

SAFETY DATA SHEET

Cat# BN00512 Dihydrofolate Reductase Inhibitor Screening Kit (Colorimetric)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Dihydrofolate Reductase Inhibitor Screening Kit (Colorimetric)
PRODUCT CODES: Cat# BN00512
MANUFACTURER: Assay Genie (brand of Reagent Genie Ltd.)
ADDRESS: G1 The Steelworks, Foley Street, Dublin 1
EMERGENCY PHONE: +353 1 8879802

SECTION 2: HAZARDS IDENTIFICATION

Component	Description	Volume	Safety Information
DHFR Assay Buffer	Liquid	25 ml	No hazards
DHFR Substrate	Contains BME	450 µl	See below
Dihydrofolate Reductase (lyophilized)	--	25 µl	No hazards
NADPH	--	1 vial	No hazards
Methotrexate (10 mM)	In DMSO	55 µl	See below

BME:

Emergency Overview

OSHA Hazards:

Target Organs:

GHS Classification:

GHS Label elements, including precautionary statements

Pictogram:



Target Organ Effect

Eyes, Skin

Reproductive toxicity (Category 1B)

Signal word:

Hazard statement(s):

Danger

H301 + H331 Toxic if swallowed or if inhaled

H311: Toxic in contact with skin

H315 Causes skin irritation.

H317 May cause an allergic skin reaction.

H318 Causes serious eye damage.

H373 May cause damage to organs (Liver, Heart) through prolonged or repeated exposure if swallowed.

H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s): P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P262 Do not get in eyes, on skin, or on clothing.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment

P314 Get medical advice/ attention if you feel unwell.

P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention

HMIS Classification

Health hazard: 4

Chronic Health Hazard: *

Flammability: 2

Physical hazards: 0

NFPA Rating

Health hazard: 3

Fire: 2

Reactivity Hazard: 0

Hazards not otherwise classified (HNOC) or not covered by GHS

DMSO:

Emergency Overview

OSHA Hazards: Combustible liquid, Target organ effect

Target Organs: Eyes, Skin

GHS Classification: Flammable liquids (Category 4)

GHS Label elements, including precautionary statements

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Pictogram: none
Signal word: Warning
Hazard statement(s): H227 Combustible liquid
Precautionary statement(s): none

HMIS Classification

Health hazard: 0
Chronic Health Hazard: *
Flammability: 2
Physical hazards: 0

NFPA Rating

Health hazard: 0
Fire: 2
Reactivity Hazard: 0

Potential Health Effects

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.

Skin: May be harmful if absorbed through skin. May cause skin irritation.

Eyes: May cause eye irritation.

Ingestion: May be harmful if swallowed.

Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	EC-No.	Molecular Weight	Chemical Formula
β-mercaptoethanol (BME)	60-24-2	200-464-6	78.13	C ₂ H ₆ OS
DMSO	67-68-5	200-664-3	78.13	C ₂ H ₆ OS

SECTION 4: FIRST AID MEASURES

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact: Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.

If swallowed: DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5: FIRE-FIGHTING MEASURES

BME:

Conditions of flammability: Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

Hazardous combustion products: Hazardous combustion products formed under fire conditions – no data available.

Further information: Use water spray to cool unopened containers.

DMSO:

Suitable extinguishing media: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.

Hazardous combustion products: Hazardous combustion products formed under fire conditions – no data available.

Further information: Use water spray to cool unopened containers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods for cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations. Keep in suitable, closed containers for disposal.

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SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition – no smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature: -20 °C

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

BME:

Components	CAS-No.	Value	Control parameters	Basis
2-Mercaptoethanol	60-24-2	TWA	0.2 ppm	USA. Workplace Environmental Exposure Levels (WEEL)
Remarks:	Skin			

DMSO:

Components	CAS-No.	Value	Control parameters	Basis
Dimethyl sulfoxide	67-68-5	TWA	250 ppm	USA. Workplace Environmental Exposure Levels (WEEL)

Personal protective equipment

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection

Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Property	BME	DMSO
Appearance:	Yellow liquid	Clear liquid
pH:	4.5-6	No data available
Water Solubility:	Soluble	Completely miscible
Other Solubility:	No data available	No data available
Boiling Point (°C):	157 °C (315 °F)	189 °C (372 °F)
Melting Point (°C):	< -50 °C (< -58 °F)	16-19 °C (61-66 °F)
Flash Point (°C):	68 °C (154 °F)	87 °C (189 °F)
Ignition Temperature (°C):	295 °C (563 °F)	301 °C (574 °F)
Density:	1.114 g/ml	1.1 g/ml

SECTION 10: STABILITY AND REACTIVITY

Property	BME	DMSO
Chemical stability:	Stable under recommended storage conditions	
Conditions to avoid:	Heat, flames, and sparks	Heat, Flames, Sparks
Materials to avoid:	Metals, oxidizing agents	Acid chlorides, Phosphorus halides, Strong acids, Strong oxidizing agents, Strong reducing agents

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Hazardous decomposition products:	Carbon oxides, sulfur oxides	Carbon oxides, sulfur oxides
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SECTION 11: TOXICOLOGICAL INFORMATION

BME:

Acute toxicity: LD50 Oral – rat – 98-162 mg/kg

LD50 Inhalation – rat – 4 h – 2 mg/l

LD50 Dermal – rabbit – 112-224 mg/kg

Skin corrosion/irritation: Skin – rabbit – irritating to skin Draize Test

Serious eye damage/eye irritation: Eyes – rabbit – risk of serious damage to eyes

Respiratory or skin sensitization: Maximization Test – guinea pig – OECD Test Guideline 406 – May cause sensitization by skin contact.

Germ cell mutagenicity: Experiments showed mutagenic effects in cultured bacterial cells.

Carcinogenicity:

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available

Teratogenicity: no data available

Specific target organ toxicity – single exposure (GHS): no data available

Specific target organ toxicity – repeated exposure (GHS): no data available

Aspiration hazard: no data available

Potential Health Effects

Inhalation: Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

Skin: May be fatal if absorbed through skin. Causes skin burns.

Eyes: Causes eye burns.

Ingestion: Toxic if swallowed.

Signs and Symptoms of Exposure: Exposure may cause a burning sensation, cough, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, weakness, unconsciousness. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema.

Synergistic effects: no data available

Additional information: RTECS: KL5600000

DMSO:

Acute toxicity: LD50 Oral – rat – 14,500 mg/kg

LC50 Inhalation – rat – 4 h – 40250 ppm

LD50 Dermal – rabbit – >5,000 mg/kg

Skin corrosion/irritation: Skin – rabbit – no skin irritation – 4h

Serious eye damage/eye irritation: Eyes – rabbit – mild eye irritation

Respiratory or skin sensitization: no data available

Germ cell mutagenicity: Genotoxicity in vitro – mouse – lymphocyte: Cytogenetic analysis

Genotoxicity in vitro – mouse – lymphocyte: Mutation in mammalian somatic cells

Genotoxicity in vivo – rat – Intraperitoneal: Cytogenetic analysis

Genotoxicity in vivo – mouse – Intraperitoneal: DNA damage

Carcinogenicity: Carcinogenicity – rat – Oral Tumorigenic: equivocal tumorigenic agent by RTECS criteria. Skin and appendages: other: tumors.

Carcinogenicity – mouse – Oral Tumorigenic: equivocal tumorigenic agent by RTECS criteria. Leukemia skin and appendages: other: tumors.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Reproductive toxicity – rat – Intraperitoneal Effects on fertility: abortion

Reproductive toxicity – rat – Intraperitoneal Effects on fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants)

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Reproductive toxicity – rat – Subcutaneous □ Effects on fertility: post-implantation mortality (e.g. dead and/or resorbed implants per total number of implants). Effects on fertility: litter size (e.g. # fetuses per litter; measured before birth)

Reproductive toxicity – mouse – Oral □ Effects on fertility: post-implantation mortality (e.g. reduction in number of implants per female; total number of implants per corpora lutea). Effects on embryo/fetus: Fetotoxicity (except death, e.g. stunted fetus). Specific developmental abnormalities: musculoskeletal system.

Teratogenicity: Developmental toxicity – mouse – Intraperitoneal: Effects on embryo/fetus: Fetotoxicity (except death, e.g. stunted fetus). Specific developmental abnormalities: musculoskeletal system

Specific target organ toxicity – single exposure (GHS): no data available

Specific target organ toxicity – repeated exposure (GHS): no data available

Aspiration hazard: no data available

Potential Health Effects

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.

Skin: May be harmful if absorbed through skin. May cause skin irritation.

Eyes: May cause eye irritation.

Ingestion: May be harmful if swallowed.

Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body.

Signs and Symptoms of Exposure: Effects due to ingestion may include: nausea, fatigue, and/or headache.

Additional information: RTECS: PV6210000

SECTION 12: ECOLOGICAL INFORMATION

BME:

Persistence and degradability: Biodegradability □ Result: <86% - not readily biodegradable

Result: 6% - not readily biodegradable

Result: aerobic, <10% - not readily biodegradable

Toxicity: Toxicity to fish: LC50 – *Leuciscus idus* (Golden orfe) – 46-100 mg/l – 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50- *Daphnia* – 0.89 mg/l – 48 h; Method: OECD Test Guideline 202

Toxicity to algae: LC50 – Bacteria – 125 mg/l – 17 h

Bioaccumulative potential: Does not accumulate in organisms.

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: Biochemical Oxygen Demand (BOD): 105 mg/g

Chemical Oxygen Demand (COD): 1.894 mg/g

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Very toxic to aquatic life with long lasting effects.

DMSO:

Elimination information (persistence and degradability): no data available

Ecotoxicity effects: Toxicity to fish LC50 - *Pimephales promelas* (fathead minnow) - 34,000 mg/l - 96 h; LC50 - *Oncorhynchus mykiss*

(rainbow trout) - 35,000 mg/l - 96 h; Toxicity to daphnia and other aquatic invertebrates.; EC50 - *Daphnia pulex* (Water flea) - 27,500 mg/l

Toxicity to algae EC50 - *Lepomis macrochirus* (Bluegill) - > 400,000 mg/l - 96 h

Further information on ecology: no data available

SECTION 13: DISPOSAL CONSIDERATIONS

Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

BME:

DOT (US): UN-number: 2966, Class: 6.1, Packing group: II; Proper shipping name: Thioglycol; Marine pollutant: No; Poison Inhalation Hazard: No

IMDG: UN-number: 2966, Class: 6.1, Packing group: II; EMS-No.: F-A, S-A; Proper shipping name: THIOGLYCOL; Marine pollutant: No

IATA: UN-number: 2966, Class: 6.1, Packing group: II; Proper shipping name: Thioglycol; Marine pollutant: No

DMSO:

DOT (US): UN-Number: 1993 Class: CBL Packing group: III; Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide); Marine pollutant: No; Poison Inhalation Hazard: No

IMDG: Not dangerous goods.

IATA: Not dangerous goods.

SECTION 15: REGULATORY INFORMATION

SARA 302 Components: SARA 302: No chemical in this material are subject to the reporting requirements of SARA Title III, Section 302.

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SARA 313 Components: SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title II, Section 313.

SARA 311/312 Hazards: BME: Fire Hazard, Acute Health Hazard

DMSO: Fire Hazard, Chronic Health Hazard

Massachusetts Right To Know Components: 2-Mercaptoethanol, CAS-No. 60-24-2; Revision Date: 1993-04-24

Pennsylvania Right To Know Components: 2-Mercaptoethanol, CAS-No. 60-24-2; Revision Date: 1993-04-24

Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01

New Jersey Right To Know Components: 2-Mercaptoethanol, CAS-No. 60-24-2; Revision Date: 1993-04-24

Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01

California Prop. 65 Components: This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

EU regulations

Component	Risk Phrases	Safety Phrases
BME	R23/24/25, R38, R41, R48/22, R50/53	S24/25, S36/37/39, S46, S57
DMSO	R10, R36/37/38	S24/25, S36/37/39, S45

SECTION 16: OTHER INFORMATION

DISCLAIMER:

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Assay Genie shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.