



**Exalpha**  
biologicals INC

## BROMODEOXYURIDINE (BrdU) - FL™ IMMUNOFLUORESCENCE KIT INSTRUCTION MANUAL

### FEATURES

- Easy to use system
- Reagents titered for success
- Proven protocol

### ORDERING INFORMATION

**CATALOG NUMBER**

FL488™  
- X2839K (50 slides)

FL549™  
- X2840K (50 slides)

**FORMAT**

Immunofluorescence Kit

**SPECIES REACTIVITY**

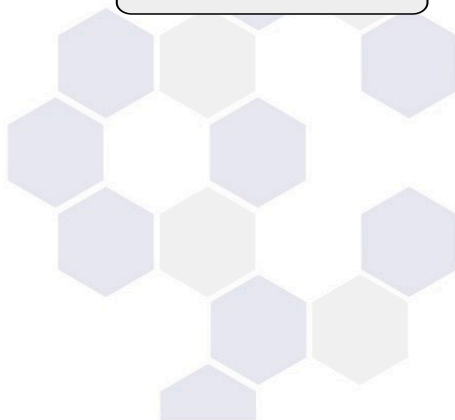
Ubiquitous

**COMPANY INFORMATION**

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## RELATED KITS AVAILABLE FROM EXALPHA BIOLOGICALS

### **APOMARK™ COLORIMETRIC (DAB) APOPTOSIS DETECTION KIT**

X2044K1 (30 TESTS)

X2044K2 (60 TESTS)

### **APOMARK™ FL FLUORESCENT APOPTOSIS DETECTION KIT**

APOMARK™ FL488

- X2835K1 (30 TESTS)

- X2835K2 (60 TESTS)

APOMARK™ FL549

- X2836K1 (30 TESTS)

- X2836K2 (60 TESTS)

APOMARK™ FL594

- X2837K1 (30 TESTS)

- X2837K2 (60 TESTS)

APOMARK™ FL649

- X2838K1 (30 TESTS)

- X2838K2 (60 TESTS)

### **BRDU COLORIMETRIC CELL PROLIFERATION ELISA KIT**

X1327K1 (200 TESTS)

X1327K2 (1000 TESTS)

X1327K3 (5000 TESTS)

### **BRDU CHEMILUMINESCENT CELL PROLIFERATION ELISA KIT**

X1623K1 (200 TESTS)

X1623K2 (1000 TESTS)

X1623K3 (5000 TESTS)

### **BRDU IMMUNOHISTOCHEMISTRY KIT**

X1545K (50 SECTIONS)

### **BRDU IMMUNOFLUORESCENCE KIT**

X2839K (FL488, 50 SECTIONS)

X2840K (FL549, 50 SECTIONS)

### **ANTI-FADE MOUNTING MEDIA**

X2841 (7 MLS)

### **BRDU REAGENT FOR IN VIVO INJECTION**

X2834 (5 x 5 MG)

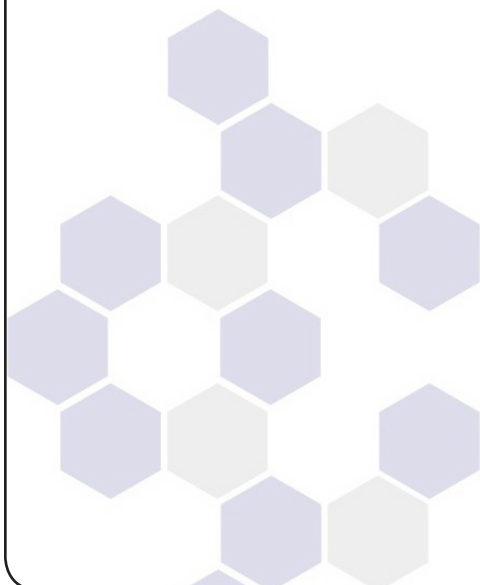
### **BRDU UNSTAINED CONTROL SLIDES**

X2743 (5 SLIDES)

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# BRdU

## IMMUNOFLUORESCENCE KIT

### Intended Use

The Exalpa Biologicals BrdU Immunofluorescence Kit is a histochemical staining kit for the detection and localization of bromodeoxyuridine incorporated into newly synthesized DNA of actively proliferating cells.

**This assay is for research use only and not for use in diagnostic or therapeutic procedures.**

### Storage of Kit Components

The Exalpa Biologicals BrdU Immunofluorescence Kit components are shipped on blue ice. Upon receipt, store entire kit at -20°C. Once the kit is thawed, you may keep at 4°C for 5 days. For long-term storage, it is recommended you aliquot and freeze the components at -20°C, particularly the Streptavidin-FL Conjugate, the Detector Antibody and the Trypsin Concentrate. Wearing of latex or rubber gloves is recommended when running this kit.

### Background

*A non-isotopic immunofluorescence staining for the localization of DNA synthesis and cell proliferation.*

Evaluation of cell cycle progression is essential for investigations in many scientific fields. Measurement of [<sup>3</sup>H] thymidine incorporation as cells enter S phase has long been the traditional method for the detection of cell proliferation. Subsequent quantification of [<sup>3</sup>H] thymidine is performed by scintillation counting or autoradiography. This technology is slow, labor intensive and has several limitations including the handling and disposal of radioisotopes and the necessity of expensive equipment.

A well-established alternative to [<sup>3</sup>H] thymidine uptake has been demonstrated by numerous investigators. In these methods bromodeoxyuridine (BrdU), a thymidine

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analog, replaces [<sup>3</sup>H] thymidine. BrdU is incorporated into newly synthesized DNA strands of actively proliferating cells. Following partial denaturation of double stranded DNA, BrdU is detected immunochemically allowing the assessment of the population of cells which are actively synthesizing DNA.

Exalpa Biologicals BrdU Immunofluorescence Kit involves incorporation of BrdU into proliferating cells, in vivo or in vitro, and fluorescent staining of these cells which is achieved using a biotinylated anti-BrdU antibody followed by Streptavidin-FL Conjugate

## Materials Provided<sup>\*</sup>

The following is the list of components which are included in the BrdU Immunofluorescence Kit.

1A**	4x Trypsin Enzyme Concentrate	3 ml
1B**	Trypsin Dilution Buffer	12 ml
2	Denaturing Solution	6 ml
3	Blocking Buffer	6 ml
4	Detector Antibody (Biotinylated and pre-diluted)	6 ml
5	Streptavidin-FL Conjugate (pre-diluted)	6 ml
6	Mounting Media	7 ml
7	5 Control Slides: Intestinal tissue from mouse injected with BrdU	5 unstained

*\* The material in this kit is sufficient to run 50 slides. The average test area is defined as a circle around the tissue with an approximate diameter of 2 centimeters.*

*\*\* Trypsin is only required if using formalin fixed tissues. If the tissues are fixed in alcohol, trypsin digestion is not required.*

## Materials Required But Not Provided

- Microscope equipped with excitation filter of 493 nm for FL488 and 556 nm for FL549
- Hydrogen peroxide (30% solution) for quenching endogenous peroxidase activity and autofluorescence from red blood cells (RBCs).
- Phosphate buffered saline (PBS) solution

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- Distilled water
- Ethyl alcohol
- Xylene
- Coverslips
- Bromodeoxyuridine (BrdU)
- Methanol

## Preparation of Slides

Paraffin-Embedded tissue sections:

1. Sample animals are labeled with BrdU
2. Animals are sacrificed by inhalation of isofluorane and perfused with PBS followed by 4% buffered formalin.
3. Target tissue is removed and immersed in 4% buffered formalin over night.
4. Tissue is then dehydrated and embedded in paraffin
  - a. PBS – 10 min
  - b. 70% EtOH – 1 hour
  - c. 85% EtOH – 1 hour
  - d. 95% EtOH – 30 min
  - e. 100% EtOH – 15min (2X)
  - f. Xylene – 15 min (2X)
  - g. 1:1 Xylene and Paraffin – 45 min
  - h. Paraffin – 30 min (4X)
5. 5 micron sections are cut from the paraffin blocks and placed on slides.
6. Slides remain on a 37°C heating tray overnight and are then stored at 4°C.

## Cultured Cells and Cell Suspensions

Preparation of Cells

- A. Cells in Flasks
  1. Using sterile tissue culture techniques, culture cells with 10 $\mu$ M BrdU for 2-24 hours at 37°C.
  2. Remove the media containing the BrdU label and wash twice with PBS.
  3. Using a cytospin, centrifuge 100 $\mu$ l of cells at 1 x 10<sup>6</sup> cells/ml onto suitable slides and allow to air dry.
- B. Cells on Chamber Slides (Adherent cells only)
  1. Using sterile tissue culture techniques, culture cells in chambers with 10 $\mu$ M BrdU for 2-24 hours at 37°C.
  2. Remove the labeling media and wash twice with PBS.
  3. Fix cells with 70% ethanol or other suitable fixative for 30 minutes.

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4. Wash twice with PBS.

Proceed with Staining Protocol

## Staining Protocol

1. Deparaffinization (FOR PARAFFIN-EMBEDDED TISSUES ONLY)

*Note: If you are not using paraffin-embedded tissues, skip to step 2 below. If paraffin-embedded tissues are used, it is necessary to deparaffinize the slides before following the BrdU staining protocol below.*

Deparaffinization involves incubation of the slides in xylene followed by a graded alcohol series as follows:

Xylene	5 Minutes, then change to new coplin jar containing Xylene
Xylene	5 Minutes
100% ethyl alcohol	5 Minutes
90% ethyl alcohol	3 Minutes
80% ethyl alcohol	3 Minutes
70% ethyl alcohol	3 Minutes
PBS	3 Minutes

2. Staining

Component	Component Preparation	Procedure	Time (min)
Component 10 (not provided)	Quenching Solution (not provided). Dilute 30% hydrogen peroxide* 1:10 in methanol.	Immerse slides into a coplin jar or other appropriate container filled with quenching solution for 10 minutes. Wash with PBS 1x for 2 minutes.	10

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Component 1A and 1B	Trypsin (0.2% solution)** FOR FORMALIN FIXED TISSUES ONLY. Add 1 drop of Component 1A to 3 drops of Component 1B and mix well.	Add 2 or more drops to each slide. Incubate at room temperature for 10 minutes, followed by a 3 minute rinse in distilled water.	10
Component 2	Denaturing Solution	Add 2 or more drops to each slide and incubate at room temperature for 30 minutes. Wash twice with PBS, 2 minutes per wash.	30
Component 3	Blocking solution	Add 2 or more drops to each slide and incubate at room temperature for 10 mins. Drain the solution by blotting on paper towels (DO NOT RINSE).	10
Component 4	Detector Antibody	Add 2 or more drops to each section and incubate at room temperature for 60 minutes. Wash twice with PBS, 2 minutes per wash.	60

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Component 5	Streptavidin-FL conjugate	Add 2 drops or more to each section and incubate at room temperature for 10 minutes. Wash twice with PBS, 2 minutes per wash.	10
Component 6	Mounting Media	Add 1-2 drops of mounting media and coverslip.	
Analyze slide(s) using a fluorescence microscope, excitation 493nm, emission 518nm for FL488 and excitation 556, emission 571 for FL549			

\* Hydrogen peroxide is not stable for long periods of time. Be sure the reagent you are using has not expired.

\*\* The concentration of trypsin used is very important. It may be necessary to titer the trypsin reagent for use in your system. Usually a final concentration of 0.02% to 0.2% is appropriate. *Other methods for digesting the tissue to expose epitopes for antibody recognition may also be used.*

## Troubleshooting

### Poor Positive Staining or No Positive Staining with Little or No Background Staining

1. Little or no BrdU labeling occurred in the tissue or cells prior to preparing the slides.
2. Detector antibody or Streptavidin-FL reagent was omitted or used in the wrong order.
3. Use a longer incubation times for Detector Antibody.
4. Wrong excitation filter used.
5. DO NOT LET SLIDES DRY OUT; keep wet at all times during the staining procedure.
6. Insufficient blotting between blocking step and detector antibody step. This could dilute out the Detector Antibody component.
7. If tissue is formalin fixed and digestion of the tissue is necessary, the trypsin component may need titering.
8. Use fresh xylene solution as solution which has been used many times will contain residual paraffin and may interfere with staining.

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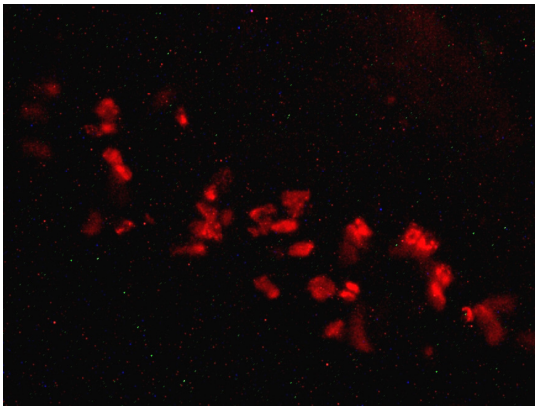
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## High Background Staining and Autofluorescence

1. Reduce concentration of the Streptavidin-FL Component.
2. Increase the number and time of washes in between steps.
3. Slides incorrectly deparaffinized (use fresh reagents, xylene and ethanol, for the deparaffinization procedure).
4. Try longer incubation during the blocking step.
5. Sudan Black treatment
  - A. 0.2% Sudan Black (w/v) in 70% EtOH stirred in the dark for 2 hours; **Sudan Black solution should be prepared fresh each time it is used.**
  - B. Apply to slide for 15 minutes after the fluorescent label application & 2x PBS wash steps.
  - C. Rinse quickly with TBS or PBS 8 times and mount. Addition of 0.02% tween 20 may be required.

## Sample Pictures

Examples pictures of formalin-fixed, paraffin embedded mouse intestinal tissue sections stained using Exalalpha's BrdU Immunofluorescence kits.

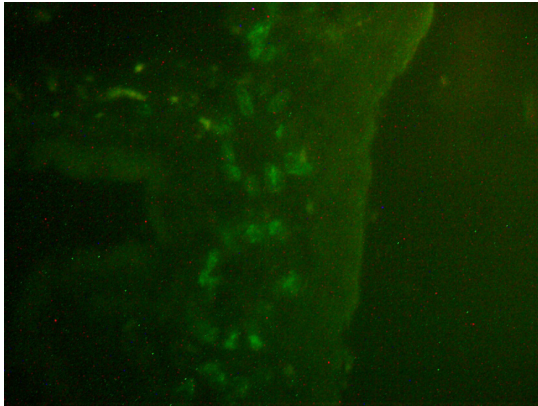


Legend:  
Staining of formalin-fixed, paraffin embedded mouse intestinal tissue from mice injected with BrdU using BrdU Immunofluorescence FL549 Kit (Cat. No. X2840K).

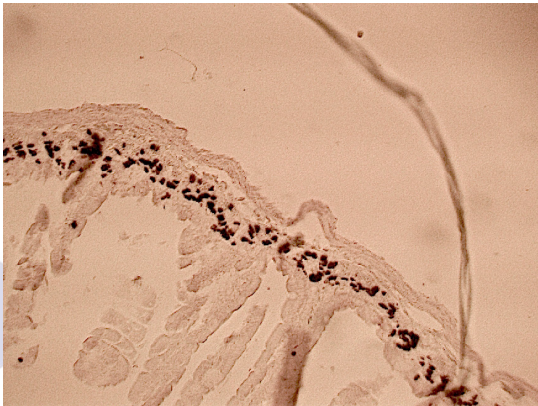
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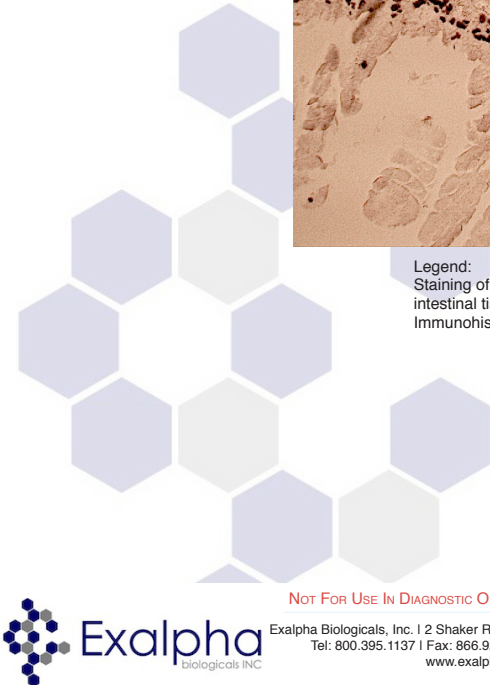




Legend:  
Staining of formalin-fixed, paraffin embedded mouse intestinal tissue from mice injected with BrdU using BrdU Immunofluorescence FL488 Kit (Cat. No. X2839K).



Legend:  
Staining of formalin-fixed, paraffin embedded mouse intestinal tissue from mice injected with BrdU using BrdU Immunohistochemistry Kit (Cat. No. X1545K).



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## Ordering Information

FL488™  
- X2839K (50 Slides)

FL549™  
- X2840K (50 Slides)

## Contact Information

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