

Anti-2019-nCoV Spike (P681H) Mutant (9F7E4)

Monoclonal Antibody

Catalog # C19S1-6701M

Lot #: T4394-5

Applications

ELISA, WB (human samples): 1 µg/mL

Anti-2019-nCoV Spike (P681H) Mutant Specific Spike antibody(9F7E4) can specifically detect SARS-CoV-2 Alpha Variant (B.1.1.7, UK) S1 protein, but not SARS-CoV-2 WT Spike S1 protein by ELISA and WB. It can also detect mutant peptide (681H), but not WT peptide (681P). All other applications and species not yet tested.

Specificity

May cross-react with several virus variant lineages containing the P681H mutation, including B.1.1.318, B.1.621, B.1.621.1, P.3. but all of these lineages are rarely present in current pandemic.

Cross Reactivity

Virus

Host/Isotype/Clone#

Mouse, IgG2a, Kappa

Formulation

PBS + 0.02% sodium azide.

Concentration

1mg/mL

Storage and Stability

Stable at 4°C for three months and -20°C for up to one year. As with all antibodies care should be taken to avoid repeated freeze thaw cycles. Antibodies should not be exposed to prolonged high temperatures.

Scientific Background

In September of 2020 a new lineage of SARS-CoV-2, known as B.1.1.7 and named as Alpha variant, was discovered in the United Kingdom. This lineage was found to have developed 14 lineage-specific amino acid replacements and 3 deletions prior to its discovery. The transmission of alpha variant (B.1.1.7 lineage) was increased at least 50%. Increased severity and higher death rate were also found in alpha variant. Alpha variant will not affect the effectiveness of COVID19 vaccine. One of the mutations associated with this lineage is a N501Y in the spike protein of the virus. It is believed that this mutation is able to increase the spike protein's affinity for the host ACE2 receptor and it has been associated with increased infectivity and virulence. B.1.1.7 viruses have also been shown to have a P681H mutation in the cleavage site of spike protein. This location is one of the residues that make up the furin cleavage site between S1 and S2 in spike protein.

References

- 1) Duchene et al. *Virus Evolution* 6(2): veaa061.
- 2) Gu et al. *Science* 369(6511):1603-1607
- 3) Hoffmann et al. *Molecular Cell* 78(4):779-784.e5
- 4) Davies et al. *Science* 372(6538):eabg3055.
- 5) Davies et al. *Nature*. 593(7858):270-274.
- 6) Graham, et al. *The Lancet Public Health*. 6(5): e335-e345.
- 7) Horby et al. *New & Emerging Threats Advisory Group*. 2020;91:264-266.

Sample Data

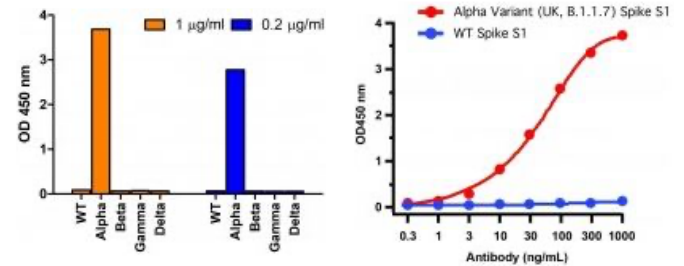


Figure 1. ELISA Validation of P681H Mutant Specific Spike Antibodies with SARS-CoV-2 Alpha Variant Spike S1 Protein. Anti-2019-nCoV Spike P681H mutant specific antibody (9F7E4) can specifically detect UK variant (B.1.1.7) spike S1 protein, but not WT spike S1 protein.

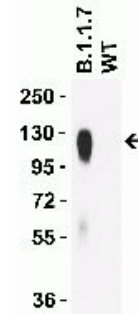


Figure 2. WB Validation of P681H Mutant Specific Spike Antibodies with SARS-CoV-2 Alpha Variant Spike S1 Protein. Anti-2019-nCoV Spike P681H mutant specific antibody (9F7E4) can specifically detect UK variant spike S1 protein, but not WT spike S1 protein (50ng protein per lane).

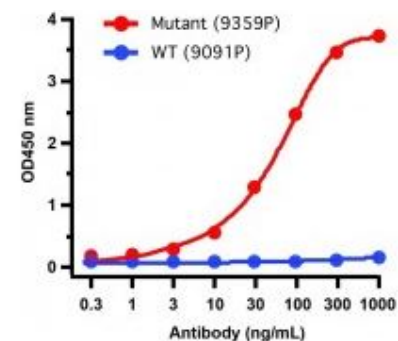


Figure 3. ELISA Validation of P681H Mutant Specific Spike Antibodies with Mutant and WT Peptide. Anti-2019-nCoV Spike P681H mutant specific antibody (9F7E4) can specifically detect UK variant spike S1 peptide (681H), but not WT peptide (681P).

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SAFETY DATA SHEET

Article 1 - Product Identification and Use

Product Name: Anti-2019-nCoV Spike (P681H) Mutant (9F7E4)**Catalog #C19S1-6701M**

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

Emergency Overview: The product contains no substances which at their given concentration, are considered to be hazardous to health.
WHMIS Classification: Not WHMIS controlled
GHS Classification: Not a dangerous substance according to GHS.

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
Sodium Chloride	Sodium Chloride	7647-14-5	0.0162%
Sodium Phosphate, Dibasic	Sodium Phosphate, Dibasic	7782-85-6	0.0029%
Protein	-	-	0.01%
Potassium Phosphate, Monobasic	Potassium Phosphate, Monobasic	7778-77-0	0.00048%
Potassium Chloride	Potassium Chloride	7447-40-7	0.0162%
Sodium azide	Sodium azide	26628-22-8	0.02%

Article 4 - First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** Move to fresh air. If cannot breathe, give artificial respiration and consult a physician.
- **After skin contact:** Remove contaminated clothing. Immediately wash with soap and plenty of water and rinse thoroughly. Wash contaminated clothing before re-use.
- **After eye contact:** Check for and if possible, remove contact lenses. Rinse opened eyes with plenty of water for at least 15 minutes.
- **After swallowing:** If the patient is conscious, 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 -20 °C. Keep container upright and tightly closed.

Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:** N/A
- **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

Appearance: Colorless fluid.	Danger of explosion: Product does not present an explosion hazard.
Odour/Odour Threshold: Not determined.	Explosion limits: Not available.
pH: Not available.	Decomposition temperature: Not available.
Melting point/freezing point: Not determined.	Vapor pressure at 20 °C: Not determined.
Boiling point/Boiling range: Not determined.	Density: Not determined.
Flash point: Not determined.	Relative density: Not determined.
Flammability (solid, gaseous): Not determined.	Vapor density: Not determined.
Ignition temperature: Not determined	Evaporation rate: Not determined.
Auto-igniting: Product is not self-igniting.	Solubility in / Miscibility with Water: 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:** None determined.
- **Incompatible materials:** Avoid contact with metals (aluminum, mercury, copper, lead, zinc) and acids. Do not dispose of Sodium Azide or other chemicals down the drain.
- **Hazardous decomposition products:** May emit toxic fumes under normal fire conditions. Sodium azide can react with heavy metals to form explosive azides.

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Article 11 - Toxicological Information

- **Acute toxicity:** Not available.
- **LD/LC50:** Sodium azide: LD50 Oral: 27mg/kg (rat); LD50 Skin: 20mg/kg (rabbit).
- **Skin corrosion/irritation:** May cause mild irritation. Prolonged and extensive skin contact may result in absorption with systemic symptoms similar to ingestion.
- **Serious eye damage/eye irritation:** May cause irritation.
- **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: Ingestion of sodium azide has been reported to cause shortness of breath, nausea, vomiting, restlessness, diarrhea, lowering of blood pressure (hypotension) and collapse.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.
- **Signs and Symptoms of Exposure:** Not available.
- **Synergistic effects:** Not available.

Article 12 - Ecological Information

- **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.

Article 13 - Disposal Considerations

- **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.

Article 14 - Transport Information

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

Article 15 - Regulatory Information

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

Article 16 - Other Information

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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