Okadaic Acid

25 µg

Background: Okadaic acid is an inhibitor of the serine/threonine protein phosphatases PP1 (IC_{50} = 15-20 nM) and PP2A (IC_{50} = 0.1 nM), exhibiting much greater activity towards the latter. PP2A is completely inhibited at 1-2 nM, compared to greater than 1 µM for PP1 (1). This is unlike the protein phosphatase inhibitor Calyculin A, which potently inhibits both PP1 (IC_{50} = 2 nM) and PP2A (IC_{50} = 0.5-1 nM) (2). Okadaic acid does not effectively inhibit PP2C, acid and alkaline phosphatases, nor phosphotyrosine protein phosphatases (2,3). It has shown to inhibit PP2B, but at much higher concentrations than with PP1 and PP2A (3). Okadaic acid has also been described as a non-TPA type potent tumor promoter (4). These tumor-promoting properties and its ability to significantly increase protein phosphorylation make okadaic acid a very useful tool for studying cellular processes that are regulated by reversible phosphorylation of proteins (5).

Molecular Formula: C_{44}H_{68}O_{13}

Molecular Weight: 805.00 g/mol

Solubility: Soluble in DMSO or ethanol.

Purity: >98%

Directions for Use: Okadaic Acid is supplied as a lyophilized powder. For a 1 mM stock, reconstitute the 25 µg in 31.1 µl DMSO. Working concentrations and length of treatments vary depending on the desired effect, but it is typically used at 10-1000 nM for 15-60 min.

Background References:

Storage: Store lyophilized or in solution at -20°C, desiccated. In lyophilized form, the chemical is stable for 24 months. Once in solution, use within 1 week to prevent loss of potency. Aliquot to avoid multiple freeze/thaw cycles.
Section 1: Identification

Product identifier

Product number

UN number

Other means of identification

Recommended use and restrictions on use

Identified uses

Uses avoided against

Manufacturer: Importer: supplier

Manufacturer address

Website

Emergency telephone number

Section 2: Hazard (s) identification

Classification

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

Inhalation

Skin contact

Eye contact

Ingestion

Health hazards: may cause death

Other information

Signal Word

Danger

Section 3: Composition/information on ingredients

No information available.

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

Immediate medical attention is required. Wash off immediately with soap and plenty of water; remove all contaminated clothing and shoes. Remove and wash contaminated clothing, then wash hands before re-use. Keep patient under medical observation. In case of irritation, get medical advice/advice.

Inhalation

Immediate medical attention is required. Remove to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor immediately. In case of respiratory distress, assist patient to breath normally.

Ingestion

Do NOT induce vomiting. Immediately medical attention is required. Never give anything by mouth to an unconscious person. Drink plenty of water. Clean mouth with water. Do NOT induce vomiting without medical advice. Consult a physician.

Section 5: Fire-fighting measures

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.

Section 6: Accident release measures

Methods or materials for containment and cleaning up

Do not flush into surface water or sanitary sewer system.

Methods and materials for personal protection

Use personal protective equipment. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

Section 7: Handling and storage

Precautions for safe handling

Use only in areas provided with appropriate exhaust ventilation. Wear personal protective equipment.

Conditions for safe storage, including any incompatibilities

Storage conditions

Technical measures/Storage conditions

No information available.

Packaging material

No information available.

Incompatible products

None known based on information supplied.

Section 8: Exposure controls/personal protection

Control parameters

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

Appropriate engineered 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 implement engineering controls, frequency/length of work activities and the concentrations of the hazardous substance.

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.

Section 9: Physical and chemical properties

Information on basic physical and chemical properties

Physical state

Solid

Appearance

Crystalline powder

Solubility

No information available.

Vapor pressure

No information available.

Relative density

No information available.

Viscosity

No information available.

Molecular Weight

805.00  g/mol

VOC content

No information available.

Density

No information available.

Solubility in other solvents

Aqueous, wine, food, and water.

Section 10: Stability and reactivity

Stability

Stable under normal handling conditions.

Conditions to avoid

None known based on information supplied.

Incompatible materials

None known based on information supplied.

Hazard statement(s)

Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled. Causes skin irritation. Suspected of causing cancer.

Precautionary Statement(s)

Obey all safety precautions and use safe practices.

Precautionary Statements

Precautionary Statement(s)

Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled. Causes skin irritation. Suspected of causing cancer.
**SECTION 10. Stability and reactivity**

**Reactivity**
No information available.

**Chemical stability**
Stable under recommended storage conditions.

**Possibility of hazardous reactions**
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**: Toxic by inhalation.
- **Eye contact**: There is no data available for this product.
- **Skin contact**: Irritating to skin. Toxic in contact with skin.
- **Ingestion**: Toxic 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 toxocological and physiological properties of this compound is not well defined.

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

**Symptoms**
Common initial symptoms include: nausea, vomiting, abdominal cramps, diarrhea, headache, short-term memory loss, hypertension, visual abnormality, dysarthria, seizures, myoclonus, convulsion, delirium, agitation, coma, mucous, loss of deep pain sensation, impaired peripheral circulation, hyperventilation, pulmonary edema, sensation, hypotension, peripheral vasodilation, tachycardia and pulmonary edema.

**Skin corrosion/irritation**
No information available.

**Sensitization**
No information available.

**Toxicity**
No component of this product present at levels greater than or equal to 0.1% is identifiable as a harmful carcinogen by IARC, ACGIH, NTP, or OSHA. Laboratory experiments on animals have reported the development of tumors.

**Reproductive toxicity**
No information available.

**STOT - single exposure**
No information available.

**STOT - repeated exposure**
Avoid repeated exposure. STOT - single exposure.

**Chronic Toxicity**
Avoid repeated exposure. STOT - single exposure.

**SECTION 12. Ecological information**

**Ecotoxicity**
100% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

**Persistence and degradability**
No information available.

**Bioaccumulation**
No information available.

**Other adverse effects**
No information available.

**SECTION 13. Disposal considerations**

**Waste Disposal Methods**
Should not be released into the environment.

**Disposal considerations**
Do not empty into drains; dispose of the material and its container in a safe way.

**SECTION 14. Transport information**

**DOT**
- **UN number**: UN3462
- **Transport hazard class(es)**
  - 6.1
- **Emergency response guide number**: 103

**IATA**
- **UN number**: UN3462
- **Packing group**: T2
- **Special provisions**: A3, A43

**SECTION 15. Regulatory information**

**Canadian Workplaces Hazardous Materials Information System (WHMIS) Classification**
- **Class D1A**: Very Toxic Materials at >= 1%
- **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 311/321 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 122.43).

**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 302). There may be specific reporting requirements at the local, regional, or state level relating to releases of the material.

**California Proposition 65**
The product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations**
The product does not contain any substances regulated under applicable state right-to-know regulations

**U.S. FIFRA Label Information**
The product does not contain any substances regulated as pesticides.

**US Commerce Department - Export Administration Regulations Information**
The product does not contain any substances regulated under the Chemical Weapons Convention (CWC).

**U.S. Deep Enforcement Administration Information**
The product does not contain any substances regulated under the DEA.

**SECTION 16. Other information**

**Issuing Date**: 2015-04-27
**Revision Date**: 2015-04-28

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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 to the specific material designated and may not be valid for any material used in combination with other materials or in any process, unless specified in the test.