant, carcinogen, and potential reproductive hazard. X-CLARITY™ Hydrogel Solution is an irritant, neurotoxin, carcinogen, mutagen, teratogen and potential reproductive hazard. Before starting the protocol, read and understand the information in the safety data sheets of all reagents. Wear personal protective equipment and handle all hazardous reagents in a fume hood.

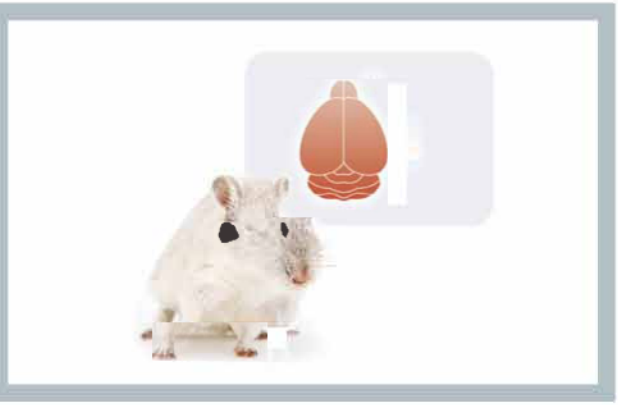
Did You Know?

CLARITY stands for Clear Lipid-exchanged Acrylamide-hybridized Rigid Imaging/Immunostaining/In situ hybridization-compatible Tissue hYdrogel.

THE X-CLARITY™ WORKFLOW !

STEP 1 Tissue Preparation

The sample is fixed in paraformaldehyde.
Samples fixed in formalin may also be used. Blood must be removed prior to fixation to prevent autofluorescence.

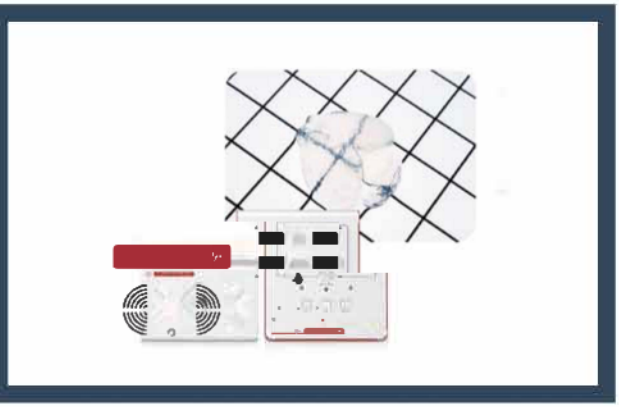


STEP 2 Hydrogel Infusion & Polymerization

The sample is infused with hydrogel monomers and then heated to initiate radical polymerization, covalently linking the biomolecules in the tissue sample to a sturdy hydrogel network. This step preserves molecular information and structural integrity.

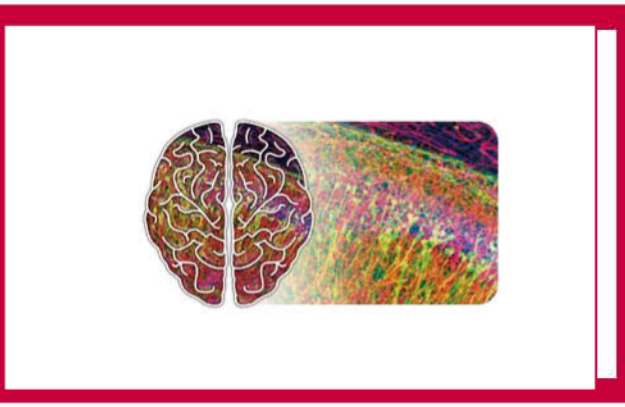
STEP 3 Tissue Clearing

Lipids are broken up through electrophoresis in the presence of ionic detergents, resulting in a transparent tissue-hydrogel hybrid that is chemically accessible for molecular phenotyping.



STEP 4 Antibody Labeling & Imaging

The sample is immunolabeled and placed in an RI matching solution prior to imaging to optimize transparency.
The sample may be imaged with confocal or light sheet microscopes.



STEP 01

Tissue Preparation

What is X-CLARITY™ ?

On paper, the CLARITY method is simple to follow and understand. In practice, it can be laborious, error-prone, and difficult. Proper hydrogel polymerization can be prevented due to insufficient oxygen removal prior to heating. Not only is the DIY electrophoresis chamber challenging to build, it is difficult to maintain temperature control, buffer circulation, or a uniform electric field – leading to inconsistent clearing. X-CLARITY™ is a collection of systems and ready-to-use reagents developed by Logos Biosystems to standardize, simplify, and accelerate each step of the electrophoretic tissue clearing process.

1. Use the appropriate fixation method according to the tissue sample:

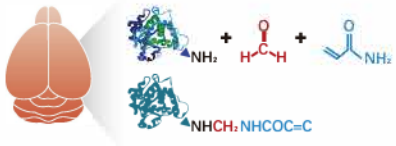
a. Small/thin tissues: Immersion fixation in 4% PFA. Fixation time will depend on tissue size and type.

b. Large tissues/organs: Perfusion fixation followed by immersion fixation. Immersion fixation time will depend on tissue size and type.
Example: For a whole mouse brain, perfuse the animal with cold 1X PBS followed by 4% PFA. Extract the brain and incubate in 4% PFA for 24 hours at 4°C.

c. Formalin-fixed human tissues: Formalin-fixed tissues do not require additional fixation.

2. (Optional) Slice the sample if necessary.

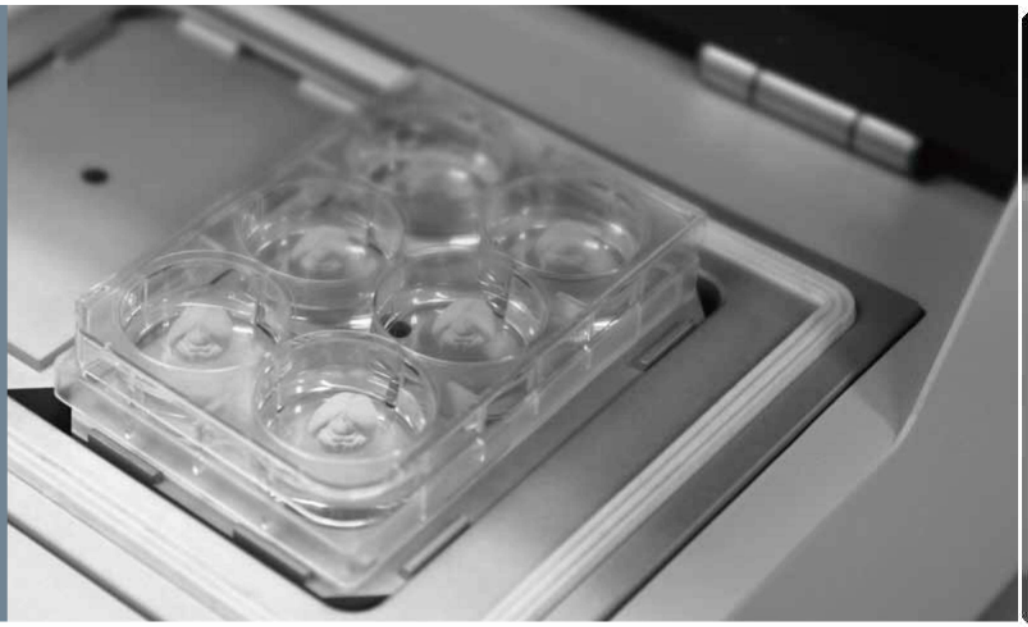
3. Wash several times with 1X PBS.



! Store the sample in 1X PBS at 4°C for long term storage.

STEP 02

Hydrogel Infusion & Polymerization



The principle behind hydrogel polymerization

Although there are many tissue clearing techniques, the loss of the protein content remains a big concern – especially when organic solvents or high concentrations of detergents are used. CLARITY addresses this issue by embedding tissues into a polymerized hydrogel. After fixation, the sample is placed in a hydrogel solution composed of hydrogel monomers, a cross-linker, and a thermal initiator to allow the solution to diffuse into the tissue. At high temperatures (e.g. 37°C), the thermal initiator decomposes in solution and generates free radicals that react with the monomers to initiate polymerization. The process is done in a strictly anaerobic environment, as oxygen is highly reactive with free radicals and consequently a strong inhibitor of free radical induced polymerization.

1. Add one part 25% (w/v) X-CLARITY™ Polymerization Initiator to 100 parts X-CLARITY™ Hydrogel Solution. Mix thoroughly.

   Note: Hydrogel-initiator mixture can be stored for up to 6 months at -20°C in the dark. Thaw O/N at 4°C before use.

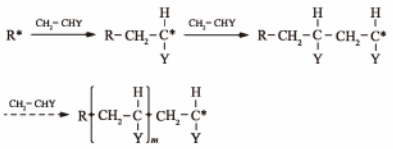
2. Incubate in hydrogel-initiator solution at 4°C for 24 hours.
   Use enough solution to submerge samples.

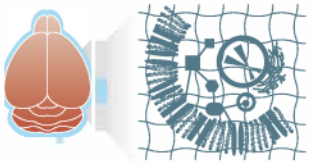
3. Initiate polymerization with the X-CLARITY™ Polymerization System. Run the system at 37°C for 3 hours at -90 kPa.

4. Shake samples gently for 1 minute after polymerization.

   Note: Bis-acrylamide creates crosslinks between polyacrylamide chains, which hardens the hydrogel network and forms a rigid gel around tissue samples that must be removed prior to clearing. X-CLARITY™ Hydrogel Solution does not contain bis-acrylamide, which prevents a gel from forming around the sample. A successfully polymerized bis-free hydrogel solution is sticky. The final shaking step is important to ensure homogenous distribution of the solution throughout the sample.

5. Rinse with 1X PBS.

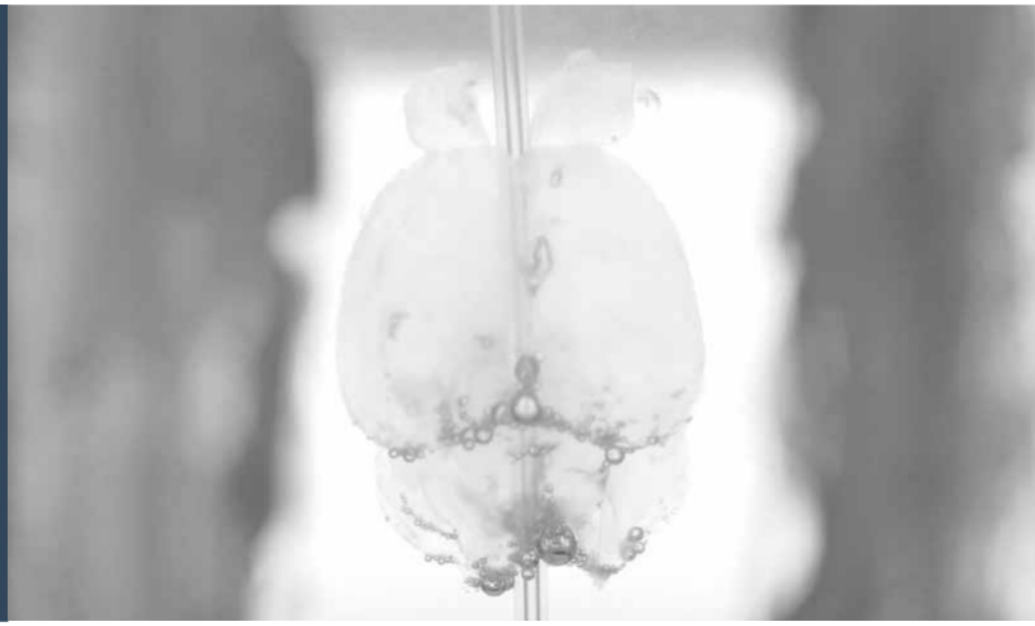




! Store the sample in 1X PBS at 4°C for long term storage.

STEP 03

Tissue Clearing



Lipid extraction using micelles and electricity

During tissue clearing, a tissue-hydrogel hybrid is placed in an SDS-based clearing solution. SDS micelles diffuse in and out of the sample, collecting lipids as they do so. Applying an electric field propels negatively-charged micelles towards a positive electrode and accelerates lipid extraction, ultimately increasing tissue clearing speed and efficiency.
A tissue-hydrogel hybrid has hydrogel polymers incorporated into its cross-linked biomolecules, which reinforces structural stability and allows lipids to be removed via electrophoresis without structural damage to the tissue. Once lipids are removed, both light and molecules can access the sample, making it transparent and accessible for downstream labeling. Electrophoretic tissue clearing is especially useful when it comes to clearing larger samples, samples with endogenous fluorescent proteins, or samples that are hard to clear.

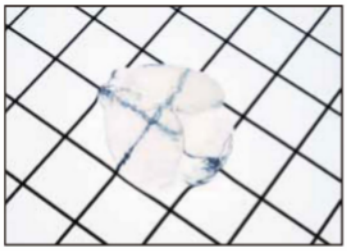
1. Run the X-CLARITY™ Tissue Clearing System with the following settings:

Holders	Current	Temperature	Pump	Time
Holder for 1 Tissue Container C12002 – use with C12001	0.8-1.2 A*	37°C	30-50 rpm	Varies
Mouse Brain Slice Holder C12004	0.8-1.2 A*	37°C	30-50 rpm	Varies
Whole Rat Brain Holder C12007	1.0-1.4 A*	37°C	30-50 rpm	Varies
Holder for 36 Mouse Brain Slices C12010 - 1.5 Φ / C12020 - 0.6 Φ	0.8-1.2 A*	37°C	100 rpm	Varies
Holder for 6 Slices C12011 - 1.5 Φ / C12021 - 0.6 Φ	0.8-1.2 A*	37°C	100 rpm	Varies
Holder for 1 Sample C12012 - 1.5 Φ / C12022 - 0.6 Φ	1.0-1.4 A*	37°C	100 rpm	Varies
Holder for 6 Mouse Brains C12013 - 1.5 Φ / C12023 - 0.6 Φ	0.8-1.2 A*	37°C	100 rpm	Varies
Holder for 48 Samples C12014 - 1.5 Φ / C12024 - 0.6 Φ	0.6-1.0 A*	37°C	100 rpm	Varies
Holder for 192 Samples C12015 - 1.5 Φ / C12025 - 0.6 Φ	0.2-0.6 A*	37°C	100 rpm	Varies

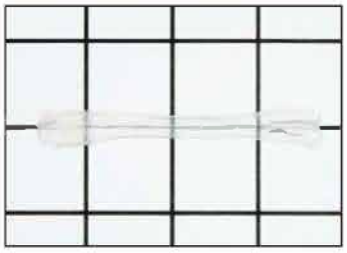
*Current settings will need to be optimized based on how many samples are stacked together and desired clearing speed. When samples contain fluorescent proteins such as GFP, further lower the current to lower fluorescence signal loss.

Tip! When clearing a tissue type for the first time or using a different sample holder, check the sample every two hours to keep tabs on its progression.

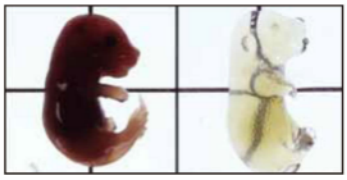
NOTE: When using multi-sample holders, slowly lower the holder into enough Electrophoretic Tissue Clearing Solution to just submerge the samples. Gently tap the holder to dislodge any trapped bubbles. Bubbles will impede the flow of electric current and ultimately affect tissue clearing.



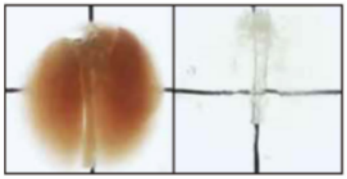
Mouse Brain



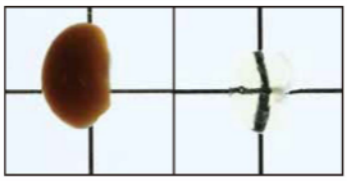
Mouse Spinal Cord



Mouse Embryo



Mouse Trachea and Lungs



Mouse Kidney

The following table is a reference for tissues cleared in the Holder for 1 Tissue Container at 1.2 A.

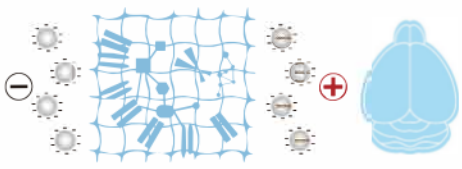
Tissue		ETC Time*	Notes/Comments/Remarks
Mouse	Brain - whole	6 h	
	Brain - hemisphere	3-4 h	
	Brain – 1 mm slice	1-2 h	
	Brain – 2-3 mm slice	2-3 h	
	Bone	6 h	Bone must be decalcified after fixation and prior to hydrogel infusion. Use decalcifying agents appropriate for the type of staining and imaging you are doing. After decalcification, wash with 1X PBS overnight at 4°C.
	Heart	20 h	Do not exceed 24 hours clearing time - increased clearing time will not achieve perfect transparency – nor is it necessary. Increased transparency can be achieved by RI matching in X-CLARITY™ Mounting Solution.
	Kidney	20 h	
	Liver	20 h	
	Muscle	20 h	
	Spleen	20 h	
	Tongue	20 h	
	Intestine	2-3 h	
	Lungs	4-5 h	Once harvested, remove air from the lungs by degassing with the X-CLARITY™ Polymerization System for 1 hour. Ensure complete immersion in all solutions.
	Pancreas	6 h	
	Skin	2-3 h	
	Spinal Cord	6 h	
	Thymus	6 h	
	Uterus	6 h	
	Embryo	2-72 h	Clearing time will increase with embryonic development.
Rat	Brain - whole	10 h	
	Brain - hemisphere	8 h	
Zebrafish		4-6 h	Remove the pigmented stripes on zebrafish after tissue clearing and prior to antibody labeling. Incubate in a potassium permanganate bleach solution (0.15 mg $KMnO_4$ and 0.3% H_2SO_4 in 50 mL dH_2O) for 30 minutes. Wash several times with 1X PBS. Incubate in 1% oxalic acid solution until colorless but for no longer than 30 minutes.
Spheroids		1-2 h	
Arabidopsis thaliana		1 h	Do not overclear as this may lead to protein loss.

* Clearing time will depend on various factors such as the number of samples being cleared, the holder used, how tissues were processed prior to clearing, tissue type, and/or species.

2. Wash several times with 1X PBS or 1X PBST.

3. Incubate in 1X PBS or 1X PBST overnight at RT with gentle shaking.
This step removes SDS, which inhibits antibody labeling.

NOTE: Tissues will turn opaque in PBS/PBST. Transparency will be regained after incubation in X-CLARITY™ Mounting Solution.



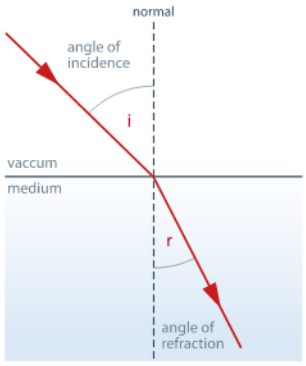
! Store the sample in 1X PBS at 4°C for up to 1 week.

STEP 04

Antibody Labeling & Imaging

Refractive index and tissue clearing

The refractive index (RI) is the ratio of the speed of light in a vacuum to a given medium. For example, the RI of water is 1.333, representing that light travels 1.333 times slower in water than in a vacuum. RI determines how light propagates, refracts, or scatters. Animal tissues are composed of a variety of materials, including proteins, nucleic acids, lipids, and carbohydrates – all of which have different RIs. Scientists previously tried to clear tissues by homogenizing the RI of these different materials by replacing water with high RI solvents. In the CLARITY protocol, RI homogenization is the final step for tissue preparation prior to imaging.



Refractive index

In a hydrogel-like matrix, the diffusion coefficient of intact IgG is reported to be 1.1 x $10^{-7}$$cm^2$/s (3). Antibody incubation time will depend on various factors such as antibody size, concentration, quality, tissue type, and sample thickness. Below is a general guideline.

1. Incubate in a primary antibody solution (1:100 or higher in antibody dilution solution - refer to pg. 1, Materials Needed) at 37°C with gentle shaking.
   Anti-collagen type IV is recommended as a positive control. Incubation time will depend on various factors and must be optimized.
   NOTE: For a 1 mm mouse brain slice, incubation will take at least two days with most antibodies. For a whole mouse brain, at least four weeks is required.

2. Rinse the sample several times with PBST at RT with gentle shaking. Replace with fresh PBST and wash for 2 hours/mm tissue thickness at RT with gentle shaking. Increase washing time if high background signal is observed.

3. Incubate the sample in a secondary antibody solution (1:100 or higher) for the same amount of time as the primary antibody in the dark at 37°C with gentle shaking.

4. Rinse the sample several times with PBST in the dark at RT with gentle shaking. Replace with fresh PBST and wash for 2 hours/mm tissue thickness in the dark at RT with gentle shaking.

! Store the sample in PBS at 4°C for no longer than two weeks.

5. Wash the sample three times with distilled water for 5 minutes each in the dark at RT with gentle shaking.

6. Incubate the sample in X-CLARITY™ Mounting Solution for 1 hour in the dark at RT with gentle shaking. Replace with fresh X-CLARITY™ Mounting Solution and incubate for an additional 1-2 hours in the dark at RT with gentle shaking.

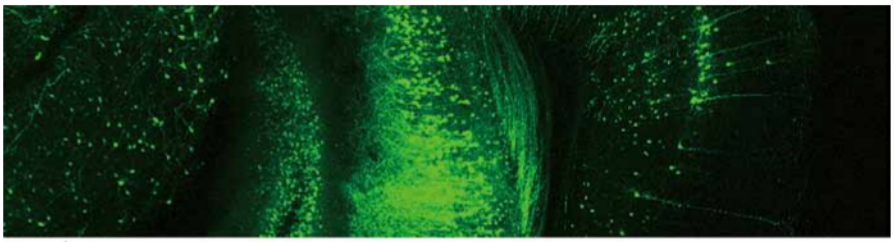
Incubating samples in RI matching media (e.g. X-CLARITY™ Mounting Solution) reduces the RI variations within cleared tissue and increases the level of transparency. It also helps with the RI alignment of the tissue samples, objective immersion media, and objectives, which is crucial for high resolution subcellular imaging.

Before and After RI Matching

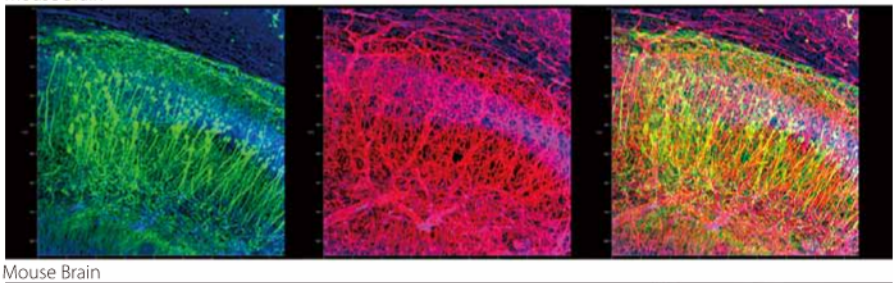
NOTE: Prolonged exposure to the X-CLARITY™ Mounting Solution will lead to the decay of the fluorescence signal over time. For optimal fluorescence imaging, image the samples as soon as possible and do not leave samples in X-CLARITY™ Mounting Solution for more than 1 week at 4°C.

7. Image the sample with a confocal or light sheet microscope.

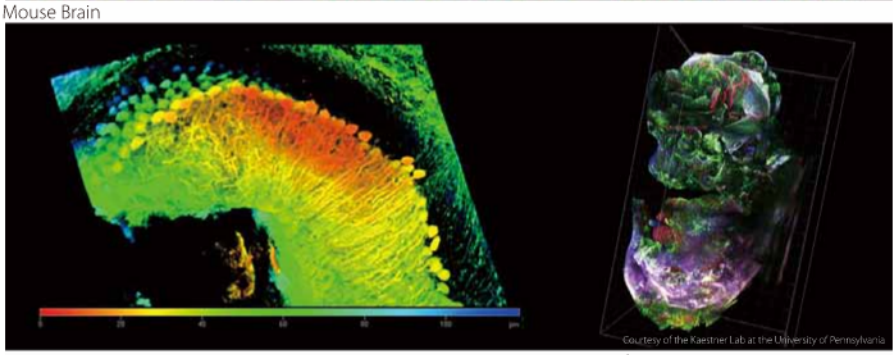
8. Store the sample in 1X PBS at 4°C in the dark after imaging.



Mouse Brain

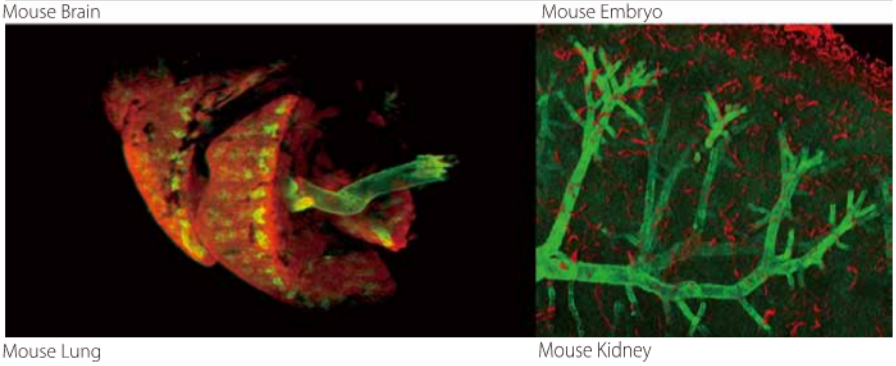


Mouse Brain



Mouse Brain

Mouse Embryo



Mouse Lung

Mouse Kidney

The following is a partial list of antibodies verified to label tissues cleared with the X-CLARITY.

Antigen	Species	Type/Clone	Antigen localization	Supplier	Cat #	Dilution
Acetylated tubulin	Mouse	Monoclonal	Cytoplasm	Sigma	T7451	1:500
β-catenin	Mouse	Monoclonal	Cytoplasm	BD Biosciences	610153	1:500
β-Tubulin III (TUBB3)	Mouse	Monoclonal	Cytoplasm	BioLegend	801201	1:350
β-Tubulin III (TUBB3)	Mouse	Monoclonal	Cytoplasm	Sigma	T8660	1:300
β-Tubulin III (TUBB3)	Rabbit	Polyclonal	Cytoplasm	Sigma	T2200	1:300
Bcl-2	Mouse	Monoclonal	Cytoplasm/Mitchondria	Santa Cruz	SC7382	1:250
Calbindin D-28k	Mouse	Monoclonal	Cytoplasm	Swant	300	1:500
Calcitonin gene-related peptide (CGRP)	Goat	Polyclonal	Cytoplasm	Abcam	ab36001	1:300
Calretinin	Rabbit	Polyclonal	Cytoplasm	Swant	7697	1:500
Caveolin	Rabbit	Polyclonal	Membrane	Abcam	ab18199	1:300
CD133	Rat	Monoclonal	Membrane	Millipore	MAB4310	1:500
CD31	Rat	Monoclonal	Membrane	BD Biosciences	557355	1:500
c-Fos	Rabbit	Polyclonal	Nuclei	Santa Cruz	SC253	1:500
Choline acetyltransferase (ChAT)	Goat	Polyclonal	Cytoplasm	Millipore	AB144P	1:100
Cleaved caspase-3	Rabbit	Polyclonal	Cytoplasm	Cell Signaling	9661	1:500
2',3'-cyclic nucleotide 3'-phosphodiesterase (CNPase)	Mouse	Monoclonal	Membrane	Millipore	MAB326	1:300
2',3'-cyclic nucleotide 3'-phosphodiesterase (CNPase)	Mouse	Monoclonal	Membrane	Sigma	C5922	1:300
Collagen type IV	Rabbit	Polyclonal	Extracellular matrix	Abcam	AB6586	1:300
Collagen type III	Rabbit	Polyclonal	Extracellular matrix	Abcam	AB7778	1:300
Ctip2	Rat	Monoclonal	Nuclei	Abcam	AB18465	1:800
Doublecortin (DCX)	Goat	Polyclonal	Cytoplasm	Santa Cruz	SC8066	1:500
Epidermal growth factor receptor (EGFR)	Rabbit	Polyclonal	Membrane	Abcam	AB2430	1:500
γ-Aminobutyric acid (GABA)	Rabbit	Polyclonal	Secretion	Sigma	A2052	1:500
Glial fibrillary acidic protein (GFAP)	Rabbit	Polyclonal	Cytoplasm	Abcam	AB7260	1:800
Glial fibrillary acidic protein (GFAP)	Mouse	Monoclonal	Cytoplasm	Cell Signaling	3670	1:500
Glial fibrillary acidic protein (GFAP)	Rabbit	Polyclonal	Cytoplasm	Dako	Z0334	1:500
Glial fibrillary acidic protein (GFAP)	Rat	Monoclonal	Cytoplasm	Thermo Fisher	130330	1:500
Glucose transporter 1 (GLUT1)	Rabbit	Polyclonal	Membrane	Abcam	AB15309	1:800
Glutamic acid decarboxylase 67 (GAD67)	Mouse	Monoclonal	Cytoplasm	Millipore	MAB5406	1:500
GFP	Chicken	Polyclonal	-	Abcam	AB13970	1:500
GFP	Rabbit	Polyclonal	-	Abcam	AB290	1:300
Growth associated protein 43 (GAP43)	Rabbit	Polyclonal	Cytoplasm	Abcam	AB16053	1:500
Heme oxygenase 1 (HO-1)	Mouse	Monoclonal	Endoplasmic reticulum	Abcam	AB13248	1:250
Inositol 1,4,5-trisphosphate 3-kinase A (IP3KA)	Goat	Polyclonal	Cyotoplasm	Santa Cruz	SC11206	1:500
Ionized calcium binding adapter molecule 1 (Iba1)	Rabbit	Polyclonal	Cytoplasm	Wako Chemicals	019-19741	1:500
Laminin	Rabbit	Polyclonal	Extracellular matrix	Sigma	L9393	1:500
Microtubule-associated protein 2 (MAP2)	Mouse	Monoclonal	Cytoplasm	Millipore	MAB3418	1:500
Microtubule-associated protein 2B (MAP2B)	Rabbit	Polyclonal	Cytoplasm	BD Biosciences	610460	1:500
Myelin basic protein (MBP)	Rabbit	Polyclonal	Membrane	Abcam	AB40390	1:500
Myelin basic protein (MBP)	Chicken	Polyclonal	Membrane	Aves Labs	MBP	1:300
Nestin	Mouse	Monoclonal	Cytoplasm	Millipore	MAB353	1:500
Neural cell adhesion molecule (NCAM)	Rabbit	Monoclonal	Membrane	Millipore	AB5032	1:250
Neurofilament H, non-phosphorylated (NFH)	Mouse	Monoclonal	Cytoplasm	BioLegend	801701	1:500
Neurofilament H (NFH)	Mouse	Monoclonal	Cytoplasm	Cell Signaling	2836	1:300
Neurofilament M (NFM)	Mouse	Monoclonal	Cytoplasm	Santa Cruz	SC51683	1:500
Neuronal nuclear antigen (NeuN)	Mouse	Monoclonal	Nuclei	Millipore	MAB377	1:500
Neuron-glial antigen 2 (NG2)	Rabbit	Polyclonal	Membrane	Millipore	AB5320	1:500
Nitric oxide synthase 1 (NOS1)	Rabbit	Polyclonal	Membrane	Santa Cruz	SC648	1:250
Olfactory marker protein (OMP)	Rabbit	Polyclonal	Cytoplasm	Thermo Fisher	OSP00001W	1:250
Oligodendrocyte lineage transcription factor 2 (Olig2)	Rabbit	Polyclonal	Nuclei	IBL International	JP-18953	1:250
Oligodendrocyte lineage transcription factor 2 (Olig2)	Rabbit	Polyclonal	Nuclei	Millipore	AB9610	1:300
O4	Mouse	Monoclonal	Membrane	Millipore	MAB345	1:250
Parvalbumin	Mouse	Monoclonal	Cytoplasm	Millipore	MAB1572	1:500
Platelet-derived growth factor receptor (CD140a)	Rat	Monoclonal	Membrane	BD Biosciences	558774	1:500
Polysialic acid neural cell adhesion molecule (PSA-NCAM)	Mouse	Monoclonal	Membrane	Millipore	MAB5324	1:500
Postsynaptic density protein 95 (PSD95)	Rabbit	Polyclonal	Membrane	Thermo Fisher	51-6900	1:500
Proliferating cell nuclear antigen (PCNA)	Mouse	Monoclonal	Nuclei	Santa Cruz	SC56	1:250
Regulated in development and DNA damage responses 1 (REDD1)	Rabbit	Polyclonal	Membrane	Proteintech	10638-1-AP	1:250
RFP	Rabbit	Polyclonal	-	Abcam	AB62341	1:300
S100	Mouse	Monoclonal	Membrane	Sigma	S2532	1:500
Smooth muscle protein 22-alpha (SM22α)	Rabbit	Polyclonal	Membrane	Abcam	AB14106	1:300
Special AT-rich sequence-binding protein 2 (SATB2)	Rabbit	Monoclonal	Nuclei	Abcam	AB34735	1:500
Trombosphondin 1	Goat	Polyclonal	Cytoplasm	R&D Systems	AF3074	1:500
Tropomyosin receptor kinase A (TrkA)	Goat	Polyclonal	Membrane	R&D Systems	AF1056	1:500
Tyrosine hydroxylase (TH)	Rabbit	Polyclonal	Cytoplasm	Millipore	AB152	1:300
Tyrosine hydroxylase (TH)	Mouse	Monoclonal	Cytoplasm	Santa Cruz	SC14007	1:250
Vesicular glutamate transporter 1 (VGLUT1)	Mouse	Monoclonal	Membrane	Synaptic Systems	135311	1:500
Vimentin	Goat	Polyclonal	Cytoplasm	Millipore	AB1620	1:300

References

01 Lee, E. et al.

ACT-PRESTO. Rapid and consistent tissue clearing and labeling method for 3 dimensional (3D) imaging. Scientific Reports 6, 18631 (2016).

02 [Application Note]

An automated and high-throughput polymerization solution for downstream tissue clearing: the X-CLARITY Polymerization System, Logos Biosystems (2016).

03 Jun, Li et al.

Fast immune-labeling by electrophoretically driven infiltration for intact tissue imaging. Scientific Reports 5, 10640 (2015).

04 Chung, K and Deisseroth, K

CLARITY for mapping the nervous system. Nature Methods 10, 508–513 (2013).

Ordering Information

Equipment and accessories

Hydrogel Infusion & Polymerization		
Cat #	Product	Quantity
C20001	X-CLARITY™ Polymerization System	1 unit
C20002	X-CLARITY™ Heat Block for 6 x 50 mL tubes	1 unit
C20003	X-CLARITY™ Heat Block for flat-bottom plates	1 unit
Tissue Clearing		
Cat #	Product	Quantity
C10001	X-CLARITY™ Tissue Clearing System Starter Kit C10101 X-CLARITY™ ETC Chamber C10201 X-CLARITY™ ETC Controller C10301 X-CLARITY™ Pump C10401 X-CLARITY™ Reservoir C12001 Tissue Container C12002 Container Holder for 1 Tissue Container C13001 Electrophoretic Tissue Clearing Solution	1 set
C12001	Tissue Container	1 box
C12002	Container Holder for 1 Tissue Container	1 unit
C12004	Whole Rat Brain Holder	1 unit
C12007	Mouse Brain Slice Holder	1 unit
C12010	1.5 Φ Holder for 36 Mouse Brain Slices	1 set
C12011	1.5 Φ Holder for 6 Slices	1 set
C12012	1.5 Φ Holder for 1 Sample	1 set
C12013	1.5 Φ Holder for 6 Mouse Brains	1 set
C12014	1.5 Φ Holder for 48 Samples	1 set
C12015	1.5 Φ Holder for 192 Samples	1 set
C12020	0.6 Φ Holder for 36 Mouse Brain Slices	1 set
C12021	0.6 Φ Holder for 6 Slices	1 set
C12022	0.6 Φ Holder for 1 Sample	1 set
C12023	0.6 Φ Holder for 6 Mouse Brains	1 set
C12024	0.6 Φ Holder for 48 Samples	1 set
C12025	0.6 Φ Holder for 192 Samples	1 set

Reagents

Hydrogel Infusion & Polymerization		
Cat #	Product	Quantity
C1310X	X-CLARITY™ Hydrogel Solution Kit C13103 X-CLARITY™ Hydrogel Solution C13104 X-CLARITY™ Polymerization Initiator	1 box
Tissue Clearing		
Cat #	Product	Quantity
C13001	Electrophoretic Tissue Clearing Solution	12 x 1 L
Antibody Labeling & Imaging		
Cat #	Product	Quantity
C13101	X-CLARITY™ Mounting Solution	1 x 25 mL
C13102	X-CLARITY™ Mounting Solution Value Pack	10 x 25 mL
C13107	X-CLARITY™ Mounting Solution Bulk Pack	20 x 25 mL

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