



MATERIAL SAFETY DATA SHEET

1-IDENTIFICATION OF THE MATERIAL AND SUPPLIER

- ◆ **Product name:** Lullaby® siRNA delivery reagent
- ◆ **Catalog number:** LL70050, LL70500, LL71000, LL73000
- ◆ **Chemical name or synonyms:** none
- ◆ **Contact**

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2-HAZARDS IDENTIFICATION

Emergency Overview:

This material is HAZARDOUS by OSHA Hazard Communication definition. Flammable Liquid. Material can burn with little or no visible flame. May be irritating to the eyes, skin, and respiratory system. May cause central nervous system depression.

OSHA Hazards:

Flammable liquid, Target Organ Effect, Irritant.

Target Organs:

Central nervous system, Heart, Liver

Labelling according Regulation (EC) No 1272/2008

Pictogram:



Signal word:

DANGER!

Hazard statement(s)

H225

Highly flammable liquid and vapor.

H315 + H320

Causes skin and eye irritation

H335

May cause respiratory irritation.

Precautionary statement(s)

P501

Dispose of contents and container to an approved waste disposal plant.

P240

Ground/bond container and receiving equipment.

P337 + P313

If eye irritation persists: Get medical attention.

P305 + P351 + P338 IF IN EYES:

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P303 + P361 + P353 IF ON SKIN (or hair):

Remove immediately all contaminated clothing.

Rinse skin with water.

P370 + P378

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

P210

Keep away from heat, sparks, open flames, and hot surfaces. No smoking.

P233

Keep container tightly closed.

P403 + P235

Store in a well-ventilated place. Keep cool.

P243

Take precautionary measures against static discharge.

P241

Use explosion-proof electrical, ventilating, and lighting equipment.

P242 Use only non-sparking tools.
 P264 Wash hands thoroughly after handling.
 P280 Wear protective gloves and eye and face protection.

GHS Classification(s)

Eye irritation (Category 2B)
 Flammable Liquids (Category 2)
 Skin irritation (Category 2)
 Specific target organ toxicity - single exposure (Category 3)

Other hazards which do not result in classification:

Potential Health Effects:

Organ	Description
Eyes	Causes irritation to the eyes. Can cause painful sensitization to light. Can cause a form of chemical conjunctivitis and cause corneal damage.
Ingestion	Can cause gastrointestinal irritation with nausea, vomiting and diarrhea. Systemic toxicity and acidosis can occur. Advanced stages can lead to respiratory failure, kidney failure, coma, and death.
Inhalation	Causes respiratory tract irritation. Can cause narcotic effects in high concentration. Vapors may cause dizziness or suffocation. Systemic toxicity and acidosis can occur. Advanced stages can lead to respiratory failure, kidney failure, coma, and death.
Skin	Causes moderate skin irritation. Can cause dermatitis by de-fating the skin from prolonged or repeated contact.

3-INFORMATION ON INGREDIENTS

Ingredient name	CAS number	%	EINEC	Classification
Synthetic Material	None	<1%	None	None
Water	7732-18-5	<20%	231-791-2	None
Ethanol	64-17-5	>80%	200-578-6	F; R11 Flam.Liq. 2; H225

4-FIRST AID MEASURES

• **General advice**

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

• **Skin**

Immediately flush affected area with plenty of water while removing contaminated clothing. Wash contaminated clothing before reuse. Contact a doctor. If irritation persists, get medical attention.

• **Inhalation**

Remove person to fresh air. If signs/symptoms continue, get medical attention. Give oxygen or artificial respiration as needed.

• **Eyes**

Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

• **Ingestion**

DO NOT induce vomiting. If vomiting does occur, have victim lean forward to prevent aspiration. Rinse mouth with water. Seek medical attention. Never give anything by mouth to an unconscious individual.

• **Note to Physician**

Symptoms will vary with alcohol level of the blood. Mild alcohol intoxication occurs at blood levels between 0.05-0.15%. Approximately 25% of individuals show signs of intoxication at these levels. Above 0.15% the person is definitely under the influence of ethanol; 50-95% of individuals are clinically intoxicated at these levels. Severe poisoning occurs when the blood is ethanol level is 0.3- 0.5%. Above 0.5% the individual will be comatose and death can occur. The unabsorbed ethanol should be removed by gastric lavage after intubating the patient to prevent aspiration. Avoid the use of depressant drugs and administering excessive amounts of fluids.

5-FIRE FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media:

SMALL FIRE: Use dry chemicals, CO₂, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam. Cool all affected containers with flooding quantities of water.

Specific hazards arising from the chemical (e.g., nature of any hazardous combustion products):

Carbon monoxide is expected to be the primary hazard.

Special protective equipment and precautions for firefighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Keep unopened containers cool by spraying with water.

Unusual Fire and Explosion Hazards:

- May produce a floating fire hazard.
- Static ignition hazard can result from handling and use.
- Vapors may travel to source of ignition and flash back.
- Vapors may settle in low or confined spaces.

Alcohols burn with a pale blue flame which may be extremely hard to see under normal lighting conditions. Personnel may only be able to feel the heat of the fire without seeing flames. Extreme caution must be exercised in fighting alcohol fires. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire.

Flammable Properties:

Classification

OSHA/NFPA Class IB Flammable Liquid.

Flash point

14 °C (57 °F) - closed cup

Autoignition temperature

363 °C (685 °F)

6-ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Do not inhale vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions:

Stop leak. Contain spill if possible and safe to do so. Prevent product from entering drains.

Methods and materials for containment and cleaning up:

Highly flammable liquid. Eliminate all sources of ignition. All equipment used when handling this product must be grounded. A vapor suppressing foam may be used to reduce vapors. Do not touch or walk through spilled material. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations. Use clean non-sparking tools to collect absorbed material.

7-HANDLING AND STORAGE

Precautions for safe handling:

Do not get on skin or in eyes. Do not inhale vapor or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge. Open and handle container with care.

Conditions for safe storage, including any incompatibilities:

Keep container tightly closed in a cool, dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Consult local fire codes for additional storage information.

8-EXPOSURE CONTROLS & PERSONAL PROTECTION

Ventilation Data: Provide adequate general exhaust ventilation.

Respiratory Protection: None required if ventilation is adequate.

Protective Gloves: Rubber or chemical resistant gloves should be worn.

Other Protective Equipment: Safety glasses with side shields are advised. Eye wash stations and deluge showers should also be available. Finally, a lab coat should be worn.

Other Engineering Controls: None

Work Practices: Good laboratory technique should be used when handling this product. Do not pipette with mouth. Observe appropriate chemical hygiene. Avoid contact with skin or eyes

Hygienic Practices: Do not eat, drink or smoke while working with reagents. Upon completion of work activities involving this product, wash any exposed body areas thoroughly with soap and water.

9-PHYSICAL AND CHEMICAL PROPERTIES

Appearance and odor information: Colorless liquid, alcoholic odor.

Boiling point: 78°C

Flash point: 12°C (53.6°F)

Fire promoting: substance does not have any oxidizing properties.

Ignition temperature: 425 °C.

Lower Explosion Limit (% by volume): 3.5%

Upper Explosion Limit (% by volume): 15%

Vapour pressure at 20°C: 57 hPa

Vapour density: N/A

Solubility in water: fully miscible

10-STABILITY & REACTIVITY

Incompatibility (material to avoid): None.

Hazardous Decomposition Products: No dangerous decomposition products known.

Will Hazardous Polymerization Occur: None.

Is the product stable(y; n; n/a; n/i): Yes, under normal handling and storage conditions.

Condition to avoid: Vapour forms explosive mixture with air. Keep away from source of heat or ignition.

11-TOXICOLOGICAL INFORMATION

Ethanol

Oral toxicity:	LD50 rat 7.060 mg / kg
Toxicity (inhalation):	LD50 mouse 19000 ppm (4h)
Toxicity (others):	LD50 intraperitoneal rat 4.070 mg / kg

Irritation:

Eyes (ETHANOL)

Eye exposure to Ethanol generally causes transient pain, irritation, and reflex lid closure. A foreign-body sensation may persist for one to two days. Vapors produce transient stinging and tearing, but no apparent adverse effects. Transiently impaired preception of color may occur with acute ingestion or chronic alcoholism. Standard Draize eye test (rabbit) - Dose: 500 mg Reaction: Severe Dose: 500 mg/24 hrs Reaction: Mild

Respiratory or Skin Sensitization

No data available

Skin

Standard Draize skin test (rabbit) - Dose: 20 mg/24 hrs Reaction: Moderate Repeated exposure may cause skin dryness or cracking.

Reproductive Toxicity

Reproductive toxicity - Human - female - Oral. Effects on Newborns - measured low apgar scores and showed signs of alcohol dependence.

Specific target organ toxicity - single exposure (Globally Harmonized System)

Inhalation - May cause respiratory irritation. – Lungs

Carcinogenicity

IARC: Not classifiable as a human carcinogen.
 ACGIH: Not classifiable as a human carcinogen.
 NTP: Not classifiable as a human carcinogen.
 OSHA: Not classifiable as a human carcinogen.
 Carcinogenicity - Mouse - Oral. Tumorigenic. Tumors found in liver and formation of lymphomas in blood.

Other Hazards

Organ	Description
Eyes	Causes irritation to the eyes. Can cause painful sensitization to light. Can cause a form of chemical conjunctivitis and cause corneal damage
Ingestion	Can cause gastrointestinal irritation with nausea, vomiting and diarrhea. Systemic toxicity and acidosis can occur. Advanced stages can lead to respiratory failure, kidney failure, coma, and death.
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12-ECOLOGICAL INFORMATION

Ecotoxicity (aquatic and terrestrial, where available):

Acute Fish toxicity (ETHANOL)

LC50 / 96 HOUR Oncorhynchus mykiss (rainbow trout) > 10,000 mg/l
 LC50 / 96 HOUR Pimephales promelas (fathead minnow) > 13,400 mg/l

Toxicity to aquatic plants (ETHANOL)

Growth inhibition / 96 HOURS Chlorella vulgaris (Fresh water algae) 1,000 mg/l

Toxicity to microorganisms (ETHANOL)

Toxicity Threshold / Pseudomonas putida 6,500 mg/l
 Summary: Inhibition of cell multiplication begins.

Persistence and degradability:

Biodegradation is expected.

Bioaccumulative potential:

Biaccumulation is unlikely

Other adverse effects:

No data available

13-DISPOSAL CONSIDERATIONS

Waste stream: Not available.

Waste disposal method: Contact a licensed professional waste disposal service to dispose of this material. Dispose in accordance with governmental environmental regulations. Observe all federal, state, and local environmental regulations.

European waste catalogue (EWC): Not available.

Hazardous waste: Will not occur.

14-TRANSPORT INFORMATION

General Information regarding Ethanol:

UN number ADR/RID: 1170 IMDG: 1170 IATA: 1170
 UN proper shipping name ADR/RID: ETHANOL
 IMDG: ETHANOL
 IATA: Ethanol
 Transport hazard class(es) ADR/RID: 3 IMDG: 3 IATA: 3

Packaging group ADR/RID: II IMDG: II IATA: II
Environmental hazards ADR/RID: no IMDG Marine pollutant: no IATA: no
Special precautions for user No data available

Australia Road and Rail

This material is a Class 3 - Flammable Liquid according to The Australian Code for the Transport of Dangerous Goods by Road and Rail. (7th edition) Class 3 - Flammable Liquids are incompatible in a placard load with any of the following: - Class 1, Explosives - Division 2.1, Flammable Gases, (Division 2.1 and Class 3 are incompatible in transport if both are in tanks or other receptacles with a capacity individually exceeding 500 L.) - Division 2.3, Toxic Gases - Division 4.2 Spontaneously Combustible Substances - Division 5.1 Oxidising Agents and Division 5.2, Organic Peroxides - Class 6 Toxic or Infectious Substances (where the flammable liquid is nitromethane) - Class 7 Radioactive Substances.

Maritime Dangerous Goods Code (IMDG Code) for transport by sea. UN No.: 1170 Class: 3 Packaging Group: II EMS No.: F-E, S-D Special Provision: 144

Air Transport (ICAO/IATA): Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air. UN No.: 1170 Class: 3 Packaging Group: II Label: Flammable Liquid Packaging Instructions (passenger & cargo): 353 Packaging Instructions (cargo only): 364 Special Provision: A3, A58, A180 U.N.

15-REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question:

OSHA Hazards

Flammable liquid, Target Organ Effect, Irritant

All ingredients are on the following inventories or are exempted from listing:

Country	Notification
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS/ISHL
Korea	ECL
N-Z	NZIoC
Philippines	PICCS
USA	TSCA

SARA 302 Components

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

SARA 313 Components

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

SARA 311/312 Hazards

Acute Health Hazard
Chronic Health Hazard
Fire Hazard

CERCLA

No chemicals in this material with known CAS numbers are subject to the reporting requirements of CERCLA

Massachusetts Right To Know Components

Ethanol CAS-No.64-17-5 Revision Date 2007-03-01

Pennsylvania Right To Know Components

Ethanol CAS-No.64-17-5 Revision Date 2007-03-01

New Jersey Right To Know Components

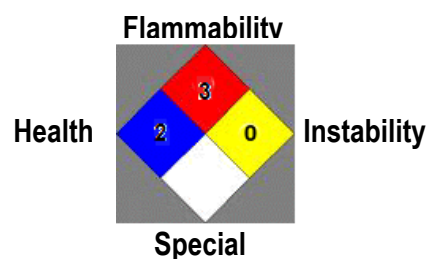
Ethanol CAS-No.64-17-5 Revision Date 2007-03-01

California Prop 65 Components

WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm (ETHYL ALCOHOL) CAS No. 64-17-5 Revision Date: December 11, 2009

◆ **Hazardous Material Information System (U.S.A.):**

Health	2
Fire hazard	3
Reactivity	0
Personal protection	

◆ **National Fire Protection Association (U.S.A.):**

0 = not significant
 1 = slight
 2 = moderate

3 = high
 4 = extreme
 * = chronic

◆ **Revisions:**

Issue Date: 22-May-2014

Last Revision Date: 23-Aug-2016

Revision note: New format. updated Section 2,8,15,16.

The information provided is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. OZ Biosciences shall not be held liable for any damage resulting from handling or from contact with the product. Special permission has been granted in accordance with EU Directive 99/45, Article 10, which permit small packages of less to 125mL containing materials that are highly flammable to be unlabelled with the hazard identification information given in the safety data sheet.