

# Forskolin

✓ 10 mg

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

**Support** ■ 877-678-TECH (8324)  
info@cellsignal.com

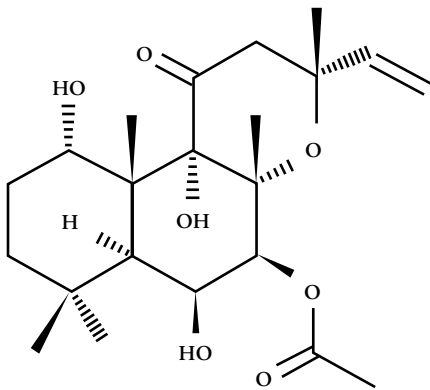
**Web** ■ www.cellsignal.com

rev. 01/14/16

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

**Background:** Forskolin, a naturally occurring diterpene from the Indian plant, *Coleus forskohlii*, activates adenylate cyclase, and thus increases the intracellular cAMP concentration (1). The second messenger cAMP activates cAMP-dependent protein kinase (PKA or cAPK) and controls many cellular mechanisms such as gene transcription, ion transport and protein phosphorylation (2).

**Molecular Formula:** C<sub>22</sub>H<sub>34</sub>O<sub>7</sub>

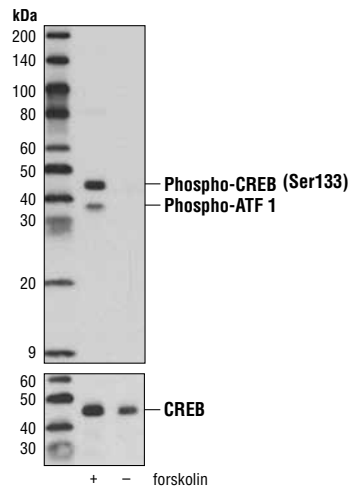


**Molecular Weight:** 410.5 g/mol

**Solubility:** Soluble in DMSO and methanol.

**Purity:** >99%

**Directions for use:** For 30 mM stock, reconstitute 10 mg in 812 µl DMSO.



Western blot analysis of extracts from SH-SY5Y cells, forskolin-treated (30 µM for 20 min.) or untreated, using Phospho-CREB (Ser133) Antibody #9191 (upper) or CREB Antibody #9192 (lower).

**Storage:** Store lyophilized or in solution at -20°C, desiccated. Protect from light. In lyophilized form, the chemical is stable for 24 months. Once in solution, use within 3 months to prevent loss of potency. Aliquot to avoid multiple freeze/thaw cycles.

**Background References:**

- (1) Laurenza, A. et al. (1989) *Trends Pharmacol Sci* 10, 442-7.
- (2) Montminy, M. (1997) *Annu Rev Biochem* 66, 807-22.

### SECTION 1. Identification

**Product identifier**

Product number 3828  
 Product name Forskololn  
 Other means of identification 3828S

**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)

Acute dermal toxicity	Category 4
Reproductive toxicity	Category 2

**GHS Label elements, including precautionary statements**



**Signal Word**  
 Warning

**Hazard statement(s)**  
 Harmful in contact with skin  
 Suspected of damaging fertility or the unborn child

**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**

Do not flush into surface water or sanitary sewer system.

**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. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry. Take up mechanically and collect in suitable container for disposal. Avoid dust formation. Clean contaminated surface thoroughly.

### SECTION 7. Handling and storage

**Precautions for safe handling**

Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Prevent the formation of vapors, mists and aerosols. Do not eat, drink or smoke when using this product.

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

**Technical measures/Storage conditions** Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children.  
**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**

**Precautionary Statement(s)**

Obtain special instructions before use  
 Do not handle until all safety precautions have been read and understood  
 Wear protective gloves/protective clothing/eye protection/face protection  
 IF exposed or concerned: Get medical advice/attention  
 IF ON SKIN: Wash with plenty of soap and water  
 Call a POISON CENTER or doctor/physician if you feel unwell  
 Wash contaminated clothing before reuse  
 Store locked up  
 Dispose of contents/container to an approved waste disposal plant

**Supplementary Hazard Information**

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

### SECTION 3. Composition/information on ingredients

**Formula** C<sub>22</sub>H<sub>35</sub>O<sub>7</sub>  
**Molecular Weight** 410.5 g/mol  
**Chemical nature** Monocoisubstituent substance  
**Synonyms** Colforsin;  
 Forskololn;  
 7B-Acetoxy-8,13-epoxy-1a,6b,9a-trihydroxy-labd-14-en-11-one;  
 1H-Naphthol[2,1-b]pyran-1-one  
 5-(acetyloxy)-3-ethenyldodecathydro-6,10,10b-trihydroxy-3,4a,7,7,10a-pentamethyl-,  
 [3R-(3a,4a,5b,6b,6a,10a,10aB,10bA)]-

Chemical Name	CAS No	Weight %
colforsin	66575-29-9	100

### 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** Consult a physician if necessary. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes.  
**Inhalation** Move to fresh air. Consult a physician. If not breathing, give artificial respiration.  
**Ingestion** Rinse mouth. Drink plenty of water. If symptoms persist, call a physician. Do NOT induce vomiting. Never give anything by mouth to an unconscious person.

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

Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

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

Treat symptomatically.

**Advice for emergency responders**

**General advice** If symptoms persist, call a physician. Show this safety data sheet to the doctor in attendance. Do not breathe dust/fume/gas/mist/vapors/spray.  
**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.

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**

**Physical state** Solid  
**Appearance** Crystalline powder  
**Odor** No information available  
**Color** White  
**Odor Threshold** No information available  
**pH** No information available  
**Melting point/freezing point** 225-235 °C  
**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** Practically insoluble  
**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  
**Molecular Weight** 410.5 g/mol  
**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**

<b>Inhalation</b>	Inhalation of particulates may cause mechanical irritation to upper respiratory tract. May be harmful if inhaled.
<b>Eye contact</b>	Contact with eyes may cause mechanical irritation.
<b>Skin contact</b>	May be harmful in contact with skin.
<b>Ingestion</b>	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
colforsin	2550 mg/kg ( Rat )	-	-

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

<b>Symptoms</b>	Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.
<b>Sensitization</b>	No information available.
<b>Mutagenic effects</b>	No information available.
<b>Carcinogenicity</b>	No component of this product present at levels greater than or equal to 0.1% is identifiable as probable, possible or confirmed carcinogen by IARC, ACGIH, NTP, or OSHA.
<b>Reproductive toxicity</b>	No information available.
<b>Developmental toxicity</b>	Administration of forskolin during early stages of embryogenesis is capable of causing cardiovascular malformations in the chick embryo. Cardiovascular malformations were induced in 51% of embryos treated with forskolin doses larger than $1 \times 10^{-8}$ mol/egg. Major malformations included remnant of the left 4th aortic arch and ventricular septal defect. These results indicate that forskolin induces cardiovascular malformations in the chick embryo and suggest that increased levels of cyclic 3',5'-adenosine monophosphate produced by forskolin may be related to the malformations observed.
<b>STOT - single exposure</b>	No information available.
<b>STOT - repeated exposure</b>	No information available.
<b>Target Organ Effects</b>	Cardiovascular system, Smooth muscle, Reproductive system.
<b>Neurological effects</b>	No information available.
<b>Aspiration Hazard</b>	No information available.

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

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

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

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**

Issuing Date: 2015-01-22

Revision Date: 2015-01-23

**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

**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
colforsin	Not Listed	Not Listed	Not Listed	Not Listed

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

	Class D2A - Very Toxic Material at >= 0.1%
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**SARA 313**

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

**SARA 311/312 Hazard Categories**

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

**Clean Water Act**

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

**CERCLA**