hACE2-Fc

Soluble human Angiotensin-Converting Enzyme 2 (ACE2) protein fused to a human IgG1 Fc tag

Catalog code: fc-hace2

https://www.invivogen.com/human-ace2-proteins

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PRODUCT INFORMATION

Contents:
- 50 µg of lyophilized hACE2-Fc protein
- 1.5 ml endotoxin-free water

Protein construction:
Human ACE2 extracellular domain [M1-S740] with a human IgG1 Fc tag in C-terminus

Accession sequence: AAQ89076

Species: Human

Tag: C-terminal human IgG1 Fc

Total protein size: 967 a.a. (secreted form)

Molecular weight: ~130 kDa

Purification: Protein A affinity chromatography

Purity: >95% (SDS-PAGE)

Formulation:
0.2 µm filtered solution in a sodium phosphate buffer with glycine, saccharose, and stabilizing agents

Storage:
- Product is shipped at room temperature. Store lyophilized product at -20 °C. Lyophilized product is stable for at least 1 year.
- Reconstituted protein is stable for 1 month when stored at 4°C and for 1 year when aliquoted and stored at -20 °C. Avoid repeated freeze-thaw cycles.

Quality control:
- The size and purity of the protein has been confirmed by SDS-PAGE.
- hACE2-Fc has been functionally validated by ELISA using a coated Spike-RBD-His fusion protein
- Absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and TLR4 cellular assays.

BACKGROUND

Human ACE2 (angiotensin I-converting enzyme-2) is a type I surface transmembrane protein expressed in arteries, heart, kidneys, and epithelia of the lung and small intestine[1,2]. It plays a critical role in the pathogenesis of the Coronavirus Disease-19 (COVID-19) caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Indeed, hACE2 is now established as being the receptor for the Spike (S) protein of SARS-CoV and SARS-CoV-2, facilitating viral entry into target cells[3-5]. The blockade of ACE2 and the delivery of an excessive soluble form of ACE2 are among the strategies being investigated to treat COVID-19[5,6]. Of note, treatment with a soluble form of ACE2 not only slows viral entry into target cells, but also rescues the endogenous cellular ACE2 activity, protecting the lung from injury[6].

PRODUCT DESCRIPTION

hACE2-Fc is a soluble human ACE2 fusion protein generated by fusing the ACE2 extracellular domain (a.a. 1-740) to a C-terminal human IgG1 Fc tag with a TEV (Tobacco Etch Virus) sequence linker. This fusion protein has a molecular weight of ~130 kDa on a SDS-PAGE gel. hACE2-Fc has been generated by recombinant DNA technology, produced in CHO cells, and purified by protein G affinity chromatography.

APPLICATIONS

- SARS-CoV and SARS-CoV-2 neutralization assays.
- Screening of small molecule inhibitors or of neutralizing antibodies able to block Spike-RBD and ACE2 interaction.

METHODS

hACE2-Fc resuspension (100 µg/ml)

Note: Ensure you see the lyophilized pellet before resuspension.
- Add 500 µl of endotoxin-free water to the vial and gently pipette until completely resuspended.
- Prepare aliquots and store at -20 °C or 4°C.

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PROTEIN SEQUENCE

M S S S S W L L L S L V A V T A A Q S T I E E Q A K T F L D K F N H E
A E D L F Y Q S S L A S W N Y N T N I T E E N V Q N M N N A G D K
W S A F L K E Q S T L A Q M Y P L Q E I Q N L T V K L Q L Q A L Q Q
N G S S V L S E D K S K R L N T I L N T M S T I Y S T G K V C N P D N
P Q E C L L L E P G L N E I M A N S L D Y N E R L W A W E S W R S E
V G K Q L R P L Y E E Y V V L K N E M A R A N H Y E D Y G D Y W R
G D Y E V N G V D G Y D Y S R G Q L I E D V E H T F E E I K P L Y E
H L H A Y V R A K L M N A Y P S Y I S P I G C L P A H L L G D M W G
R F W T N L Y S L T V P F G Q K P N I D V T D A M V D Q A W D A Q
R I F K E A E K F F V S V G L P N M T Q G F W E N S M L T D P G N V
Q K A V C H P T A W D L G K G D F R I L M C T K V T M D D F L T A
H H E M G H I Q Y D M A Y A A Q P F L L R N G A N E G F H E A V G
E I M S L S A A T P K H L K S I G L L S P D F Q E D N E T E I N F L L
K Q A L T I V G T L P F T Y M L E K W R W M V F K G E I P K D Q W
M K K W W E M K R E I V G V V E P V P H D E T Y C D P A S L F H V
S N D Y S F I R Y Y T R T L Y Q F Q F Q E A L C Q A A K H E G P L H
K C D I S N S T E A G Q K L F N M L R L G K S E P W T L A L E N V V
G A K N M N V R P L L N Y F E P L F T W L K D Q N K N S F V G W S
T D W S P Y A D Q S I K V R I S L K S A L G D K A Y E W N D N E M Y
L F R S S V A Y A M R Q Y F L K V K N Q M I L F G E E D V R V A N L
K P R I S F N F F V T A P K N V S D I I P R T E V E K A I R M S R S R I
N D A F R L N D N S L E F L G I Q P T L G P P N Q P P V S R T E N L
Y F Q G S G S E P K S S D K T H T C P P C P A P E A E G G P S V F L
F P P K P K D Q L M I S R T P E V T C V V V D V S H E D P E V K F N
W Y V D G V E V H N A K T K P R E E Q Y N S T Y R V V S V L T V L H
Q D W L N G K E Y K C K V S N K A L P A S I E K T I S K A K G Q P R
E P Q V Y T L P P S R E E M T K N Q V S L T C L V K G F Y P S D I A V
E W E S N G Q P E N N Y K T T P P V L D S D G S F F L Y S K L T V D
K S R W Q Q G N V F S C S V L H E A L H N H Y T Q K S L S L S P G K

Green: signal sequence
Blue: ACE2 sequence
Black: TEV cleavage sequence
Red: Human IgG1 Fc sequence

REFERENCES

1. Li F., 2016. Structure, function, and evolution of coronavirus spike proteins. Annu. Rev. Virol. 3:237-261. **2. Li F. *et al.*, 2005.** Structure of SARS coronavirus spike receptor-binding domain complexed with receptor. Science. 309:1864-1868. **3. Wang N. *et al.*, 2020.** Subunit vaccines against emerging pathogenic human coronaviruses. Front. Microbiol. 11:298. DOI: 10.3389/fmicb.2020.00298. **4. Padron-Regalado E., 2020.** Vaccines for SARS-CoV-2: Lessons from other coronavirus strains. Infect. Dis. Ther. DOI: 10.1007/s40121-020-00300-x. **5. Monteil V. *et al.*, 2020.** Inhibition of SARS-CoV-2 infections in engineered human tissues using clinical-grade soluble human ACE2. Cell. 181:1-9. **6. Zhang *et al.*, 2020.** Angiotensin-converting enzyme 2 (ACE2) as a SARS-CoV-2 receptor: molecular mechanisms and potential target. Intensive Care Medicine. 46(4):586-590.

RELATED PRODUCTS

Product	Catalog Code
Anti-Spike-RBD-hIgG1	srbd-mab1
Anti-Spike-RBD-hIgM	srbd-mab5
Anti-Spike-RBD-hIgA2	srbd-mab6
Spike-RBD-Fc	fc-sars2-srbd
Spike-RBD-His	his-sars2-srbd
Spike-S1-Fc	fc-sars2-s1
Spike-S1-His	his-sars2-s1
pDUO2-hACE2-TMPRSS2a	pduo2-hace2tpsa

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