

#14821 Store at 4°C

PathScan® Cancer Phenotype Antibody Array Kit (Chemiluminescent Readout)

1 Kit (32 multiplexed assays)



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

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

New 04/15

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

Species Cross-Reactivity: H

Description: The PathScan® Cancer Phenotype Antibody Array Kit (Chemiluminescent Readout) uses glass slides as the planar surface and is based upon the sandwich immunoassay principle. The array kit allows for the simultaneous detection of 19 cancer cell associated proteins. Target-specific capture antibodies have been spotted in duplicate onto nitrocellulose-coated glass slides. Each kit contains two slides allowing for the interrogation of 32 different samples and the generation of 608 data points in a single experiment. Cell lysates are incubated on the slide followed by a biotinylated detection antibody cocktail. HRP-linked Streptavidin and LumiGLO® Reagent are then used to visualize the bound detection antibody by chemiluminescence. An image of the slide 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® Cancer Phenotype Antibody Array Kit (Chemiluminescent Readout) detects the target proteins as specified on the Array Target Map. No substantial cross-reactivity has been observed between targets. This kit is optimized for cell lysates diluted to a total protein concentration between 0.2 and 1 mg/ml (see kit protocol). All sandwich assays have been validated for human derived samples. This kit may also detect homologous proteins from other species.

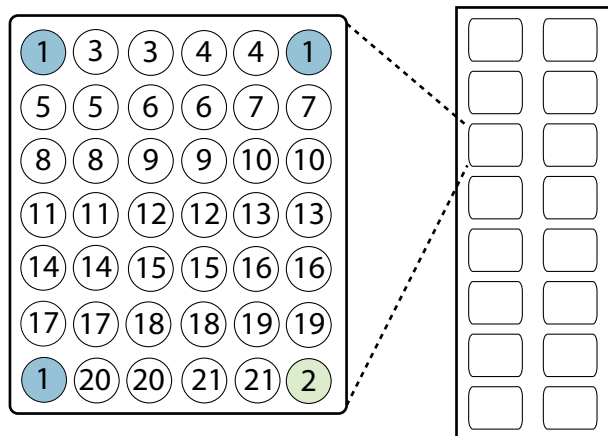


Figure 1. Target Map of the PathScan® Cancer Phenotype Antibody Array Kit (Chemiluminescent Readout) #14821.

| Products Included | Quantity | Cap Color |
|-------------------------------------|-----------|-----------|
| Array Slides | 2 slides | |
| Multi-Well Gasket | 2 gaskets | |
| Sealing Tape | 2 sheets | |
| Chemiluminescent Development Folder | 2 folders | |
| 20X Array Wash Buffer | 15 ml | White |
| Array Blocking Buffer | 5 ml | Red |
| Array Diluent Buffer | 15 ml | Blue |
| 10X Detection Antibody Cocktail | 300 µl | White |
| 10X HRP-linked Streptavidin | 300 µl | Clear |
| 20X LumiGLO® Reagent A #7003 | 5 ml | Brown |
| 20X Peroxide Reagent B #7003 | 5 ml | Clear |
| *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).

Cancer Phenotype

| Target | Site | Modification |
|--------|------------------|----------------------------|
| 1 | Positive Control | N/A |
| 2 | Negative Control | N/A |
| 3 | CD31 (PECAM-1) | Total |
| 4 | EpCAM | Total |
| 5 | Vimentin | Total |
| 6 | CD44 | Total |
| 7 | CD45 | Total |
| 8 | PCNA | Total |
| 9 | Ki-67 | Total |
| 10 | p27 Kip1 | Total |
| 11 | E-Cadherin | Total |
| 12 | N-Cadherin | Total |
| 13 | VE-Cadherin | Total |
| 14 | MUC1 | Total |
| 15 | Rb | Ser807/811 Phosphorylation |
| 16 | HIF-1α | Total |
| 17 | Survivin | Total |
| 18 | p53 | Total |
| 19 | HER2/ErbB2 | Total |
| 20 | Met | Total |
| 21 | EGF Receptor | Total |

LumiGLO is a registered trademark of Kirkegaard & Perry Laboratories.

U.S. Patent No. 5,675,063

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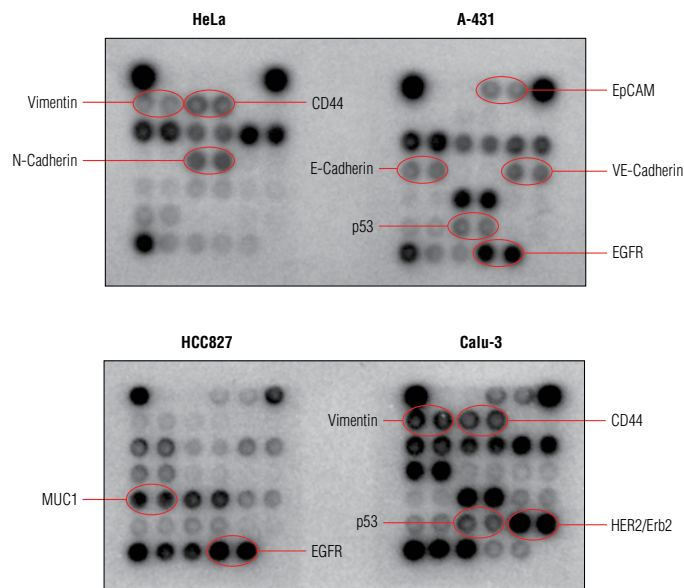


Figure 2. HeLa and A-431 cells (upper), and HCC827 and Calu-3 cells (lower) were grown to 90% confluency. Cell lysates were prepared and analyzed using the PathScan® Cancer Phenotype Antibody Array Kit (Chemiluminescent Readout) #14821. Images were acquired by briefly exposing the slide to standard chemiluminescent film.

Background: Despite shared hallmarks and common overarching principles, cancers are heterogeneous in nature. Widely used tumor-derived cell lines will often exhibit both genetic and proteomic differences relative to one another and to the parent cells or tissue. Factors contributing to these differences include the gradual accumulation of genetic lesions within cell lines, transcriptional networks and epigenetic marks remaining from the original tissue, and various adaptations to *in vitro* growth conditions. Cell lines may differ considerably in the architectural details of basic machineries, the wiring of signal transduction circuitry, and the set points of metabolic pathways. As a result, heterogeneous phenotypes within cell lines will manifest as differences in fundamental cellular functions and a range of behaviors under experimental conditions.

The cell surface represents a compartment where a high level of heterogeneity is displayed. Cancer cells can use the wide array of cell surface proteins to sense, attract, and respond to survival or growth factors in order to promote cancer cell proliferation and tumor growth. These cell surface molecules shield cancer cells from the immune response, help to procure nutrients and create more favorable conditions, and provide a means for the spread and colonization of the cancer cells to other tissues. The presence (or absence) of specific cellular proteins can be regarded as a characteristic phenotypic trait that allows for the classification of cancer cell type and may help predict cellular response to specific experimental conditions both *in vitro* and *in vivo*.

Understanding and modeling tumor cell behavior, sensitivity and resistance to various drugs, identification of oncogene dependencies and network vulnerabilities requires a systems-level measurement of multiple parameters. Therefore, it is important to simultaneously survey both the cell surface as well as key molecules that serve as indicators for cell cycle progression, epithelial to mesenchymal transition, and activation of the hypoxic response program.

Background References:

- (1) Scheel, C. and Weinberg, R.A. (2012) *Semin Cancer Biol* 22, 396-403.
- (2) Hale, J.S. et al. (2012) *Cell Adh Migr* 6, 346-55.
- (3) Varga, J. et al. (2014) *FEBS Lett* 588, 2422-7.
- (4) Zöller, M. (2011) *Nat Rev Cancer* 11, 254-67.
- (5) van Roy, F. (2014) *Nat Rev Cancer* 14, 121-34.
- (6) Schnell, U. et al. (2013) *Biochim Biophys Acta* 1828, 1989-2001.
- (7) Kufe, D.W. (2013) *Oncogene* 32, 1073-81.

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PathScan® Cancer Phenotype Antibody Array Kit (Chemiluminescent Readout)

A Preparing Cell Lysates

1. Thaw 1X Cell Lysis Buffer #7018 and mix thoroughly. Supplement 1X Cell Lysis Buffer with a Protease Inhibitor Cocktail (100X) #5871. Keep lysis buffer on ice.
2. Remove media and wash cells once with ice-cold 1X PBS.
3. Remove PBS and add ice-cold 1X Cell Lysis Buffer. For adherent cells, use 0.5 ml 1X Cell Lysis Buffer #7018 for each plate (10 cm in diameter). Incubate on ice for 2 minutes.
4. Transfer lysates to a microcentrifuge tube and microcentrifuge at maximum speed for 2 minutes at 4°C.
5. Transfer the supernatant to a new tube. The supernatant is the cell lysate and may be used immediately or stored at -80°C in single-use aliquots.
6. Dilute lysates to 0.2 – 1.0 mg/ml in Array Diluent Buffer immediately before performing the assay. Set aside on ice.

B Assay Procedure

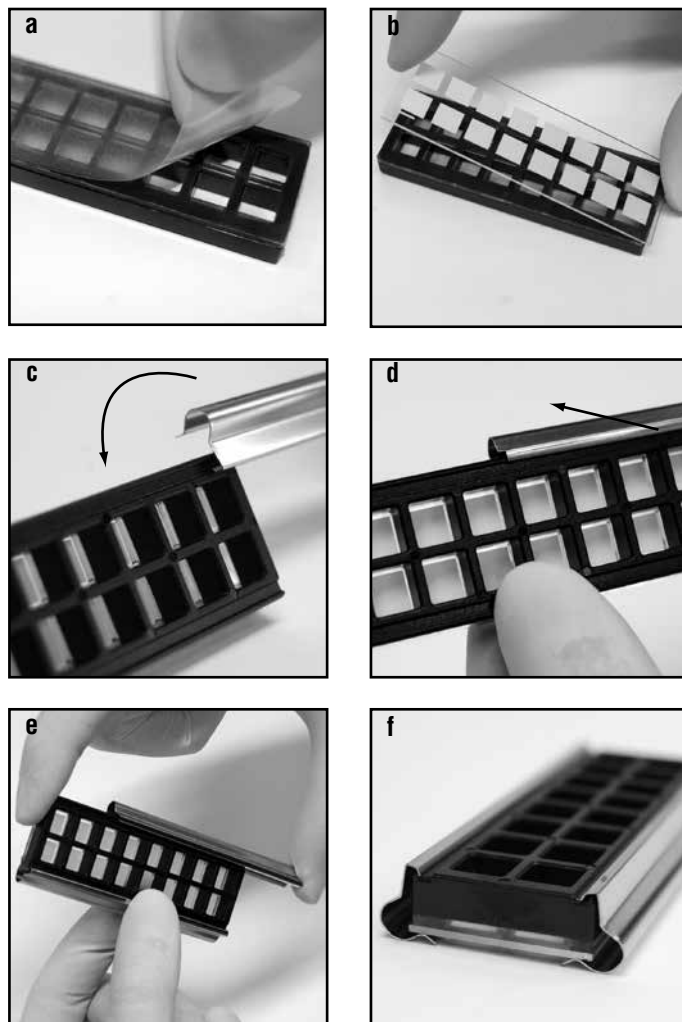
1. Bring glass slides and blocking buffer to room temperature before use.
2. Prepare 1X Array Wash Buffer by diluting 20X Array Wash Buffer in deionized water. Dilute 1 ml of 20X Array Wash Buffer with 19 ml of deionized water. Label as 1X Array Wash Buffer. Keep at room temperature.
3. Prepare 1X Detection Antibody Cocktail as follows:
For running only 1 slide: Dilute 150 µl of 10X Detection Antibody Cocktail with 1350 µl of Array Diluent Buffer.
For running 2 slides: Dilute 300 µl of 10X Detection Antibody Cocktail with 2700 µl of Array Diluent Buffer. Keep on ice.
4. Prepare 1X HRP-linked Streptavidin by diluting 10X HRP-linked Streptavidin in Array Diluent Buffer. Keep on ice.
5. Affix the multi-well gasket to the glass slide (see figure at right):
 - a. Place the multi-well gasket facedown on the bench top (the silicone layer should be facing up). Remove the protective plastic film.
 - b. Carefully place the glass slide on top of the multi-well gasket with the nitrocellulose pads facing down while aligning the pads with the openings in the gasket. The orientation line should appear in the upper left hand corner when the slide is oriented vertically.
 - c. Insert the metal clip into the groove in the gasket and rotate the clip into the locked position. Ensure that the clip is on the same side as the orientation line on the slide.

Note: one of the clips has a small dot etched onto the upper rib to assist with pad designation (see slide assembly photos).

- d. Slide the clip into place.
 - e. Snap the unmarked metal clip to the other side of the assembly in the same manner and slide into place.
 - f. The assembled array is ready to use.
6. Add 100 µl Array Blocking Buffer to each well and cover with sealing tape. Incubate for 15 minutes at room temperature on an orbital shaker.
Note: Do not allow the pads to dry out at any time during the assay.
 7. Decant Array Blocking Buffer by gently flicking out the liquid into a sink or other appropriate waste receptacle. Add 75 µl diluted lysate to each well and cover with sealing tape. Incubate for 2 hours at room temperature (or overnight at 4°C) on an orbital shaker.
 8. Decant well contents by gently flicking out the liquid into a sink or other appropriate waste receptacle. Add 100 µl 1X Array Wash Buffer to each well and incubate for 5 minutes at room temperature on an orbital shaker. Repeat three more times. Decant well contents.
 9. Add 75 µl 1X Detection Antibody Cocktail to each well and cover with sealing tape. Incubate for 1 hour at room temperature on an orbital shaker.
 10. Wash 4 X 5 minutes with 100 µl 1X Array Wash Buffer as in step 8.
 11. Add 75 µl 1X HRP-linked Streptavidin to each well and cover with sealing tape. Incubate for 30 minutes at room temperature on an orbital shaker.
 12. Wash 4 X 5 minutes with 100 µl 1X Array Wash Buffer as in step 8.
 13. Remove multi-well gasket by pulling the bottom of the metal clips away from the center of the slide, then peeling the slide and gasket apart.
 14. Place the slide face up in a plastic dish (a clean pipette tip box cover works well). Wash briefly with 10 ml 1X Array Wash Buffer.

15. Dilute and combine LumiGLO® and Peroxide reagents immediately before use (to make 10 ml of a 1X solution, combine 9 ml deionized water with 0.5 ml of 20X LumiGLO® and 0.5 ml of 20X Peroxide). Note for Kodak® Biomax® film users: This dilution of LumiGLO®/Peroxide may necessitate very short exposure times (2-3 seconds) for some targets. For more convenient exposure times (20-30 seconds) add 20 ml of deionized water to the 10 ml LumiGLO®/Peroxide mix to make a 3 fold more diluted chemiluminescent reagent.
16. Decant Array Wash Buffer and cover slide with LumiGLO®/Peroxide reagent.
17. Transfer slide to sheet protector, ensuring that it is still covered by LumiGLO®/Peroxide reagent (add a small amount on top of the slide).
18. Immediately capture an image of the slide using a digital imaging system capable of detecting chemiluminescent signals. If desired, quantify spot intensities using commercially available array image analysis software. Alternatively, chemiluminescent film may be used. Expose film for 2-30 seconds using even and light pressure on the top of the development cassette (do not fasten the cassette clamps) to avoid squeezing out the LumiGLO®/Peroxide reagent. Develop the film using an automated film developer.
Note: If both slides are being used, it is not recommended to expose them simultaneously in the same development cassette. In this case, leave the second slide in the wash buffer (step 12) while proceeding with steps 13-18 using the first slide. After the first slide is finished, proceed with steps 13-18 using the second slide and freshly diluted LumiGLO®/Peroxide reagent.

LumiGLO® is a registered trademark of Kirkegaard & Perry Laboratories. Kodak® and BioMax® are trademarks of Eastman Kodak Company.



SECTION 1. Identification

Product identifier

Product number 9H990W
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
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.
Hazards not otherwise classified (HNOC) Not applicable.

SECTION 3. Composition/information on ingredients

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

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 procedure

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

| Property | Values | Remarks_Method |
|---|---------------------------|----------------|
| pH | 7.4 | @ 20 °C |
| Melting point/freezing point | | |
| Initial boiling point and boiling range | | |
| 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 | |
| Viscosity | No information available | |
| Viscosity, dynamic | No information available | |
| Explosive properties | No information available | |
| Oxidizing properties | No information available | |
| Other information | | |
| Softening point | No information available | |
| Molecular Weight | No information available | |
| VOC content | No information available | |
| Density | No information available. | |
| Bulk Density VALUE | 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 toxicological and physiological properties of this compound is not well defined.

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**

| | |
|--------------------------------------|---------------------------|
| 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 16. Other information

Issuing Date: 2014-10-27
Revision Date: 2016-01-11
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

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

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.



Safety Data Sheet (SDS) According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
Issuing Date: 2015-12-11 Revision Date: 2015-12-09

Version: 1

SECTION 1. Identification**Product identifier**

| | |
|-----------------------|----------------------|
| Product number | UI3YXO |
| Product name | Array Diluent 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 www.cellsignal.com |
| Website | support@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)

| | |
|--|------------|
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2 |
| Skin sensitization | Category 1 |

GHS Label elements, including precautionary statements

Signal Word
Warning

Hazard statement(s)
Causes skin irritation. Causes serious eye irritation. May cause an allergic skin reaction.

Precautionary Statement(s)

Wash face, hands and any exposed skin thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust/fume/gas/mist/vapors/spray. Contaminated work clothing should not be allowed out of the workplace.

IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash before reuse. If skin irritation or rash occurs. Get medical advice/attention.
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.
Dispose of contents/container to an approved waste disposal plant.

Supplementary Hazard Information

May produce an allergic reaction

Hazards not otherwise classified (HNOC)

Not applicable.

SECTION 3. Composition/information on ingredients

| Chemical Name | CAS No | Weight % |
|--|------------|----------|
| Bovine Serum Albumin | 9048-46-8 | 5 |
| reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) | 55965-84-9 | 0,5 |

SECTION 4. First-aid measures

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Get medical attention if irritation persists.

Skin contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. May cause an allergic skin reaction. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Inhalation IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention immediately if symptoms occur.

Ingestion Clean mouth with water and afterwards drink plenty of water. Do NOT induce vomiting. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

May cause an allergic skin reaction including itching, redness, and rash. Liquid, aerosols and vapors of this product are irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes. Contains an animal derived biological. May produce an allergic reaction in susceptible individuals. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, or flushing.

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.**

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 Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. Physical and chemical properties**Information on basic physical and chemical properties**

| Property | Values | Remarks | Method |
|--|--------------------------|-----------------------|--------------------------|
| Physical state | Liquid | | |
| Appearance | No information available | Color | No information available |
| Odor | No information available | 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 | No information available | | |
| Decomposition temperature | No information available | | |
| Viscosity | No information available | | |
| Viscosity, dynamic | No information available | | |
| Explosive properties | No information available | | |
| Oxidizing properties | No information available | | |
| Other information | | | |
| Softening point | No information available | | |
| Molecular Weight | No information available | | |
| VOC content | No information available | | |
| Density | No information available | | |
| Bulk Density VALUE | No information available | | |

SECTION 10. Stability and reactivity**Reactivity**

No information available.

Chemical stability

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 Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not get in eyes, on skin, or on clothing. Use personal protective equipment. For personal protection see section 8.

Other information No information available.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

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 Soak up with inert absorbent material. 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. Wear personal protective equipment. Refer to Section 8. Prevent contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Do not eat, drink or smoke when using this product.

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. Strong acids. 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

Stable under recommended storage conditions.

Possibility of hazardous reactions

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

Conditions to Avoid

Extremes of temperature and direct sunlight.

Incompatible Materials

Strong oxidizing agents. Strong acids. Strong bases.

Hazardous Decomposition Products

None known based on information supplied.

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

Inhalation May cause irritation of respiratory tract.
Eye contact Expected to be an irritant based on components. Severely irritating to eyes.
Skin contact Expected to be an irritant based on components. Prolonged contact may cause redness and irritation. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.
Ingestion May be 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 |
|--|------------------------------------|-------------|-----------------|
| dipotassium hydrogenorthophosphate | 4900 mg/kg (Rat) | - | - |
| Bovine Serum Albumin | 12,500 mg/kg (Rat) (Intravenous) | - | - |
| reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) | 53 mg/kg (Rat) | - | - |

ATEmix (oral) 4121 mg/kg

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

Symptoms May cause an allergic skin reaction including itching, redness, and rash. Liquid, aerosols and vapors of this product are irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes. Contains an animal derived biological. May produce an allergic reaction in susceptible individuals. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain, or flushing.

Sensitization May cause sensitization by skin contact.
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

94.5% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

| Chemical Name | Toxicity to algae | Toxicity to fish | Toxicity to daphnia and other aquatic invertebrates |
|---|--|--|--|
| reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) | EC50 0.11 - 0.16 mg/L (Pseudokirchneriella subcapitata) 72 h EC50 0.03 - 0.13 mg/L (Pseudokirchneriella subcapitata) 96 h EC50 0.31 mg/L (Anabaena flos-aquae) 120 h | LC50 1.6 mg/L (Oncorhynchus mykiss) 96 h | EC50 0.12 - 0.3 mg/L (Daphnia magna) 48 h EC50 0.71 - 0.99 mg/L (Daphnia magna) 48 h EC50 4.71 mg/L (Daphnia magna) 48 h |

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

| Chemical Name | Octanol-Water Partition Coefficient |
|---|-------------------------------------|
| reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) | -0.71 |

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 |
|---|------------|----------------|--------|------------|
| Bovine Serum Albumin | Listed | Not Listed | Listed | Not Listed |
| reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) | Not Listed | Section 5: 1 % | 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 does not contain any substances regulated under applicable state right-to-know regulations

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

Revision Date: 2015-12-09

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.



Safety Data Sheet (SDS) According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
 Issuing Date: 2016-01-11 Revision Date: 2015-01-09 Version: 2

SECTION 1. Identification

Product identifier

Product number 7003
 Product name 20X LumiGLO® Reagent
 Other means of identification 7003L, 7003P, 7003P2, 7003P3, 7003S

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
 www.cellsignal.com
 Website support@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)

| | |
|-----------------------------------|------------|
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | Category 2 |

GHS Label elements, including precautionary statements



Signal Word
 Warning

Hazard statement(s)
 Causes skin irritation. 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 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

No information available.
Hazards not otherwise classified (HNOC)
 May accelerate skin absorption of other materials. Special attention needed when toxic materials are present in dimethyl sulfoxide because of enhanced skin absorption.
Unknown Acute Toxicity 80% of the mixture consists of ingredient(s) of unknown acute toxicity

SECTION 3. Composition/information on ingredients

| Chemical Name | CAS No | Weight % |
|--------------------|---------|----------|
| dimethyl sulfoxide | 67-68-5 | <=20 |

SECTION 4. First-aid measures

| | |
|---------------------|--|
| Eye contact | Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing. |
| Skin contact | Wash off immediately with plenty of water for at least 15 minutes. If symptoms persist, call a physician. Remove and wash contaminated clothing before re-use. Wash off immediately with plenty of water. Immediate medical attention is not required. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. |
| Inhalation | Move to fresh air. If symptoms persist, call a physician. Immediate medical attention is not required. IF INHALED; Remove to fresh air and keep at rest in a position comfortable for breathing. |
| Ingestion | Immediate medical attention is not required. Rinse mouth. Drink plenty of water. Do NOT induce vomiting. Clean mouth with water. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Consult a physician. 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 | Immediate medical attention is not required. Show this safety data sheet to the doctor in attendance. If symptoms persist, call a physician. |
| Protection of first-aiders | Use personal protective equipment. |

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

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. Face-shield. |
| 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 | When using, do not eat, drink or smoke. Remove and wash contaminated clothing before re-use. 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 | Color | Light yellow |
| Appearance | Clear | Odor Threshold | No information available |
| Odor | No information available | | |
| Property | Values | Remarks | Method |
| pH | No information available | | |
| Melting point/freezing point | | | |
| Initial boiling point and boiling range | | | |
| Flash point | | | |
| Evaporation rate | No information available | | |
| Flammability (solid, gas) | No information available | | |
| Upper flammability limit | | | |
| 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 | | |
| Viscosity | No information available | | |
| Viscosity, dynamic | No information available | | |
| Explosive properties | No information available | | |
| Oxidizing properties | No information available | | |
| Other information | | | |
| Softening point | No information available | | |
| Molecular Weight | No information available | | |
| VOC content | No information available | | |
| Density | No information available. | | |
| Bulk Density VALUE | No information available. | | |

SECTION 10. Stability and reactivity

Reactivity

No information available.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

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 | Use personal protective equipment. Avoid contact with the skin and the eyes. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. |
| Other information | No information available. |

Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas. Do not flush into surface water or sanitary sewer system. 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 | Soak up with inert absorbent material. Pick up and transfer to properly labeled containers. After cleaning, flush away traces with water. Prevent product from entering drains. Dam up. |

SECTION 7. Handling and storage

Precautions for safe handling

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

Conditions for safe storage, including any incompatibilities

| | |
|--|---|
| Technical measures/Storage conditions | Keep container tightly closed. Keep out of the reach of children. Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labeled containers. |
| Packaging material | No information available. |
| Incompatible products | Strong oxidizing agents, Acid chlorides, Acid anhydrides. |

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

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

Conditions to Avoid

No information available.

Incompatible Materials

Strong oxidizing agents, Acid chlorides, Acid anhydrides.

Hazardous Decomposition Products

None known based on information supplied. Thermal decomposition can lead to release of irritating gases and vapors: Carbon oxides (COx), Sulfur oxides.

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. Components of this product may be absorbed into the body through the skin. |
| Ingestion | May be harmful if swallowed. |

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 |
|--------------------|---------------------|---------------------|-----------------|
| dimethyl sulfoxide | 14500 mg/kg (Rat) | 40000 mg/kg (Rat) | - |

Unknown Acute Toxicity 80% of the mixture consists of ingredient(s) of unknown acute toxicity.

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

| | |
|--|--|
| Symptoms | No information available. |
| Skin corrosion/irritation | Irritating to skin. |
| Serious eye damage/eye irritation | 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. |
| Chronic Toxicity | Avoid repeated exposure. |
| Neurological effects | No information available. |
| Aspiration Hazard | No information available. |
| Other information | May accelerate skin absorption of other materials. Special attention needed when toxic materials are present in dimethyl sulfoxide because of enhanced skin absorption. |

SECTION 12. Ecological information

Ecotoxicity

| Chemical Name | Toxicity to algae | Toxicity to fish | Toxicity to daphnia and other aquatic invertebrates |
|--------------------|---|--|---|
| dimethyl sulfoxide | EC50 12350 - 25600 mg/L (Skeletonema costatum) 96 h | LC50 40 g/L (Lepomis macrochirus) 96 h LC50 33 - 37 g/L (Oncorhynchus mykiss) 96 h LC50 34000 mg/L (Pimephales promelas) 96 h LC50 41.7 g/L (Cyprinus carpio) 96 h | EC50 7000 mg/L (Daphnia species) 24 h |

Persistence and degradability No product level data available.
Bioaccumulation Some components of this material are unlikely to bioaccumulate but have not been tested.
Mobility Will likely be mobile in the environment due to its water solubility

| Chemical Name | Octanol-Water Partition Coefficient |
|--------------------|-------------------------------------|
| dimethyl sulfoxide | -2.03 |

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 |
|--------------------|-----------|------------|--------|------------|
| dimethyl sulfoxide | 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

Safety Data Sheet (SDS) According to the OSHA Hazard Communication Standard 29 CFR 1910.1200
 Issuing Date: 2016-01-11 Revision Date: 2016-01-11 Version: 1

SECTION 1. Identification**Product identifier**

Product number 7018
Product name PathScan® Sandwich ELISA Lysis Buffer (1X)
Other means of identification 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
 United States
 TEL: +1 978 867 2300
 FAX: +1 978 867 2400
 www.cellsignal.com
Website
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 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.

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 |
|--------------------|------------|---------------|--------------|
| dimethyl sulfoxide | Listed | Not Listed | Not Listed |

U.S. FIFRA Label Information

This product does not contain any substances regulated as pesticides.

U.S. 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: 2015-01-09
Revision Date: 2015-01-09
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

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.
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 % |
|---|------------|----------|
| polyethylene glycol | 9002-93-1 | 0.5-1.5 |
| p-(1,1,3,3-tetramethylbutyl)phenylether | | |
| tetrasodium pyrophosphate, decahydrate | 13472-36-1 | 0.1-1 |
| sodium fluoride | 7681-49-4 | 0.1-1 |

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 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: Dry chemical, Carbon dioxide (CO₂), 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 | Occupational exposure limit values | | |
|--|------------------------------------|---|---|
| | ACGIH TLV | OSHA PEL | NIOSH REL |
| tetrasodium pyrophosphate, decahydrate | - | - | TWA: 5 mg/m ³ |
| sodium fluoride | TWA: 2.5 mg/m ³ | TWA: 2.5 mg/m ³ TWA dust: 2.5 mg/m ³ | IDLH: 250 mg/m ³ TWA: 2.5 mg/m ³ |
| trisodium tetraoxovanadate | - | - | Ceiling: 0.05 mg/m ³ |

(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.

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

| Chemical Name | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|--|-------------------|----------------------|-----------------|
| polyethylene glycol | 1,800 mg/kg (Rat) | 8,000 mg/kg (Rabbit) | - |
| p-(1,1,3,3-tetramethylbutyl)phenyl ether | - | - | - |
| tetrasodium pyrophosphate, decahydrate | - | - | - |

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.

| Chemical Name | IARC | NTP | OSHA |
|------------------------------|------|-----|------|
| sodium fluoride 7881-49-4 | 2A | - | X |

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.

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 | EC50 272 mg/L (Pseudokirchneriella subcapitata) 96 h EC50 850 mg/L (Desmodesmus subspicatus) 72 h | LC50 180 mg/L (Pimephales promelas) 96 h LC50 38 - 68 mg/L (Oncorhynchus mykiss) 96 h LC50 830 mg/L (Lepomis macrochirus) 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 |

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.
 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.

Hygiene measures

SECTION 9. Physical and chemical properties

Information on basic physical and chemical properties.

| Property | Values | Remarks | Method |
|--|---------------------------|-----------------------|--------------------------|
| Physical state | Liquid | | |
| Appearance | No information available | Color | Clear |
| Odor | No information available | Odor Threshold | No information available |
| pH | 7.5 | | |
| Melting point/freezing point | | | |
| Initial boiling point and boiling range | | | |
| Flash point | | | |
| Evaporation rate | No information available | | |
| Flammability (solid, gas) | No information available | | |
| Upper flammability limit | | | |
| 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 | | |
| Viscosity | No information available | | |
| Viscosity, dynamic | No information available | | |
| Explosive properties | No information available | | |
| Oxidizing properties | No information available | | |
| Other information | No information available | | |
| Softening point | No information available | | |
| Molecular Weight | No information available | | |
| VOC content | No information available | | |
| Density | No information available | | |
| Bulk Density VALUE | 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.

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

Other adverse effects.

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 |
|--|-----------|------------|--------|------------|
| polyethylene glycol | Listed | Not Listed | Listed | Not Listed |
| p-(1,1,3,3-tetramethylbutyl)phenyl ether | - | - | - | - |
| sodium fluoride | Listed | Not Listed | Listed | Not Listed |

Canadian Workplace Hazardous Materials Information System (WHMIS) Classification.

This product does not meet the criteria for classification under the Hazardous Products Act.

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 | CWA - Bioaccumulative Chemicals of Concern (BCCs) |
|-----------------|-----------------------------|------------------------|---------------------------|----------------------------|---|
| sodium fluoride | 1000 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 |
|-----------------|--------------------------|------------------------------------|
| sodium fluoride | 1000 lb | Not Listed |

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

| Chemical Name | New Jersey | Massachusetts | Pennsylvania |
|--|------------|---------------|--------------|
| tetrasodium pyrophosphate, decahydrate | Listed | Listed | Listed |
| sodium fluoride | 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