Human Monoclonal Antibody Panel for SARS-CoV-2 S1 Protein

Twist anti-SARS-CoV-2 S1 Antibody Panel

Twist Biopharma has developed a panel of antibodies that targets the SARS-CoV-2 Spike Protein (Catalog #102895). Because these antibodies have high affinity to the SARSCoV-2 Spike Protein, they have a potential dual-purpose and could be developed either for virus neutralization or detection in therapeutic and diagnostic applications, respectively.

In response to the COVID-19 pandemic, we have also developed a second panel of human antibodies that targets the extracellular domain (ECD) of the human ACE2 receptor (Catalog #102896). These antibodies have high affinity to the ACE2 receptor indicating that they have the potential to be developed as blocking or competitive antibodies for therapeutic applications.

PRODUCT OVERVIEW

Product Name	Twist anti-SARS-CoV-2 S1 Antibody Panel
Catalog Number	102895
Description	32 Human antibodies that recognize SARS-CoV-2 Spike glycoprotein
Host Species	Human
Species Reactivity	Reacts with Human Coronavirus SARS-CoV-2
Panning Antigen	Recombinant fragment corresponding to Human SARS-CoV-2 S1 glycoprotein
Database Link	MN908947.3

PRODUCT NOTES

Twist Anti-SARS-CoV-2 Spike Glycoprotein Antibody Panel consists of a subset of human antibodies that were developed using Twist Biopharma's variant library generation and screening capabilities. A library was rapidly created on our proprietary silicon-based DNA synthesis platform and then screened for binding to S1 using phage display panning techniques. Candidates were cloned into human antibody IgG backbones to generate IgG1 antibodies for further testing and characterization. All this was accomplished in less than 6 weeks from library design to antibody candidates.

PRODUCT FORMAT

Volume	20 µL/well
Concentration	1 mg/mL
Shipping and Storage	Shipped on dry ice. Store frozen at -20°C upon receipt. Avoid multiple freeze/thaw cycles.
Storage Buffer	43 mM sodium citrate, 130 mM sodium bicarbonate, pH 6
Clonality	Recombinant Monoclonal
Isotype	hIgG1
Purity	>95% by CE-SDS

Data

This collection of 32 new antibodies exhibits very high specificity and affinity to their antigen targets with affinities in the picomolar to nanomolar range. Figure 1 below is an example of SPR affinity data for one of the antibodies in the panel.

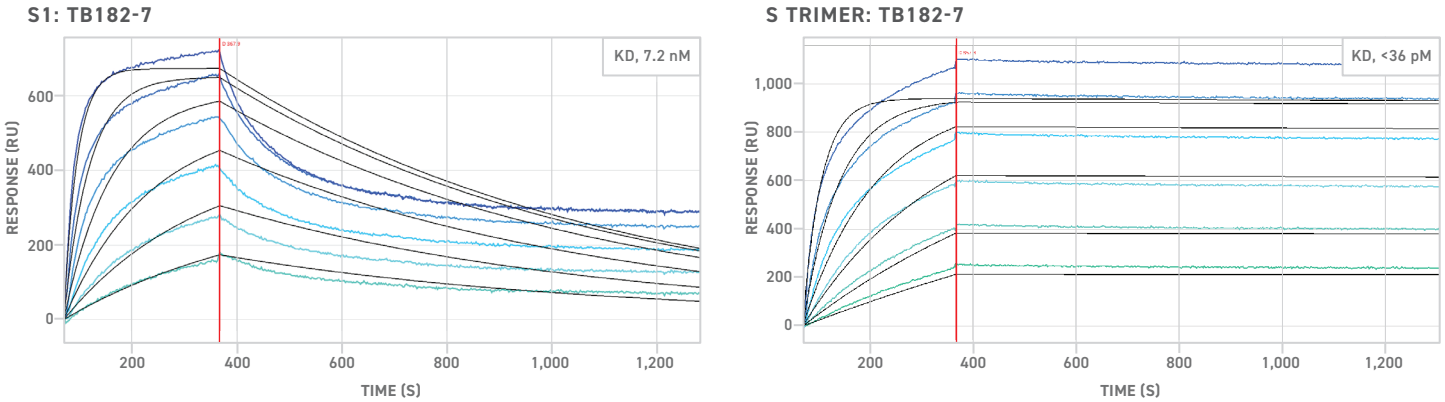

Figure 1: Example of Antibody Binding Kinetics for S1 and S Trimer. Antibody immobilized at 10 ug/ml, 2.3 – 200 nM antigen, S1 or S1 Trimer (ACROBiosystems Cat. No. S1N-S52H5, SPN-C52H8) in HBSTE + 0.5% BSA and run on Carterra® LSA® instrument.

Our panel of antibodies shows varying degrees of specific binding to recombinant S1 protein as shown in Figure 2 and Table 1. Recombinant SARS-CoV-2 S1 protein (ACROBiosystems catalog # S1N-C82E8) was passively immobilized at 1.0 mg/ml, 20 µL per well on 384-well (NUNC® MaxiSorp ELISA plates) overnight at 4°C. Plates were blocked using 100 µL/well (Thermo Fisher Scientific® SuperBlock® T20 TBS, catalog # 37536) for 1 hour at room temperature. The anti-S1 panel of antibodies were normalized in PBS and prepared in a dilution series from 50 nM down to 0.0076 nM and added to the blocked plate, allowed to incubate for 1 hour at room temperature and washed 5X with PBS, 0.05% Tween20. Binding was detected by addition of Peroxidase AffiniPure Goat anti-Human IgG secondary antibody at 1:5,000 dilution, 20 µL/well (Jackson Immuno Research Laboratories catalog # 109-035-098). Wash step (5X) with PBS Tween20 was followed by addition of 30 µL/well HRP substrate (Thermo Fisher Scientific TMB Ultra ELISA catalog # 34029), and 30 µL/well of 1.0 M H3PO4 was added to stop the reaction. Absorbance at 450 nm was measured and plotted as % maximal binding vs. [log] concentration. EC50 was calculated as half-maximal binding using Graphpad Prism® 8 three parameter nonlinear curve fitting software.

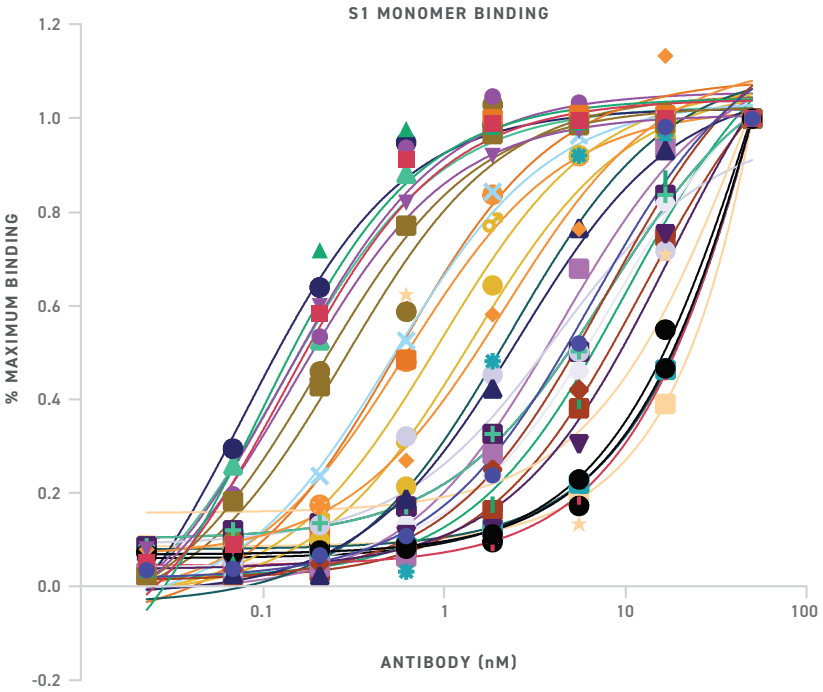

Figure 2: Antibody Panel ELISA Binding Titrations

ANTIBODY	EC50 (nM)
TB182-13	0.08001
TB181-04	0.09604
TB181-03	0.133
TB182-03	0.1332
TB181-06	0.1479
TB181-13	0.2035
TB182-07	0.283
TB181-36	0.523
TB181-42	0.5584
TB182-04	0.612
TB181-47	0.9402
TB181-41	1.409
TB181-08	2.15
TB181-25	2.284
TB181-14	2.559
TB181-39	4.157

ANTIBODY	EC50 (nM)
TB181-40	4.413
TB181-02	6.548
TB181-23	7.833
TB181-28	7.92
TB182-14	7.92
TB181-44	8.669
TB181-53	10.25
TB182-15	12.58
TB181-19	17.5
TB181-27	48.46
TB182-05	63.43
TB181-12	95.66
TB181-48	95.66
TB181-51	98.17
TB182-17	100
TB182-20	100

Table 1: Antibody Panel ELISA Binding Titrations (EC50)

QC and Characterization

Purified antibodies were quantitated by A280 (Big Lunatic, Unchained Labs®) and analyzed for purity by reduced CE-SDS (Perkin Elmer® LabChip® System).

TWIST ANTI-SARS-COV-2 S1 ANTIBODY PANEL PLATE MAP

	1	2	3	4
A	TB181-02	TB181-19	TB181-41	TB182-04
B	TB181-03	TB181-23	TB181-42	TB182-05
C	TB181-04	TB181-25	TB181-44	TB182-07
D	TB181-06	TB181-27	TB181-47	TB182-13
E	TB181-08	TB181-28	TB181-48	TB182-14
F	TB181-12	TB181-36	TB181-51	TB182-15
G	TB181-13	TB181-39	TB181-53	TB182-17
H	TB181-14	TB181-40	TB182-03	TB182-20

Plate Map: indicates the location of each clone and clone names for bulk reorders

Twist anti-SARS-CoV-2 S1 Antibody Panel is a component of the Twist Biopharma portfolio of products. Learn more at **twistbioscience.com/coronavirus-research-tools**

Contact Twist Biopharma at **biopharma@twistbioscience.com** for more information.

ORDERING INFORMATION

102895 Twist anti-SARS-CoV-2 S1 Antibody Panel

102896 Twist Human anti-ACE2 Antibody Panel

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YOUR PARTNER FOR ANTIBODY DISCOVERY AND EARLY DEVELOPMENT

DECREASE RISK | LOWER FAILURE RATE | INCREASE SPEED TO MARKET

Twist Biopharma, a division of Twist Bioscience, is accelerating the way our partners discover and optimize antibody therapeutics with our unique DNA writing technology.

Twist constructs proprietary antibody libraries precisely designed to match sequences that occur in the human body giving our partners an integral and unbiased resource for antibody therapeutic discovery and optimization.

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