

Store at  
4°C  
**#15472**

# CellSimple™ Epithelial to Mesenchymal Transition Antibody Assay Kit

1 Kit (50 assays)



Support: +1-978-867-2388 (U.S.)  
www.cellsignal.com/support

Orders: 877-616-2355 (U.S.)  
orders@cellsignal.com

Rev. 12/07/16

**For Research Use Only. Not For Use In Diagnostic Procedures.**

Products Included	Product #	Quantity	Storage Temp.
Vimentin (D21H3) XP® Rabbit mAb (PE Conjugate)	12020	1 x 25 µl	4°C
E-Cadherin (24E10) Rabbit mAb (Alexa Fluor® 488 Conjugate)	3199	1 x 25 µl	4°C
16% Formaldehyde, Methanol-free	12606	2 x 10 ml	RT
Phosphate Buffered Saline (PBS-20X)	9808	1 x 25 ml	RT

## Species Cross-Reactivity: H

**Description:** CellSimple™ Epithelial to Mesenchymal Transition Antibody Assay Kit is a fluorescent assay designed for use with the CellSimple™ Cell Analyzer. The kit includes E-Cadherin (24E10) Rabbit mAb (Alexa Fluor® 488) #3199 and Vimentin (D21H3) XP® Rabbit mAb (PE Conjugate) #12020, that can differentiate between epithelial and mesenchymal cell origins, respectively. Thus mean fluorescence intensity (MFI) in the green (525/45 nm) and red (561 nm LP) channels can be used as an indicator for cells undergoing epithelial-mesenchymal transition (EMT).

**Specificity/Sensitivity:** Antibodies provided in the CellSimple™ Epithelial to Mesenchymal Transition Antibody Assay Kit detect endogenous levels of their respective target.

**Background:** Epithelial-mesenchymal transition (EMT) is an essential process during development whereby epithelial cells acquire mesenchymal, fibroblast-like properties and display reduced intracellular adhesion and increased motility. This is a critical feature of normal embryonic development, which is also utilized by malignant epithelial tumors to spread beyond their origin (1-3). This tightly regulated process is associated with a number of cellular and molecular events. EMT depends on a reduction in expression of cell adhesion molecules. Cadherins mediate calcium-dependent cell-cell adhesion and play critical roles in normal tissue development (4). E-cadherin is considered to be an active suppressor of invasion and growth in many epithelial cancers (4-6). Recent studies indicate that cancer cells have upregulated N-cadherin in addition to loss of E-cadherin. This change in cadherin expression is called the "cadherin switch" and downregulation of E-cadherin is one of the hallmarks of EMT (1). Cells undergoing EMT may also continue to express epithelial markers and show epithelial morphology while exhibiting increased expression of mesenchymal markers such as vimentin (7).

**CellSimple™ Cell Analysis System:** The CellSimple™ Cell Analyzer is a benchtop instrument that utilizes a disposable thin-film cassette and a combination of a 488 nm laser, two photomultiplier tubes (525/45 nm and 561 nm LP filters), Coulter Principle-based cell measurements, and on-board software to provide easy-to-run applications and data analysis. Data acquisition occurs within approximately 10 seconds per test. The instrument relies on disposable cassettes for sample handling, which alleviates the need for flow cell cleaning and fluidics maintenance and the instrument is small enough to be portable between the lab bench and the hood. Applications include quantitative assessments of cell viability, apoptosis, other labeled antibody markers and single and multiplexed bead-based assays for protein and cellular analysis.

**Storage:** The conjugated antibodies in this kit are supplied in PBS (pH 7.2), less than 0.1% sodium azide and 2 mg/ml BSA. Store at 4°C. *Do not aliquot the antibodies. Protect from light. Do not freeze.* The remaining components of the kit should be stored at the recommended temperature upon receipt. All components in this kit are stable for at least 12 months when stored at the recommended temperature and left unused.

## Background References:

- (1) Aigner, K. et al. (2007) *Oncogene* 26, 6979-88.
- (2) Peinado, H. et al. (2007) *Nat Rev Cancer* 7, 415-28.
- (3) Moreno-Bueno, G. et al. (2008) *Oncogene* 27, 6958-69.
- (4) Wheelock, M.J. and Johnson, K.R. (2003) *Annu Rev Cell Dev Biol* 19, 207-35.
- (5) Christofori, G. (2003) *EMBO J* 22, 2318-23.
- (6) Hazan, R.B. et al. (2004) *Ann N Y Acad Sci* 1014, 155-63.
- (7) Helfand, B.T. et al. (2004) *J Cell Sci* 117, 133-41.

This product is provided under an intellectual property license from Life Technologies Corporation. The transfer of this product is contingent on the buyer using the purchased product solely in research, including use with HCS or other automated imaging applications but excluding use in combination with DNA microarrays. The buyer must not sell or otherwise transfer this product or its components for (a) diagnostic, therapeutic or prophylactic purposes; (b) testing, analysis or screening services, or information in return for compensation on a per-test basis; (c) manufacturing or quality assurance or quality control, or (d) resale, whether or not resold for use in research. For information on purchasing a license to this product for purposes other than as described above, contact Life Technologies Corporation, 5791 Van Allen Way, Carlsbad, CA 92008 USA or [outlicensing@lifetech.com](mailto:outlicensing@lifetech.com)

Alexa Fluor is a registered trademark of Life Technologies Corporation.

Thank you for your recent purchase. If you would like to provide a review visit [cellsignal.com/comments](http://cellsignal.com/comments).

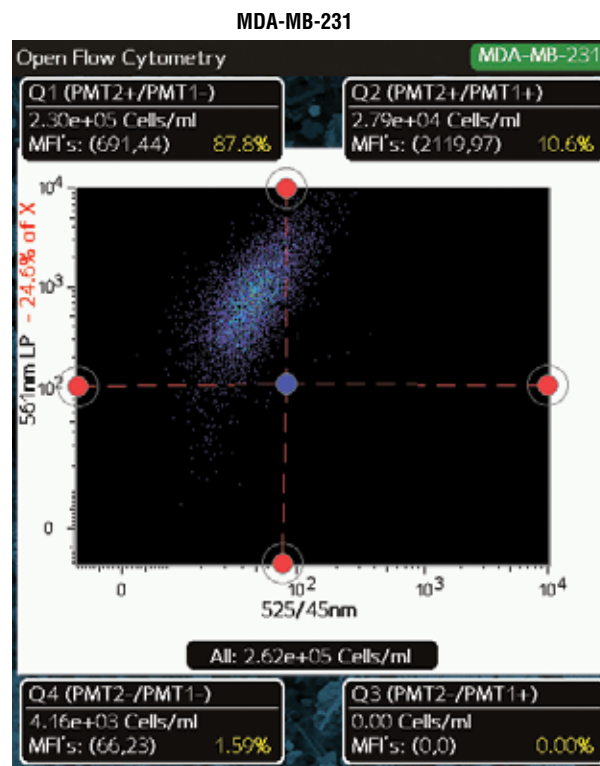
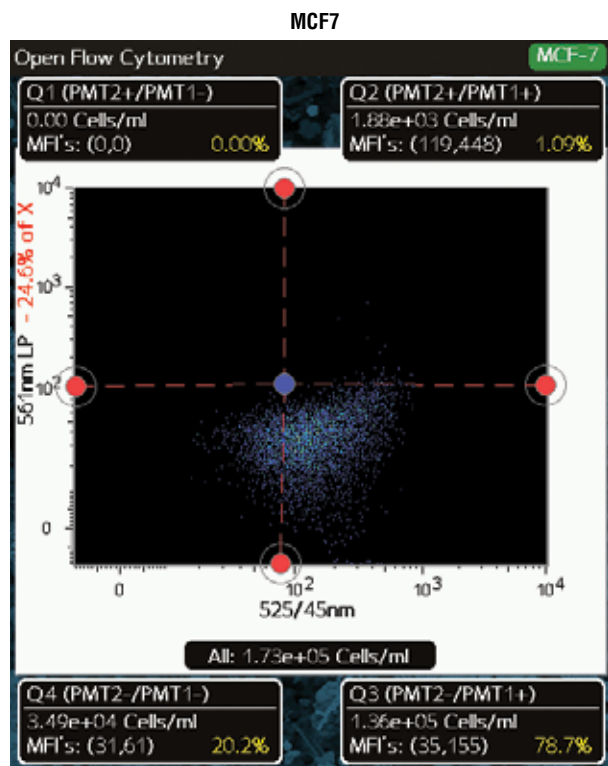
[www.cellsignal.com](http://www.cellsignal.com)

Please note your screen may look slightly different from the screen shots on the data sheet due to variations between software versions.

© 2016 Cell Signaling Technology, Inc.

XP, CellSimple and Cell Signaling Technology are trademarks of Cell Signaling Technology, Inc.

Applications: W—Western IP—Immunoprecipitation IHC—Immunohistochemistry ChIP—Chromatin Immunoprecipitation IF—Immunofluorescence F—Flow cytometry E-P—ELISA-Peptide Species Cross-Reactivity: H—human M—mouse R—rat Hm—hamster Mk—monkey Mi—mink C—chicken Dm—D. melanogaster X—Xenopus Z—zebrafish B—bovine Dg—dog Pg—pig Sc—S. cerevisiae Ce—C. elegans Hr—Horse All—all species expected Species enclosed in parentheses are predicted to react based on 100% homology.



CellSimple™ cell-based analysis of MCF7 (left panel) and MDA-MB-231 (right panel) cells using the CellSimple™ Epithelial to Mesenchymal Transition Antibody Assay Kit. Data was collected in both green (525/45 nm) and red channels (561 nm/LP) and analyzed on the Open Flow Cytometry application. Mean fluorescence intensity (MFI) of E-Cadherin (24E10) Rabbit mAb (Alexa Fluor® 488 Conjugate) #3199 (x-axis) and Vimentin (D21H3) XP® Rabbit mAb (PE Conjugate) #12020 (y-axis) is shown in each dot plot. Cell concentration, MFI, and percentages are displayed in the boxes adjacent to each quadrant. Instrument screen shots are shown.

Thank you for your recent purchase. If you would like to provide a review visit [cellsignal.com/comments](http://cellsignal.com/comments).

[www.cellsignal.com](http://www.cellsignal.com)

## Immunostaining Protocol for CellSimple™ Antibody-based Kits

- A. Instrumentation:** These kits were specially designed for use with the CellSimple™ Cell Analyzer. However, they may also be used with a flow cytometer or plate reader capable of providing excitation between 480 nm and 490 nm and detecting fluorescent emission between 520 nm and 590 nm.
- B. Kit components:**
- Antibody pair (kit specific)
  - 16% Formaldehyde (Methanol-free)
- NOTE: The screw cap allows for the entire vial contents to be used at once. To extend the product's shelf-life, small volumes should be extracted by piercing the silicone top with a needle and syringe. Store protected from light and use within one month after opening.
- Phosphate Buffered Saline (PBS-20X)
- C. Additional reagents needed, but not supplied.**
- 90% methanol
  - Bovine Serum Albumin #9998 or equivalent
  - Reverse osmosis/deionized (RO/DI) water or equivalent
- D. Reagent preparation**
1. **1X PBS:** To prepare 1 L 1X PBS add 25 ml PBS-20X to 475 ml RO/DI water, mix.
  2. **Incubation Buffer:** Dissolve 0.5 g Bovine Serum Albumin in 100 ml 1X PBS. Store at 4°C.
- E. Fixation**
1. Collect cells by centrifugation and aspirate supernatant. For adherent cells, remove cells from the plate or flask by trypsinization followed by trypsin neutralization with medium that contains 10% fetal bovine serum.
  2. Resuspend cells in 0.5 - 1 ml 1X PBS to  $0.5 \times 10^6$  -  $5 \times 10^6$  cells/ml by gently pipetting up and down. Add 16% Formaldehyde to obtain a final concentration of 4% and vortex gently (for example 335  $\mu$ l of 16% Formaldehyde added to 1 ml of cell suspension).
  3. Fix for 10 min at 37°C.
  4. Chill tubes on ice for 1 min.
  5. Spin down the cells at 400 x g for 5 min in a chilled microcentrifuge.
  6. Carefully remove the supernatant containing formaldehyde into a hazardous waste receptacle.
- F. Permeabilization**
1. Permeabilize cells by slowly adding 1 - 1.5 ml of ice-cold 90% methanol. Pipette up and down several times to ensure uniform cell suspension.
  2. Incubate 30 min on ice.
  3. Proceed with immunostaining or store cells at -20°C in 90% methanol.
- G. Immunostaining**
1. Aliquot 0.5 -  $1 \times 10^6$  cells into each assay tube.
  2. Wash the cells twice in 1 ml incubation buffer by centrifugation at 400 x g for 5 min.
  3. Dilute each of the two fluorochrome-conjugated antibodies 1:50 in incubation buffer. Prepare enough diluted antibody mix to resuspend each of your test samples in 25  $\mu$ l. For example, for 3 test samples add 1.5  $\mu$ l of antibody mix to 75  $\mu$ l of incubation buffer. Note: the antibodies are mixed together to allow a simultaneous detection in both the green and the red channels.
  4. Add 25  $\mu$ l of the diluted antibody mix to each test sample and gently pipette up and down a few times to ensure even cell suspension.
  5. Incubate for 1 hr at room temperature with occasional gentle mixing.
  6. Wash once by centrifugation using incubation buffer.
  7. Resuspend cells in 0.1 - 0.2 ml PBS and analyze 75  $\mu$ l on CellSimple™ Cell Analyzer using the Open Flow Cytometry application and using both Green (525/45 nm) and Red (561 nm LP) channels. For more information on how to use the Open Flow Cytometry application and detailed instructions on how to operate the CellSimple™ Cell Analyzer please refer to the CellSimple user guide.

SAFETY DATA SHEET (SDS): According to the OSHA Hazard Communication Standard 29 CFR 1910.1200  
 Issuing Date: 2014-04-02 Revision Date: 2014-05-07 Version: 1

**SECTION 1. Identification**

**Product identifier**

Product No. 12606  
 Product name 16% Formaldehyde, Methanol-Free  
 UN number UN3334  
 Other means of identification 12606S, 12606P, 12606P2

**Recommended use of the chemical and restrictions on use**

**Identified uses** This product is intended for research purposes only.  
**Uses advised against** This product is not intended for use in diagnostic procedures or therapeutics.  
 This product is not intended for use in humans or animals.

**Manufacturer, importer, supplier**

**Manufacturer address** Cell Signaling Technology, Inc.  
 3 Trask Lane  
 Danvers, MA 01923  
 TEL: +1 978 867 2300  
 FAX: +1 978 867 2400  
 www.cellsignal.com  
 support@cellsignal.com  
 978-867-2300  
 In case of emergency call CHEMTREC 1-800-424-9300

**Website**  
**Email address**  
**Company phone number**  
**Emergency telephone number**

**SECTION 2. Hazard(s) identification**

**Classification**

This substance/mixture is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute oral toxicity	Category 4
Acute dermal toxicity	Category 4
Acute inhalation toxicity	Category 3
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Skin sensitization	Category 1
Germ cell mutagenicity	Category 1B
Carcinogenicity	Category 1A
Specific target organ toxicity - single exposure (STOT SE)	Category 3

**GHS Label elements, including precautionary statements**



**Signal Word**  
 Danger

**Hazard statement(s)**  
 Harmful if swallowed  
 Harmful in contact with skin  
 Toxic if inhaled  
 Causes skin irritation  
 Causes serious eye irritation  
 May cause an allergic skin reaction  
 May cause genetic defects  
 May cause cancer  
 May cause respiratory irritation

**Precautionary Statement(s)**  
 Obtain special instructions before use  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Call a POISON CENTER or doctor/physician if you feel unwell  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
 Store in a well-ventilated place. Keep container tightly closed

**Supplementary Hazard Information**

**Hazards not otherwise classified (HNOC)** None

**SECTION 3. Composition/information on ingredients**

Chemical Name	CAS No.	Weight %
formaldehyde (non-stabilised)	50-00-0	10-30

**SECTION 4. First-aid measures**

**Eye contact** Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

**Skin contact** Wash skin with soap and water.

**Inhalation** Move to fresh air.

**Ingestion** Rinse mouth.

**Most important symptoms and effects, both acute and delayed**

Low-dose acute exposure can result in headache, rhinitis, and dyspnea; higher doses may cause severe mucous membrane irritation, burning, and laceration, and lower respiratory effects such as bronchitis, pulmonary edema, or pneumonia. Sensitive individuals may experience asthma and dermatitis, even at very low doses. Ocular exposure to formaldehyde vapors produces irritation and laceration. Depending on the concentration, formaldehyde solutions may cause transient discomfort and irritation or more severe effects, including corneal opacification and loss of vision. Formaldehyde is absorbed through intact skin and may cause irritation or allergic dermatitis. Ingestion may cause corrosive injury to the gastrointestinal mucosa, with nausea, vomiting, pain, bleeding, and perforation. Systemic effects include metabolic acidosis, CNS depression and coma, respiratory distress, and renal failure.

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**Advice for emergency responders**

**General advice** For further assistance, contact your local Poison Control Center.  
**Protection of First-aiders** Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

**SECTION 5. Fire-fighting measures**

**Extinguishing media**

**Suitable Extinguishing Media** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
**Unsuitable Extinguishing Media** CAUTION: Use of water spray when fighting fire may be inefficient.

**Specific hazards arising from the chemical**

No information available.

**Explosion Data**

**Sensitivity to Mechanical Impact** None.  
**Sensitivity to Static Discharge** None.

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**SECTION 6. Accidental release measures**

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel** Ensure adequate ventilation.  
**Other information** No information available.

**Environmental precautions**

See Section 12 for additional information.

**Methods and material for containment and cleaning up**

**Methods for containment** Prevent further leakage or spillage if safe to do so.  
**Methods for cleaning up** Pick up and transfer to properly labeled containers.

**SECTION 7. Handling and storage**

**Precautions for safe handling**

Handle in accordance with good industrial hygiene and safety practice.

**Conditions for safe storage, including any incompatibilities**

**Technical measures/Storage conditions** Keep containers tightly closed in a dry, cool and well-ventilated place.  
**Packaging material** No information available.  
**Incompatible products** Strong oxidizing agents, Alkalis, Acids, Phenols, Urea.

**SECTION 8. Exposure controls/personal protection**

**Control parameters**

Chemical Name	Occupational exposure limit values		
	ACGIH TLV	OSHA PEL	NIOSH REL
formaldehyde (non-stabilised)	Ceiling: 0.3 ppm	TWA: 0.75 ppm STEL: 2 ppm	IDLH: 20 ppm TWA: 0.016 ppm Ceiling: 0.1 ppm

**Appropriate engineering controls**

Showers, eyewash stations, and ventilation systems.

**Individual protection measures, such as personal protective equipment**

Personal protective equipment (PPE) needs to be selected depending on the implemented engineering controls, frequency/duration of work activities and the concentrations of the hazardous substance.

**Eye/face protection** Safety glasses with side-shields.  
**Skin and body protection** Wear protective gloves/clothing.  
**Respiratory protection** If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.  
**Hygiene measures** Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use.

**SECTION 9. Physical and chemical properties**

**Information on basic physical and chemical properties**

**Physical state** Liquid  
**Appearance** Clear  
**Odor** Pungent Characteristic  
**Color** Light yellow  
**Odor Threshold** No information available  
**pH** 5.4 @ 20 °C  
**Melting point/freezing point** No information available  
**Initial boiling point and boiling range** -19.5 °C (formaldehyde)  
**Flash point** 185 °C Closed cup (37% formaldehyde, methanol-free)  
**Evaporation rate** No information available  
**Flammability (solid, gas)** No information available  
**Upper flammability limit** 73% No information available.  
**Lower flammability limit** 7% No information available.  
**Vapor pressure** 3,890 mm Hg @ 25 °C (formaldehyde)  
**Vapor density** No information available  
**Relative density** No information available.  
**Solubility** No information available.  
**Solubility in other solvents** No information available  
**Partition coefficient: n-octanol/water** 0.35 (formaldehyde)  
**Autoignition temperature** No information available  
**Decomposition temperature** No information available.  
**Explosive properties** No information available  
**Oxidizing properties** No information available  
**VOC content** No information available.  
**Viscosity** No information available.  
**Density** No information available.

**SECTION 10. Stability and reactivity****Reactivity**

No information available.

**Chemical stability**

Stable under recommended storage conditions. Sealed with nitrogen gas.

**Possibility of hazardous reactions**

**Hazardous reactions** None under normal processing.  
**Hazardous polymerization** Polymerization can occur.

**Conditions to Avoid**

No information available.

**Incompatible Materials**

Strong oxidizing agents, Alkalis, Acids, Phenols, Urea.

**Hazardous Decomposition Products**

None under normal use. Reacts with HCl to form bis-Chloromethyl ether.

**SECTION 11. Toxicological information****Information on likely routes of exposure**

**Inhalation** Vapours may irritate throat and respiratory system. Toxic by inhalation.  
**Eye contact** Vapor may cause irritation. Contact with eyes may cause irritation.  
**Skin contact** Irritating to skin. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Harmful in contact with skin.  
**Ingestion** Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

**Information on toxicological effects**

This material should only be handled by, or under the close supervision of, those properly qualified in the handling and use of potentially hazardous chemicals. It should be borne in mind that the toxicological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
formaldehyde (non-stabilised)	= 100 mg/kg ( Rat )	= 270 mg/kg ( Rabbit )	= 250 ppm ( Rat ) 4 h

**NOAEL Oral Value**

Rat 2-Year Bioassay: 15 mg/kg/day

**LOAEL Oral Value**

Rat 2-Year Bioassay: 82 mg/kg/day (Reduced weight gain, histopathology in rats)

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

No information available.

**SECTION 13. Disposal considerations****Waste Disposal Methods**

Dispose of in accordance with all applicable national environmental laws and regulations.

**Disposal considerations**

Do not empty into drains; dispose of this material and its container in a safe way.

**SECTION 14. Transport information**

This material is subject to regulation as a hazardous material for shipping when offered or intended by aircraft.

**DOT**

**UN number** UN3334  
**UN proper shipping name** Aviation regulated liquid, n.o.s. (formaldehyde)  
**Transport hazard class(es)** 9  
**Special precautions for user** A35, A189  
**Emergency Response Guide Number** 171

**IATA**

**UN number** UN3334  
**UN proper shipping name** Aviation regulated liquid, n.o.s. (formaldehyde)  
**Transport hazard class(es)** 9  
**Packing Group** III  
**Special precautions for user** A27

**SECTION 15. Regulatory information****North American Inventory Listing**

Chemical Name	TSCA 8(b)	TSCA 12(b)	DSL	NDSL
formaldehyde (non-stabilised)	Listed	Not Listed	Listed	Not Listed

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name	CAS No.	SARA 313 - Threshold Values %
formaldehyde (non-stabilised)	50-00-0	0.1

**SARA 311/312 Hazard Categories**

**Acute Health Hazard** Yes  
**Chronic Health Hazard** Yes  
**Fire Hazard** No  
**Sudden Release of Pressure Hazard** No  
**Reactive Hazard** No

**Clean Water Act**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

**Symptoms**

Low-dose acute exposure can result in headache, rhinitis, and dyspnea; higher doses may cause severe mucous membrane irritation, burning, and lacrimation, and lower respiratory effects such as bronchitis, pulmonary edema, or pneumonia. Sensitive individuals may experience asthma and dermatitis, even at very low doses. Ocular exposure to formaldehyde vapors produces irritation and lacrimation. Depending on the concentration, formaldehyde solutions may cause transient discomfort and irritation or more severe effects, including corneal opacification and loss of vision. Formaldehyde is absorbed through intact skin and may cause irritation or allergic dermatitis. Ingestion may cause corrosive injury to the gastrointestinal mucosa, with nausea, vomiting, pain, bleeding, and perforation. Systemic effects include metabolic acidosis, CNS depression and coma, respiratory distress, and renal failure.

**Skin corrosion/irritation****Serious eye damage/eye irritation****Corrosivity****Sensitization****Mutagenic effects****Carcinogenicity**

No information available.

May cause sensitization of susceptible persons.

No specific testing was done on this product. Mutagenic testing of the hazardous ingredient in this product has resulted in some positive mutagenic results.

The list below indicates any ingredient listed as a carcinogen:

Chemical Name	IARC	NTP	OSHA
formaldehyde (non-stabilised) 50-00-0	1	Known	X

**Legend:**

**IARC:** (International Agency for Research on Cancer) Group 1 - Carcinogenic to Humans

**NTP:** (National Toxicity Program) Known - Known Carcinogen

**OSHA:** (Occupational Safety & Health Administration) X - Present

**Reproductive toxicity**

There is limited evidence that formaldehyde causes adverse reproductive effects. Formaldehyde has not been proven to be teratogenic in animals and is probably not a human teratogen at occupationally permissible levels.

**STOT - single exposure**

Respiratory system.

**STOT - repeated exposure**

No information available.

**Neurological effects**

No information available.

**Aspiration Hazard**

No information available.

**SECTION 12. Ecological information****Ecotoxicity**

Product does not present an aquatic toxicity hazard based on known or supplied information.

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
formaldehyde (non-stabilised)	-	LC50 41 mg/L (Brachydanio rerio) 96 h LC50 23.2 - 29.7 mg/L (Pimephales promelas) 96 h LC50 1510 µg/L (Lepomis macrochirus) 96 h LC50 100 - 136 mg/L (Oncorhynchus mykiss) 96 h LC50 22.6 - 25.7 mg/L (Pimephales promelas) 96 h LC50 0.032 - 0.226 mL/L (Oncorhynchus mykiss) 96 h	EC50 11.3 - 18 mg/L (Daphnia magna) 48 h LC50 2 mg/L (Daphnia magna) 48 h

**Persistence and degradability**

Readily biodegradable.

**Bioaccumulation**

Does not bioaccumulate.

**Mobility**

Will likely be mobile in the environment due to its water solubility

Chemical Name	Octanol-Water Partition Coefficient
formaldehyde (non-stabilised)	0.35

**Other adverse effects**

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances	CWA - Bioaccumulative Chemicals of Concern (BCCs)
formaldehyde (non-stabilised)	100 lb	Not Listed	Not Listed	Listed	Not Listed

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
formaldehyde (non-stabilised)	100 lb	100 lb

**California Proposition 65**

This product contains the following Proposition 65 chemicals:

Chemical Name	California Prop. 65
formaldehyde (non-stabilised)	Carcinogen

**U.S. State Right-to-Know Regulations**

This product contains the following U.S. State Right to Know chemicals:

Chemical Name	New Jersey	Massachusetts	Pennsylvania
formaldehyde (non-stabilised)	Listed	Listed	Listed

**U.S. FIFRA Label Information**

This product does not contain any substances regulated as pesticides.

**US Commerce Department - Export Administration Regulations Information**

This product does not contain any substances regulated under the Chemical Weapons Convention (CWC).

**U.S. Drug Enforcement Administration Information**

This product does not contain any substances regulated under the DEA.

**SECTION 16. Other information**

**Issuing Date:** 2014-04-02

**Revision Date:** 2014-05-07

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet



Safety Data Sheet (SDS) According to the OSHA Hazard Communication Standard 29 CFR 1910.1200  
 Issuing Date: 2014-02-24 Revision Date: 2014-02-24 Version: 1

### SECTION 1. Identification

#### Product identifier

Product number 9808  
 Product name Phosphate Buffered Saline (PBS-20X)  
 Other means of identification 9808BC, 9808P, 9808P2, 9808S

#### Recommended use of the chemical and restrictions on use

Identified uses This product is intended for research purposes only.  
 Uses advised against This product is not intended for use in diagnostic procedures or therapeutics.  
 This product is not intended for use in humans or animals.

#### Manufacturer, importer, supplier

Manufacturer address Cell Signaling Technology, Inc.  
 3 Trask Lane  
 Danvers, MA 01923  
 United States  
 TEL: +1 978 867 2300  
 FAX: +1 978 867 2400

Website www.cellsignal.com  
 Email address support@cellsignal.com  
 Emergency telephone number In case of emergency call CHEMTREC 1-800-424-9300

### SECTION 2. Hazard(s) identification

#### Classification

This substance/mixture is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation	Category 2B
-----------------------------------	-------------

#### GHS Label elements, including precautionary statements

#### Signal Word

Warning

#### Hazard statement(s)

Causes eye irritation.

#### Precautionary Statement(s)

Wash face, hands and any exposed skin thoroughly after handling.  
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

#### Supplementary Hazard Information

No information available.

### SECTION 3. Composition/information on ingredients

9808 - Phosphate Buffered Saline (PBS-20X)

Revision Date: 2014-02-24

#### Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Pick up and transfer to properly labeled containers.

### SECTION 7. Handling and storage

#### Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice.

#### Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions	Keep containers tightly closed in a dry, cool and well-ventilated place.
Packaging material	No information available.
Incompatible products	None known based on information supplied.

### SECTION 8. Exposure controls/personal protection

#### Control parameters

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

#### Appropriate engineering controls

Showers, eyewash stations, and ventilation systems.

#### Individual protection measures, such as personal protective equipment

Personal protective equipment (PPE) needs to be selected depending on the implemented engineering controls, frequency/duration of work activities and the concentrations of the hazardous substance.

Eye/face protection	Safety glasses with side-shields.
Skin and body protection	Wear protective gloves/clothing.
Respiratory protection	If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice.

### SECTION 9. Physical and chemical properties

#### Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Color	Colorless
Odor	No information available
Odor Threshold	No information available
pH	7.4
Melting point/freezing point range	No information available
Initial boiling point and boiling range	No information available
Flash point	No information available.
Evaporation rate	No information available
Flammability (solid, gas)	No information available
Upper flammability limit	No information available.

9808 - Phosphate Buffered Saline (PBS-20X)

Revision Date: 2014-02-24

#### Chemical nature Aqueous buffer solution

Chemical Name	CAS No	Weight %
sodium chloride	7647-14-5	10-30

### SECTION 4. First-aid measures

Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.
Skin contact	Wash skin with soap and water.
Inhalation	Move to fresh air.
Ingestion	If swallowed, do not induce vomiting - seek medical advice.

#### Most important symptoms and effects, both acute and delayed

No information available.

#### Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

#### Advice for emergency responders

General advice	For further assistance, contact your local Poison Control Center.
Protection of first-aiders	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

### SECTION 5. Fire-fighting measures

#### Extinguishing media

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	CAUTION: Use of water spray when fighting fire may be inefficient.

#### Specific hazards arising from the chemical

No information available.

#### Explosion Data

Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.

#### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### SECTION 6. Accidental release measures

#### Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Ensure adequate ventilation.
Other information	No information available.

#### Environmental precautions

See Section 12 for additional information.

9808 - Phosphate Buffered Saline (PBS-20X)

Revision Date: 2014-02-24

Lower flammability limit	No information available
Vapor pressure	No information available
Vapor density	No information available
Relative density	No information available
Solubility	No information available.
Solubility in other solvents	No information available
Partition coefficient: n-octanol/water	No information available
Autoignition temperature	No information available
Decomposition temperature	No information available.
Explosive properties	No information available
Oxidizing properties	No information available
VOC content	No information available
Viscosity	No information available.
Density	No information available.
Solubility in other solvents	No information available

### SECTION 10. Stability and reactivity

#### Reactivity

No information available.

#### Chemical stability

Stable under recommended storage conditions.

#### Possibility of hazardous reactions

Hazardous reactions	None under normal processing.
Hazardous polymerization	None under normal processing.

#### Conditions to Avoid

No information available.

#### Incompatible Materials

None known based on information supplied.

#### Hazardous Decomposition Products

None known based on information supplied.

### SECTION 11. Toxicological information

#### Information on likely routes of exposure

Inhalation	There is no data available for this product.
Eye contact	May cause temporary eye irritation.
Skin contact	There is no data available for this product.
Ingestion	There is no data available for this product.

#### Information on toxicological effects

This material should only be handled by, or under the close supervision of, those properly qualified in the handling and use of potentially hazardous chemicals. It should be borne in mind that the toxicological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
sodium chloride	3000 mg/kg ( Rat )	10 g/kg ( Rabbit )	42 g/m <sup>3</sup> ( Rat ) 1 h

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

<b>Symptoms</b>	No information available.
<b>Sensitization</b>	No information available.
<b>Mutagenic effects</b>	No information available.
<b>Carcinogenicity</b>	No component of this product present at levels greater than or equal to 0.1% is identifiable as probable, possible or confirmed carcinogen by IARC, ACGIH, NTP, or OSHA.
<b>Reproductive toxicity</b>	No information available.
<b>STOT - single exposure</b>	No information available.
<b>STOT - repeated exposure</b>	No information available.
<b>Neurological effects</b>	No information available.
<b>Aspiration Hazard</b>	No information available.

**SECTION 12. Ecological information****Ecotoxicity**

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
sodium chloride	-	LC50 5560 - 6080 mg/L (Lepomis macrochirus) 96 h LC50 12946 mg/L (Lepomis macrochirus) 96 h LC50 4747 - 7524 mg/L (Oncorhynchus mykiss) 96 h LC50 7050 mg/L (Pimephales promelas) 96 h LC50 6420 - 6700 mg/L (Pimephales promelas) 96 h LC50 6020 - 7070 mg/L (Pimephales promelas) 96 h	EC50 340.7 - 469.2 mg/L (Daphnia magna) 48 h EC50 1000 mg/L (Daphnia magna) 48 h

<b>Persistence and degradability</b>	No information available.
<b>Bioaccumulation</b>	No information available.
<b>Mobility</b>	No information available.

**Other adverse effects**

No information available.

**SECTION 13. Disposal considerations****Waste Disposal Methods**

Dispose of in accordance with all applicable national environmental laws and regulations.

**Disposal considerations**

Do not empty into drains; dispose of this material and its container in a safe way.

**SECTION 14. Transport information**

This material is not subject to regulation as a hazardous material for shipping.

**SECTION 15. Regulatory information****North American Inventory Listing**

Chemical Name	TSCA 8(b)	TSCA 12(b)	DSL	NDSL

Page 5 / 7

**SECTION 16. Other information**

Issuing Date: 2014-02-24  
 Revision Date: 2014-02-24  
**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

sodium chloride	Listed	Not Listed	Listed	Not Listed
-----------------	--------	------------	--------	------------

**Canadian Workplace Hazardous Materials Information System (WHMIS) Classification**

	Class D2B - Toxic Material at >= 1%
--	-------------------------------------

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**SARA 311/312 Hazard Categories**

<b>Acute Health Hazard</b>	Yes
<b>Chronic Health Hazard</b>	No
<b>Fire Hazard</b>	No
<b>Sudden Release of Pressure Hazard</b>	No
<b>Reactive Hazard</b>	No

**Clean Water Act**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

**CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations**

This product contains the following U.S. State Right to Know chemicals:

Chemical Name	New Jersey	Massachusetts	Pennsylvania
disodium hydrogenorthophosphate	Listed	Listed	Listed

**U.S. FIFRA Label Information**

This product does not contain any substances regulated as pesticides.

**US Commerce Department - Export Administration Regulations Information**

This product does not contain any substances regulated under the Chemical Weapons Convention (CWC).

**U.S. Drug Enforcement Administration Information**

This product does not contain any substances regulated under the DEA.

Page 6 / 7