SIGNALCHEM

Catalog #	Aliquot Size
RNI01-G511-2000	2000 U

Murine RNase Inhibitor

Recombinant protein expressed in *E. Coli*

Catalog # RNI01-G511

Lot # Y4280-16

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.

Formulation

Recombinant protein stored in 20 mM HEPES-KOH pH 7.6, 50 mM KCl, 8 mM DTT, 50% Glycerol

Storage and Stability

Store product at –30°C to –15°C. For optimal performance aliquot product into smaller quantities after centrifugation and store at recommended temperature. Avoid repeated handling and multiple freeze/thaw cycles.

Scientific Background

Murine RNase inhibitor inhibits RNases by binding noncovalently in a 1:1 ratio with high affinity. The inhibitor has been shown to inactivate a variety of RNases that are present in many tissues and cell types. It is not effective against RNase 1, RNase T1, S1 Nuclease, RNase H or RNase from Aspergillus. In addition, no inhibition of polymerase activity is observed when RNase inhibitor is used with Taq DNA polymerase or M-MLV Reverse Transcriptase. Compared with the human origin RNase inhibitor, the Murine RNases inhibitor doesn't contain the two Cys residues that are sensitive to oxidation. Therefore, it has improved resistance to oxidant activity and is more ideal for high-DTT-sensitive experiments (e.g. qPCR).

References

1. Haigis M C, et al: Evolution of ribonuclease inhibitor by exon duplication. Mol Biol Evol. 2002, 19:959-963.
2. Lomax J E, et al: Functional evolution of ribonuclease inhibitor: insights from birds and reptiles. J. Mol Biol. 2014, 126(17): 3041-3056.
3. Dickson K A, et al: Ribonuclease inhibitor: Structure and function. Prog Nucleic Acid Res Mol Biol. 200580:349-374, 2005.

Specific Activity

The specific activity of Murine RNase Inhibitor was determined to be **40 U/µl** as per the activity assay protocol, 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.

Applications for this product include: First strand synthesis of cDNA, polysome isolation, *in vitro* reverse transcription and *in vitro* cell-free translation system.

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

Murine RNase Inhibitor

Recombinant protein expressed in *E. Coli*

Catalog #	RNI01-G511
Specific Activity	40 Units/µl
Lot #	Y4280-16
Concentration	40 Units/µl
Stability	1yr at –30°C~–15°C from date of shipment
Storage & Shipping	Store product at –30°C~–15°C. For optimal performance aliquot product into smaller quantities after centrifugation and store at recommended temperature. Avoid repeated handling and multiple freeze/thaw cycles. Product shipped on ice pack.

To place your order, please contact us by phone 1-(604)-232-4600, fax 1-604-232-4601
or by email: orders@signalchem.com or IVD@signalchem.com - www.signalchem.com

FOR IN VITRO RESEARCH PURPOSES ONLY. NOT INTENDED FOR USE IN HUMAN OR ANIMALS.

Protocol

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
RNase inhibitor (40 U/µl)	1 µl
PureScript Reverse Transcriptase (200U/µl)	1 µl
Template RNA	10pg-2.5 µg
RNase-free ddH_2O	to 20 µl

2. Incubate at 42°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 is 25 ~ 55℃.
b. The RNase Inhibitor will be inactivated at temperature ≥65℃.
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.

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.

Manufacturer's Name:	SignalChem Biotech Inc.
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Article 2 - Hazard Identification

- **WHMIS Classification:** Not WHMIS controlled.
- **GHS classification:** Skin irritation (Category 3); Eye irritation (Category 2B).
- **Hazard Pictograms:** none.
- **Signal words:** Warning.
- **Hazard statements:** Causes mild skin irritation (H316); Causes eye irritation (H320).
- **Precautionary statements:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305 + P351 + P338).
- **Other hazards:** none known.

Article 3 – Composition/Information on Ingredients

Chemical Characterization: Mixture.
Description: This product consists of the substances listed below.

Common name	Chemical name	CAS-No.	Concentration
Glycerol	Glycerol	56-81-5	50%
HEPES	N-(2-Hydroxyethyl)piperazine-N'-(2-ethanesulfonic acid)	7365-45-9	0.4766%
KCl	Potassium Chloride	7447-40-7	0.3728%
DTT	1,4-Dithio-DL-threitol	3483-12-3	0.1234%
Protein	N/A	N/A	Not determined

Article 4 – First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** Breathe in fresh air. If cannot breath, 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. Consult a physician.
- **After swallowing:** rinse the mouth with plenty of water and consult a physician.

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 sate handling:** Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.
- **Conditions for safe storage:** Store in a dry and well-ventilated place in -30 °C~-15 °C. 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/m³ for mist	British Columbia, Canada
TWA	3 mg/m³ for respirable mist	British Columbia, Canada
TWA	10 mg/m³	Alberta, Canada
TWAEV	10 mg/m³	Ontario, Canada
TWAEV	10 mg/m³	Quebec, Canada
TWA	10 mg/m³	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 fluid.	**Danger of explosion:** Product does not present an explosion hazard.
Odour/Odour Threshold: Not determined.	**Explosion limits:** Not determined.
pH: ~7.2	**Decomposition temperature:** Not available.
Melting point/freezing point: Not determined.	**Vapor pressure at 20 °C:** 0.1 hPa
Boiling point/Boiling range: ~106 °C.	**Density:** ~1.12g/cm³.
Flash point: Not determinded.	**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:** Strong acids/bases, strong oxidizing/reducing agents.
- **Hazardous decomposition products:** Carbon oxides may formed under fire conditions; no known decomposition information for other decomposition products.

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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: May be harmful if inhaled. May cause respiratory tract irritation.
  Ingestion: May be harmful if swallowed.
  Skin: May be harmful if absorbed through skin. May cause skin irritation.
  Eyes: May cause eye irritation.
- **Signs and Symptoms of Exposure:** Not 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.