

Summary of COVID-19 vaccine candidates and related agreements

This table tracks various development, production, supply, funding, and intellectual property agreements for COVID-19 vaccine candidates. The information included in the table was sourced from publicly available information such as company websites and reputable news sources. In addition, the *WHO Draft Landscape of COVID-19 Candidate Vaccines* was used as a central reference point to identify new vaccine candidates. Please note: the contents of this table are formed from GHIAA's understanding and interpretation of publicly available information. The purpose of this table is to begin to identify agreements related to the COVID-19 response, however it should not be relied upon to provide a complete overview of the current landscape.

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
AZD1222 (previously ChAdOx1) Non-Replicating Viral Vector	Jenner Institute, University of Oxford (academic institution) AstraZeneca (multinational pharmaceutical company) Serum Institute of India (vaccine manufacturer) IQVIA (contract research organization)	Phase 3 clinical trial ISRCTN Registry Identifier: ISRCTN89951424 (Phase 3) ClinicalTrials.gov Identifiers (U.S.): NCT04456595 (Phase 3) NCT04352608 (Phase 1/2) NCT04383574 (Phase 1/2) EU Clinical Trials Register Identifier: 2020-001228-32 (Phase 2b/3) 2020-001072-15 (Phase 1/2) Pan African Clinical Trials Registry Identifier: PACTR202006922165132 (Phase 1/2)	UK Government (government) University of Oxford (academic institution) BARDA (government) CEPI (funder) Gavi, the Vaccine Alliance (multilateral organization)	Supply agreement between AstraZeneca & Inclusive Vaccines Alliance Licensing, manufacturing, and distribution agreement between R-Pharm and AstraZeneca Supply agreement between Symbiosis Pharmaceutical and AstraZeneca Supply agreement for 300 million doses between U.S. Government and AstraZeneca Supply agreement for 100 million doses (30 million by Sept. 2020) between U.K. Government and AstraZeneca Supply/manufacturing agreement between Brazilian Government and AstraZeneca Manufacturing agreement between AstraZeneca & Catalent Supply & licensing agreement between Serum Institute of India and AstraZeneca Manufacturing agreement for clinical trials between Serum Institute of India and AstraZeneca

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				<p>Manufacturing, procurement and distribution agreement for 300 million doses between CEPI, Gavi, and AstraZeneca</p> <p>Manufacturing agreement (1-year) between Oxford Biomedica & AstraZeneca</p> <p>Funding partnership between BARDA and AstraZeneca</p> <p>Funding partnership between CEPI, Gavi, and AstraZeneca</p> <p>Development agreement between Oxford & AstraZeneca</p> <p>Development collaboration between IQVIA & AstraZeneca</p>
<p>mRNA-1273 LNP-encapsulated mRNA</p>	<p>Moderna (biotechnology company)</p> <p>Lonza (multinational pharmaceutical company)</p> <p>NIAID (government)</p>	<p>Phase 3 clinical trial</p> <p>ClinicalTrials.gov Identifiers (U.S.): NCT04283461 (Phase 1) NCT04405076 (Phase 2) NCT04470427 (Phase 3)</p>	<p>NIAID (government)</p> <p>BARDA (government)</p> <p>CEPI (funder)</p> <p>Operation Warp Speed (government)</p>	<p>10-year strategic collaboration agreement between Moderna & Lonza</p> <p>Funding partnership between Moderna & CEPI</p> <p>Funding partnership between Moderna & BARDA</p> <p>Manufacturing agreement between Moderna & Laboratorios Farmacéuticos Rovi</p>
<p>Inactivated vaccine</p>	<p>Wuhan Institute of Biological Products (state-owned biotechnology company)</p> <p>Sinopharm (state-owned biotechnology company)</p>	<p>Phase 3 clinical trial</p> <p>Chinese Clinical Trials Registry Identifiers: ChiCTR2000031809 (Phase 1/2)</p>		

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		ChiCTR2000034780 (Phase 3)		
Inactivated vaccine	Beijing Institute of Biological Products (state-owned biotechnology company) Sinopharm (state-owned biotechnology company)	Phase 3 clinical trial Chinese Clinical Trials Registry Identifier: ChiCTR2000032459 (Phase 1/2) ChiCTR2000034780 (Phase 3)		
CoronaVac Inactivated + alum	Sinovac (state-owned biotechnology company) Instituto Butantan (research institute)	Phase 3 clinical trial ClinicalTrials.gov Identifiers (U.S.): NCT04456595 (Phase 3) NCT04352608 (Phase 1/2) NCT04383574 (Phase 1/2)	Advantech Capital (general industry) Vivo Capital (general industry) Government of China (government)	Development agreement between Sinovac & Instituto Butantan Clinical trial and manufacturing agreement between Sinovac & PT BioFarma
Bacillus Calmette-Guerin (BCG) live-attenuated vaccine	University of Melbourne (academic institution) Murdoch Children's Research Institute (research institute) Radboud University Medical Center (non-profit) Faustman Lab at Massachusetts General Hospital (research institute)	Phase 2/3 clinical trial ClinicalTrials.gov Identifiers (U.S.): NCT04327206, NCT04328441	Gates Foundation (funder) Sarah and Lachlan Murdoch (funder) The Royal Children's Hospital Foundation (non-profit) The Minderoo Foundation (non-profit) South Australian government (funder) NAB Foundation (non-profit)	Funding agreement between Gates and University of Melbourne

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			Calvert-Jones Foundation (non-profit / funder) HUG Foundation (non-profit / funder) River Capital (general industry) Individual donors	
BNT162b2 LNP-mRNA	Pfizer (multinational pharmaceutical company) BioNTech (biotechnology company) Fosun Pharma (multinational pharmaceutical company)	Phase 2/3 clinical trial EU Clinical Trials Register Identifier: 2020-001038-36 (Phase 1/2) ClinicalTrials.gov Identifier (U.S.): NCT04368728 (Phase 1/2) Chinese Clinical Trial Registry Identifier: ChiCTR2000034825 (Phase 1/2)		Material transfer and Collaboration agreement between Pfizer & BioNTech Licensing & equity investment agreement between Fosun and BioNTech Supply agreement for 100 million doses between U.S. Government, Pfizer & BioNTech Supply agreement for 120 million doses between Government of Japan, Pfizer, & BioNTech Clinical trial agreement between Pfizer, BioNTech, The University of Rochester Medical Center and Rochester Regional Health
Adjuvanted recombinant protein (RBD-Dimer) Protein Subunit	Anhui Zhifei Longcom Biopharmaceutical (biotechnology company) Institute of Microbiology, Chinese Academy of Sciences (academic institution)	Phase 2 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04445194 (Phase 1) NCT04466085 (Phase 2)		Development partnership between Anhui Zhifei Longcom Biopharmaceutical & Institute of Microbiology, Chinese Academy of Sciences

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
Ad5-nCoV Adenovirus Type 5 Vector, Non-Replicating Viral Vector	CanSino Biologics (biotechnology company / vaccine manufacturer) Beijing Institute of Biotechnology (academic institution)	Phase 2 clinical trial Chinese Clinical Trial Registry Identifiers: ChiCTR2000030906 (Phase 1), ChiCTR2000031781 (Phase 2) ClinicalTrials.gov Identifier (U.S.): NCT04313127		Development agreement between National Research Council Canada & CanSino Biologics Development agreement between Sartorius, Beijing Institute of Biotechnology & CanSino Biologics 2014 Licensing agreement (between CanSino and National Research Council Canada – for cell line)
NVX-CoV2373 Full length recombinant SARs CoV-2 glycoprotein nanoparticle vaccine adjuvanted with Matrix M – Protein Subunit	Novavax (biotechnology company)	Phase 1/2 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04368988 (Phase 1/2)	Operation Warp Speed (government) CEPI (funder) U.S. Department of Defense (government)	Manufacturing agreement between AGC Biologics & Novavax Funding agreement between Novavax and the U.S. Department of Defense Funding agreement between Novavax and CEPI Funding agreement including the delivery of 100 million doses starting late 2020 between Operation Warp Speed and Novavax Contract development and manufacturing agreement between Emergent & Novavax Phase 1 clinical trial agreement between Nucleus & Novavax
ZyCoV-D: DNA plasmid vaccine	Cadila Healthcare Limited (multinational pharmaceutical company)	Phase 1/2 clinical trial Chinese Clinical Trial Registry Identifier:		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
		CTRI/2020/07/026352 (Phase 1/2)		
DNA plasmid vaccine	Osaka University (academic institution) AnGes (biotechnology company) Takara Bio (biotechnology company)	Phase 1/2 clinical trial Japanese Clinical Trial Identifier: JapicCTI-205328 (Phase I) ClinicalTrials.gov Identifier (U.S.): NCT04463472 (Phase 1/2)		Collaboration between Osaka University, AnGes & Takara Bio Manufacturing agreement between Cytiva & Takara Bio
Inactivated vaccine	Institute of Medical Biology, Chinese Academy of Medical Sciences (academic institution)	Phase 1/2 clinical trial ClinicalTrials.gov Identifiers (U.S.): NCT04412538 (Phase I) NCT04470609 (Phase 1/2)	Jack Ma Foundation (funder)	
RBD-based vaccine Protein Subunit	Kentucky Bioprocessing, Inc (British American Tobacco) (general industry)	Phase 1/2 clinical trial ClinicalTrials.gov Identifiers (U.S.): NCT04473690 (Phase 1/2)		
Ad26 Non-Replicating Viral Vector	Janssen Pharmaceutical Companies (multinational pharmaceutical company)	Phase 1/2 clinical trial	BARDA (government)	Development partnership between Beth Israel Deaconess Medical Center & Janssen 5-Year CDMO services agreement between Emergent & Janssen Manufacturing agreement between Catalent & Janssen
LUNAR-COV19, mRNA	Arcturus (biotechnology company)	Phase 1/2 clinical trial		Collaboration between Arcturus & Duke-NUS medical school

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	Duke-NUS (academic institution)	ClinicalTrials.gov Identifiers (U.S.): NCT04480957 (Phase 1/2)		Manufacturing agreement between Arcturus & Catalent
INO-4800 DNA plasmid vaccine with electroporation	Inovio Pharmaceuticals (biotechnology company) International Vaccine Institute (multilateral organization)	Phase 1 clinical trial ClinicalTrials.gov Identifiers (U.S.): NCT04447781 (Phase 1/2) NCT04336410 (Phase 1/2)	Gates Foundation (funder) CEPI (funder) U.S. Department of Defense (government)	Manufacturing partnership between Richter-Helm BioLogics GmbH & Co. KG, VGXI & Inovio Technology transfer and manufacturing agreement between Ology Bioservices & Inovio, funded by U.S. Department of Defense Funding agreement between CEPI & Inovio Funding agreement between Gates & Inovio Phase 1/2 clinical trial partnership between IVI, Seoul National University Hospital & Inovio
bacTRL-Spike	Symvivo (biotechnology company) Vaccine Evaluation Center (academic institution) BC Children's Hospital Research Institute (academic institution) University of British Columbia (academic institution) Canadian Center for Vaccinology (research institute) Dalhousie University (academic institution)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04334980		Development partnership for Phase 1 Trial between Symvivo, Vaccine Evaluation Center, BC Children's Hospital Research Institute, University of British Columbia, the Canadian Center for Vaccinology, Dalhousie University & IWK Health Centre in Halifax

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	IWK Health Centre in Halifax (academic institution)			
LV-SMENP-DC Dendritic cells modified with lentiviral vector expressing synthetic minigene based on domains of selected viral proteins administered with antigen-specific cytotoxic T lymphocytes	Shenzhen Geno-Immune Medical Institute (government)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04276896		
Artificial antigen-presenting cells modified with lentiviral vector expressing synthetic minigene based on domains of selected viral proteins	Shenzhen Geno-Immune Medical Institute (government)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04299724		
The RNA Printer™ mRNA-based COVID-19 vaccine	CureVac (biotechnology company) The Institute for Tropical Medicine in Tübingen (academic institution)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04449276	European Investment Bank (multilateral organization) European Commission (multilateral organization) CEPI (funder) Gates Foundation (funder) DARPA (government) German Government (government)	Funding agreement between CEPI & CureVac Funding agreement between German government & CureVac

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GX-19 DNA Vaccine	Consortium: Genexine, Binex, GenNBio, International Vaccine Institute, Korea Advanced Institute of Science and Technology and Pohang University of Science and Technology (product development partnership)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04445389 (Phase 1/2a)	Finnish Government (government)	MOU for human trials in Indonesia between Genexine & Kalbe) MOU between Binex & Genexine Joint venture for Indonesian clinical trial between Kingen Holdings & Genexine
Adeno-based, Non-Replicating Viral Vector	Gamaleya Research Institute (research institute) Sechenov University (academic institution)	Phase 1 clinical trial ClinicalTrials.gov Identifiers (U.S.): NCT04436471 (Phase 1) NCT04437875 (Phase 1)		
SCB-2019 Native like Trimeric subunit Spike Protein vaccine, Protein Subunit	Clover Biopharmaceuticals Inc (multinational pharmaceutical company) GSK (multinational pharmaceutical company) Dynavax (biotechnology company)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04405908 (Phase 1)	CEPI (funder)	Development agreement between GSK & Clover Development agreement between Dynavax & Clover Funding partnership between CEPI & Clover
LNP-nCoVsaRNA	Imperial College London (academic institution)	Phase 1 clinical trial ISRCTN Registry Identifier: ISRCTN17072692	U.K. Government (funder)	Partnership between Morningside Ventures & Imperial College to create VacEquity

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ARCoV mRNA	People's Liberation Army Academy of Military Sciences (government) Walvax Biotech (biotechnology company)	Phase 1 clinical trial Chinese Clinical Trial Registry Identifier: ChiCTR2000034112		Development partnership between People's Liberation Army Academy of Military Sciences & Walvax
Recombinant spike protein with Advax™ adjuvant, Protein Subunit	Vaxine Pty Ltd (biotechnology company) Medytox (multinational pharmaceutical company)	Phase 1 clinical trial ClinicalTrials.gov Identifier (U.S.): NCT04453852		Collaboration for Phase 1 Trial Between Flinders University & Vaxine Technical collaboration partnership between Oracle, Flinders University & Vaxine Manufacturing agreement between Sypharma & Vaxine
Plant-derived VLP adjuvanted with GSK or Dynavax adjs.	Medicago (biotechnology company) Université Laval (academic institution) GSK (multinational pharmaceutical company)	Phase 1 ClinicalTrials.gov Identifier (U.S.): NCT04450004 (Phase I)	Canadian Institutes for Health Research (government / funder)	Collaboration between Medicago & Laval University Development agreement between Medicago & GSK
Whole-Virion Inactivated Vaccine	Bharat Biotech (biotechnology company)	Phase 1 Chinese Clinical Trial Registry Identifier: CTRI/2020/07/026300		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
Molecular clamp stabilized Spike protein with MF59 adjuvant Protein Subunit	University of Queensland (academic institution) CSL (biotechnology company) Seqirus (biotechnology company / vaccine manufacturer)	Phase 1 Australian New Zealand Clinical Trial Registry Identifier: ACTRN12620000674932p	Queensland Government (government) Australian Government (government) Paul Ramsey Foundation (funder) CEPI (funder) CSL (biotechnology company)	Development & manufacturing agreement between the University of Queensland, CEPI & CSL
S-2P protein + CpG 1018 Protein Subunit	Medigen Vaccine Biologics Corporation (biotechnology company / vaccine manufacturer) NIAID (government) Dynavax (biotechnology company)	Phase 1 NCT04487210 (Phase 1)		
Inactivated whole virus	National Research Centre, Egypt (research institute)	Pre-clinical		
S,S1,S2,RBD &N DNA plasmid vaccine	National Research Centre, Egypt (research institute)	Pre-clinical		
PittCoVacc Microneedle arrays S1 subunit, Protein Subunit	University of Pittsburgh Center for Vaccine Research (academic institution)	Pre-clinical	CEPI (funder)	Funding partnership between CEPI & University of Pittsburgh
Ii-Key peptide	Generex Biotechnology (biotechnology company) EpiVax (biotechnology company)	Pre-clinical		Development & commercial licensing between partners in China & Generex Development agreement between EpiVax & Generex

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Oral recombinant vaccine gene-based vaccine	Vaxart (biotechnology company)	Pre-clinical	Operation Warp Speed (government)	Development & manufacturing agreement for phase 1 study between Emergent & Vaxart Manufacturing agreement between KindredBio & Vaxart)
DNA-based vaccine	Takis Biotech (biotechnology company) Applied DNA Sciences (biotechnology company) Evvivax (biotechnology company)	Pre-clinical		Development agreement between Applied DNA & Takis
MVA-S Non-replicating viral vector	IDIBAPS-Hospital Clinic, Spain (non-profit)	Pre-clinical		
AdCOVID Intranasal vaccine, adenovirus-based NasoVAX expressing SARS2-CoV spike protein, Non-Replicating Viral Vector	Altimmune (biotechnology company) DynPort (biotechnology company)	Pre-clinical		Collaboration between UAB & Altimmune Teaming agreement between Altimmune & DynPort
T-COVIDTM	Altimmune (biotechnology company)	Pre-clinical		
DNA with electroporation	OPENCORONA Project – Karolinska Institute & Cobra Biologics (product development partnership)	Pre-clinical	Horizon 2020 (European Union) (funder)	
DNA with electroporation	Chula Vaccine Research Center (academic institution)	Pre-clinical		
Plasmid DNA Needle-Free Delivery	Immunomic Therapeutics, Inc. (biotechnology company)	Pre-clinical		Development agreement between Immunomic, EpiVax & PharmaJet

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	EpiVax (biotechnology company) PharmaJet (general industry)			
DNA vaccine	BioNet Asia (biotechnology company / vaccine manufacturer)	Pre-clinical		Collaboration between the Thai National Control Laboratory & BioNet Asia
msDNA vaccine	University of Waterloo (academic institution) Mediphage Bioceuticals (biotechnology company)	Pre-clinical	Natural Sciences and Engineering Research Council of Canada (government)	
DNA vaccine	Entos Pharmaceuticals (biotechnology company)	Pre-clinical		Development agreement between EpiVax & Entos Manufacturing agreement between Cytiva & Entos
Inactivated vaccine	Beijing Minhai Biotechnology Co., Ltd. (biotechnology company / vaccine manufacturer)	Pre-clinical		
Inactivated vaccine	Osaka University (academic institution) BIKEN (biotechnology company) NIBIOHN (government)	Pre-clinical		
Inactivated + CpG 1018 vaccine	Sinovac (biotechnology company / vaccine manufacturer)	Pre-clinical		Development agreement between Sinovac & Dynavax

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	Dynavax (biotechnology company)			
Inactivated + CpG 1018 vaccine	Valneva (biotechnology company) Dynavax (biotechnology company)	Pre-clinical		Development agreement between Valneva & Dynavax
Inactivated vaccine	Research Institute for Biological Safety Problems, Republic of Kazakhstan (government)	Pre-clinical		
Codon deoptimized live attenuated vaccine	Codagenix (biotechnology company) Serum Institute of India (vaccine manufacturer)	Pre-clinical	Adjuvant Capital (funder)	Manufacturing & distribution agreement between Codagenix & Serum Institute of India
Codon deoptimized live attenuated vaccine	Indian Immunologicals Ltd (biotechnology company / vaccine manufacturer) Griffith University (academic institution)	Pre-clinical		Collaboration between Indian Immunologicals & Griffith University
AAVCOVID Adeno-associated virus vector, Non-Replicating Viral Vector	Massachusetts Eye and Ear (non-profit) Massachusetts General Hospital (non-profit) AveXis (biotechnology company) – Subsidiary of Novartis (multinational pharmaceutical company)	Pre-clinical		Manufacturing agreement between Massachusetts Eye and Ear, Massachusetts General Hospital & AveXis

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
MVA encoded VLP, Non-Replicating Viral Vector	GeoVax (biotechnology company) BravoVax (biotechnology company / vaccine manufacturer)	Pre-clinical		Development agreement between GeoVax & BravoVax
Replication defective Simian Adenovirus (GRAd) encoding SARS-CoV-2 S Non-Replicating Viral Vector	ReiThera (biotechnology company) LEUKOCARE (biotechnology company) Univercells (vaccine manufacturer)	Pre-clinical		Strategic collaboration agreement between ReiThera, Leukocare & Univercells Manufacturing partnership between Exyte & Univercells
MVA-S encoded, Non-replicating viral vector	DZIF – German Center for Infection Research (government) IDT Biologika GmbH (vaccine manufacturer)	Pre-clinical	CEPI (funder)	Manufacturing partnership between DZIF & IDT for pre-clinical trials
[E1-, E2b-, E3-] hAd5-COVID19-Spike/Nucleocapsid Non-Replicating Viral Vector	ImmunityBio, Inc. (biotechnology company) NantKwest, Inc. (biotechnology company)	Pre-clinical		Joint development, manufacture, and marketing agreement between ImmunityBio & NantKwest
Ad5 S (GREVAX™ platform) Non-Replicating Viral Vector	Greffex (biotechnology company)	Pre-clinical		
Oral Ad5 S Non-replicating viral vector	Stabilitech Biopharma Ltd (biotechnology company)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
Adenovirus-based + HLA-matched peptides Non-replicating viral vector	Valo Therapeutics Ltd (biotechnology company)	Pre-clinical		
MVA expressing structural proteins Non-replicating viral vector	Centro Nacional Biotecnología (CNB-CSIC) (government)	Pre-clinical	Jesús Serra Foundation (Catalana Occidente Group) (non-profit / funder)	
Dendritic cell-based vaccine Non-replicating viral vector	University of Manitoba (academic institution)	Pre-clinical	Canadian Government (funder)	
Parainfluenza virus 5 (PIV5)-based vaccine expressing the spike protein Non-replicating viral vector	University of Georgia (academic institution) University of Iowa (academic institution)	Pre-clinical	National Institutes of Health (government / funder) Cystic Fibrosis Foundation (non-profit / funder) Roy J. Carver Charitable Trust (non-profit / funder) Biao He (funder) Fred C. Davison endowment (non-profit / funder)	Academic partnership between University of Georgia & University of Iowa University licensing from the University of Georgia
Recombinant deactivated rabies virus containing S1 Non-replicating viral vector	Bharat Biotech (biotechnology company) Thomas Jefferson University (academic institution)	Pre-clinical		Licensing & development agreement between Bharat Biotech & Thomas Jefferson University
Protein Subunit	Adeleke University (academic institution)	Pre-clinical	Helix Biogen Consult (general industry)	Partnership between Adeleke University, Helix Biogen Consult & Trinity Immoefficient Laboratory

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	Helix Biogen Consult (general industry) Trinity Immono-efficient Laboratory (pharmaceutical manufacturer)		Trinity Immono-efficient Laboratory (pharmaceutical manufacturer)	
Influenza A H1N1 vector	National Research Centre, Egypt (research institute)	Pre-clinical		
Inactivated Flu-based SARS-CoV2 vaccine + Adjuvant Non-replicating viral vector	National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand (research institute) Government Pharmaceutical Organization (GPO), Thailand (government)	Pre-clinical	Government Pharmaceutical Organization (GPO), Thailand (government)	
Protein Subunit	University of San Martin (academic institution) CONICET (government)	Pre-clinical		
RBD protein fused with Fc of IgG + Adj. Protein Subunit	Chulalongkorn University (academic institution) Government Pharmaceutical Organization (GPO), Thailand (government)	Pre-clinical	Government Pharmaceutical Organization (GPO), Thailand (government)	
Capsid-like Particle Protein Subunit	AdaptVac (PREVENT-nCoV consortium) (product development partnership)	Pre-clinical	Horizon 2020 (European Union) (funder)	Manufacturing agreement between AGC Biologics & AdaptVac Licensing agreement between Bavarian Nordic & AdaptVac

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
				Grant agreement between Horizon 2020/IMI & AdaptVac
Drosophila S2 insect cell expression system VLPs Protein Subunit	ExpreS2ion (biotechnology company)	Pre-clinical	Horizon 2020 (European Union) (funder)	
DPX-COVID-19, Peptide antigens formulated in LNP Protein Subunit	IMV Inc (biotechnology company)	Pre-clinical		Collaboration for the Phase I trial between IMV & the lead study investigators
S protein Protein Subunit	WRAIR (government) USAMRIID (government)	Pre-clinical		
S protein +Adjuvant Protein Subunit	National Institute of Infectious Disease (NIID), Japan (government) Shionogi (multinational pharmaceutical company) UMN Pharma (biotechnology company/ vaccine manufacturer / pharmaceutical manufacturer)	Pre-clinical		
Peptide Protein Subunit	Vaxil Bio (biotechnology company)	Pre-clinical		
Adjuvanted protein subunit (RBD)	Biological E Ltd (biotechnology company/ vaccine manufacturer / pharmaceutical manufacturer)	Pre-clinical		
Peptide Protein Subunit	Flow Pharma Inc (biotechnology company)	Pre-clinical		Manufacturing agreement between Oakwood Labs & Flow Pharma

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S protein	AJ Vaccines (biotechnology company / vaccine manufacturer)	Pre-clinical		
VLP-recombinant protein + Adjuvant	Osaka University (academic institution) BIKEN (biotechnology company) National Institutes of Biomedical Innovation, Japan (government)	Pre-clinical		Partnership between Osaka University, BIKEN, & National Institutes of Biomedical Innovation, Japan
S protein Protein Subunit	EpiVax (biotechnology company) University of Georgia (academic institution)	Pre-clinical		Partnership between EpiVax & University of Georgia
Protein Subunit EPV-CoV-19 Protein Subunit	EpiVax (biotechnology company)	Pre-clinical	Crowdsourcing	Licensing from EpiVax to the GAIA Vaccine Foundation
S protein (baculovirus production) Protein Subunit	Sanofi Pasteur (multinational pharmaceutical company) GSK (multinational pharmaceutical company)	Pre-clinical	BARDA (government)	Development/supply agreement between Sanofi, GSK, & U.S. Government for 100 million doses Development & material transfer agreement between Sanofi Pasteur & GSK Funding partnership between BARDA & Sanofi Pasteur
gp-96 backbone Protein Subunit	Heat Biologics (biotechnology company) University of Miami (academic institution)	Pre-clinical		Partnership between Heat Biologics & University of Miami Manufacturing agreement for Phase I clinical trials between Waisman & Heat Biologics
Peptide vaccine Protein Subunit	State Research Center of Virology and Biotechnology	Pre-clinical		

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	VECTOR of the Federal Service for Surveillance in Consumer Rights Protection and Human Well-being (FSRI SRC VB VECTOR), Russia (government)			
Subunit vaccine Protein Subunit	State Research Center of Virology and Biotechnology VECTOR of the Federal Service for Surveillance in Consumer Rights Protection and Human Well-being (FSRI SRC VB VECTOR), Russia (government)	Pre-clinical		
S1 or RBD protein Protein Subunit	Baylor College of Medicine (academic institution)	Pre-clinical	Tito's Handmade Vodka (general) Texas Children's Hospital (non-profit) Baylor College of Medicine (academic institution)	Partnership between the Baylor College of Medicine, Texas Children's Hospital & PATH
Subunit protein, plant produced	iBio (biotechnology company) CC-Pharming (biotechnology company)	Pre-clinical		Development partnership between iBio & CC-Pharming)
Recombinant protein, nanoparticles (based on S-protein and other epitopes) Protein Subunit	Saint-Petersburg Scientific Research Institute of Vaccines and Serums (government)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
COVID-19 XWG-03 truncated S (spike) proteins Protein Subunit	Innovax Biotech (biotechnology company / vaccine manufacturer) Xiamen University (academic institution) GSK (multinational pharmaceutical company)	Pre-clinical		Development agreement between GSK & Innovax Partnership between Innovax & Xiamen University
Adjuvanted microsphere peptide Protein Subunit	VIDO-InterVac (University of Saskatchewan) (academic institution)	Pre-clinical	Canada Foundation for Innovation (government) Western Economic Diversification - Regional Economic Growth Through Innovation Program (funder)	
Synthetic Long Peptide Vaccine candidate for S and M proteins	OncoGen (pharmaceutical manufacturer)	Pre-clinical		
Oral E. coli-based protein expression system of S and N proteins Protein Subunit	MIGAL Galilee Research Institute (research institute)	Pre-clinical	OurCrowd (funder)	
Nanoparticle vaccine Protein Subunit	LakePharma, Inc. (vaccine manufacturer)	Pre-clinical		
Plant-based subunit (RBD-Fc + Adjuvant) Protein Subunit	Baiya Phytopharm (biotechnology company) Chula Vaccine Research Center (academic institution)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
OMV-based vaccine Protein Subunit	Quadram Institute Biosciences (academic institution)	Pre-clinical		
OMV-based vaccine Protein Subunit	BiOMViS Srl (biotechnology company) University of Trento (academic institution)	Pre-clinical		Partnership between BiOMViS Srl & University of Trento
Structurally modified spherical particles of the tobacco mosaic virus (TMV) Protein Subunit	Lomonosov Moscow State University (academic institution)	Pre-clinical		
Spike-based Protein Subunit	University of Alberta (academic institution)	Pre-clinical	Alberta Innovates (funder) Canadian Institutes of Health Research (government)	Partnership between Tonix Pharma & University of Alberta
Recombinant S1-Fc fusion protein Protein Subunit	AnyGo Technology (general industry)	Pre-clinical		
Recombinant protein Protein Subunit	Yisheng Biopharma (multinational pharmaceutical company)	Pre-clinical		
Recombinant S protein in IC-BEVS Protein Subunit	Vabiotech (Vietnam Ministry of Health) (government)	Pre-clinical		Partnership between University of Bristol & Vabiotech
Orally delivered, heat stable subunit	Applied Biotechnology Institute, Inc. (biotechnology company)	Pre-clinical		
Peptides derived from Spike protein	Axon Neuroscience SE (biotechnology company)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
Protein Subunit				
Protein Subunit	MOGAM Institute for Biomedical Research (non-profit) GC Pharma (biotechnology company)	Pre-clinical		
RBD-based vaccine Protein Subunit	Neovii (multinational pharmaceutical company) Tel Aviv University (academic institution)	Pre-clinical		Licensing agreement between Neovii & Tel Aviv University
Outer Membrane Vesicle (OMV)-peptide Protein Subunit	Intravacc (contract research organization) Epivax (biotechnology company)	Pre-clinical		Development agreement between Intravacc & Epivax)
Spike-based (epitope screening)	ImmunoPrecise (contract research organization) LiteVax BV (biotechnology company)	Pre-clinical		
YF17D Vector Replicating Viral Vector	KU Leuven (academic institution)	Pre-clinical		
Measles Vector Replicating Viral Vector	Cadila Healthcare Limited (multinational pharmaceutical company)	Pre-clinical		
Measles Vector Replicating Viral Vector	Merck (multinational pharmaceutical company) Institute Pasteur (non-profit)	Pre-clinical	CEPI (funder)	Development partnership between Institute Pasteur, Themis & University of Pittsburg Funding partnership between CEPI & Institute Pasteur

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	Themis (biotechnology company) University of Pittsburg Center for Vaccine Research (academic institution)			
Measles Vector Replicating Viral Vector	State Research Center of Virology and Biotechnology VECTOR of the Federal Service for Surveillance in Consumer Rights Protection and Human Well-being (FSRI SRC VB VECTOR), Russia (government)	Pre-clinical		
Measles Virus (S, N targets) Live attenuated virus	DZIF – German Center for Infection Research (government) CanVirex AG (biotechnology company)	Pre-clinical		
Horsepox vector expressing S protein Replicating Viral Vector	Tonix Pharma (biotechnology company) Southern Research (contract research organization)	Pre-clinical		Development agreement between Tonix & Southern Research
Live viral vectored vaccine based on attenuated influenza virus backbone (intranasal) Replicating Viral Vector	BiOCAD (biotechnology company / vaccine manufacturer) IEM (government)	Pre-clinical		
Recombinant vaccine based on Influenza A virus (intranasal) Replicating Viral Vector	State Research Center of Virology and Biotechnology VECTOR of the Federal Service for Surveillance in Consumer Rights Protection	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	and Human Well-being (FSRI SRC VB VECTOR), Russia (government)			
Attenuated Influenza expressing an antigenic portion of the Spike protein Replicating Viral Vector	Fundação Oswaldo Cruz (non-profit) Instituto Butantan (academic institution)	Pre-clinical		
Influenza vector expressing RBD Replicating Viral Vector	University of Hong Kong (academic institution)	Pre-clinical	CEPI (funder)	Funding partnership between CEPI & University of Hong Kong
Replication-competent VSV chimeric virus technology (VSVΔG) delivering the SARS-CoV-2 Spike (S) glycoprotein Replicating Viral Vector	IAVI (non-profit) Merck (multinational pharmaceutical company)	Pre-clinical	BARDA (funder)	Manufacturing agreement between IAVI & Batavia Development agreement between IAVI & Merck Funding partnership between BARDA, IAVI & Merck
VSV-S Replicating Viral Vector	University of Western Ontario (academic institution)	Pre-clinical	Canada (government)	
VSV vector Replicating Viral Vector	State Research Center of Virology and Biotechnology VECTOR of the Federal Service for Surveillance in Consumer Rights Protection and Human Well-being (FSRI SRC VB VECTOR), Russia (government)	Pre-clinical		
VSV vector Replicating Viral Vector	Israel Institute for Biological Research (research institute)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	Weizmann Institute of Science (academic institution)			
M2-deficient single replication (M2SR) influenza vector Replicating Viral Vector	University of Wisconsin–Madison (academic institution) FluGen (biotechnology company) Bharat Biotech (biotechnology company)	Pre-clinical		Development agreement (including licensing) between University of Wisconsin–Madison, FluGen & Bharat Biotech
Newcastle disease virus vector (NDV-SARS-CoV-2/Spike) Replicating Viral Vector	Intravacc (contract research organization) Wageningen Bioveterinary Research (contract research organization) Utrecht University (academic institution)	Pre-clinical		Development partnership between Utrecht University, Wageningen Bioveterinary Research & Intravacc
Avian paramyxovirus vector (APMV) Replicating Viral Vector	Lancaster University (academic institution)	Pre-clinical		
LNP-mRNA	Translate Bio (biotechnology company) Sanofi Pasteur (multinational pharmaceutical company)	Pre-clinical		Development agreement (including pre-existing licensing agreement) between Translate & Sanofi
LNP-mRNA	CanSino Biologics (biotechnology company / vaccine manufacturer) Precision NanoSystems (biotechnology company)	Pre-clinical		Development agreement (including IP rights) between CanSino Biologics & Precision NanoSystems

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
LNP-encapsulated mRNA cocktail encoding VLP RNA	Fudan University (academic institution) Shanghai Jiao Tong University (academic institution) RNACure Biopharma (biotechnology company)	Pre-clinical		Development collaboration between Fudan University, Shanghai JiaoTong University & RNACure Biopharma
LNP-encapsulated mRNA encoding RBD RNA	Fudan University (academic institution) Shanghai Jiao Tong University (academic institution) RNACure Biopharma (biotechnology company / vaccine manufacturer)	Pre-clinical		Development collaboration between Fudan University, Shanghai JiaoTong University, and RNACure Biopharma
Replicating Defective SARS-CoV-2 derived RNAs	Centro Nacional Biotecnología (CNB-CSIC) (government)	Pre-clinical	Jesús Serra Foundation (Catalana Occidente Group) (funder)	
LNP-encapsulated mRNA	University of Tokyo (academic institution) Daiichi-Sankyo (multinational pharmaceutical company)	Pre-clinical		Development partnership between University of Tokyo & Daiichi-Sankyo
Liposome-encapsulated mRNA	BIOCAD (biotechnology company / vaccine manufacturer)	Pre-clinical		
Several mRNA candidates	RNAimmune, Inc. (biotechnology company)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
mRNA	State Research Center of Virology and Biotechnology VECTOR of the Federal Service for Surveillance in Consumer Rights Protection and Human Well-being (FSRI SRC VB VECTOR), Russia (government)	Pre-clinical		
mRNA	China CDC (government) Tongji University (academic institution) Stermina Therapeutics (biotechnology company)	Pre-clinical		Development partnership between China CDC, Tongji University & Stermina Therapeutics
LNP-mRNA	Chula Vaccine Research Center (academic institution) University of Pennsylvania (academic institution)	Pre-clinical		
mRNA - intranasal delivery system	eTheRNA, EpiVax, Nexelis, REPROCELL, and the Centre for the Evaluation of Vaccination of the University of Antwerp (Product development partnership)	Pre-clinical		
mRNA	Greenlight Biosciences (biotechnology company)	Pre-clinical	Flu Lab (funder) Xeraya Capital (funder)	

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
			Baird Capital (funder)	
mRNA	IDIBAPS-Hospital Clinic (non-profit)	Pre-clinical		
S protein integrated in HIV VLPs	IrsiCaixa AIDS Research IRTA-CReSA (research institute) The Animal Health Research Center IRTA-CReSA (research institute) Barcelona Supercomputing Centre (non-profit) Grifols (multinational pharmaceutical company)	Pre-clinical	Grifols (multinational pharmaceutical company)	Development partnership between the IrsiCaixa AIDS Research Institute, the Barcelona Supercomputing Center (BSC) and the Animal Health Research Center IRTA-CReSA
VLP + Adjuvant	Mahidol University (academic institution) Government Pharmaceutical Organization (GPO), Thailand (government) Siriraj Hospital (non-profit)	Pre-clinical	GPO (government)	
VLP, lentivirus and baculovirus vehicles	Navarrabiomed, Oncoimmunology Group (government)	Pre-clinical		
VLP based on RBD displayed on virus-like particles	Saiba GmbH (biotechnology company)	Pre-clinical		Partnership between Bern University & Saiba GmbH
ADDomer™ multiepitope display VLP	Imophoron Ltd (biotechnology company)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	Max Planck Centre (Bristol University) (academic institution)			
VLP	Doherty Institute (partnership between the University of Melbourne & The Royal Melbourne Hospital) (product development partnership)	Pre-clinical	Jack Ma Foundation (funder) Victoria government (government) a2 Milk Company (general industry)	
VLP	OSIVAX (biotechnology company)	Pre-clinical	EIC Accelerator (funder)	
eVLP	ARTES Biotechnology (biotechnology company)	Pre-clinical		
VLPs peptides/whole virus	University of Sao Paulo (academic institution)	Pre-clinical		
Unknown	Tulane University (academic institution)	Pre-clinical	Brown Foundation (funder)	
Unknown	Université Laval (academic institution)	Pre-clinical	Canadian Government (government)	
Unknown	Adeleke University (academic institution)	Pre-clinical	Trinity Immunodeficient Laboratory (pharmaceutical manufacturer) Helix Biogen Consult (general industry)	
Inactivated + alum	KM Biologics (biotechnology company)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
Inactivated	Selcuk University (academic institution)	Pre-clinical		
DNA	Ege University (academic institution)	Pre-clinical		
DNA plasmid vaccine RBD&N	Scancell (biotechnology company) University of Nottingham (academic institution) Nottingham Trent University (academic institution)	Pre-clinical		Development partnership between Scancell & University of Nottingham
Codon deoptimized live attenuated vaccines	Mehmet Ali Aydinlar University (academic institution) Acibadem Labmed Health Services A.S. (contract research organization)	Pre-clinical		
Sendai virus vector, Non-Replicating Viral Vector	ID Pharma (biotechnology company) National Institute of Infectious Diseases, Japan (government)	Pre-clinical		
Adenovirus-based vaccine, Non-Replicating Viral Vector	Ankara University (academic institution)	Pre-clinical		
Recombinant S protein, Protein	Izmir Biomedicine and Genome Center (academic institution)	Pre-clinical		
Peptide + novel adjuvant, Protein Subunit	Bogazici University (academic institution)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
S subunit intranasal liposomal formulation with GLA/3M052 adjs., Protein Subunit	University of Virginia (academic institution)	Pre-clinical		
mRNA	Selcuk University (academic institution)	Pre-clinical		
VLP	Middle East Technical University (academic institution)	Pre-clinical		
RBD-protein, Protein Subunit	Mynvax (biotechnology company)	Pre-clinical		
VSV-S, Replicating Viral Vector	Aurobindo (pharmaceutical manufacturer)	Pre-clinical		
HGCO19 Self-amplifying RNA	Gennova (biotechnology company) HDT Bio (biotechnology company)	Pre-clinical		Development agreement between Gennova & HDT Bio
Inactivated	Erciyes University (academic institution)	Pre-clinical		
Adeno5-based, Non-replicating viral vector	Erciyes University (academic institution)	Pre-clinical		
VLP	Bezmialem Vakif University (academic institution)	Pre-clinical		
HDT-301, RNA	University of Washington (academic institution) National Institutes of Health Rocky Mountain Laboratories (government)	Pre-clinical		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	HDT Bio Corp (biotechnology company)			
Protein subunit plant virus nanotechnology formulated as injectable and microneedle patch	University of California, San Diego (academic institution)	Early development	National Science Foundation (funder)	
Protein subunit S protein	University of Cambridge (academic institution) DIOSynVax – spinout of U. of Cambridge (academic institution)	Early development		
RNA Vaccine	GeneOne Life Science (biotechnology company) Houston Methodist Hospital (non-profit)	Early development		Pre-Existing exclusive license agreement between GeneOne & Houston Methodist
RNA ZIP-1642 Combination of mRNA molecules, encoding multiple SARS-CoV-2 antigens	Ziphius Therapeutics (biotechnology company) Ghent University (academic institution)	Early development		Development partnership between Ziphius & Ghent University
Enveloped virus-like particle (eVLP) Pan-coronavirus vaccine candidate, targeting COVID-19, SARS and MERS spike protein	VBI Vaccines (biotechnology company / vaccine manufacturer) National Research Council of Canada (government)	Early development		Development partnership between VBI & NRCC
Unknown	Catholic University, Millennium Institute of Immunology and Immunotherapy (academic institution)	Early development		

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	Technological Consortium in Clinical Molecular Biomedicine (non-profit)			
<u>Vaccine: ISR-50</u>	ISR Immune System Regulation (biotechnology company)	Early development		
Unknown	Covaxx (biotechnology company)	Early development		
HaloVax™: Self-assembling vaccine Fusion protein of a heat shock protein and Avidin with biotinylated immunogenic peptides	Voltron Therapeutics (biotechnology company) The Vaccine & Immunotherapy Center at Massachusetts General Hospital (research institute) Hoth Therapeutics, Inc. (biotechnology company)	Early development	Analog Devices Foundation (funder)	Joint Venture (HaloVax™, LLC) between Voltron and Hoth for the development of HaloVax™ Research agreement between Voltron and Massachusetts General Licensing agreement for Massachusetts General's Self-Assembling Vaccine platform between Massachusetts General and Voltron
Gene-encoded antibody vaccine non-viral nanoparticle delivery	SmartPharm Therapeutics (biotechnology company) Sorrento Therapeutics (biotechnology company)	Early development		Research & development agreement between SmartPharm & Sorrento Therapeutics
Unknown	Vir Biotechnology (biotechnology company) GSK (multinational pharmaceutical company)	Early development		Equity investment & development agreement between Vir & GSK
Unknown	Emergex Vaccines (vaccine manufacturer) George Mason University - National Center for Biodefense and Infectious	Early development		Academic-Industry Development Partnership between Emergex Vaccines & George Mason University

Vaccine candidate/technology	Developer(s)	Current development stage	Funders	Related agreements/partnerships/collaborations
	Diseases (NCBID) (academic institution)			
AVI-205	AbVision (biotechnology company)	Pre-clinical		
Unknown	SK Biosciences (multinational pharmaceutical company)	Pre-clinical	Gates Foundation (funder)	Funding partnership between Gates Foundation & SK Biosciences
MV-014-210, live attenuated vaccine	Meissa Vaccines (biotechnology company)	Pre-clinical		
Unknown	Precision Vaccines Program - Boston Children's Hospital (research institute)	Early development		
TerraCoV2	Oragenics (Noachis Terra) (biotechnology company) Aragen Bioscience (contract research organization)	Early development		Worldwide, non-exclusive license agreement between NIAID and Noachis Terra Development agreement between Aragen & Oragenics
Recombinant LVS ΔcapB Vectored vaccine expressing multiple SARS-CoV-2 antigens	University of California, Los Angeles (academic institution)	Early development		