#14471 Store at 4°C

PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout)

1 Kit (4 multiplexed assays)

www.cellsignal.com

Support: 877-678-TECH (8324)
www.cellsignal.com/support

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

rev. 07/10/15

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

Species Cross-Reactivity: H

Description: The PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout) is a nitrocellulose membrane antibody array founded upon the sandwich immunoassay principle. The array kit allows for the simultaneous detection of 18 important and well-characterized signaling molecules when phosphorylated or cleaved. Target-specific capture antibodies have been spotted in duplicate onto individual nitrocellulose membranes. Each kit contains 4 membranes, allowing the user to test up to 4 samples and generate 72 data points in a single experiment. Cell lysate is incubated on the membrane followed by a biotinylated detection antibody cocktail. Streptavidin-conjugated HRP and a chemiluminescent reagent are then used to visualize the bound detection antibody by chemiluminescence. An image of the membrane can be captured with either a digital imaging system or standard chemiluminescent film. The image can be analyzed visually or the spot intensities quantified using array analysis software.

Specificity/Sensitivity: PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout) detects the indicated cellular proteins and signaling nodes only when phosphorylated or cleaved at the specified residues (see Figure 1). No significant cross-reactivity has been observed between targets. This kit is optimized for cell lysates diluted to a total protein concentration between 0.1 and 0.5 mg/ml (see kit protocol). This kit detects proteins from the indicated species as determined through in-house testing, but may also detect homologous proteins from other species.

Products Included	Quantity	Cap Color
Array Membranes	4 membranes	
Multi-Chamber Plastic Dish with Cover	1 dish	
Chemiluminescent Development Folder	2 folders	
20X Array Wash Buffer	2 x 15 ml	White
Membrane Array Diluent Buffer	2 x 15 ml	Red
10X Detection Antibody Cocktail	650 µl	White
10X HRP-linked Streptavidin	650 µl	Clear
SignalFire™ ECL Reagent	6 ml (3 ml each substrate)	
*Cell Lysis Buffer #7018	30 ml	Clear

*Kit should be stored at 4°C with the exception of 1X Cell Lysis Buffer, which is stored at –20°C (packaged separately).

Intracellular Signaling

	Target	Modification Site	Modification
1	Positive Control	N/A	N/A
2	Negative Control	N/A	N/A
3	ERK1/2	Thr202/Tyr204	Phosphorylation
4	Stat1	Tyr701	Phosphorylation
5	Stat3	Tyr705	Phosphorylation
6	Akt	Thr308	Phosphorylation
7	Akt	Ser473	Phosphorylation
8	AMPKα	Thr172	Phosphorylation
9	S6 Ribosomal Protein	Ser235/236	Phosphorylation
10	mTOR	Ser2448	Phosphorylation
11	HSP27	Ser78	Phosphorylation
12	Bad	Ser112	Phosphorylation
13	p70 S6 Kinase	Thr389	Phosphorylation
14	PRAS40	Thr246	Phosphorylation
15	p53	Ser15	Phosphorylation
16	p38	Thr180/Tyr182	Phosphorylation
17	SAPK/JNK	Thr183/Tyr185	Phosphorylation
18	PARP	Asp214	Cleavage
19	Caspase-3	Asp175	Cleavage
20	GSK-3β	Ser9	Phosphorylation

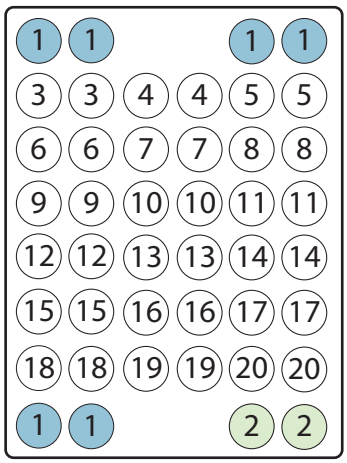

Figure 1. Target map of the PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout).

Cell Signaling TECHNOLOGY®

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.

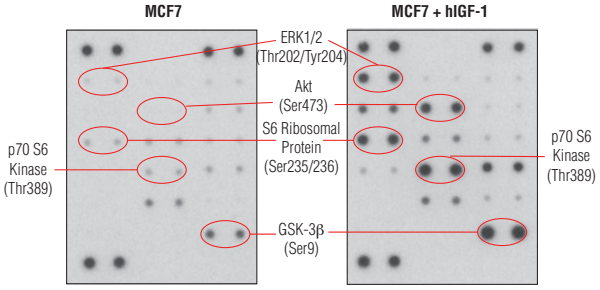

Figure 2. MCF7 cells were grown to 80% confluency and then serum starved overnight. Cells were either untreated (left panel) or treated with Human Insulin-like Growth Factor I (hIGF-I) #8917 (100 ng/ml, 20 min; right panel). Cell extracts were prepared and analyzed using the PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout). Images were acquired by briefly exposing the membranes to standard chemiluminescent film.

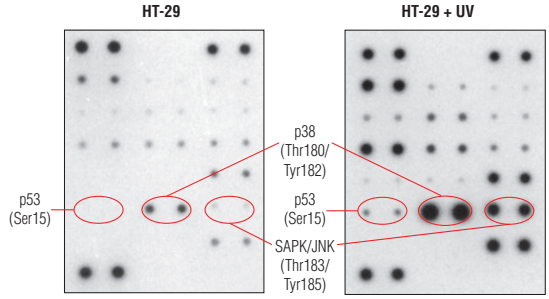

Figure 3. HT-29 cells were grown to 80% confluency and then either untreated (left panel) or UV-irradiated (30 mJ) and allowed to recover for 60 min (right panel). Cell extracts were prepared and analyzed using the PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout). Images were acquired by briefly exposing the membranes to standard chemiluminescent film.

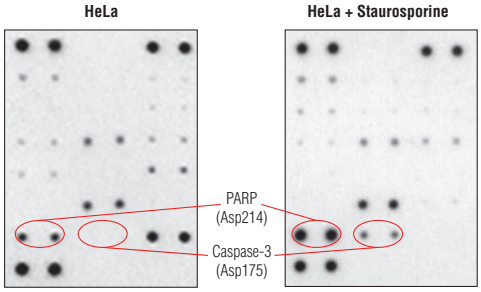

Figure 4. HeLa cells were grown to 90% confluency and then either untreated (left panel) or treated with Staurosporine #9953 (1 µM, 3.5 hr; right panel). Cell extracts were prepared and analyzed using the PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout). Images were acquired by briefly exposing the membranes to standard chemiluminescent film.

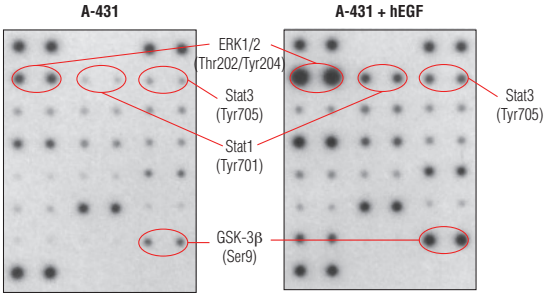

Figure 5. A-431 cells were grown to 80% confluency and then serum starved overnight. Cells were either untreated (left panel) or treated with Human Epidermal Growth Factor (hEGF) #8916 (100 ng/ml, 5 min; right panel). Cell extracts were prepared and analyzed using the PathScan® Intracellular Signaling Membrane Array Kit (Chemiluminescent Readout). Images were acquired by briefly exposing the membranes to standard chemiluminescent film.

Background: Phosphorylation and proteolysis are two widespread covalent post-translational modifications that represent important regulatory mechanisms in biology. Detection of these modifications on a set of cellular proteins playing a well-understood role in cell biology can provide a broad snapshot of intracellular signaling.

The MAPK/Erk cascade is one of the best characterized and widely studied signaling modules. It is involved in a broad range of cellular processes such as proliferation, differentiation, and motility. MAPK/Erk is activated by a wide range of extracellular signals including growth factors, cytokines, hormones, and neurotransmitters. It is activated by dual phosphorylation at Thr202 and Tyr204 by the dual specificity kinases MEK1 and MEK2.

p38 and JNK MAPKs are core components of two additional structurally related signal transduction modules. p38 and JNK are activated through a similar dual phosphorylation mechanism by various MAPK kinases in response to pro-inflammatory cytokines, stressful conditions, or genotoxicity.

Stat1 and Stat3 are important signaling molecules that are involved in immunity and inflammation and can be activated by a variety of cytokines or growth factors. Stat1 and Stat3 are phosphorylated at Tyr701 or Tyr705, respectively, by cytokine receptor-tethered tyrosine kinases of the Jak family or, in some cases, by other tyrosine kinases such as Src.

Akt is a protein kinase generally activated in response to growth factor stimulation that transmits growth and survival signals. Phosphorylation of Akt at Ser473 and Thr308 by TORC2 complex and PDK1, respectively, are reliable predictors of Akt activation. Phosphorylation of PRAS40 at Thr246 by Akt relieves PRAS40 inhibition of TORC1. Akt phosphorylation of the pro-apoptotic protein Bad at Ser112 and the multifunctional kinase GSK-3β at Ser9 inhibits their activity and promotes cell survival.

mTOR is an important signaling hub that is a major component of two macromolecular complexes, TORC1 and TORC2. mTOR is phosphorylated at Ser2448 and integrates growth factor signaling and nutrient availability, thus playing an important role in cell growth and homeostasis. mTORC1 phosphorylates p70 S6 Kinase at Thr389, leading to kinase activation and cell cycle progression. The S6 ribosomal protein is found downstream of p70 S6 Kinase and its phosphorylation at Ser235/236 reflects mTOR pathway activation and predicts cell cycle progression.

AMPK is an energy sensor that is activated by phosphorylation at Thr172 in response to elevated AMP levels. AMPK regulates fatty acid metabolism, as well as modulates protein synthesis and cell growth.

HSP27 is a mediator of cell stress that confers resistance to adverse environmental change. HSP27 is phosphorylated at Ser78 within the p38 MAPK pathway.

p53 plays an important role in cellular response to DNA damage and other genomic aberrations. Phosphorylation of p53 at Ser15 by ATM/ATR or DNA-PK in response to DNA damage leads to its stabilization and accumulation.

Caspase-3 is a critical executor of apoptosis. Caspase-3 is activated by endoproteolytic cleavage at Asp175 and exerts its pro-apoptotic activity through cleavage of multiple cellular targets. PARP, an enzyme that is involved in DNA repair, is one of the main substrates of activated caspase-3. Cleavage at Asp214 leads to PARP inactivation. Increased levels of cleaved caspase-3 and cleaved PARP are reliable indicators of apoptosis.

Selected References:

(1) Manning, B.D. and Cantley, L.C. (2007) *Cell* 129, 1261-74.

(2) Huang, J. and Manning, B.D. (2009) *Biochem Soc Trans* 37, 217-22.

(3) Dufner, A. and Thomas, G. (1999) *Exp Cell Res* 253, 100-9.

(4) Hardie, D.G. et al. (2012) *Nat Rev Mol Cell Biol* 13, 251-62.

(5) Rubinfeld, H. and Seger, R. (2005) *Mol Biotechnol* 31, 151-74.

(6) Keshet, Y. and Seger, R. (2010) *Methods Mol Biol* 661, 3-38.

(7) Cuadrado, A. and Nebreda, A.R. (2010) *Biochem J* 429, 403-17.

(8) Brognard, J. and Hunter, T. (2011) *Curr Opin Genet Dev* 21, 4-11.

(9) Hunter, T. (2009) *Curr Opin Cell Biol* 21, 140-6.

(10) Manning, G. et al. (2002) *Science* 298, 1912-34.

(11) Kurokawa, M. and Kornbluth, S. (2009) *Cell* 138, 838-54.

(12) Shi, Y. (2004) *Cell* 117, 855-8.

(13) Boatright, K.M. and Salvesen, G.S. (2003) *Curr Opin Cell Biol* 15, 725-31.

Cell Signaling TECHNOLOGY®

#14471 Intracellular Signaling Membrane Array Protocol

A. Preparing Cell Lysates

For adherent cells

1. Thaw 1X Cell Lysis Buffer #7018 and mix thoroughly. Supplement 1X Cell Lysis Buffer with PMSF #8553 (not included) to a final concentration of 1 mM, or with Protease Inhibitor Cocktail (100X) #5871 (not included). Keep lysis buffer on ice.
2. Aspirate media when the culture reaches 80-90% confluence. Treat cells by adding fresh media containing regulator for desired time.
3. Remove media and rinse cells once with ice-cold 1X PBS
4. Remove PBS and add 0.5 ml ice-cold 1X Cell Lysis Buffer to each plate (10 cm diameter) and incubate the plate on ice for 5 min.
5. Scrape the cells off the plate and transfer to an appropriate tube. Keep on ice.
6. Microcentrifuge for 10 min. (14,000 rpm) at 4°C and transfer the supernatant to a new tube. The supernatant is the cell lysate. Store at -80°C in single use aliquots.

For suspension cells

1. Thaw 1X Cell Lysis Buffer #7018 and mix thoroughly. Supplement Cell Lysis Buffer with PMSF #8553 (not included) to a final concentration of 1 mM, or with Protease Inhibitor Cocktail (100X) #5871 (not included). Keep lysis buffer on ice.
2. Remove media by low speed centrifugation (~1200 rpm) when the culture reaches 0.5-1.0 x 106 viable cells/ml. Treat cells by adding fresh media containing regulator for desired time.
3. Collect cells by low speed centrifugation (~1200 rpm) and wash once with 5-10 ml ice-cold 1X PBS.
4. Cells harvested from 50 ml of growth media can be lysed in 2.0 ml of 1X Cell Lysis Buffer.
5. Microcentrifuge for 10 min. (14,000 rpm) at 4°C and transfer the supernatant to a new tube. The supernatant is the cell lysate. Store at -80°C in single use aliquots.

B. Assay Procedure

1. Allow the desired number of nitrocellulose Membranes, the Membrane Array Diluent Buffer, and the 20X Array Wash Buffer to acclimate to room temperature before using.
2. Prepare 1X Array Wash Buffer by diluting 20X Array Wash Buffer in deionized water. Dilute 25 ml of 20X Array Wash Buffer with 475 ml of deionized water. Label as 1X Array Wash Buffer and keep at room temperature.
3. Prepare Detection Antibody Cocktail as follows:
   For running 2 membranes:
   Dilute 320 µl of 10X Detection Antibody Cocktail with 2880 µl of Membrane Array Diluent Buffer. Keep the 1X Detection Antibody Cocktail on ice.
   For running 4 membranes:
   Dilute 640 µl of 10X Detection Antibody Cocktail with 5760 µl of Membrane Array Diluent Buffer. Keep the 1X Detection Antibody Cocktail on ice.
4. Prepare 1X HRP-linked Streptavidin as follows:
   For running 2 membranes:
   Dilute 320 µl of 10X HRP-linked Streptavidin with 2880 µl of Membrane Array Diluent Buffer. Keep the 1X HRP-linked Streptavidin on ice.
   For running 4 membranes:
   Dilute 640 µl of 10X HRP linked Streptavidin with 5760 µl of Membrane Array Diluent Buffer. Keep the 1X HRP-linked Streptavidin on ice.
5. Place the desired number of membranes into each well of the Multi-Chamber Plastic Dish.

NOTE: Membranes must be placed into the Multi-Chamber Plastic Dish with the red dots and numbers facing up.

6. Add 2.0 ml of Membrane Array Diluent Buffer per individual membrane into each well of the Multi-Chamber Plastic Dish. Incubate for 1 hr at room temperature on a rocking platform shaker. This incubation is the block step.

NOTE: The red spots will disappear once the Membrane Array Diluent Buffer is added to the membranes. The spotted antibodies will remain immobilized on the nitrocellulose membrane.

7. During the block step, prepare the desired number of cell lysates by diluting with the Membrane Array Diluent Buffer to final protein concentrations of 0.25 mg/ml. Bring up the volume with Membrane Array Diluent Buffer to a total of 1.5 ml for each lysate.

NOTE: The recommended final lysate protein concentration ranges from 0.1 to 0.5 mg/ml.

8. Aspirate the Membrane Array Diluent Buffer and add the prepared lysates to each membrane. Cover the Multi-Chamber Plastic Dish and incubate overnight at 4°C on a rocking platform shaker.
9. Using tweezers, carefully remove each membrane from the Multi-Chamber Plastic Dish and place each into a separate plastic tray containing 10 ml of 1X Array Wash Buffer. Each membrane must be placed within its own plastic tray containing 10 ml of 1X Array Wash Buffer (a clean pipette tip box cover works well). Clean the Multi-Chamber Plastic Dish using soap and deionized water for later use.

NOTE: Whenever handling the membranes, avoid touching with bare hands and make sure to avoid contact with the area of the membrane containing the spotted antibodies.

10. Wash each membrane with 1X Array Wash Buffer for 5 min at room temperature on a rocking platform shaker. Repeat the wash step 3 more times.
11. Add 1.5 ml of 1X Detection Antibody Cocktail per each array into the Multi-Chamber Plastic Dish. Carefully remove each membrane from the wash buffer then drip excess liquid onto an absorbent paper e.g. Kimwipe®. Place each membrane into the Multi-Chamber Plastic Dish containing the 1X Detection Antibody Cocktail. Cover the Multi-Chamber Plastic Dish and incubate for 1 hr at room temperature on a rocking platform shaker.
12. Repeat wash steps 9 and 10.
13. Add 1.5 ml of 1X HRP-linked Streptavidin per each membrane into the Multi-Chamber Plastic Dish. Carefully remove each membrane from the wash buffer then drip excess liquid onto an absorbent paper e.g. Kimwipe®. Place each membrane into the Multi-Chamber Plastic Dish containing the 1X HRP-linked Streptavidin. Cover the Multi-Chamber Plastic Dish and incubate for 30 min at room temperature on a rocking platform shaker.
14. Repeat wash steps 9 and 10.

NOTE: Keep the membrane(s) in the wash buffer from the previous wash step until the next step is complete.

15. Prepare 1X Chemiluminescent Reagent as follows:
    For running 2 membranes:
    Dilute 1.25 ml of the Reagent A of SignalFire™ #6883 with 11.3 ml of deionized water. Dilute 1.25 ml of the Reagent B of SignalFire™ #6883 with 11.3 ml of deionized water. Combine both the diluted Reagent A Solution and Reagent B Solution into one container.
    For running 4 membranes:
    Dilute 2.5 ml of the Reagent A of SignalFire™ #6883 with 22.5 ml of deionized water. Dilute 2.5 ml of the Reagent B of SignalFire™ #6883 with 22.5 ml of deionized water. Combine both the Reagent A Solution and Reagent B Solution into one container and mix thoroughly.
16. Discard the 1X Array Wash Buffer from step 14.
17. Add 10.0 ml of 1X Chemiluminescent Reagent prepared in step 15 to each of the dishes containing the membranes.
18. Incubate for 2 min at room temperature on a rocking platform shaker.
19. Place each membrane with the numbers facing up into a Chemiluminescent Development folder.
20. Pipette an additional 200-300 µl 1X Chemiluminescent Reagent directly on top of each membrane.
21. Gently fold down the development folder making sure to remove any air bubbles.
22. Blot any excess 1X Chemiluminescent Reagent using an absorbent paper e.g. Kimwipe® or paper towel.
23. Place the development folder containing the membranes into an autoradiography film cassette.
24. Expose to film for 20 to 60 sec using even and light pressure on the top of the film cassette.

NOTE: Multiple exposure times may be necessary.

SAFETY DATA SHEET (SDS): According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
Issuing Date: 2014-01-31 **Revision Date:** 2015-02-03 **Version:** 1

SECTION 1. Identification

Product identifier

Product number 14755
Product name Luminol / Enhancer Solution
Other means of identification 14755S

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
Company phone number 978-867-2300
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)

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2
Specific target organ toxicity - repeated exposure (STOT RE)	Category 2

GHS Label elements, including precautionary statements

Signal Word
Warning

Hazard statement(s)

Causes skin irritation
Causes serious eye irritation
May cause damage to organs through prolonged or repeated exposure

Precautionary Statement(s)
Wash face, hands and any exposed skin thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe dust/fume/gas/mist/vapors/spray.
Get medical advice/attention if you feel unwell.
IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse
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

Hazards not otherwise classified (HNOC) None

SECTION 3. Composition/information on ingredients

Chemical nature Aqueous solution of organic and inorganic compounds

Chemical Name	CAS No	Weight %
trometamol	77-86-1	1-5
ethanediol	107-21-1	1-3

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. Rinse mouth. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Irritation to eyes, skin, nose, throat; nausea, vomiting, abdominal pain, lassitude (weakness, exhaustion); dizziness, stupor, convulsions, central nervous system depression.

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, chromium trioxide, potassium permanganate, sodium peroxide.

SECTION 8. Exposure controls/personal protection

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH REL
ethanediol	Ceiling: 100 mg/m³	-	-

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.

SECTION 9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state Liquid
Appearance No information available
Odor No information available
Color Colorless, light pink
Odor Threshold No information available
pH 9.5 @ 20 °C
Melting point/freezing point 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.
Lower flammability limit No information available.
Vapor pressure No information available
Vapor density No information available
Relative density No information available
Solubility Soluble in water
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.

SECTION 10. Stability and reactivity

Reactivity

No information available.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Hazardous reactions Vapors may form explosive mixtures with air.
Hazardous polymerization None under normal processing.

Conditions to Avoid

No information available.

Incompatible Materials

Strong oxidizing agents, chromium trioxide, potassium permanganate, sodium peroxide.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 11. Toxicological information

Information on likely routes of exposure

Inhalation Inhalation of vapors in high concentration may cause irritation of respiratory system.
Eye contact Expected to be an irritant based on components.
Skin contact Expected to be an irritant based on components.
Ingestion May cause adverse kidney effects.

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 toxocological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
trometamol	5900 mg/kg (Rat)	-	-
ethanediol	-	-	-

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

Symptoms Irritation to eyes, skin, nose, throat; nausea, vomiting, abdominal pain, lassitude (weakness, exhaustion); dizziness, stupor, convulsions, central nervous system depression.
Sensitization No information available.
Mutagenic effects No information available.
Carcinogenicity 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.

Reproductive toxicity No information available.
STOT - single exposure No information available.
STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure: Kidney, Respiratory system.
Target Organ Effects Central nervous system (CNS), Eyes, Skin, Respiratory system, Kidney.
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
trometamol	-	-	NOEC >100 mg/L (Selenastrum capricornutum) 96 h
ethanediol	EC50 6500 - 13000 mg/L (Pseudokirchneriella subcapitata) 96 h	LC50 40761 mg/L (Oncorhynchus mykiss) 96 h LC50 27540 mg/L (Lepomis macrochirus) 96 h LC50 41000 mg/L (Oncorhynchus mykiss) 96 h LC50 14 - 18 mL/L (Oncorhynchus mykiss) 96 h LC50 40000 - 60000 mg/L (Pimephales promelas) 96 h LC50 16000 mg/L (Poecilia reticulata) 96 h	EC50 46300 mg/L (Daphnia magna) 48 h

Persistence and degradability No information available.
Bioaccumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubilty but will likely degrade over time

Chemical Name	Octanol-Water Partition Coefficient
ethanediol	-1.93

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
trometamol	Listed	Not Listed	Listed	Not Listed
ethanediol	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 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 %
ethanediol	107-21-1	1.0

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 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, 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
ethanediol	5000 lb	Not Listed

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
ethanediol	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: 2014-01-31
Revision Date: 2015-02-03
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

Cell Signaling TECHNOLOGY®

SAFETY DATA SHEET (SDS): According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
Issuing Date: 2014-02-10 **Revision Date:** 2014-02-11 **Version:** 1

SECTION 1. Identification

Product identifier

Product No. 7018
Product name PathScan® Sandwich ELISA Lysis Buffer (1X)
Other means of identification 7018M, 7018P2, 7018S

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
Website www.cellsignal.com
Email address support@cellsignal.com
Company phone number 978-867-2300
Emergency telephone number In case of emergency call CHEMTREC 1-800-424-9300

SECTION 2. Hazard(s) identification

Classification

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

Serious eye damage/eye irritation	Category 2A

GHS Label elements, including precautionary statements

Signal Word
Warning

Hazard statement(s)

Causes serious eye irritation

Precautionary Statement(s)
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
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

Hazards not otherwise classified (HNOC) Contact with acids liberates very toxic gas

SECTION 3. Composition/information on ingredients

Chemical nature Aqueous solution of organic and inorganic compounds.

Chemical Name	CAS No.	Weight %
sodium fluoride	7681-49-4	0.1-1
tetrasodium pyrophosphate, decahydrate	13472-36-1	0.1-1
polyethylene glycol p-(1,1,3,3-tetramethylbutyl)phenylether	9002-93-1	0.5-1.5

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 Call a physician immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If swallowed, do not induce vomiting - seek medical advice. Rinse mouth.

Most important symptoms and effects, both acute and delayed

No information or data specific to the product on this toxicological (health) effect is available.

Indication of any immediate medical attention and special treatment needed

Notes to physician 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:. Dry chemical. Carbon dioxide (CO_2). Water spray. Alcohol-resistant foam.
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 Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Use personal protective equipment.
Other information No information available.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

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 Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

SECTION 7. Handling and storage

Precautions for safe handling

Use only in area provided with appropriate exhaust ventilation. Wear personal protective equipment. Prevent the formation of vapors, mists and aerosols.

Conditions for safe storage, including any incompatibilities

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

SECTION 8. Exposure controls/personal protection

Control parameters

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH REL
sodium fluoride 7681-49-4	TWA: 2.5 mg/m³	TWA: 2.5 mg/m³ (vacated) TWA: 2.5 mg/m³	IDLH: 250 mg/m³ TWA: 2.5 mg/m³
tetrasodium pyrophosphate, decahydrate 13472-36-1	-	(vacated) TWA: 5 mg/m³	TWA: 5 mg/m³ (Listed as: Tetrasodium pyrophosphate)

(vacated) = Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

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 Tightly fitting safety goggles.
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. When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing.

SECTION 9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	No information available
Odor	No information available
Color	Clear
Odor Threshold	No information available
pH	7.5
Melting point/freezing point	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
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

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 Expected to be an irritant based on components.
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 toxocological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
sodium fluoride 7681-49-4	= 52 mg/kg (Rat)	= 175 mg/kg (Rat)	-
tetrasodium pyrophosphate, decahydrate 13472-36-1	> 2000 mg/kg (Rat)	-	-
polyethylene glycol p-(1,1,3,3-tetramethylbutyl)phenylether 9002-93-1	= 1,800 mg/kg (Rat)	= 8,000 mg/kg (Rabbit)	-

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

Symptoms	No information available.
Corrosivity	No information available.
Sensitization	No information available.
Mutagenic effects	No information available.
Carcinogenicity	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.
Reproductive toxicity	No information available.
Developmental Toxicity	No information available.
Teratogenicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.
Neurological effects	No information available.
Aspiration Hazard	No information available.
Endocrine Disruptor Information	No information available.

SECTION 12. Ecological information

Ecotoxicity

99.02% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
sodium fluoride 7681-49-4	EC50 850 mg/L (Desmodesmus subspicatus) 72 h EC50 272 mg/L (Pseudokirchneriella subcapitata) 96 h	LC50 180 mg/L (Pimephales promelas) 96 h LC50 830 mg/L (Lepomis macrochirus) 96 h LC50 38 - 68 mg/L (Oncorhynchus mykiss) 96 h LC50 530 mg/L (Lepomis macrochirus) 96 h	EC50 338 mg/L (Daphnia magna) 48 h EC50 98 mg/L (Daphnia magna) 48 h
polyethylene glycol p-(1,1,3,3-tetramethylbutyl)phenylether 9002-93-1		LC50: 8.9 mg/L (Pimephales promelas) 96 h	EC50: 26 mg/L (Daphnia) 48 h

Persistence and degradability No information available.
Bioaccumulation No information available.
Mobility 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.

California Waste Status This product contains one or more substances that are listed with the State of California as a hazardous waste

Chemical Name	California Hazardous Waste Status
sodium fluoride 7681-49-4	Toxic

SECTOIN 14. Transport information

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

SECTION 15. Regulatory information

All of the components in the product are on the following Inventory lists:

TSCA -
DSL -
NDSL Complies

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

Acute Health Hazard Yes
Chronic Health Hazard No
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):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
sodium fluoride 7681-49-4	1000 lb			X

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
sodium fluoride 7681-49-4	1000 lb	

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
sodium fluoride 7681-49-4	Listed	Listed	Listed
tetrasodium pyrophosphate, decahydrate 13472-36-1	Listed	Listed	Listed

U.S. EPA Label Information

This product does not contain any substances regulated as pesticides.

SECTION 16. Other information

Issuing Date: 2014-02-10
Revision Date: 2014-02-11
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End of Safety Data Sheet

Cell Signaling TECHNOLOGY®

SAFETY DATA SHEET (SDS): According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
Issuing Date: 2014-01-31 **Revision Date:** 2014-10-21 **Version:** 1

SECTION 1. Identification

Product identifier

Product number 14549
Product name Array Membranes
UN number UN3270
Other means of identification 14549P, 14549S

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
Company phone number 978-867-2300
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)

Flammable solids	Category 1

GHS Label elements, including precautionary statements

Signal Word
Danger

Hazard statement(s)
Flammable solid

Precautionary Statement(s)
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Ground/Bond container and receiving equipment
Wear protective gloves/protective clothing/eye protection/face protection

Supplementary Hazard Information

Hazards not otherwise classified (HNOC) None

SECTION 3. Composition/information on ingredients

Chemical nature Lyophilized mixture of organic and inorganic compounds coating nitric esters of cellulose
Synonyms cellulose nitrate, nitrocellulose, nitrocellulose membrane filter.

Chemical Name	CAS No	Weight %
nitrocellulose, containing a maximum of 12,6 % nitrogen	9004-70-0	60-100

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 Clean mouth with water and afterwards drink plenty of water.

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 None.

Specific hazards arising from the chemical

Extremely flammable. Will be easily ignited by heat, sparks or flames.

Explosion Data

Sensitivity to Mechanical Impact Not impact sensitive.
Sensitivity to Static Discharge Yes.

Protective Equipment and Precautions for Firefighters

In the event of fire and/or explosion do not breathe fumes. Use self-contained pressure-demand breathing apparatus if needed to prevent exposure to smoke or airborne toxins.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). During unexpected circumstances and elevated temperatures such as a fire, evacuate personnel to safe areas and use personal protective equipment to prevent exposure to volatiles.
Other information Keep substance wet using water spray.

For emergency responders Use personal protective equipment as required.

Environmental precautions

Should not be released into the environment. 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 Use personal protective equipment. Flush area with flooding quantities of water. Take up mechanically and collect in suitable container for disposal. Clean contaminated surface thoroughly.

SECTION 7. Handling and storage

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Take precautionary measures against static discharges. Remove all sources of ignition. Use according to package label instructions.

Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions Keep at temperatures below 4°C. Stable at recommended temperature for up to 6 months.
Packaging material No information available.
Incompatible products Strong oxidizing agents, strong acids, and strong bases.

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

Process enclosure and/or 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 impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection None required under normal usage. If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. 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	Solid
Appearance	Membrane
Odor	Odorless
Color	White with red dots
Odor Threshold	No information available
pH	No information available
Melting point/freezing point	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.
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	>160 °C
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

Reacts with incompatible materials causing a fire and explosioin hazard.

Chemical stability

Stable under recommended storage conditions. Decomposes violently under high temperature.

Possibility of hazardous reactions

Hazardous reactions Exothermic reaction possible with strong oxidizers.
Hazardous polymerization None under normal processing.

Conditions to Avoid

Heat, flames and sparks. Exposure to UV-rays. Storage near to reactive materials.

Incompatible Materials

Strong oxidizing agents, strong acids, and strong bases.

Hazardous Decomposition Products

Hazardous decomposition products formed under fire conditions: Nitrogen oxides (NOx), Carbon oxides (COx), Aldehydes.

SECTION 11. Toxicological information

Information on likely routes of exposure

Inhalation Not an expected route of exposure.
Eye contact Not an expected route of exposure.
Skin contact No known hazard in contact with skin.
Ingestion No known hazard by swallowing.

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 toxocological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
nitrocellulose, containing a maximum of 12,6 % nitrogen	> 5000 mg/kg (Rat)	-	-

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

Symptoms	No information available.
Sensitization	No information available.
Mutagenic effects	No information available.
Carcinogenicity	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.
Reproductive toxicity	No information available.
STOT - single exposure	No information available.
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.

Persistence and degradability No data is available on the product itself.
Bioaccumulation Not likely to bioaccumulate.
Mobility Is not likely mobile in the environment

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

DOT

UN number	UN3270
UN proper shipping name	Nitrocellulose membrane filters
Transport hazard class(es)	4.1
Packing group	II
Special provisions	43, A1
Emergency response guide number	133

IATA

UN number	UN3270
UN proper shipping name	Nitrocellulose membrane filters
Transport hazard class(es)	4.1
Packing group	II
ERG code	3L

SECTION 15. Regulatory information

North American Inventory Listing

Chemical Name	TSCA 8(b)	TSCA 12(b)	DSL	NDSL
nitrocellulose, containing a maximum of 12,6 % nitrogen	Listed	Not Listed	Listed	Not Listed

Canadian Workplace Hazardous Materials Information System (WHMIS) Classification

	Class B4 - Flammable Solids

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

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	Yes
Sudden Release of Pressure Hazard	No
Reactive Hazard	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
nitrocellulose, containing a maximum of 12,6 % nitrogen	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: 2014-01-31
Revision Date: 2014-10-21
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

Cell Signaling TECHNOLOGY®

SAFETY DATA SHEET (SDS): According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
Issuing Date: 2014-10-27 **Revision Date:** 2015-01-29 **Version:** 1

SECTION 1. Identification

Product identifier

Product number	MTL2800L
Product name	20X Array Wash Buffer

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
Company phone number	978-867-2300
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

Hazards not otherwise classified (HNOC) None

SECTION 3. Composition/information on ingredients

Chemical Name	CAS No	Weight %
Sorbitan monolaurate, ethoxylated	9005-64-5	0.1-1
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.

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	Clear
Odor	No information available
Color	Colorless
Odor Threshold	No information available
pH	7.4 @ 20 °C
Melting point/freezing point	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.

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.

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	Not an expected route of exposure. Aerosol expected to be irritating based on components.
Eye contact	Contact with eyes may cause mild irritation.
Skin contact	May cause slight irritation after prolonged contact with skin.
Ingestion	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 toxocological and physiological properties of this compound is not well defined.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sorbitan monolaurate, ethoxylated	3550 mg/kg (Rat)	> 10000 mg/kg (Rabbit)	> 42000 mg/kg (Rat)
sodium chloride	3000 mg/kg (Rat)	-	-

ATEmix (oral) 17818 mg/kg

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

Symptoms	No information available.
Serious eye damage/eye irritation	Mildly irritating to eyes.
Sensitization	No information available.
Mutagenic effects	No information available.
Carcinogenicity	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.
Reproductive toxicity	No information available.
STOT - single exposure	No information available.
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
sodium chloride	-	LC50 4747 - 7824 mg/L (Oncorhynchus mykiss) 96 h LC50 12946 mg/L (Lepomis macrochirus) 96 h LC50 5560 - 6080 mg/L (Lepomis macrochirus) 96 h LC50 6420 - 6700 mg/L (Pimephales promelas) 96 h LC50 7050 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

Persistence and degradability	No information available.
Bioaccumulation	No information available.
Mobility	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
Sorbitan monolaurate, ethoxylated	Listed	Not Listed	Listed	Not Listed
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

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

SECTION 16. Other information

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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