

## TEV Protease, Active

Recombinant Tobacco etch virus protein expressed in *E. coli*

**Catalog # T525-31BH**

Lot # Y4436-12

### Product Description

Recombinant TEV Protease protein (aa 1-237) from Tobacco etch virus was expressed in *E. coli* using a C-terminal His tag. The gene accession number is [M15239](#).

### Alternative name(s)

rTEV, TEV, P1 protease, Tobacco Etch Virus nuclear-inclusion-a endopeptidase. Uniprot accession [Q0GDU8](#).

### Formulation

Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 250mM NaCl, 1mM DTT, 10% glycerol.

### Storage and Stability

Aliquot product into smaller quantities after centrifugation and store at  $-70^{\circ}\text{C}$ . For best performance, avoid repeated handling and multiple freeze/thaw cycles.

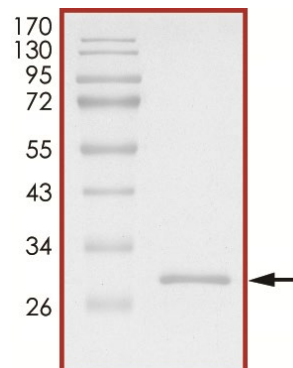
### Scientific Background

TEV Protease is a highly sequence specific cysteine protease originating from the Tobacco Etch Virus (1). The optimum recognition site for this enzyme is the sequence ENLYFQ(G/S) and cleavage occurs between the Gln and Gly/Ser residues (2,3). It is frequently used in affinity purification of proteins to remove affinity tags from recombinant proteins.

### References

- Phan J, Zdanov A, Evdokimov AG, Tropea JE, Peters HK 3rd, Kapust RB, Li M, Wlodawer A, Waugh DS. 2002. Structural basis for the substrate specificity of tobacco etch virus protease. *J Biol Chem.* 27;277(52):50564-72.
- Kostallas G, Löfdahl PÅ, Samuelson P. 2011. Substrate profiling of tobacco etch virus protease using a novel fluorescence-assisted whole-cell assay. *PLoS One.* 6(1):e16136.
- Carrington JC, Dougherty WG. 1988. A viral cleavage site cassette: identification of amino acid sequences required for tobacco etch virus polyprotein processing. *Proc Natl Acad Sci USA.* 85(10):3391-5.

### Purity



The purity of TEV Protease, Active was determined to be **>95%** by densitometry. Observed MW **~28 kDa**. Calculated MW **~28 kDa**

### Specific Activity

The specific activity of TEV Protease was determined to be **10 Units/µl** as per the activity assay protocol, using the Unit Definition below,

#### Unit Definition:

One Unit of TEV protease cleaves >90% of 2µg of control substrate in 30 minutes at  $30^{\circ}\text{C}$ .

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Purity

>95%

Concentration

10 Units/µl

Stability

1yr at  $-70^{\circ}\text{C}$  from date of shipment

Storage & Shipping

Aliquot product into smaller quantities after centrifugation and store at  $-70^{\circ}\text{C}$ . For best performance, avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

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# Activity Assay Protocol

## Reaction Components

### Active TEV Protease (Catalog #: T525-31BH)

Active TEV Protease diluted with TEV Digestion Buffer to a working concentration appropriate to provide 10 U per 100µl reaction.

### 10X TEV Digestion Buffer (User Prepared)

500 mM Tris-HCl, 1.5 M NaCl

### Control Substrate / Target Fusion Protein

KRAS (G12C) protein (Catalog # R06-32DH) was used as the target substrate in the Unit definition of this product

### 100 mM DTT (User Prepared)

## Reaction Protocol

The following conditions may be different for different proteins. Optimize the protocol for each specific protein by adjusting the amount of TEV added, adjusting incubation time, and/or adjusting the incubation temperature of the reaction.

**Step 1.** Optional: dialyze the target fusion protein in 1 x TEV Digestion Buffer prior to digestion.

**Step 2.** In a microfuge tube, add the following reaction components bringing the initial reaction volume up to 100 µl:

<b>Component 1.</b>	20 µg of Target Fusion Protein / Control Substrate
<b>Component 2.</b>	10 µl of 10 x TEV Digestion Buffer
<b>Component 3.</b>	1 µl of 100 mM DTT
<b>Component 4.</b>	10 U of TEV protease
<b>Component 5.</b>	H <sub>2</sub> O to 100 µl

**Step 3.** Incubate reactions at 30°C.

**Step 4.** Take 10 µl aliquots into 10 µl 2X SDS sample after 0.5, 1, 2, and 3 hours.

**Step 5.** Monitor the level of cleavage products at each time point by SDS-PAGE. Run a sample of the undigested Target Fusion Protein as a control.

**Unit Definition:** One Unit corresponds to the amount of TEV protease enzyme required to cleave >90% of 2 µg of control substrate in 30 minutes at 30°C.

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# SAFETY DATA SHEET

## Article 1 – Product Identification

**Product Name: TEV Protease, Active**

**Catalog # T525-31BH**

*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.  
 Street Address: 110-13120 Vanier Place  
 City, Prov. Postal Code: Richmond, BC, V6V 2J2  
 Fax: 604-232-4601  
 EMERGENCY PHONE: 604-232-4600

## 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:** Mixtures.

**Description:** This product consists of the substances listed below.

Common name	Chemical name	CAS-No.	Concentration
Glycerol	Glycerol	56-81-5	10%
Tris-HCl; Tris (hydroxymethyl) aminomethane hydrochloride	2 - Amino - 2 - (hydroxymethyl) propane - 1, 3 - diol hydrochloride	1185-53-1	<0.8%
NaCl	Sodium chloride	7647-14-5	≤1.753%
DTT; Dithiothreitol	(R*,R*)-1,4-Dimercaptobutane-2,3-diol	3483-12-3	0.0154%
Protein	N/A	N/A	≤0.01%

## Article 4 – First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** Breathe in fresh air. If 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. 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 safe 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 -70 °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/m <sup>3</sup> for mist	British Columbia, Canada
TWA	3 mg/m <sup>3</sup> for respirable mist	British Columbia, Canada
TWA	10 mg/m <sup>3</sup>	Alberta, Canada
TWAEV	10 mg/m <sup>3</sup>	Ontario, Canada
TWAEV	10 mg/m <sup>3</sup>	Quebec, Canada
TWA	10 mg/m <sup>3</sup>	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

<b>Appearance:</b> Colorless fluid.	<b>Danger of explosion:</b> Product does not present an explosion hazard.
<b>Odour/Odour Threshold:</b> Not determined.	<b>Explosion limits:</b> Lower: 0.9 Vol %; Upper: 0.0 Vol %.
<b>pH:</b> Not available.	<b>Decomposition temperature:</b> Not available.
<b>Melting point/freezing point:</b> Not determined.	<b>Vapor pressure at 20 °C:</b> 0.1 hPa
<b>Boiling point/Boiling range:</b> 100 °C.	<b>Density:</b> Not determined.
<b>Flash point:</b> > 100 °C.	<b>Relative density:</b> Not determined.
<b>Flammability (solid, gaseous):</b> Not determined.	<b>Vapor density:</b> Not determined.
<b>Ignition temperature:</b> 400 °C.	<b>Evaporation rate:</b> Not determined.
<b>Auto-igniting:</b> Product is not self-igniting.	<b>Solubility in / Miscibility with Water:</b> 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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# SAFETY DATA SHEET

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## Article 11 - Toxicological Information

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- **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:**  
Prolonged or repeated exposure can cause: Nausea, Dizziness.
- **Synergistic effects:** Not available.

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## Article 12 - Ecological Information

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- **Eco-toxicity:** Not applicable.
- **Biodegradability:** Not applicable.
- **Bio-accumulative potential:** Not applicable.
- **Mobility in soil:** Not applicable.
- **PBT and vPvB assessment:** Not applicable.
- **Other adverse effects:** Not applicable.

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## Article 13 - Disposal Considerations

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- **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.

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## Article 14 - Transport Information

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

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## Article 15 - Regulatory Information

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

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## Article 16 - Other Information

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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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