DRAFT landscape of COVID-19 candidate vaccines – 30 September 2020

41 candidate vaccines in clinical evaluation

COVID-19 Vaccine developer/manufacturer	Vaccine platform	Type of candidate vaccine	Number of doses	Timing of doses	Route of Administration	Clinical Stage			
						Phase 1	Phase 1/2	Phase 2	Phase 3
Sinovac	Inactivated	Inactivated	2	0, 14 days	IM		NCT04383574 NCT04352608 NCT04551547		NCT04456595 669/UN6.KEP/EC/2020
Wuhan Institute of Biological Products/Sinopharm	Inactivated	Inactivated	2	0,21 days	IM		ChiCTR2000031809 Interim Report		ChiCTR2000034780
Beijing Institute of Biological Products/Sinopharm	Inactivated	Inactivated	2	0,21 days	IM		ChiCTR2000032459		ChiCTR2000034780 NCT04560881
University of Oxford/AstraZeneca	Non-Replicating Viral Vector	ChAdOx1-S	1		IM		PACTR202006922165132 2020-001072-15 NCT04568031 Interim Report	2020-001228-32	ISRCTN89951424 NCT04516746 NCT04540393 CTRI/2020/08/027170
CanSino Biological Inc./Beijing Institute of Biotechnology	Non-Replicating Viral Vector	Adenovirus Type 5 Vector	1		IM	ChiCTR2000030906 Study Report		ChiCTR2000031781 Study Report	NCT04526990 NCT04540419
Gamaleya Research Institute	Non-Replicating Viral Vector	Adeno-based (rAd26-S+rAd5-S)	2	0,21 days	IM		NCT04436471 NCT04437875 Study Report		NCT04530396 NCT04564716
Janssen Pharmaceutical Companies	Non-Replicating Viral Vector	Ad26COVS1	2	0, 56 days	IM		NCT04436276		NCT04505722

Novavax	Protein Subunit	Full length recombinant SARS CoV-2 glycoprotein nanoparticle vaccine adjuvanted with Matrix M	2	0, 21 days	IM		NCT04368988 Study Report	NCT04533399 (phase 2b)	2020-004123-16
Moderna/NIAID	RNA	LNP-encapsulated mRNA	2	0, 28 days	IM	NCT04283461 Interim Report Final Report		NCT04405076	NCT04470427
BioNTech/Fosun Pharma/Pfizer	RNA	3 LNP-mRNAs	2	0, 28 days	IM		2020-001038-36 ChiCTR2000034825 NCT04537949 Study Report		NCT04368728
Anhui Zhifei Longcom Biopharmaceutical/Institute of Microbiology, Chinese Academy of Sciences	Protein Subunit	Adjuvanted recombinant protein (RBD-Dimer)	2 or 3	0,28 or 0,28,56 days	IM	NCT04445194	NCT04550351	NCT04466085	
Curevac	RNA	mRNA	2	0, 28 days	IM	NCT04449276		NCT04515147	
Institute of Medical Biology, Chinese Academy of Medical Sciences	Inactivated	Inactivated	2	0, 28 days	IM	NCT04412538	NCT04470609		
Research Institute for Biological Safety Problems, Rep of Kazakhstan	Inactivated	Inactivated	2	0, 21 days	IM		NCT04530357		
Inovio Pharmaceuticals/ International Vaccine Institute	DNA	DNA plasmid vaccine with electroporation	2	0, 28 days	ID		NCT04447781 NCT04336410		
Osaka University/ AnGes/ Takara Bio	DNA	DNA plasmid vaccine + Adjuvant	2	0, 14 days	IM		NCT04463472 NCT04527081		
Cadila Healthcare Limited	DNA	DNA plasmid vaccine	3	0, 28, 56 days	ID		CTRI/2020/07/026352		
Genexine Consortium	DNA	DNA Vaccine (GX-19)	2	0, 28 days	IM		NCT04445389		
Bharat Biotech	Inactivated	Whole-Virion Inactivated	2	0, 14 days	IM		NCT04471519 CTRI/2020/09/027674		
Kentucky Bioprocessing, Inc	Protein Subunit	RBD-based	2	0, 21 days	IM		NCT04473690		

Sanofi Pasteur/GSK	Protein Subunit	S protein (baculovirus production)	2	0, 21 days	IM		NCT04537208		
Arcturus/Duke-NUS	RNA	mRNA			IM		NCT04480957		
SpyBiotech/Serum Institute of India	VLP	RBD-HBsAg VLPs	2	0, 28 days	IM		ACTRN12620000817943		
ReiThera/LEUKOCARE/Univercells	Non-Replicating Viral Vector	Replication defective Simian Adenovirus (GRAd) encoding S	1		IM	NCT04528641			
Institute of Biotechnology, Academy of Military Medical Sciences, PLA of China	Non-Replicating Viral Vector	Ad5-nCoV	2	0, 28 days	IM/mucosal	NCT04552366			
Vaxart	Non-Replicating Viral Vector	Ad5 adjuvanted Oral Vaccine platform	2	0, 28 days	Oral	NCT04563702			
Ludwig-Maximilians - University of Munich	Non-Replicating Viral Vector	MVA-SARS-2-S	2	0, 28 days	IM	NCT04569383			
Clover Biopharmaceuticals Inc./GSK/Dynavax	Protein Subunit	Native like Trimeric subunit Spike Protein vaccine	2	0, 21 days	IM	NCT04405908			
Vaxine Pty Ltd/Medytox	Protein Subunit	Recombinant spike protein with Advax™ adjuvant	1		IM	NCT04453852			
University of Queensland/CSL/Seqirus	Protein Subunit	Molecular clamp stabilized Spike protein with MF59 adjuvant	2	0, 28 days	IM	ACTRN12620000674932p ISRCTN51232965			
Medigen Vaccine Biologics Corporation/NIAID/Dynavax	Protein Subunit	S-2P protein + CpG 1018	2	0, 28 days	IM	NCT04487210			
Instituto Finlay de Vacunas, Cuba	Protein Subunit	RBD + Adjuvant	2	0, 28 days	IM	IFV/COR/04			
FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo	Protein Subunit	Peptide	2	0, 21 days	IM	NCT04527575			
West China Hospital, Sichuan University	Protein Subunit	RBD (baculovirus production expressed in Sf9 cells)	2	0, 28 days	IM	ChiCTR2000037518			
University Hospital Tuebingen	Protein Subunit	SARS-CoV-2 HLA-DR peptides	1		SC	NCT04546841			
COVAXX	Protein Subunit	S1-RBD-protein	2	0, 28 days	IM	NCT04545749			

Institute Pasteur/Themis/Univ. of Pittsburg CVR/Merck Sharp & Dohme	Replicating Viral Vector	Measles-vector based	1 or 2	0, 28 days	IM	NCT04497298			
Beijing Wantai Biological Pharmacy/ Xiamen University	Replicating Viral Vector	Intranasal flu-based-RBD	1		IM	ChiCTR2000037782			
Imperial College London	RNA	LNP-nCoVsaRNA	2		IM	ISRCTN17072692			
People's Liberation Army (PLA) Academy of Military Sciences/Walvax Biotech.	RNA	mRNA	2	0, 14 or 0, 28 days	IM	ChiCTR2000034112			
Medicago Inc.	VLP	Plant-derived VLP adjuvanted with GSK or Dynavax adjs.	2	0, 21 days	IM	NCT04450004			

151 candidate vaccines in preclinical evaluation

Platform	Type of candidate vaccine	Developer	Coronavirus target	Current stage of clinical evaluation/regulatory status- Coronavirus candidate	Same platform for non-Coronavirus candidates
DNA	DNA, engineered vaccine inserts compatible with multiple delivery systems	DIOSynVax Ltd / University of Cambridge	SARS-CoV-2 and Sarbeco-CoV	Pre-Clinical	
DNA	DNA vaccine	Ege University	SARS-CoV2	Pre-Clinical	
DNA	DNA plasmid vaccine RBD&N	Scancell/University of Nottingham/ Nottingham Trent University	SARS-CoV2	Pre-Clinical	
DNA	DNA plasmid vaccine S,S1,S2,RBD &N	National Research Centre, Egypt	SARS-CoV2	Pre-Clinical	
DNA	DNA with electroporation	Karolinska Institute / Cobra Biologics (OPENCORONA Project)	SARS-CoV2	Pre-Clinical	
DNA	DNA with electroporation	Chula Vaccine Research Center	SARS-CoV2	Pre-Clinical	
DNA	DNA	Takis/Applied DNA Sciences/Evvivax	SARS-CoV2	Pre-Clinical	
DNA	Plasmid DNA, Needle-Free Delivery	Immunomic Therapeutics, Inc./EpiVax, Inc./PharmaJet	SARS-CoV2	Pre-Clinical	SARS
DNA	DNA vaccine	BioNet Asia	SARS-CoV2	Pre-Clinical	
DNA	msDNA vaccine	Mediphage Bioceuticals/University of Waterloo	SARS-CoV2	Pre-Clinical	
DNA	DNA vaccine	Entos Pharmaceuticals	SARS-CoV2	Pre-Clinical	

DNA	bacTRL-Spike	Symvivo	SARS-CoV2	Pre-Clinical	
Inactivated	Egg-based, inactivated, whole chimeric Newcastle Disease Virus (NDV) expressing membrane-anchored pre-fusion-stabilized trimeric SARS-CoV-2 S protein (Hexapro) + CpG 1018	Institute of Vaccines and Medical Biologicals (IVAC; Vietnam) / Dynavax / PATH	SARS-CoV2	Pre-Clinical	
Inactivated	Egg-based, inactivated, whole chimeric Newcastle Disease Virus (NDV) expressing membrane-anchored pre-fusion-stabilized trimeric SARS-CoV-2 S protein (Hexapro) + CpG 1018	Government Pharmaceutical Organization (GPO; Thailand) / Dynavax / PATH	SARS-CoV2	Pre-Clinical	
Inactivated	Egg-based, inactivated, whole chimeric Newcastle Disease Virus (NDV) expressing membrane-anchored pre-fusion-stabilized trimeric SARS-CoV-2 S protein (Hexapro) + CpG 1018	Institute Butantan (Brazil) / Dynavax / PATH	SARS-CoV-2	Pre-clinical	
Inactivated	Inactivated + alum	KM Biologics	SARS-CoV2	Pre-Clinical	JE, Zika
Inactivated	Inactivated	Selcuk University	SARS-CoV2	Pre-Clinical	
Inactivated	Inactivated	Erciyes University	SARS-CoV2	Pre-Clinical	
Inactivated	Inactivated whole virus	National Research Centre, Egypt	SARS-CoV2	Pre-Clinical	
Inactivated	Inactivated	Beijing Minhai Biotechnology Co., Ltd.	SARS-CoV2	Pre-Clinical	
Inactivated	TBD	Osaka University/ BIKEN/ NIBIOHN	SARS-CoV2	Pre-Clinical	
Inactivated	Inactivated + CpG 1018	Sinovac/Dynavax	SARS-CoV2	Pre-Clinical	
Inactivated	Inactivated + CpG 1018	Valneva/Dynavax	SARS-CoV2	Pre-Clinical	
Inactivated	Inactivated		SARS-CoV2	Pre-Clinical	
Live Attenuated Virus	Codon deoptimized live attenuated vaccines	Mehmet Ali Aydinlar University / Acıbadem Labmed Health Services A.S.	SARS-CoV2	Pre-Clinical	
Live Attenuated Virus	Codon deoptimized live attenuated vaccines	Codagenix/Serum Institute of India	SARS-CoV2	Pre-Clinical	HAV, InfA, ZIKV, FMD, SIV, RSV, DENV
Live Attenuated Virus	Codon deoptimized live attenuated vaccines	Indian Immunologicals Ltd/Griffith University	SARS-CoV2	Pre-Clinical	
Non-Replicating Viral Vector	Sendai virus vector	ID Pharma	SARS-CoV2	Pre-Clinical	
Non-Replicating Viral Vector	Adenovirus-based	Ankara University	SARS-CoV2	Pre-Clinical	
Non-Replicating Viral Vector	Adeno-associated virus vector (AAVCOVID)	Massachusetts Eye and Ear/Massachusetts General Hospital/AveXis	SARS-CoV2	Pre-Clinical	
Non-Replicating Viral Vector	MVA encoded VLP	GeoVax/BravoVax	SARS-CoV2	Pre-Clinical	LASV, EBOV, MARV, HIV
Non-replicating viral vector	MVA-S encoded	DZIF – German Center for Infection Research/IDT Biologika GmbH	SARS-CoV2	Pre-clinical	Many

Non-replicating viral vector	MVA-S	IDIBAPS-Hospital Clinic, Spain	SARS-CoV2	Pre-clinical	
Non-Replicating Viral Vector	adenovirus-based NasoVAX expressing SARS2-CoV spike protein	Altimmune	SARS-CoV2	Pre-Clinical	influenza
Non-Replicating Viral Vector	Adeno5-based	Erciyes University	SARS-CoV2	Pre-Clinical	
Non-Replicating Viral Vector	2nd Gen E2b- Ad5 Spike, RBD, Nucleocapsid Subcutaneous&Oral	ImmunityBio, Inc. & NantKwest, Inc.	SARS-CoV2	Pre-Clinical	flu, Chik, Zika, EBOV, LASV, HIV/SIV,Cancer
Non-Replicating Viral Vector	Ad5 S (GREVAX™ platform)	Greffex	SARS-CoV2	Pre-Clinical	MERS
Non-Replicating Viral Vector	Oral Ad5 S	Stabilitech Biopharma Ltd	SARS-CoV2	Pre-Clinical	Zika, VZV, HSV-2 and Norovirus
Non-Replicating Viral Vector	adenovirus-based + HLA-matched peptides	Valo Therapeutics Ltd	Pan-Corona	Pre-Clinical	
Non-Replicating Viral Vector		Vaxart	SARS-CoV2	Pre-Clinical	InfA, CHIKV, LASV, NORV; EBOV, RVF, HBV, VEE
Non-Replicating Viral Vector	MVA expressing structural proteins	Centro Nacional Biotecnología (CNB-CSIC), Spain	SARS-CoV2	Pre-Clinical	Multiple candidates
Non-Replicating Viral Vector	parainfluenza virus 5 (PIV5)-based vaccine expressing the spike protein	University of Georgia/University of Iowa	SARS-CoV2	Pre-Clinical	MERS
Non-Replicating Viral Vector	Recombinant deactivated rabies virus containing S1	Bharat Biotech/Thomas Jefferson University	SARS-CoV2	Pre-Clinical	HeV, NiV, EBOV, LASSA, CCHFV, MERS
Non-Replicating Viral Vector	Influenza A H1N1 vector	National Research Centre, Egypt	SARS-CoV2	Pre-Clinical	
Non-Replicating Viral Vector	Newcastle disease virus expressing S	Icahn School of Medicine at Mount Sinai	SARS-CoV2	Pre-Clinical	
Protein Subunit	RBD protein delivered in mannose-conjugated chitosan nanoparticle	Ohio State University / Kazakh National Agrarian University	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant spike protein with Essai O/W 1849101 adjuvant	Kazakh National Agrarian University	SARS-CoV2	Pre-Clinical	
Protein Subunit	Peptides	Neo7Logic	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant spike protein with Essai O/W 1849101 adjuvant	Kazakh National Agrarian University, Kazakhstan / National Scientific Center for Especially Dangerous Infections	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant S protein	Max-Planck-Institute of Colloids and Interfaces	SARS-CoV2	Pre-Clinical	
Protein Subunit	RBD protein (baculovirus production) + FAR-Squalene adjuvant	Farmacológicos Veterinarios SAC (FARVET SAC) / Universidad Peruana Cayetano Heredia (UPCH)	SARS-CoV2	Pre-Clinical	
Protein Subunit	Protein Subunit	Research Institute for Biological Safety Problems, Rep of Kazakhstan	SARS-CoV2	Pre-Clinical	
Protein Subunit	RBD-protein	Mynvax	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant S protein	Izmir Biomedicine and Genome Center	SARS-CoV2	Pre-Clinical	

Protein Subunit	Peptide + novel adjuvant	Bogazici University	SARS-CoV2	Pre-Clinical	
Protein Subunit	S subunit intranasal liposomal formulation with GLA/3M052 adjs.	University of Virginia	SARS-CoV2	Pre-Clinical	
Protein Subunit	S-Protein (Subunit) + Adjuvant, E coli based Expression	Helix Biogen Consult, Ogbomoso & Trinity Immonoefficient Laboratory, Ogbomoso, Oyo State, Nigeria.	SARS-CoV2	Pre-Clinical	
Protein Subunit	Protein Subunit S,N,M&S1 protein	National Research Centre, Egypt	SARS-CoV2	Pre-Clinical	
Protein Subunit	Protein Subunit	University of San Martin and CONICET, Argentina	SARS-CoV2	Pre-Clinical	
Protein Subunit	RBD protein fused with Fc of IgG + Adj.	Chulalongkorn University/GPO, Thailand	SARS-CoV2	Pre-Clinical	
Protein Subunit	Capsid-like Particle	AdaptVac (PREVENT-nCoV consortium)	SARS-CoV2	Pre-Clinical	
Protein Subunit	Drosophila S2 insect cell expression system VLPs	ExpreS2ion	SARS-CoV2	Pre-Clinical	
Protein Subunit	Peptide antigens formulated in LNP	IMV Inc	SARS-CoV2	Pre-Clinical	
Protein Subunit	S protein	WRAIR/USAMRIID	SARS-CoV2	Pre-Clinical	
Protein Subunit	S protein +Adjuvant	National Institute of Infectious Disease, Japan/Shionogi/UMN Pharma	SARS-CoV2	Pre-Clinical	Influenza
Protein Subunit	VLP-recombinant protein + Adjuvant	Osaka University/ BIKEN/ National Institutes of Biomedical Innovation, Japan	SARS-CoV2	Pre-Clinical	
Protein Subunit	microneedle arrays S1 subunit	Univ. of Pittsburgh	SARS-CoV2	Pre-Clinical	MERS
Protein Subunit	Peptide	Vaxil Bio	SARS-CoV2	Pre-Clinical	
Protein Subunit	Adjuvanted protein subunit (RBD)	Biological E Ltd	SARS-CoV2	Pre-Clinical	
Protein Subunit	Peptide	Flow Pharma Inc	SARS-CoV2	Pre-Clinical	Ebola, Marburg, HIV, Zika, Influenza, HPV therapeutic vaccine, BreastCA vaccine
Protein Subunit	S protein	AJ Vaccines	SARS-CoV2	Pre-Clinical	
Protein Subunit	Ii-Key peptide	Generex/EpiVax	SARS-CoV2	Pre-Clinical	Influenza, HIV, SARS-CoV
Protein Subunit	S protein	EpiVax/Univ. of Georgia	SARS-CoV2	Pre-Clinical	H7N9
Protein Subunit	Protein Subunit EPV-CoV-19	EpiVax	SARS-CoV2	Pre-Clinical	
Protein Subunit	gp-96 backbone	Heat Biologics/Univ. Of Miami	SARS-CoV2	Pre-Clinical	NSCLC, HIV, malaria, Zika
Protein Subunit	Subunit vaccine	FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo	SARS-CoV2	Pre-Clinical	
Protein Subunit	S1 or RBD protein	Baylor College of Medicine	SARS-CoV2	Pre-Clinical	SARS
Protein Subunit	Subunit protein, plant produced	iBio/CC-Pharming	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant protein, nanoparticles (based on S-protein and other epitopes)	Saint-Petersburg scientific research institute of vaccines and serums	SARS-CoV2	Pre-Clinical	
Protein Subunit	COVID-19 XWG-03	Innovax/Xiamen Univ./GSK	SARS-CoV2	Pre-Clinical	HPV

	truncated S (spike) proteins				
Protein Subunit	Adjuvanted microsphere peptide	VIDO-InterVac, University of Saskatchewan	SARS-CoV2	Pre-Clinical	
Protein Subunit	Synthetic Long Peptide Vaccine candidate for S and M proteins	OncoGen	SARS-CoV2	Pre-Clinical	
Protein Subunit	Oral E. coli-based protein expression system of S and N proteins	MIGAL Galilee Research Institute	SARS-CoV2	Pre-Clinical	
Protein Subunit	Nanoparticle vaccine	LakePharma, Inc.	SARS-CoV2	Pre-Clinical	
Protein Subunit	Plant-based subunit (RBD-Fc + Adjuvant)	Baiya Phytopharm/ Chula Vaccine Research Center	SARS-CoV2	Pre-Clinical	
Protein Subunit	OMV-based vaccine	Quadram Institute Biosciences	SARS-CoV2	Pre-Clinical	Flu A, plague
Protein Subunit	OMV-based vaccine	BiOMViS Srl/Univ. of Trento	SARS-CoV2	Pre-Clinical	
Protein subunit	structurally modified spherical particles of the tobacco mosaic virus (TMV)	Lomonosov Moscow State University	SARS-CoV2	Pre-Clinical	rubella, rotavirus
Protein Subunit	Spike-based	University of Alberta	SARS-CoV2	Pre-Clinical	Hepatitis C
Protein Subunit	Recombinant S1-Fc fusion protein	AnyGo Technology	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant protein	Yisheng Biopharma	SARS-CoV2	Pre-Clinical	
Protein Subunit	Recombinant S protein in IC-BEVS	Vabiotech	SARS-CoV2	Pre-Clinical	
Protein Subunit	Orally delivered, heat stable subunit	Applied Biotechnology Institute, Inc.	SARS-CoV2	Pre-Clinical	
Protein Subunit	Peptides derived from Spike protein	Axon Neuroscience SE	SARS-CoV2	Pre-Clinical	
Protein Subunit	Protein Subunit	MOGAM Institute for Biomedical Research, GC Pharma	SARS-CoV2	Pre-Clinical	
Protein Subunit	RBD-based	Neovii/Tel Aviv University	SARS-CoV2	Pre-Clinical	
Protein Subunit	Outer Membrane Vesicle (OMV)-subunit	Intravacc/Epivax	SARS-CoV2	Pre-Clinical	
Protein Subunit	Outer Membrane Vesicle(OMV)-peptide	Intravacc/Epivax	SARS-CoV2	Pre-Clinical	
Protein Subunit	Spike-based (epitope screening)	ImmunoPrecise/LiteVax BV	SARS-CoV2	Pre-Clinical	
Replicating Bacteria Vector	Oral Salmonella enteritidis (3934Vac) based protein expression system of RBD	Farmacológicos Veterinarios SAC (FARVET SAC) / Universidad Peruana Cayetano Heredia (UPCH)	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	YF17D Vector	KU Leuven	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	Measles Vector	Cadila Healthcare Limited	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	Measles Vector	FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	Measles Virus (S, N targets)	DZIF – German Center for Infection Research/CanVirex AG	SARS-CoV2	Pre-clinical	Zika, H7N9, CHIKV
Replicating Viral Vector	Horsepox vector expressing S protein	Tonix Pharma/Southern Research	SARS-CoV2	Pre-Clinical	Smallpox, monkeypox
Replicating Viral Vector	Live viral vectored vaccine based on attenuated influenza virus backbone (intranasal)	BiOCAD and IEM	SARS-CoV2	Pre-Clinical	Influenza

Replicating Viral Vector	Recombinant vaccine based on Influenza A virus, for the prevention of COVID-19 (intranasal)	FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo	SARS-CoV2	Pre-Clinical	Influenza
Replicating Viral Vector	Attenuated Influenza expressing an antigenic portion of the Spike protein	Fundação Oswaldo Cruz and Instituto Buntantan	SARS-CoV2	Pre-Clinical	Influenza
Replicating Viral Vector	Influenza vector expressing RBD	University of Hong Kong	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	Replication-competent VSV chimeric virus technology (VSVΔG) delivering the SARS-CoV-2 Spike (S) glycoprotein.	IAVI/Merck	SARS-CoV2	Pre-Clinical	Ebola, Marburg, Lassa
Replicating Viral Vector	Replicating VSV vector-based DC-targeting	University of Manitoba	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	VSV-S	University of Western Ontario	SARS-CoV2	Pre-Clinical	HIV, MERS
Replicating Viral Vector	VSV-S	Aurobindo	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	VSV vector	FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	VSV-S	Israel Institute for Biological Research/Weizmann Institute of Science	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	M2-deficient single replication (M2SR) influenza vector	UW–Madison/FluGen/Bharat Biotech	SARS-CoV2	Pre-Clinical	influenza
Replicating Viral Vector	Newcastle disease virus vector (NDV-SARS-CoV-2/Spike)	Intravacc/ Wageningen Bioveterinary Research/Utrecht Univ.	SARS-CoV2	Pre-Clinical	
Replicating Viral Vector	Avian paramyxovirus vector (APMV)	The Lancaster University, UK	SARS-CoV2	Pre-Clinical	
RNA	saRNA formulated in a NLC	Infectious Disease Research Institute/ Amyris, Inc.	SARS-CoV2	Pre-Clinical	
RNA	LNP-encapsulated mRNA encoding S	Max-Planck-Institute of Colloids and Interfaces	SARS-CoV2	Pre-Clinical	
RNA	Self-amplifying RNA	Gennova	SARS-CoV2	Pre-Clinical	
RNA	mRNA	Selcuk University	SARS-CoV2	Pre-Clinical	
RNA	LNP-mRNA	Translate Bio/Sanofi Pasteur	SARS-CoV2	Pre-Clinical	
RNA	LNP-mRNA	CanSino Biologics/Precision NanoSystems	SARS-CoV2	Pre-Clinical	
RNA	LNP-encapsulated mRNA cocktail encoding VLP	Fudan University/ Shanghai JiaoTong University/RNACure Biopharma	SARS-CoV2	Pre-Clinical	
RNA	LNP-encapsulated mRNA encoding RBD	Fudan University/ Shanghai JiaoTong University/RNACure Biopharma	SARS-CoV2	Pre-Clinical	
RNA	Replicating Defective SARS-CoV-2 derived RNAs	Centro Nacional Biotecnología (CNB-CSIC), Spain	SARS-CoV2	Pre-Clinical	
RNA	LNP-encapsulated mRNA	University of Tokyo/ Daiichi-Sankyo	SARS-CoV2	Pre-Clinical	MERS
RNA	Liposome-encapsulated mRNA	BIOCAD	SARS-CoV2	Pre-Clinical	
RNA	Several mRNA candidates	RNAimmune, Inc.	SARS-CoV2	Pre-Clinical	

RNA	mRNA	FBRI SRC VB VECTOR, Rospotrebnadzor, Koltsovo	SARS-CoV2	Pre-Clinical	
RNA	mRNA	China CDC/Tongji University/Stermina	SARS-CoV2	Pre-Clinical	
RNA	LNP-mRNA	Chula Vaccine Research Center/University of Pennsylvania	SARS-CoV2	Pre-Clinical	
RNA	mRNA in an intranasal delivery system	eTheRNA	SARS-CoV2	Pre-Clinical	
RNA	mRNA	Greenlight Biosciences	SARS-CoV2	Pre-Clinical	
RNA	mRNA	IDIBAPS-Hospital Clinic, Spain	SARS-CoV2	Pre-Clinical	
T-cell based	CD8 T cell peptide targeting (S, M, N) and (NSPs) SARS-CoV-2 proteins	OSE immunotherapeutics	SARS-CoV2	Pre-Clinical	
VLP	VLP	Max Planck Institute for Dynamics of Complex Technical Systems	SARS-CoV2	Pre-Clinical	
VLP	Virus-like particle-based Dendritic Cell(DC)-targeting vaccine	University of Manitoba	SARS-CoV2	Pre-Clinical	
VLP	VLP	Bezmialem Vakif University	SARS-CoV2	Pre-Clinical	
VLP	VLP	Middle East Technical University	SARS-CoV2	Pre-Clinical	
VLP	Enveloped Virus-Like Particle (eVLP)	VBI Vaccines Inc.	SARS-CoV-2, SARS-CoV, & MERS-CoV	Pre-Clinical	CMV, GBM, Zika
VLP	S protein integrated in HIV VLPs	IrsiCaixa AIDS Research/IRTA-CReSA/Barcelona Supercomputing Centre/Grifols	SARS-CoV2	Pre-Clinical	
VLP	VLP + Adjuvant	Mahidol University/ The Government Pharmaceutical Organization (GPO)/Siriraj Hospital	SARS-CoV2	Pre-Clinical	
VLP	Virus-like particles, lentivirus and baculovirus vehicles	Navarrabiomed, Oncoimmunology group	SARS-CoV2	Pre-Clinical	
VLP	Virus-like particle, based on RBD displayed on virus-like particles	Saiba GmbH	SARS-CoV2	Pre-Clinical	
VLP	ADDomerTM multiepitope display	Imophoron Ltd and Bristol University's Max Planck Centre	SARS-CoV2	Pre-Clinical	
VLP	Unknown	Doherty Institute	SARS-CoV2	Pre-Clinical	
VLP	VLP	OSIVAX	SARS-CoV1 SARS-CoV2	Pre-Clinical	
VLP	eVLP	ARTES Biotechnology	SARS-CoV2	Pre-Clinical	malaria

VLP	VLPs peptides/whole virus	Univ. of Sao Paulo	SARS-CoV2	Pre-Clinical	