

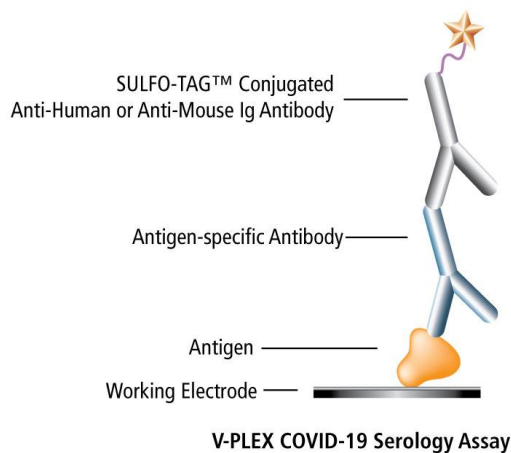


V-PLEX Serology Panels for SARS-CoV-2 Omicron

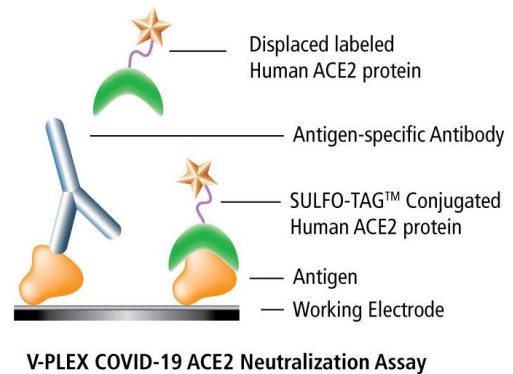
V-PLEX® Serology Panels include multiple screening panels containing RBD and Spike antigens from the Alpha, Beta, Gamma, Delta, and Omicron variants of SARS-CoV-2. These tests supplement MSD's V-PLEX SARS-CoV-2 Panel 2, which was chosen by Operation Warp Speed (OWS) as the basis of its standard binding assays for immunogenicity assessments in all funded Phase III clinical trials of vaccines.

Kits are available for use with human and mouse samples. All human V-PLEX Serology Panels are provided as complete kits, including reference standards and controls. The Reference Standard 1 in human V-PLEX Serology kits is calibrated against the WHO International Standard (NIBSC code: 20/136).

Human kits are available in 96-well format for quantitative serological testing and functional testing (ACE2 blocking). Mouse kits are available in 96-well format for qualitative serological testing.



MSD MULTI-SPOT®
96-Well 10-Spot Plate



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SARS-CoV-2 Spike Antigens

Lineages	Amino Acid Modifications	Common Designation
AY.4.2	T19R, T95I, G142D, Y145H, Δ156/157, R158G, A222V, L452R, T478K, D614G, P681R, D950N	Delta sublineage
BA.1+L452R	A67V, Δ69-70, T95I, G142D/Δ143-145, Δ211/L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N, N440K, L452R, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F	Omicron sublineage
BA.1+R346K; BA.1.1; BA.1.1.15	A67V, Δ69-70, T95I, G142D/Δ143-145, Δ211/L212I, ins214EPE, G339D, R346K, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F	Omicron sublineages
BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12	T19I, (L24-A27)toS, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineages
BA.2+L452M	T19I(L24-A27)toS, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452M, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BA.2+L452R	T19I, (L24-A27)toS, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BA.2.12.1	T19I, (L24-A27)toS, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452Q, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, S704LN764K, D796Y, Q954H, N969K	Omicron sublineage
BA.2.75	T19I, L24-A27>S, G142D, K147E, W152R, F157L, I210V, V213G, G257S, G339H, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BA.2.75.2	T19I, L24-A27>S, G142D, K147E, W152R, F157L, I210V, V213G, G257S, G339H, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, F486S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K, D1199N	Omicron sublineage
BA.3	A67V, H69-V70del, T95I, G142D, V143-Y145del, (N211-L212)tol, G339D, S371F, S373P, S375F, D405N, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BA.4	T19I, (L24-A27)toS, del69/70, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H, D614G, H655Y, N658S, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BA.4.6	V3G, T19I, L24-A27>S, H69-V70del, G142D, V213G, G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H, D614G, H655Y, N658S, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BA.5	T19I, (L24-A27)toS, del69/70, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BF.7	T19I, L24-A27>S, H69-V70del, G142D, V213G, G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BN.1	T19I, L24-A27>S, G142D, K147E, W152R, F157L, I210V, V213G, G257S, G339H, R346T, K356T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BQ.1	T19I, L24-A27>S, H69-V70del, G142D, V213G, G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, K444T, L452R, N460K, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
BQ.1.1	T19I, L24-A27>S, H69-V70del, G142D, V213G, G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, K444T, L452R, N460K, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
B.1.1.529; BA.1; BA.1.15	A67V, ΔH69-V70, T95I, G142D, Δ143-145, Δ211/L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F	Omicron sublineages
B.1.1.7	ΔH69-V70, ΔY144, N501Y, A570D, D614G, P681H, T716I, S982A, D1118H	Alpha
B.1.351	L18F, D80A, D215G, Δ242-244, R246I, K417N, E484K, N501Y, D614G, A701V	Beta
B.1.617.2; AY.3; AY.5; AY.6; AY.7; AY.14	(Alt Seq 1): T19R, G142D, Δ156/157, R158G, L452R, T478K, D614G, P681R, D950N	Delta sublineages



Lineages	Amino Acid Modifications	Common Designation
B.1.617.2; AY.4	(Alt Seq 2): T19R, T95I, G142D, Δ156/157, R158G, L452R, T478K, D614G, P681R, D950N	Delta sublineages
B.1.640.2	P9L, E96Q, C136-Y144del, R190S, D215H, R346S, N394S, Y449N, E484K, F490S, N501Y, D614G, P681H, T859N, D1139H	France (IHU)
EG.5.1	T19I, L24-A27>S, Q52H, G142D, Y144del, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, F456L, N460K, S477N, T478K, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
FL.1.5.1	T19I, L24-A27>S, G142D, Y144del, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, F456L, N460K, S477N, T478R, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, A701V, N764K, D796Y, Q954H, N969K	Omicron sublineage
HV.1	T19I, L24-A27>S, Q52H, V83A, G142D, Y144del, H146Q, F157L, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, L452R, F456L, N460K, S477N, T478K, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
JD.1.1	T19I, L24-A27>S, V83A, G142D, Y144del, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, L455F, F456L, N460K, A475V, S477N, T478K, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
JN.1	T19I, R21T, L24-A27>S, S50L, H69del, V70del, V127F, G142D, Y144del, F157S, R158G, N211del, L212I, V213G, L216F, H245N, A264D, I332V, G339H, K356T, S371F, S373P, S375F, T376A, R403K, D405N, R408S, K417N, N440K, V445H, G446S, N450D, L452W, L455S, N460K, S477N, T478K, N481K, V483del, E484K, F486P, Q498R, N501Y, Y505H, E554K, A570V, D614G, P621S, H655Y, N679K, P681R, N764K, D796Y, S939F, Q954H, N969K, P1143L	Omicron sublineage
JN.1 (v2)	ins16MPLF, T19I, R21T, L24-A27>S, S50L, H69del, V70del, V127F, G142D, Y144del, F157S, R158G, N211del, L212I, V213G, L216F, H245N, A264D, I332V, G339H, K356T, S371F, S373P, S375F, T376A, R403K, D405N, R408S, K417N, N440K, V445H, G446S, N450D, L452W, L455S, N460K, S477N, T478K, N481K, V483del, E484K, F486P, Q498R, N501Y, Y505H, E554K, A570V, D614G, P621S, H655Y, N679K, P681R, N764K, D796Y, S939F, Q954H, N969K, P1143L	Omicron sublineage
KP.2	ins16MPLF, T19I, R21T, L24-A27>S, S50L, H69del, V70del, V127F, G142D, Y144del, F157S, R158G, N211del, L212I, V213G, L216F, H245N, A264D, I332V, G339H, R346T, K356T, S371F, S373P, S375F, T376A, R403K, D405N, R408S, K417N, N440K, V445H, G446S, N450D, L452W, L455S, F456L, N460K, S477N, T478K, N481K, V483del, E484K, F486P, Q498R, N501Y, Y505H, E554K, A570V, D614G, P621S, H655Y, N679K, P681R, N764K, D796Y, S939F, Q954H, N969K, V1104L, P1143L	Omicron sublineage
KP.3	ins16MPLF, T19I, R21T, L24-A27>S, S50L, H69del, V70del, V127F, G142D, Y144del, F157S, R158G, N211del, L212I, V213G, L216F, H245N, A264D, I332V, G339H, K356T, S371F, S373P, S375F, T376A, R403K, D405N, R408S, K417N, N440K, V445H, G446S, N450D, L452W, L455S, F456L, N460K, S477N, T478K, N481K, V483del, E484K, F486P, Q493E, Q498R, N501Y, Y505H, E554K, A570V, D614G, P621S, H655Y, N679K, P681R, N764K, D796Y, S939F, Q954H, N969K, V1104L, P1143L	Omicron sublineage
LB.1	ins16MPLF, T19I, R21T, L24-A27>S, S31del, S50L, H69del, V70del, V127F, G142D, Y144del, F157S, R158G, Q183H, N211del, L212I, V213G, L216F, H245N, A264D, I332V, G339H, R346T, K356T, S371F, S373P, S375F, T376A, R403K, D405N, R408S, K417N, N440K, V445H, G446S, N450D, L452W, L455S, F456L, N460K, S477N, T478K, N481K, V483del, E484K, F486P, Q498R, N501Y, Y505H, E554K, A570V, D614G, P621S, H655Y, N679K, P681R, N764K, D796Y, S939F, Q954H, N969K, P1143L	Omicron sublineage
P.1	L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, D614G, H655Y, T1027I, V1176F	Gamma
XBB.1	T19I, L24-A27>S, G142D, Y144del, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478K, E484A, F486S, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
XBB.1.16	T19I, L24-A27>S, G142D, Y144del, H146Q, E180V, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478R, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
XBB.1.16.1	T19I, L24-A27>S, G142D, Y144del, H146Q, E180V, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478R, E484A, F486P, F490S, Q498R, N501Y, Y505H, T547I, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
XBB.1.16.6	T19I, L24-A27>S, G142D, Y144del, H146Q, E180V, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, F456L, N460K, S477N, T478R, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
XBB.1.5	T19I, L24-A27>S, G142D, Y144del, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478K, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage
XBB.1.5 v2	T19I, L24-A27>S, V83A, G142D, Y144del, H146Q, Q183E, V213E, G252V, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478K, E484A, F486P, F490S, Q498R, N501Y, Y505H, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage



Lineages	Amino Acid Modifications	Common Designation
XBB.2.3	T19I, L24-A27>S, G142D, Y144del, H146Q, Q183E, V213E, D253G, G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478K, E484A, F486P, F490S, Q498R, N501Y, Y505H, P521S, D614G, H655Y, N679K, P681H, N764K, D796Y, Q954H, N969K	Omicron sublineage

- = Not applicable

Note: Alternative S-GENE mutations for Spike of AY.1, AY.2, and B.1.617.2 are listed as "Alt Seq #."

SARS-CoV-2 S1 RBD Antigens

Lineages	Amino Acid Modifications	Common Designation
AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2; B.1.617.2+ΔY144	L452R, T478K	Delta sublineages
BA.1.1; BA.1.1.15	G339D, R346K, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H	Omicron sublineages
BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.10.1; BA.2.12	G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H	Omicron sublineages
BA.2+L452M	G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452M, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H	Omicron sublineage
BA.2+L452R	G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H	Omicron sublineage
BA.2.12.1	G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452Q, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H	Omicron sublineage
BA.2.75	G339H, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, Q498R, N501Y, Y505H	Omicron sublineage
BA.2.75.2	G339H, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, F486S, Q498R, N501Y, Y505H	Omicron sublineage
BA.3	G339D, S371F, S373P, S375F, D405N, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H	Omicron sublineage
BA.4; BA.5	G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H	Omicron sublineages
BA.4.6; BF.7	G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H	Omicron sublineages
BQ.1	G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, K444T, L452R, N460K, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H	Omicron sublineage
BQ.1.1	G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, K444T, L452R, N460K, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H	Omicron sublineage
B.1.1.529; BA.1; BA.1.15	G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H	Omicron sublineages
B.1.1.7	N501Y	Alpha
B.1.351; B.1.351.1	K417N, E484K, N501Y	Beta; Botswana
P.1	K417T, E484K, N501Y	Gamma
XBB.1	G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478K, E484A, F486S, F490S, Q498R, N501Y, Y505H	Omicron sublineage



SARS-CoV-2 Omicron Variant Screening Panels

SARS-CoV-2 Panel 22

- **Human:** K15559U (IgG), K15560U (IgM), K15561U (IgA), and K15562U (ACE2) | **Mouse:** K15563U (IgG), K15564U (IgM), and K15565U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 S1 RBD (G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 2	SARS-CoV-2 S1 RBD (K417N, E484K, N501Y)	Beta (B.1.351), Botswana (B.1.351.1)
Spot 3	BSA	-
Spot 4	SARS-CoV-2 S1 RBD (K417T, E484K, N501Y)	Gamma (P.1)
Spot 5	BSA	-
Spot 6	SARS-CoV-2 S1 RBD (N501Y)	Alpha (B.1.1.7)
Spot 7	BSA	-
Spot 8	BSA	-
Spot 9	SARS-CoV-2 S1 RBD (L452R, T478K)	Delta sublineages (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2), Vietnam (B.1.617.2+Δ144)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)

SARS-CoV-2 Panel 23

- **Human:** K15567U (IgG), K15568U (IgM), K15569U (IgA), and K15570U (ACE2) | **Mouse:** K15571U (IgG), K15572U (IgM), and K15573U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 3	SARS-CoV-2 Spike (AY.4.2)	Delta sublineage (AY.4.2)
Spot 4	SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2	Delta sublineages (B.1.617.2; AY.4)
Spot 5	BSA	-
Spot 6	BSA	-
Spot 7	SARS-CoV-2 Spike (P.1)	Gamma (P.1)
Spot 8	SARS-CoV-2 Spike (B.1.1.7)	Alpha (B.1.1.7)
Spot 9	SARS-CoV-2 Spike (B.1.351)	Beta (B.1.351)
Spot 10	SARS-CoV-2 Spike (B.1.617.2; AY.3; AY.5; AY.6; AY.7; AY.14) Alt Seq 1	Delta sublineages (B.1.617.2; AY.3; AY.5; AY.6; AY.7; AY.14)

Note: Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #."

SARS-CoV-2 Panel 24

- **Human:** K15575U (IgG), K15576U (IgM), K15577U (IgA), and K15578U (ACE2) | **Mouse:** K15579U (IgG), K15580U (IgM), and K15581U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2	Delta sublineages (B.1.617.2; AY.4)
Spot 5	BSA	-
Spot 6	BSA	-
Spot 7	SARS-CoV-2 Spike (P.1)	Gamma (P.1)
Spot 8	SARS-CoV-2 Spike (B.1.1.7)	Alpha (B.1.1.7)
Spot 9	SARS-CoV-2 Spike (B.1.351)	Beta (B.1.351)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)

Note: Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #."



SARS-CoV-2 Panel 25

- **Human:** K15583U (IgG), K15584U (IgM), K15585U (IgA), and K15586U (ACE2) | **Mouse:** K15587U (IgG), K15588U (IgM), and K15589U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 3	SARS-CoV-2 Spike (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 4	SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2	Delta sublineages (B.1.617.2; AY.4)
Spot 5	SARS-CoV-2 Spike (BA.3)	Omicron sublineage (BA.3)
Spot 6	SARS-CoV-2 Spike (BA.1+R346K; BA.1.1; BA.1.1.15)	Omicron sublineages (BA.1+R346K; BA.1.1; BA.1.1.15)
Spot 7	SARS-CoV-2 Spike (BA.1+L452R)	Omicron sublineage (BA.1+L452R)
Spot 8	SARS-CoV-2 Spike (B.1.1.7)	Alpha (B.1.1.7)
Spot 9	SARS-CoV-2 Spike (B.1.351)	Beta (B.1.351)
Spot 10	SARS-CoV-2 Spike (B.1.640.2)	France (HU) (B.1.640.2)

Note: Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #."

SARS-CoV-2 Panel 26

- **Human:** K15593U (IgG), K15594U (IgM), K15595U (IgA), and K15596U (ACE2) | **Mouse:** K15597U (IgG), K15598U (IgM), and K15599U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 S1 RBD (G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 2	SARS-CoV-2 S1 RBD (K417N, E484K, N501Y)	Beta (B.1.351), Botswana (B.1.351.1)
Spot 3	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 4	SARS-CoV-2 S1 RBD (K417T, E484K, N501Y)	Gamma (P.1)
Spot 5	BSA	-
Spot 6	SARS-CoV-2 S1 RBD (N501Y)	Alpha (B.1.1.7)
Spot 7	BSA	-
Spot 8	SARS-CoV-2 S1 RBD (G339D, R346K, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H)	Omicron sublineages (BA.1.1; BA.1.1.15)
Spot 9	SARS-CoV-2 S1 RBD (L452R, T478K)	Delta sublineages (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2), Vietnam (B.1.617.2+Δ144)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)

SARS-CoV-2 Panel 27

- **Human:** K15606U (IgG), K15607U (IgM), K15608U (IgA), and K15609U (ACE2) | **Mouse:** K15610U (IgG), K15611U (IgM), and K15612U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (BA.2.12.1)	Omicron sublineage (BA.2.12.1)
Spot 3	SARS-CoV-2 Spike (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 4	SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2	Delta sublineages (B.1.617.2; AY.4)
Spot 5	SARS-CoV-2 Spike (BA.3)	Omicron sublineage (BA.3)
Spot 6	SARS-CoV-2 Spike (BA.2+L452M)	Omicron sublineage (BA.2+L452M)
Spot 7	SARS-CoV-2 Spike (BA.2+L452R)	Omicron sublineage (BA.2+L452R)
Spot 8	SARS-CoV-2 Spike (BA.4)	Omicron sublineage (BA.4)
Spot 9	SARS-CoV-2 Spike (B.1.351)	Beta (B.1.351)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

Note: Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #."



SARS-CoV-2 Panel 28

- **Human:** K15614U (IgG), K15615U (IgM), K15616U (IgA), and K15617U (ACE2) | **Mouse:** K15618U (IgG), K15619U (IgM), and K15620U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452Q, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.12.1)
Spot 2	SARS-CoV-2 S1 RBD (K417N, E484K, N501Y)	Beta (B.1.351), Botswana (B.1.351.1)
Spot 3	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 4	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452M, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2+L452M)
Spot 5	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2+L452R)
Spot 6	SARS-CoV-2 S1 RBD (N501Y)	Alpha (B.1.1.7)
Spot 7	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineages (BA.4; BA.5)
Spot 8	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, D405N, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineage (BA.3)
Spot 9	SARS-CoV-2 S1 RBD (L452R, T478K)	Delta sublineages (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2), Vietnam (B.1.617.2+Δ144)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)

SARS-CoV-2 Panel 29

- **Human:** K15624U (IgG), K15625U (IgM), K15626U (IgA), and K15627U (ACE2) | **Mouse:** K15628U (IgG), K15629U (IgM), and K15630U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (BA.2.12.1)	Omicron sublineage (BA.2.12.1)
Spot 3	SARS-CoV-2 Spike (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 4	SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2	Delta sublineages (B.1.617.2; AY.4)
Spot 5	BSA	-
Spot 6	BSA	-
Spot 7	SARS-CoV-2 Spike (BA.2.75)	Omicron sublineage (BA.2.75)
Spot 8	SARS-CoV-2 Spike (BA.4)	Omicron sublineage (BA.4)
Spot 9	SARS-CoV-2 Spike (B.1.351)	Beta (B.1.351)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

Note: Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #."

SARS-CoV-2 Panel 30

- **Human:** K15632U (IgG), K15633U (IgM), K15634U (IgA), and K15635U (ACE2) | **Mouse:** K15636U (IgG), K15637U (IgM), and K15638U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452Q, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.12.1)
Spot 2	SARS-CoV-2 S1 RBD (K417N, E484K, N501Y)	Beta (B.1.351), Botswana (B.1.351.1)
Spot 3	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 4	BSA	-
Spot 5	BSA	-
Spot 6	SARS-CoV-2 S1 RBD (N501Y)	Alpha (B.1.1.7)
Spot 7	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineages (BA.4; BA.5)
Spot 8	SARS-CoV-2 S1 RBD (G339H, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.75)
Spot 9	SARS-CoV-2 S1 RBD (L452R, T478K)	Delta sublineages (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2), Vietnam (B.1.617.2+Δ144)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)



SARS-CoV-2 Panel 31

- **Human:** K15642U (IgG), K15643U (IgM), K15644U (IgA), and K15645U (ACE2) **I Mouse:** K15646U (IgG), K15647U (IgM), and K15648U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	BSA	-
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	BSA	-
Spot 5	BSA	-
Spot 6	BSA	-
Spot 7	BSA	-
Spot 8	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)
Spot 9	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineages (BA.4; BA.5)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)

SARS-CoV-2 Panel 32

- **Human:** K15668U (IgG), K15669U (IgM), K15670U (IgA), and K15671U (ACE2) **I Mouse:** K15672U (IgG), K15673U (IgM), and K15674U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 3	SARS-CoV-2 Spike (XBB.1)	Omicron sublineage (XBB.1)
Spot 4	SARS-CoV-2 Spike (BF.7)	Omicron sublineage (BF.7)
Spot 5	SARS-CoV-2 Spike (BA.2.75.2)	Omicron sublineage (BA.2.75.2)
Spot 6	SARS-CoV-2 Spike (BQ.1.1)	Omicron sublineage (BQ.1.1)
Spot 7	SARS-CoV-2 Spike (BA.2.75)	Omicron sublineage (BA.2.75)
Spot 8	SARS-CoV-2 Spike (BA.4.6)	Omicron sublineage (BA.4.6)
Spot 9	SARS-CoV-2 Spike (BQ.1)	Omicron sublineage (BQ.1)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

SARS-CoV-2 Panel 33

- **Human:** K15676U (IgG), K15677U (IgM), K15678U (IgA), and K15679U (ACE2) **I Mouse:** K15680U (IgG), K15681U (IgM), and K15682U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 S1 RBD (G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 2	SARS-CoV-2 S1 RBD (G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, K444T, L452R, N460K, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineage (BQ.1.1)
Spot 3	SARS-CoV-2 S1 RBD (G339H, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, F486S, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.75.2)
Spot 4	SARS-CoV-2 S1 RBD (G339D, R346T, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineages (BA.4.6; BF.7)
Spot 5	BSA	-
Spot 6	SARS-CoV-2 S1 RBD (G339H, R346T, L368I, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, V445P, G446S, N460K, S477N, T478K, E484A, F486S, F490S, Q498R, N501Y, Y505H)	Omicron sublineage (XBB.1)
Spot 7	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineages (BA.4; BA.5)
Spot 8	SARS-CoV-2 S1 RBD (G339H, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.75)
Spot 9	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, K444T, L452R, N460K, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineage (BQ.1)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)



SARS-CoV-2 Panel 34

- **Human:** K15690U (IgG), K15691U (IgM), and K15693U (ACE2) | **Mouse:** K15694U (IgG), K15695U (IgM), and K15696U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 3	SARS-CoV-2 Spike (XBB.1)	Omicron sublineage (XBB.1)
Spot 4	SARS-CoV-2 Spike (BF.7)	Omicron sublineage (BF.7)
Spot 5	SARS-CoV-2 Spike (XBB.1.5)	Omicron sublineage (XBB.1.5)
Spot 6	SARS-CoV-2 Spike (BQ.1.1)	Omicron sublineage (BQ.1.1)
Spot 7	SARS-CoV-2 Spike (BA.2.75)	Omicron sublineage (BA.2.75)
Spot 8	SARS-CoV-2 Spike (BN.1)	Omicron sublineage (BN.1)
Spot 9	SARS-CoV-2 Spike (BQ.1)	Omicron sublineage (BQ.1)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

SARS-CoV-2 Panel 36

- **Human:** K15715U (IgG) and K15716U (ACE2)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 Spike (XBB.1.16.1)	Omicron sublineage (XBB.1.16.1)
Spot 5	SARS-CoV-2 Spike (XBB.1.5)	Omicron sublineage (XBB.1.5)
Spot 6	SARS-CoV-2 Spike (BQ.1.1)	Omicron sublineage (BQ.1.1)
Spot 7	SARS-CoV-2 Spike (XBB.1.16)	Omicron sublineage (XBB.1.16)
Spot 8	SARS-CoV-2 Spike (XBB.2.3)	Omicron sublineage (XBB.2.3)
Spot 9	SARS-CoV-2 Spike (XBB.1)	Omicron sublineage (XBB.1)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

SARS-CoV-2 Panel 37

- **Human:** K15721U (IgG) and K15722U (ACE2)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (FL.1.5.1)	Omicron sublineage (FL.1.5.1)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 Spike (BA.2.86)	Omicron sublineage (BA.2.86)
Spot 5	SARS-CoV-2 Spike (XBB.1.5)	Omicron sublineage (XBB.1.5)
Spot 6	SARS-CoV-2 Spike (EG.5.1)	Omicron sublineage (EG.5.1)
Spot 7	SARS-CoV-2 Spike (XBB.1.16)	Omicron sublineage (XBB.1.16)
Spot 8	SARS-CoV-2 Spike (XBB.2.3)	Omicron sublineage (XBB.2.3)
Spot 9	SARS-CoV-2 Spike (XBB.1.16.6)	Omicron sublineage (XBB.1.16.6)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)



SARS-CoV-2 Panel 38

➤ Human: K15725U (IgG), K15726U (IgA) and K15727U (ACE2)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (FL.1.5.1)	Omicron sublineage (FL.1.5.1)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 Spike (BA.2.86)	Omicron sublineage (BA.2.86)
Spot 5	SARS-CoV-2 Spike (XBB.1.5)	Omicron sublineage (XBB.1.5)
Spot 6	SARS-CoV-2 Spike (EG.5.1)	Omicron sublineage (EG.5.1)
Spot 7	SARS-CoV-2 Spike (JN.1)	Omicron sublineage (JN.1)
Spot 8	SARS-CoV-2 Spike (JD.1.1)	Omicron sublineage (JD.1.1)
Spot 9	SARS-CoV-2 Spike (HV.1)	Omicron sublineage (HV.1)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

NEW! SARS-CoV-2 Panel 39

➤ Human: K15738U (IgG), K15739U (IgA) and K15740U (ACE2)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (LB.1)	Omicron sublineage (LB.1)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 Spike (BA.2.86)	Omicron sublineage (BA.2.86)
Spot 5	SARS-CoV-2 Spike (XBB.1.5 (v2))	Omicron sublineage (XBB1.5 (v2))
Spot 6	SARS-CoV-2 Spike (KP.3)	Omicron sublineage (KP.3)
Spot 7	SARS-CoV-2 Spike (JN.1 (v2))	Omicron sublineage (JN.1 (v2))
Spot 8	SARS-CoV-2 Spike (KP.2)	Omicron sublineage (KP.2)
Spot 9	SARS-CoV-2 Spike (B.1.617.2)	Delta sublineage (B.1.617.2)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)



SARS-CoV-2 Key Variant Focus Panels

SARS-CoV-2 Key Variant Spike Panel 1

- **Human:** K15651U (IgG), K15652U (IgM), K15653U (IgA), and K15654U (ACE2) | **Mouse:** K15655U (IgG), K15656U (IgM), and K15657U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 Spike	Wuhan A (WT)
Spot 2	SARS-CoV-2 Spike (BA.2.12.1)	Omicron sublineage (BA.2.12.1)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 Spike (BA.2.75)	Omicron sublineage (BA.2.75)
Spot 5	SARS-CoV-2 Spike (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 6	SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 7	SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2	Delta sublineages (B.1.617.2; AY.4)
Spot 8	SARS-CoV-2 Spike (B.1.1.7)	Alpha (B.1.1.7)
Spot 9	SARS-CoV-2 Spike (B.1.351)	Beta (B.1.351)
Spot 10	SARS-CoV-2 Spike (BA.5)	Omicron sublineage (BA.5)

Note: Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #."

SARS-CoV-2 Key Variant RBD Panel 1

- **Human:** K15659U (IgG), K15660U (IgM), K15661U (IgA), and K15662U (ACE2) | **Mouse:** K15663U (IgG), K15664U (IgM), and K15665U (IgA)

Spot Location	Antigens	Common Designation (Lineages)
Spot 1	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452Q, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.12.1)
Spot 2	SARS-CoV-2 S1 RBD (K417N, E484K, N501Y)	Beta (B.1.351), Botswana (B.1.351.1)
Spot 3	SARS-CoV-2 Nucleocapsid	Wuhan A (WT)
Spot 4	SARS-CoV-2 S1 RBD (G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H)	Omicron sublineages (B.1.1.529; BA.1; BA.1.15)
Spot 5	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, S477N, T478K, E484A, Q493R, Q498R, N501Y, Y505H)	Omicron sublineages (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12)
Spot 6	SARS-CoV-2 S1 RBD (N501Y)	Alpha (B.1.1.7)
Spot 7	SARS-CoV-2 S1 RBD (L452R, T478K)	Delta sublineages (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2), Vietnam (B.1.617.2+Δ144)
Spot 8	SARS-CoV-2 S1 RBD (G339H, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, G446S, N460K, S477N, T478K, E484A, Q498R, N501Y, Y505H)	Omicron sublineage (BA.2.75)
Spot 9	SARS-CoV-2 S1 RBD (G339D, S371F, S373P, S375F, T376A, D405N, R408S, K417N, N440K, L452R, S477N, T478K, E484A, F486V, Q498R, N501Y, Y505H)	Omicron sublineages (BA.4; BA.5)
Spot 10	SARS-CoV-2 S1 RBD	Wuhan A (WT)

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