

# PRODUCT INFORMATION



## SARS-CoV-2 Envelope Protein (C40A, C43A, C44A mutant; recombinant) Item No. 40875

### Overview and Properties

**Synonyms:** SARS-CoV-2 E Protein, SARS-CoV-2 Envelope Small Membrane Protein, SARS-CoV-2 sM Protein, Severe Acute Respiratory Syndrome Coronavirus 2 Envelope Protein

**Source:** Recombinant SARS-CoV-2 N-terminal His- and MBP-tagged E protein (C40A, C43A, C44A mutant) expressed in *E. coli*

**Amino Acids:** 1-475

**Uniprot No.:** P0DTC4

**Molecular Weight:** 52.2 kDa

**Storage:** -80°C (as supplied)

**Stability:** ≥1 year

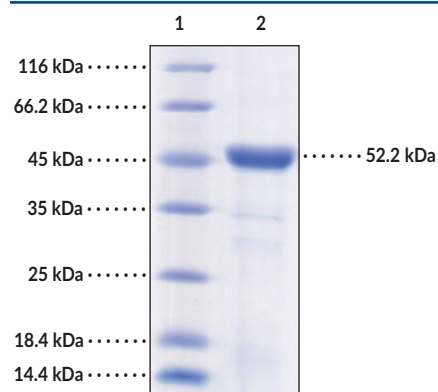
**Purity:** ≥90% estimated by SDS-PAGE

**Supplied in:** Lyophilized from sterile PBS, pH 7.4

**Protein Concentration:** *batch specific* mg/ml

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

### Image



SDS-PAGE of SARS-CoV-2 Envelope Protein (C40A, C43A, C44A mutant; recombinant).

**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.

Copyright Cayman Chemical Company, 05/03/2024

**CAYMAN CHEMICAL**  
1180 EAST ELLSWORTH RD  
ANN ARBOR, MI 48108 · USA  
PHONE: [800] 364-9897  
[734] 971-3335  
FAX: [734] 971-3640  
CUSTSERV@CAYMANCHEM.COM  
WWW.CAYMANCHEM.COM

# PRODUCT INFORMATION



## Description

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is an enveloped positive-stranded RNA virus, a member of the *Betacoronavirus* genus, and the causative agent of COVID-19.<sup>1-3</sup> 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 nine accessory factors.<sup>4</sup> The SARS-CoV-2 envelope protein (E protein) is composed of an N-terminal domain, a transmembrane domain, and a C-terminal domain, which contains three conserved cysteine residues (C40, C43, and C44) that are post-translationally palmitoylated in a similar virus, SARS-CoV.<sup>5-6</sup> It localizes to the Golgi, endoplasmic reticulum (ER), and ER-Golgi intermedium compartment (ERGIC) of SARS-CoV-2 infected cells and homo-oligomerization of the E protein forms a pH-sensitive, cation-selective ion channel, also known as a viroporin.<sup>5,7</sup> It is involved in morphogenesis, viral assembly, and maturation and retention of the spike glycoprotein, also known as surface glycoprotein.<sup>5,8</sup> SARS-CoV-2 E protein is acetylated by the histone acetyltransferase p300, and acetylated SARS-CoV-2 E protein binds to bromodomain-containing protein 4 (BRD4).<sup>9</sup> Intravenous administration of recombinant SARS-CoV-2 E protein induces spleen edema, as well as pulmonary inflammatory cell infiltration, edema, interstitial hyperemia, hemorrhage, and alveolar collapse in mice.<sup>10</sup> Cayman's SARS-CoV-2 Envelope Protein (C40A, C43A, C44A mutant; recombinant) protein consists of 475 amino acids and has a calculated molecular weight of 52.2 kDa.

## 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. 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).
5. Santos-Mendoza, T. The envelope (E) protein of SARS-CoV-2 as a pharmacological target. *Viruses* **15(4)**, 1000 (2023).
6. Liao, Y., Yuan, Q., Torres, J., *et al.* Biochemical and functional characterization of the membrane association and membrane permeabilizing activity of the severe acute respiratory syndrome coronavirus envelope protein. *Virology* **349(2)**, 264-275 (2006).
7. Cabrera-Garcia, D., Bekdash, R., Abbott, G.W., *et al.* The envelope protein of SARS-CoV-2 increases intra-Golgi pH and forms a cation channel that is regulated by pH. *J. Physiol.* **599(11)**, 2851-2868 (2021).
8. Boson, B., Legros, V., Zhou, B., *et al.* The SARS-CoV-2 envelope and membrane proteins modulate maturation and retention of the spike protein, allowing assembly of virus-like particles. *J. Biol. Chem.* **296**, 100111 (2021).
9. Vann, K.R., Acharya, A., Jang, S.M., *et al.* Binding of the SARS-CoV-2 envelope E protein to human BRD4 is essential for infection. *Structure* **30(9)**, 1224-1232 (2022).
10. Xia, B., Shen, X., He, Y., *et al.* SARS-CoV-2 envelope protein causes acute respiratory distress syndrome (ARDS)-like pathological damages and constitutes an antiviral target. *Cell Res.* **31(8)**, 847-860 (2021).

CAYMAN CHEMICAL  
1180 EAST ELLSWORTH RD  
ANN ARBOR, MI 48108 · USA  
PHONE: [800] 364-9897  
[734] 971-3335  
FAX: [734] 971-3640  
CUSTSERV@CAYMANCHEM.COM  
WWW.CAYMANCHEM.COM