

Murine RNase Inhibitor

Catalog # RNI01-G511

Lot # 1L2208-2

Product Description

Murine RNase inhibitor is a recombinant protein of mouse origin expressed in *E. coli* cells. Murine RNase inhibitor specifically inhibits RNases A, B and C to protect RNA from degradation.

Storage and Stability

Store at -30°C to -15°C. To avoid repeated handling and multiple freeze/thaw cycles aliquot product into smaller quantities.

Scientific Background

RNase inhibitor is a large (~50kDa) protein that forms extremely tight complexes with certain ribonucleases and may play an important role in regulating the lifetime of RNA *in vivo* (1). It has an unusually high cystine content and is thus sensitive to oxidation (2). Murine RNase inhibitor is a mouse sourced recombinant protein expressed in *E. coli*. Mouse sourced RNase inhibitor contains two fewer Cys residues than human RNase inhibitor and is thus less oxidation sensitive. It can inhibit the activity of RNase A, B or C in a non-competitive way to protect RNA from degradation. Murine RNase Inhibitor is thermo-stable and compatible with various commercialized reverse transcriptases and DNA polymerases. Due to its reduced oxidation sensitivity, it is ideal for high-DTT-sensitive experiments like qPCR.

References

1. Shapiro R, et al. Analysis of the interactions of human ribonuclease inhibitor with angiogenin and ribonuclease A by mutagenesis: importance of inhibitor residues inside versus outside the C-terminal "hot spot". *J Mol Biol.* 2000 Sep 15;302(2):497-519. doi: 10.1006/jmbi.2000.4075. PMID: 10970748.
2. Kim BM, et al. Variants of ribonuclease inhibitor that resist oxidation. *Protein Sci.* 1999 Feb;8(2):430-4. doi: 10.1110/ps.8.2.430. PMID: 10048337; PMCID: PMC2144251.

Activity

The activity of Murine RNase Inhibitor was determined to be 40 U/μl, using the unit definition below:

Unit Definition:

One activity unit (U) is defined as the amount of enzyme needed for inhibiting 50% activity of 5 ng RNase A. The activity of RNase A is detected by quantifying the hydrolysis of Cyclic 2', 3'-CMP to 3'-CMP.

This product is manufactured in an ISO 9001 and ISO 13485 certified facility.

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Lot #	1L2208-2
Activity	40 Units/μl
Stability	2yrs from date of shipment at -30°C to -15°C
Storage & Shipping	Store at -30°C to -15°C. Transport at ≤0 °C. To avoid repeated handling and multiple freeze/thaw cycles aliquot product into smaller quantities.

To place your order, please contact us by phone 1-778-326-0223 or 1-888-606-3424 (Toll free) or by email: orders@signalchemdx.com or info@signalchemdx.com - www.signalchemdx.com

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Reverse Transcriptase Reaction Protocol with RNase Inhibitor

1. Gently mix the following components in an RNase-free tube:

Component	20 µl system
5X PureScript Buffer	4 µl
dNTP Mix (10 mM each)	1 µl
Oligo (dT) ₁₈ (50 µM)	1 µl
Murine RNase inhibitor (40 U/µl)	1 µl
PureScript Reverse Transcriptase (200 U/µl)	1 µl
Template RNA	10pg-2.5 µg
RNase-free ddH ₂ O	to 20 µl

2. Incubate at 50°C for 45 min, then at 70°C for 15 min.
3. The products can be stored at -20°C.

Notes

- a. The reaction temperature should be 25°C ~ 55°C.
- b. The RNase Inhibitor will be inactivated at temperature $\geq 65^\circ\text{C}$.
- c. Murine RNase Inhibitor can inhibit RNase activity under a broad spectrum of pH (pH 5.0 - 9.0). The highest inhibitory activity is obtained at pH 7.0 - 8.0.
- d. It can be inactivated by bubbles when pipetting or stirring intensely (i.e. vortexing).
- e. No inhibitory activity for RNase H and RNase T1.

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SAFETY DATA SHEET

Article 1 - Product Identification

Product Name: Murine RNase Inhibitor**Catalog # RNI01-G511**

This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.

Supplier of Datasheet: SignalChem Diagnostics Inc.
Street Address: 190-13160 Vanier Place
City, Prov. Postal Code: Richmond, BC, V6V 2J2
Country: Canada
Emergency Phone: 1-888-606-3424 (Toll free)
1-778-326-0223 (local)

Article 2 - Hazard Identification

- **WHMIS Classification:** Not WHMIS controlled.
- **GHS classification:** Not GHS classified.
- **Hazard Pictograms:** No labelling applicable.
- **Signal words:** None.
- **Hazard statements:** None.
- **Precautionary statements:** Wear protective gloves/protective clothing/eye protection/ face protection. Avoid breathing dust. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- **Other hazards:** May cause eye and skin irritation. May cause respiratory and digestive tract irritation.

Article 3 – Composition/Information on Ingredients

Chemical Characterization: Mixture.

Description: The components of this product which may be hazardous are listed below.

Common name	Chemical name	CAS-No.	Concentration
Glycerol	Glycerol	56-81-5	≤50%

Article 4 – First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** Breath in fresh air. If casualty cannot breathe, give artificial respiration and consult a physician.
- **After skin contact:** Immediately wash with soap and plenty of water and rinse thoroughly. Consult a physician.
- **After eye contact:** Rinse opened eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Consult a physician.
- **After swallowing:** Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

Article 5 - Fire-fighting Measures

- **Suitable extinguishing media:** Use water spray, extinguishing powder, carbon dioxide, or other appropriate measure that is suitable to the environment.
- **Specific hazards arising from the substance or mixture:** None known.
- **Special protective equipment and precautions for fire-fighters:** Self-contained breathing apparatus if necessary.

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Article 6 – Accidental Release Measures

- **Personal precautions, protective equipment, and emergency procedures:** Apply standard laboratory practices and personal protective equipment. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation.
- **Environmental precautions:** Do not allow to enter drains.
- **Methods and materials for containment and cleaning up:** Absorb on sand or vermiculite and place in closed containers for disposal.

Article 7 - Handling and Storage

- **Precautions for safe handling:** Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.
- **Conditions for safe storage:** Store according to product label instructions. Keep container upright and tightly closed.

Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:**

Glycerol (CAS-No: 56-81-5)

Values	Control parameters	Regulations
TWA	10 mg/m ³ for mist	British Columbia, Canada
TWA	3 mg/m ³ for respirable mist	British Columbia, Canada
TWA	10 mg/m ³	Alberta, Canada
TWAEV	10 mg/m ³	Ontario, Canada
TWAEV	10 mg/m ³	Quebec, Canada
TWA	10 mg/m ³	USA

- **Appropriate engineering controls:**
Apply adequate ventilation including mechanical exhaust or laboratory fume hood. Follow standard laboratory practices.
- **Individual protection measures:**
Respiratory protection:
Use appropriate respirator if there is inadequate ventilation by following the government standards.
Hand protection:
Wear gloves and use proper glove removal technique to avoid skin contact. Discard gloves after use by following the applicable laboratory regulations. Wash and dry hands.
Eye/face protection:
Safety goggles with side-shields approved under appropriate government standards.
Skin/body protection:
Use appropriate clothing, footwear and any additional protection measures to protect from splashing or contamination.

Article 9 – Physical and Chemical Properties

Appearance: Colorless liquid.	Danger of explosion: Product does not present an explosion hazard.
Odour/Odour Threshold: Not determined.	Explosion limits: Not available.
pH: ~7.2	Decomposition temperature: Not available.
Melting point/freezing point: Not determined.	Vapor pressure at 20 °C: Not determined
Boiling point/Boiling range: ~106 °C.	Density: ~1.12g/cm ³ .
Flash point: Not determined.	Relative density: Not determined.
Flammability (solid, gaseous): Not determined.	Vapor density: Not determined.
Ignition temperature: Not determined.	Evaporation rate: Not determined.
Auto-igniting: Product is not self-igniting.	Solubility in / Miscibility with Water: Fully miscible.

Article 10 - Stability and Reactivity

- **Reactivity:** Stable under recommended transport and storage conditions.
- **Chemical stability:** Stable under recommended transport and storage conditions.
- **Possible hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** Heat and moisture.
- **Incompatible materials:** Not determined.
- **Hazardous decomposition products:** Not determined.

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Article 11 - Toxicological Information

- **Acute toxicity:** Not available.
- **LD/LC50:** Not available.
- **Skin corrosion/irritation:** Not available.
- **Serious eye damage/eye irritation:** Not available.
- **Respiratory or skin sensitization:** Not available.
- **Germ cell mutagenicity:** Not available.
- **Carcinogenicity:** No components are listed in IARC, or NTP, or OSHA, or ACGIH.
- **Reproductive toxicity:** Not available.
- **Teratogenicity:** Not available.
- **Specific target organ toxicity - single exposure/ - repeated exposure (GHS):** Not available.
- **Aspiration hazard:** Not available.
- **Potential health effects:**
 - Inhalation: No data available
 - Ingestion: No data available
 - Skin: No data available
 - Eyes: No data available
- **Signs and Symptoms of Exposure:** No data available
- **Synergistic effects:** Not available.

Article 12 - Ecological Information

- **Eco-toxicity:** No data available.
- **Biodegradability:** Not applicable.
- **Bio-accumulative potential:** Not applicable.
- **Mobility in soil:** Not applicable.
- **PBT and vPvB assessment:** Not applicable.
- **Other adverse effects:** Not applicable.

Article 13 - Disposal Considerations

- **Disposal methods:** In accordance to applicable national, regional, or local laws and regulations. For additional handling information and protection of employees please refer to Article 7 and 8.
- **Contaminated packaging:** Disposal should be made in accordance to official regulations. Use water or cleansing agents to clean the area.

Article 14 - Transport Information

- **DOT:** Not dangerous goods.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

Article 15 - Regulatory Information

- **WHMIS Classification:** Non-hazardous.
- **GHS label elements:** Not applicable.
- **Signal word:** Not applicable.
- **Hazard statements:** Not applicable.

Article 16 - Other Information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. SignalChem shall not be held liable for any damage resulting from handling or from contact with the above product. See the Technical Specification, Packing Slip, Invoice, and Product Catalog for additional terms and conditions of sale.

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