



SARS-CoV-2 spike receptor-binding domain for use in COVID-19 assays (2020-301)

Stably transfected mammalian cell lines that express the receptor-binding domain of the SARS-CoV-2 spike protein for use in assays and research relevant to COVID-19 and potential therapies.

IP Status: PCT Application Filed; **Application #:** PCT/US2021/024176

Applications

- Animal immunization: antibody response induction/antibody production
- antigen for ELISA
- antibody screening
- SARS-CoV-2 basic research

Key Benefits & Differentiators

- **Biologically relevant SARS-CoV-2 spike protein:** Protein is correctly folded, has proper glycan post translational modifications and is biologically active (binds human ACE2 with high affinity).
- **Large scale synthesis of pure protein:** Creation of stably transfected cells facilitates high protein expression and the use of a histidine tag facilitates rapid and easy purification.

Role of Spike protein in COVID-19

COVID-19, caused by the SARS-CoV-2 virus, rapidly spread across the globe in 2020 leaving researchers and medical professionals scrambling to learn about this novel disease. The SARS-CoV-2 spike receptor-binding domain (RBD) is the key part of the spike protein that binds to the host receptor angiotensin-converting enzyme 2 (ACE2). This binding is a critical step in infecting human cells. Dr. Fang Li's lab at the University of Minnesota developed a cell line to stably express the spike protein RBD for use in research, assays and therapeutic development for COVID-19.

A reliable source for SARS-CoV-2 Spike protein

Many of the therapies and vaccines being developed for COVID-19 target the SARS-CoV-2 spike protein's RBD and its interaction with ACE2. As the importance of this interaction is emphasized, basic researchers and pharma companies alike need spike protein for use in experimental research, therapeutic development and diagnostic assays. The cell lines developed are stably transfected mammalian cells and allow rapid expression of spike RBD domain of coronavirus with a high yield while still maintaining proper folding and biological activity of the domain (i.e., it binds to human ACE2 with high affinity). The use of histidine tag facilitates quick and easy purification of the protein. The system easily allows us to scale up our production of SARS-CoV-2 RBD for both industrial and commercial uses while maintaining the high quality of the product. This protein is being extensively used in the Minnesota statewide COVID-19 antibody testing.

Phase of Development

TRL: 3-4

Stably transfected HEK293 cells used to isolate SARS-CoV-2 spike-RBD protein with high purity and high

Technology ID

2020-301

Category

Life Sciences/Diagnostics &

Imaging

Life Sciences/Human Health

Life Sciences/Research Tools

COVID-19

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affinity for human ACE2 receptor.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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Researchers

- [Fang Li, PhD](#) Professor, Department of Veterinary and Biomedical Sciences

References

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2. Thomas, Stefani N., Ghaith Altawallbeh, Christopher P. Zaun, Kathryn A. Pape, Jennifer M. Peters, Philip J. Titcombe, Thamotheampillai Dileepan et al. , <https://doi.org/10.1016/j.clinbiochem.2021.01.010>, Clinical biochemistry 90 (2021): 15-22.