

PRODUCT INFORMATION



SARS-CoV-2 nsp13 Helicase (*E. coli* expressed)

Item No. 30589

Overview and Properties

Synonyms: 2019-nCoV Helicase, COVID-19 Helicase, NSP13, SARS-CoV-2 Helicase, COVID19 Helicase, Severe Acute Respiratory Syndrome Coronavirus 2 nsp13 Helicase

Source: Active recombinant N-terminal His-tagged nsp13 helicase expressed in *E. coli*

Amino Acids: 5,325-5,925

Uniprot No.: P0DTD1

Molecular Weight: 69.1 kDa

Storage: -80°C (as supplied)

Stability: ≥1 year

Purity: *batch specific* (≥80% estimated by SDS-PAGE)

Supplied in: 50 mM Tris-HCl, pH 7.5, with 5 μM zinc chloride, 1 mM DTT, 1 mM EDTA, and 10% glycerol

Endotoxin Testing: <1.0 EU/μg, determined by the LAL endotoxin assay

Protein Concentration: *batch specific* mg/ml

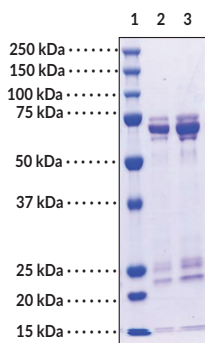
Activity: *batch specific* U/ml

Specific Activity: *batch specific* U/mg

Unit Definition: One unit is defined as the amount of enzyme required to release 1 pmol of fluorescein-labeled ssDNA from a fork DNA substrate containing a quencher on the complementary strand per minute at 25°C under the following conditions: 20 mM HEPES, pH 7.5, 20 mM NaCl, 5% glycerol, 5 mM MgCl₂, 0.01% BSA, 2 mM DTT, 2 μM unlabeled complementary ssDNA, 1 mM ATP, and 200 nM forked DNA substrate.

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

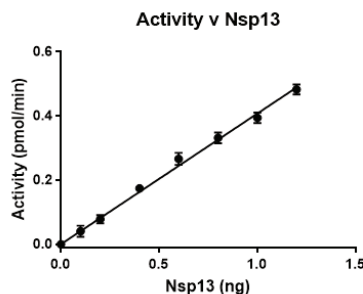
Images



Lane 1: MW Markers
Lane 2: SARS-CoV-2 nsp13 Helicase (2 μM)
Lane 3: SARS-CoV-2 nsp13 Helicase (4 μM)

SDS-PAGE Analysis of SARS-CoV-2 nsp13 Helicase.

Representative gel image shown; actual purity may vary between each batch.



Activity of Nsp13. Nsp13 activity was determined using a fork DNA substrate containing a fluorophore on one strand and a quencher on the complementary strand in a fluorescence-based assay. Separation of the DNA substrate by the active helicase also separates the fluorophore from the quencher, thereby allowing activity to be monitored by measuring increases in fluorescence.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is an enveloped positive-stranded RNA virus and the causative agent of COVID-19, a primarily respiratory illness characterized by fever, cough, and shortness of breath that can lead to life-threatening complications.¹⁻⁵ The SARS-CoV-2 genome contains approximately 30 kilobases and 14 open reading frames (ORFs) that encode four structural proteins: spike, envelope, membrane, and nucleocapsid, as well as 16 non-structural proteins and 9 accessory factors.⁶ SARS-CoV-2 nsp13 helicase is a superfamily 1B helicase and component of replicase polyprotein 1a (PP1a), which is encoded by ORF1a in the viral genome. It is composed of two canonical RecA-like ATPase domains, 1A and 2A, and a zinc-binding domain, stalk region, and 1B domain.^{7,8} SARS-CoV-2 nsp13 functions as both an RNA helicase and a nucleoside triphosphate hydrolase (NTPase), unwinding RNA in an NTP-dependent manner.⁹ It inhibits IFN- β reporter gene activation induced by the RIG-I 2CARD domain in 293FT cells, indicating a role for nsp13 helicase in suppression of the host immune response.¹⁰ Cayman's SARS-CoV-2 nsp13 Helicase (*E. coli* expressed) protein can be used for enzyme assays and Western blot (WB) applications.

References

1. Kandeel, M., Ibrahim, A., Fayez, M., *et al.* From SARS and MERS CoVs to SARS-CoV-2: Moving toward more biased codon usage in viral structural and nonstructural genes. *J. Med. Virol.* **92**(6), 660-666 (2020).
2. Lu, R., Zhao, X., Li, J., *et al.* Genomic characterisation and epidemiology of 2019 novel coronavirus: Implications for virus origins and receptor binding. *Lancet* **395**(10224), 565-574 (2020).
3. Meo, S.A., Alhowikan, A.M., Al-Khlaiwi, T., *et al.* Novel coronavirus 2019-nCoV: Prevalence, biological and clinical characteristics comparison with SARS-CoV and MERS-CoV. *Eur. Rev. Med. Pharmacol. Sci.* **24**(4), 2012-2019 (2020).
4. Klok, F.A., Kruip, M.J.H.A., van der Meer, N.J.M., *et al.* Incidence of thrombotic complications in critically ill ICU patients with COVID-19. *Thromb. Res.* **191**, 145-147 (2020).
5. Yang, F., Shi, S., Zhu, J., *et al.* Analysis of 92 deceased patients with COVID-19. *J. Med. Virol.* (2020).
6. Romano, M., Ruggiero, A., Squeglia, F., *et al.* A structural view of SARS-CoV-2 RNA replication machinery: RNA synthesis, proofreading and final capping. *Cells* **9**(5), 1267 (2020).
7. Chen, J., Malone, B., Llewellyn, E., *et al.* Structural basis for helicase-polymerase coupling in the SARS-CoV-2 replication-transcription complex. *Cell* (2020).
8. Mirza, M.U. and Froeyen, M. Structural elucidation of SARS-CoV-2 vital proteins: Computational methods reveal potential drug candidates against main protease, Nsp12 polymerase and Nsp13 helicase. *J. Pharm. Anal.* (2020).
9. Shu, T., Huang, M., Wu, D., *et al.* SARS-Coronavirus-2 Nsp13 possesses NTPase and RNA helicase activities that can be inhibited by bismuth salts. *Virol. Sin.* **35**(3), 321-329 (2020).
10. Yuen, C.-K., Lam, J.-Y., Wong, W.-M., *et al.* SARS-CoV-2 nsp13, nsp14, nsp15 and orf6 function as potent interferon antagonists. *Emerg. Microbes Infect.* **9**(1), 1418-1428 (2020).

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