

REAGENT or RESOURCE	SOURCE	IDENTIFIER
Antibodies		
PB anti-human CD3 (UCHT1), flow cytometry	BioLegend	Cat# 300442; RRID: AB_2562048
PB anti-human CD14 (M5E2), flow cytometry	BioLegend	Cat# 301828; RRID: AB_2275670
PB anti-human CD56 (NCAM), flow cytometry	BioLegend	Cat# 318326; RRID: AB_10612751
PB anti-human IgM (MHM-88), flow cytometry	BioLegend	Cat# 314514; RRID: AB_10574307
PB anti-human IgD (IA6-2), flow cytometry	BioLegend	Cat# 348224; RRID: AB_2561597
PerCP/Cyanine5.5 anti-human CD19 (HIB19), flow cytometry	BioLegend	Cat# 302230; RRID: AB_2073119
PE/Cyanine7 anti-human CD27 (M-T271), flow cytometry	BioLegend	Cat# 356412; RRID: AB_2562258
PE anti-human IgG (G18-145), flow cytometry	BD Biosciences	Cat# 555787; RRID: AB_396122
SureLight® APC anti-6X His tag (AD1.1.10), flow cytometry	abcam	Cat# ab72579
FITC anti-6X His tag, flow cytometry	abcam	Cat# ab1206
Human TruStain FcX™, flow cytometry	BioLegend	Cat# 422302; RRID: AB_2818986
SARS-CoV-2 (2019-nCoV) Nucleocapsid Antibody, Rabbit MAb	Sino Biological	Cat# 40143-R019; RRID: AB_2827973
AF488 goat anti-rabbit IgG (H+L)	Life Technologies	Cat# A11034; RRID: AB_2576217
Hoechst 33258, Pentahydrate (bis-Benzimidazole)	Molecular Probes	Cat# H3569; RRID: AB_2651133
Goat anti-Human IgG Cross-Adsorbed Secondary Antibody, HRP	Invitrogen	Cat# 62-8420; RRID: AB_2533962
Bacterial and virus strains		
Omicron BA.5.2 (hCoV-19/Hong Kong/HKU-220712-005/2022)	HKU	GISAID: EPL_ISL_13777658
Omicron BQ.1.1 (hCoV-19/Hong Kong/HKU)	HKU	GISAID: EPL_ISL_16342297
Omicron XBB.1.5 (hCoV-19/Hong Kong/HKU)	HKU	GISAID: EPL_ISL_17205250
Biological samples		
Blood samples from COVID-19 patients	Queen Mary Hospital	N/A
Chemicals, peptides, and recombinant proteins		
SARS-CoV-2 (2019-nCoV) Spike S1+S2 ECD-His Protein	Sino Biological	Cat# 40589-V08B1
SARS-CoV-2 (2019-nCoV) Spike RBD-His Recombinant Protein	Sino Biological	Cat# 40592-V08H-B
SARS-CoV-2 (2019-nCoV) Spike S2 ECD-His Recombinant Protein	Sino Biological	Cat# 40590-V08B
SARS-CoV-2 B.1.1.529 (Omicron) S1+S2 trimer Protein (His Tag)	Sino Biological	Cat# 40589-V08H26
SARS-CoV-2 B.1.1.529 (Omicron) Spike RBD Protein (His Tag)	Sino Biological	Cat# 40592-V08H121
SARS-CoV-2 B.1.1.529 (Omicron) Spike S1 NTD Protein (His Tag)	Sino Biological	Cat# 40591-V08H42
SARS-CoV-2 (BA.2) Spike S1+S2 trimer Protein (His Tag)	Sino Biological	Cat# 40589-V08H28
SARS-CoV-2 BA.2 (Omicron) Spike RBD Protein (His Tag)	Sino Biological	Cat# 40592-V08H123
SARS-CoV-2 (BA.2.12.1) Spike S1+S2 trimer Protein (His Tag)	Sino Biological	Cat# 40589-V08H34
SARS-CoV-2 (BA.4/BA.5/BA.5.2) Spike S1+S2 trimer Protein (His Tag)	Sino Biological	Cat# 40589-V08H32
DMEM	Gibco™	Cat# 11965118
Fetal Bovine Serum, qualified, Brazil	Gibco™	Cat# 10270106
Penicillin-Streptomycin	Gibco™	Cat# 15140122
Puromycin	InvivoGen	Cat# ant-pr-1
Expi293™ Expression Medium	Gibco™	Cat# A1435102
Opti-MEM™ I Reduced Serum Medium	Gibco™	Cat# 31985070
Recombinant Protein G Agarose	Thermo Fisher Scientific	Cat# 15920010
3, 3',5', 5'-Tetramethylbenzidine Liquid Substrate	Sigma-Aldrich	Cat# T4444
HEPES buffer (1M)	GIBCO	Cat# 15630080

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SuperScript™ IV Reverse Transcriptase	Thermo Fisher Scientific	Cat# 18090010
Q5® High-Fidelity DNA Polymerase	New England Biolabs	Cat# M0491S
AMPure XP Bead-Based Reagent	Beckman Coulter	Cat# A63881
Critical commercial assays		
Zombie Red™ Fixable Viability Kit, flow cytometry	BioLegend	Cat# 423109
QIAGEN OneStep RT-PCR Kit	QIAGEN	Cat# 210212
One-Step Antibody Biotinylation Kit	Miltenyi Biotec	Cat# 130-093-385
Luciferase Assay System	Promega	Cat# E1501
Pierce™ Fab Preparation Kit	Thermo Fisher Scientific	Cat# 44985
KAPA HyperPrep Kit	Roche Sequencing Solutions	Cat# 07962363001
KAPA Unique Dual-Indexed Adapter Kit	Roche Sequencing Solutions	Cat# 08861862001
KAPA Library Quantification Kit	Roche Sequencing Solutions	Cat# 07960140001
MiSeq Reagent Kit v3	Illumina	Cat# MS-102-3003
Deposited data		
Cryo-EM density map of BA.5 spike-ZCP3B4 Fab	Electron Microscopy Data Bank	EMD-36789
Cryo-EM density map of BA.5 spike-ZCP4C9 Fab	Electron Microscopy Data Bank	EMD-36788
Cryo-EM density map of BA.5 spike-ZCP4D5-1 Fab	Electron Microscopy Data Bank	EMD-36949
Cryo-EM density map of BA.5 spike-CUP2G3 Fab	Electron Microscopy Data Bank	EMD-36950
Atomic coordinate of BA.5 RBD-ZCP3B4 Fab	Protein Data Bank	8K19
Atomic coordinate of BA.5 RBD-ZCP4C9 Fab	Protein Data Bank	8K18
Experimental models: Cell lines		
HEK293T-hACE2 Cells	In house (validated by the flow cytometry)	N/A
HEK293T Cells	ATCC	Cat# CRL-3216; RRID: CVCL_0063
Expi293F™ Cells	Thermo Fisher Scientific	Cat# A14527; RRID: CVCL_D615
Experimental models: organisms/strains		
Golden Syrian hamster	Laboratory Animal Service Center, CUHK	N/A
Oligonucleotides		
ARTIC network nCoV-2019 primers v3	Integrated DNA Technologies	N/A
Recombinant DNA		
AbVec2.0-IGHG1 plasmid	Addgene	Cat# 80795; RRID: Addgene_80795
AbVec1.1-IGKC plasmid	Addgene	Cat# 80796; RRID: Addgene_80796