

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 |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | | | | | |
|---|-----------------|---|--------|----------------------|----|--|--|--|--------------------------------|
| 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 | | |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | | | | | |
|--|------------------------------|---|---|------------|------------|--|--|--|--|
| 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 | | |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | | | | | |
|---|--------------------------|--|--------|---------------------|----|----------------------------------|--|--|--|
| 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 | |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | |
|------------------------------|--|--|------------|--------------|--------------------------------------|
| 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 / Acibadem 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 |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | |
|------------------------------|---|--|------------|--------------|--|
| 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 | Altimune | 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 | |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | |
|-----------------|--|---|-----------|--------------|---|
| 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 Immono-efficient 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 | li-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 |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | |
|-----------------------------|---|--|-----------|--------------|---------------------|
| | 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 |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | |
|--------------------------|---|--|-----------|--------------|-----------------------|
| 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 | Genova | 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 | |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

| | | | | | |
|--------------|---|---|----------------------------------|--------------|----------------|
| 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 | ADDomer™ 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 |

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.

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

DISCLAIMER:

These landscape documents have been prepared by the World Health Organization (WHO) for information purposes only concerning the 2019-2020 pandemic of the novel coronavirus. Inclusion of any particular product or entity in any of these landscape documents does not constitute, and shall not be deemed or construed as, any approval or endorsement by WHO of such product or entity (or any of its businesses or activities). While WHO takes reasonable steps to verify the accuracy of the information presented in these landscape documents, WHO does not make any (and hereby disclaims all) representations and warranties regarding the accuracy, completeness, fitness for a particular purpose (including any of the aforementioned purposes), quality, safety, efficacy, merchantability and/or non-infringement of any information provided in these landscape documents and/or of any of the products referenced therein. WHO also disclaims any and all liability or responsibility whatsoever for any death, disability, injury, suffering, loss, damage or other prejudice of any kind that may arise from or in connection with the procurement, distribution or use of any product included in any of these landscape documents.