Class: E-protein

Attributes:

SARS-CoV specific
Accession #: NP_828854
Synonyms: Orf 4, small envelope protein
Molecular weight: unknown
Number of amino acids: 76
Structure: unknown

Other coronaviruses
Synonyms: small envelope protein
Molecular weight: 9.6 kDa (1)
Number of amino acids: unknown
Structure:
-is an integral membrane protein (2)
-has a short (7 to 9 aa) hydrophilic N-term preceding a large (21-29 aa) hydrophobic region, followed by large hydrophilic C-term making up ½ to 2/3 mass of the molecule (3) {**IBV**}
-N-term is exposed cytoplasmically (4)
-the N-term 2/3 spans the lipid bilayer twice, exposing the C-term region to the cytoplasm (4)
-polypeptide of 83- residues is hydrophobic particularly in the N-term domain (5)
-no classic cleaved signal sequence (5)
Processing:
-does not contain an N-glycosylation motif (1, 5)
-acylated (1) COULD NOT BE CONFIRMED BY (5)
Location:
-cytoplasmic face of the ER or Golgi (interior of virions) (5)
-C-term region is translocated into the lumen of the ER during biogenesis (1)
-the ER retention signal of E protein in IBV is at the C-term extreme 6-residues RDKLYS (6)
Abundance:
-estimate 5-10 molecules per virion (2)

Responsibilities:	**Collaborators:**
Trimerize	E_protein
E protein may provide a temporary anchor to relocate M protein to pre-Golgi	M_protein
E protein may serve to pinch off the virus from the membrane and play a role in the curvature of the viral particle	membrane
Functional consequence unknown	**U274 (SARS-specific) (7)**

1) Yu, X., et al., (1994) Mouse hepatitis virus gene 5b protein is a new virion envelope protein, *Virology*, **202(2),** 1018-23.
2) Vennema, H., et al., (1996) Nucleocapsid-independent assembly of coronavirus-like particles by co- expression of viral envelope protein genes, *EMBO J.*, **15(8),** 2020-2028.
3) Liu, D.X. and Inglis, S.C., (1991) Association of the infectious bronchitis virus 3c protein with the virion envelope, *Virology*, **185(2),** 911-7.
4) Maeda, J., et al., (2001) Membrane topology of coronavirus E protein., *Virology*, **281(2),** 163-9.
5) Raamsman, M.J.B., et al., (2000) Characterization of the Coronavirus Mouse Hepatitis Virus Strain A59 Small Membrane Protein E, *J. Virol.*, **74(5),** 2333-2342.
6) Lim, K.P. and Liu, D.X., (2001) The Missing Link in Coronavirus Assembly. RETENTION OF THE AVIAN CORONAVIRUS INFECTIOUS BRONCHITIS VIRUS ENVELOPE PROTEIN IN THE PRE-GOLGI COMPARTMENTS AND PHYSICAL INTERACTION BETWEEN THE ENVELOPE AND MEMBRANE PROTEINS, *J. Biol. Chem.*, **276(20),** 17515-17523.
7) Tan, Y.J., et al., (2004) A novel severe acute respiratory syndrome coronavirus protein, U274, is transported to the cell surface and undergoes endocytosis, *J Virol*, **78(13),** 6723-34.