COVID-19 Vaccine Tracker (Lexi-Drugs)

Candidate SARS-CoV-2 Vaccines in Advanced Clinical Trials: Key Aspects

Compiled by John D. Grabenstein, RPh, PhD | All dates are estimates. All Days are based on first vaccination at Day 0.

Vaccine Sponsor [with Major Partners]	Univ. of Oxford (Jenner Institute) with AstraZeneca	ModernaTX USA	BioNTech with Pfizer	Johnson & Johnson (Janssen Vaccines & Prevention)	Novavax	Sanofi Pasteur with GlaxoSmithKline	CureVac	CanSino Biologics with Academy of Military Medical Sciences	Sinopharm [China National Biotec Group] (Beijing IBP, Wuhan IBP)	Sinovac Biotech Co.	Gamaleya Research Institute of Epidemiology & Microbiology
Regulatory Status	WHO EUL listing with SII or SK Bio 15Feb21, with Oxford 15Apr21, with CSL or Japan 9Jul21; UK listing 29Dec20	WHO EUL listing 30Apr21, US EUA 18Dec20, US license 31Jan22	WHO EUL listing 31Dec20, US EUA 11Dec20, US license 23Aug21	WHO EUL listing 12Mar21, US EUA 27Feb21	WHO EUL listing 17Dec21				WHO EUL listing 7May21	WHO EUL listing 1Jun21	
Headquarters	Oxford, England; Cambridge, England, Gothenburg, Sweden	Cambridge, Massachusetts	Mainz, Germany; New York, New York	New Brunswick, New Jersey (Leiden, Netherlands)	Gaithersburg, Maryland	Lyon, France; Brentford, England	Tübingen, Germany	Tianjin, China; Beijing, China	Beijing, China; Wuhan, China	Beijing, China	Moscow, Russia
Product Designator	ChAdOx1-S, AZD1222, *Vaxzevria* , *Covishield*	mRNA-1273, elasomeran, *Spikevax*	BNT162b2, tozinameran, *Comirnaty*	Ad26.COV2.S, JNJ-78436735	NVX-CoV2373, *Nuvaxovid* , *Covovax* (from India)	SP0253, *Vidprevtyn*	CVnCoV, zorecimeran, CV07050101	AdS-nCoV, *Convidecia*	BBIBP-CorV	*CoronaVac*	Gam-COVID-Vac (Гам-КОВИД-Вак), Sputnik V (Спутник V)
Vaccine Type	Adenovirus Y25 vector	mRNA	mRNA	Adenovirus 26 vector	Subunit (spike) protein	Subunit (spike) protein	mRNA	Adenovirus 5 vector	Inactivated whole virus	Inactivated whole virus	Adenovirus 26 and adenovirus 5 vectors
Product Features	Chimpanzee adenovirus type Y25 vector	Within lipid nanoparticle dispersion	Within lipid nanoparticle dispersion	Human adenovirus type 26 vector	Adjuvanted with Matrix-M	Adjuvanted with AS03	Adjuvanted with AS03	Human adenovirus type 5 vector	Adjuvanted with aluminum hydroxide	Adjuvanted with aluminum hydroxide	Human adenovirus type 26 and type 5 vectors
Production Medium (origin)	HEK-293A (human embryo)	Cell free (synthetic)	Cell free (synthetic)	PER.C6 (human embryo)	Baculovirus/Sf9 (insect)	Baculovirus/Sf9 (insect)	Cell free (synthetic)	HEK-293 (human embryo)	Vero cells (monkey)	Vero cells (monkey)	Not reported
Route	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM	IM
CPT Code	91302	91301	91300	91303	91304						
CVX Code	210	207	208	212	211			506	510	511	
NDC Code	00310-1222-10	80777-0273-xx	59267-1000-xx	59676-0580-05	80631-0100-xx						
Dosing Regimen	Weeks 0 + 4-12	Days 0 + 28	Days 0 + 21	Single dose or Days 0 + 56	Days 0 + 21	Days 0 + 21	Days 0 + 28	Days 0 + 56	Days 0 + 14 to 28	Days 0 + 14 or Days 0 + 28	Days 0 + 21
Expected Dose	$5x10^{10}$ viral particles in 0.5 mL [EU: NLT 2.5 x 10^8 infectious units]	Primary: 100 mcg in 0.5 mL (dark blue cap). Boosters: 50 mcg in 0.5 mL (red cap)	12+ y/o: 30 mcg in 0.3 mL (purple cap: dilute before use; gray cap do not dilute). 5-11 y/o (orange cap): 10 mcg/0.2 mL	$5x10^{10}$ viral particles in 0.5 mL	5 mcg protein plus 50 mcg Matrix-M in 0.5 mL	10 mcg plus AS03	12 mcg	$5x10^{10}$ or $1x10^{11}$ viral particles	6.5 units in 0.5 mL	600 antigen units (SU) in 0.5 mL	$1x10^{11}$ viral particles per 0.5 mL
Expected Packaging	Suspension, 8- or 10-dose vial, preservative free	Frozen liquid. 10-dose vial, preservative-free	Frozen liquid, 6-dose vial, preservative-free. See package details for purple, gray, or orange capped vials.	Suspension, 5-dose vial, preservative-free	Liquid, 10-dose vial, preservative-free	TBA	Liquid, solution. Details TBA	TBA	Suspension. Vials and prefilled syringes, single-dose containers, preservative-free	Suspension. Vials and prefilled syringes, single-dose containers, preservative-free	Frozen liquid or freeze-dried powder formulations; packaging not described
Expected Storage & Handling Conditions	Refrigerate unopened vial @ 2°C to 8°C for up to 6 mo, protecting from light. After first use, use within 6 h, storing @ 2°C to 25°C	Ship @ -20°C. Refrigerate @ 2°C to 8°C NMT 30 d. Unpunctured @ rmTemp NMT 12 h. Punctured: NMT 6 h	Purple + Orange cap: Ship and store @ -70°C. Refrigerate @ 2°C to 8°C NMT 30 days. After diluting, use within 6 hours. Gray cap: Store @ 2°C to 8°C	Long-term storage @ -20°C up to 2 y. Refrigerate @ 2°C to 8°C up to 3 months. Unpunctured: 9°C to 25°C ≤12 h Punctured: 2°C to 8°C ≤ 6 h or max 25°C ≤ 2 h	Refrigerate @ 2°C to 8°C	Refrigerate @ 2°C to 8°C. Before injection, mix antigen with adjuvant	>3 mo @ 2°C to 8°C. Room temp 24 h	Refrigerate @ 2°C to 8°C	Refrigerate @ 2°C to 8°C	Refrigerate @ 2°C to 8°C. Agitate before withdrawing dose. Discard unused product after work day	Liquid frozen @-18°C. Lyophilized powder at 2°C to 8°C
Clinical Trial Status	Phase 3 reported	Phase 3 reported	Phase 3 reported	Phase 3 reported	Phase 3	Phase 3	Phase 2	Phase 3	Phase 3	Phase 3	Phase 3 reported
Date Data Sufficient for EUA	UK: 2020 Dec 29, US: safety + supply issues	US: issued 18 Dec 20	US: issued 11 Dec 20	US: issued 2021 Feb 27. Restricted 2022 May 6	2022 Jun ?	EUA window closing. BLA late 2022?	EUA window closing. BLA late 2022?	2020 Jun - China: military uses	2020 Jul - China: workers and families	2020 Jul - China: workers and families	Russia: 2020 Aug
Projected Date for US Licensure	Unlikely to file	Licensed 2022 Jan 31	Licensed 2021 Aug 23	Uncertain	2023 Q1 ?	2023 Q1 ?	2023 Q1 ?	PRC 2021 Jan	PRC 2021 Jan	PRC 2021 Jan	Russia: 2021 Feb
Clinicaltrials.gov Numbers	NCT04324606, NCT04400838, NCT04444674, NCT04516746, NCT04536051, NCT04536051, NCT04540393	NCT04283461, NCT04405076, NCT04470427, NCT04649151, NCT04796896	NCT04368728, NCT04380701, NCT04523571, NCT04537949	NCT04436276, NCT04505722, NCT04509947	NCT04368988, NCT04533399	NCT04537208, NCT04904549	NCT04449276, NCT04515147, NCT04652102	NCT04313127, NCT04341389, NCT04398147, NCT04526990, NCT04540419, NCT04552366	NCT04510207	NCT04352608, NCT04383574, NCT04456595, NCT04508075, NCT04551547	NCT04436471, NCT04437875, NCT04587219
Ages Reported to Date (y)	18 to 55, 5 to 12	≥18	12 to 55, 56 to 85	18 to 59, ≥60	18 to 59, 60 to 84	≥18	≥18	≥18	18 to 59, 60 to 80	≥18	18 to 30, 31 to 40, 41 to 50, 51 to 60, and ≥61
Evidence in Non-Human Primates	Graham 2020; van Doremalen 2020	Corbett 2020	Sahin 2020; Vogel 2020	Mercado 2020; Yu 2020	Guebre-Xabier 2020; Tian 2020				Wang 2020	Gao 2020	
Evidence in Humans	Folegatti 2020; Ramasamy 2020, Voysey 2020, Voysey 2021	Jackson 2020; Anderson 2020; Widge 2020; Baden 2021	Mulligan 2020; Walsh 2020; Polack 2020	Sadoff 2021	Keech 2020; Formica 2021; Sinde 2021; Heath 2021; Dunkle 2021		Kremsner 2020	*Zhu* 2020a, *Zhu* 2020b; Halperin 2021	Xia 2020 a, Xia 2020 b	Zhang 2020	Logunov 2020, Logunov 2021
Analogous Licensed Vaccines	No other adenovirus type-63 based vaccine	No other licensed mRNA vaccine	No other licensed mRNA vaccine	Adenovirus type-26 EU-registered Ebola vaccine component *Zabdeno* (Janssen, JNJ)	Influenza hemagglutinin vaccine (*FluBlok* , Sanofi), with NVX-CoV2373 adding a new adjuvant	Influenza hemagglutinin vaccine (*FluBlok* , Sanofi), with this candidate adding an adjuvant	No other licensed mRNA vaccine	No other adenovirus type-5 based vaccine	Inactivated hepatitis A, poliovirus, rabies vaccines	Inactivated hepatitis A, poliovirus, rabies vaccines	Adenovirus type-26 EU-registered Ebola vaccine component *Zabdeno* (Janssen, JNJ)

Abbreviations & Acronyms: BLA (Biologics License Application, *full license); EUA (Emergency Use Authorization); EUL (Emergency Use Listing); IBP (Institute of Biological Products); mRNA (messenger ribonucleic acid); NMT (not more than); Sf9 (*Spodoptera frugiperda*); TBA (to be announced); TBD (to be determined)

Last updated: 5/6/2022

CLINICAL TRIALS:

https://clinicaltrials.gov/ct2/show/NCT04324606

https://clinicaltrials.gov/ct2/show/NCT04400838

https://clinicaltrials.gov/ct2/show/NCT04444674

https://clinicaltrials.gov/ct2/show/NCT04516746

https://clinicaltrials.gov/ct2/show/NCT04283461

https://clinicaltrials.gov/ct2/show/NCT04405076

https://clinicaltrials.gov/ct2/show/NCT04470427

https://clinicaltrials.gov/ct2/show/NCT04368728

https://clinicaltrials.gov/ct2/show/NCT04380701

https://clinicaltrials.gov/ct2/show/NCT04523571

https://clinicaltrials.gov/ct2/show/NCT04436276

https://clinicaltrials.gov/ct2/show/NCT04505722

https://clinicaltrials.gov/ct2/show/NCT04509947

https://clinicaltrials.gov/ct2/show/NCT04368988

https://clinicaltrials.gov/ct2/show/NCT04449276

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RESOURCE DOCUMENTS:

Biomedical Advanced Research & Development Authority (BARDA): Award list: https://medicalcountermeasures.gov/app/barda/coronavirus/COVID19.aspx

Coalition for Epidemic Preparedness Innovations (CEPI): https://cepi.net/news/

Food & Drug Administration, Emergency Use Authorizations (EUA): https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization

Food & Drug Administration, Fast Track & Similar Designations: https://www.fda.gov/patients/learn-about-drug-and-device-approvals/fast-track-breakthrough-therapy-accelerated-approval-priority-review

SARS-CoV-2 Vaccines: Evidence from Human Immunogenicity Studies

Compiled by John D. Grabenstein, RPh, PhD

All Days based on first vaccination at Day 0.

Table describes results with doses carried forward into phase 3 efficacy trials. Other available data noted.

Vaccine Sponsor (with Major Partners)	Univ. of Oxford (Jenner Institute) with AstraZeneca	ModernaTX USA	BioNTech with Pfizer	Johnson & Johnson (Janssen Vaccines)	Novavax	Sanofi Pasteur with GlaxoSmithKline	CureVac	CanSino Biologics with Academy of Military Medical Sciences	Sinopharm (China National Biotec Group) (Beijing IBP, Wuhan IBP)	Sinovac Biotech Co.
Product Designator	ChAdOx1-S, AZD1222, *Vaxzevria, Covishield*	mRNA-1273, elasomeran, *Spikevax*	BNT162b2, tozinameran, *Comirnaty*	Ad26.COV2.S, JNJ-78436735	NVX-CoV2373, *Nuvaxovid, Covovax (from India)*	SP0253, *Vidprevtyn*	CVnCoV, zorecimeran, CV07050101	Ad5-nCoV, *Convidecia*	BBIBP-CorV	CoronaVac
Vaccine Type	Adenovirus Y25 vector	mRNA	mRNA	Adenovirus 26 vector	Subunit (spike) protein	Subunit (spike) protein	mRNA	Adenovirus 5 vector	Inactivated whole	Inactivated whole
Product Features	Chimpanzee adenovirus Y25 vector	Within lipid nanoparticle dispersion	Within lipid nanoparticle dispersion	Human adenovirus type 26 vector	Adjuvanted with Matrix-M	Adjuvanted with AS03	Adjuvanted with AS03	Human adenovirus type 5 vector	Adjuvanted with aluminum hydroxide	Adjuvanted with aluminum hydroxide
PHASE 3: Clin-icaltrials.gov #	NCT04400838, EudraCT # 2020-001228-32	NCT04470427, "COVE"	NCT04368728	NCT04505722, "ENSEMBLE," COV3001	EudraCT # 2020-004123-16, NCT04583995	NCT04904549	NCT04652102, "HERALD"	Trial in Pakistan, México, Russia, Chile, Argentina	Trial in UAE and Bahrain	Trial in Brazil + Turkey among healthcare workers
Volunteers	N=11,636	N=30,351	N=43,998	N=43,783	N > 15,000 in UK; 29,960 in US+Mex	N=37,430	N=36,500	N=36,717		N=12396
Dosing Regimen	$5x10^{10}$ viral particles in 0.5 mL (EU: NLT 2.5 x 10^8 infectious units)	100 mcg per 0.5 mL, Days 0 + 28	30 mcg per 0.3 mL, Days 0 + 21	$5x10^{10}$ vp per 0.5 ml IM, single dose	5 mcg spike + 50mcg Matrix-M per 0.5 mL IM. Days 0 + 21	10 mcg + AS03, Days 0 + 21	12 mcg + AS03, Days 0 + 28	Single dose	Days 0 + 14 to 28	Days 0 + 14
Age Cohorts (y)	≥18	18 to 64, ≥65 with or without risk factors	16 to 55, 56 to 85	18 to 100	18 to 59, 60 to 84	≥18	≥18	≥18	≥18	≥18
Control Arm(s)	Meningococcal ACWY vaccine	NaCl 0.9%	NaCl 0.9%	NaCl 0.9%	NaCl 0.9%	Not specified	Not specified	Mannitol, sucrose, sodium chloride, excipients	Unspecified placebo	Unspecified placebo
Source Document	Voysey 2020; Voysey 2021	VRBPAC documents, Baden 2021	VRBPAC documents, Polack 2020	VRBPAC documents 2021 Feb 26	Heath 2021; Dunkle 2021	press release, 2021 0527	press release, 2021 0616	Halperin 2021	Press release, 2020 Dec 13. WHO Summary 2021 May	Company summary, 2021 Apr 03
Interim and Primary Analyses	131 and 150 cases, identified ≥14 days after Dose 2	95 and 196 cases, identified ≥14 days after Dose 2	94 and 170 cases, identified ≥7 days after Dose 2	Primary: 154 cases ≥14 days after Dose 1 (only dose)	66, 110, and 152 cases ≥7 days after Dose 2					Brazil: 253 cases ≥14 days after Dose 2
Protective Efficacy	UK: 70% (55, 81%) EU: 60% (46, 70%) starting 15 d after Dose 2, 30 vs 131 cases	94.1%, based on 196 cases (185 control, 11 vaccine)	95%, based on 170 cases (162 control, 8 vaccine)	67% (95% CI: 59, 73%) starting 28 days after only dose. 464 cases (116 control, 348 vaccine)	Original virus: 96% (95% CI: 74, 99%). UK variant: 86% (71, 94%). Overall, UK: 90% (80, 95%) with 106 cases. Overall, US+Mex: 90% (83, 95%) with 77 cases.		Interim based on 134 disease cases: 47%, higher in younger volunteers, lower in older.	57.5% (95% CI 40, 70%) against symptomatic infection, 91% (36, 99%) against severe disease starting 28 days after vaccination	UAE and Bahrain report 86% efficacy in press release. China reports 79% efficacy. WHO pooled calculation: 78%	Any case: Brazil-51%, Turkey-91%, China-78%, UAE-86%. Brazil-84% to avoid medical treatment. Brazil-100% to avoid hospitalization
Distribution of Disease Severity	0 hospitalizations or severe cases in vaccine group, 6 in control group	100% protection against severe disease (30 control, 0 vaccine)	1 case in vaccine group, 9 in control group	Severe disease: 85% (95% CI: 54, 97%). Hospitalization: 100% (95% CI: 74, 100%)	Severe, all trials: 9 control, 0 vaccine Hospitalization: 100%			See above	Not described	See above
Principal Safety Findings	Injection-site (>60%); headache, fatigue (>50%); myalgia, malaise (>40%); pyrexia, chills (>30%); and arthralgia, nausea (>20%). More after Dose 1 than 2. AEs milder and less frequent if 65+ y/o	Common AEs: injection-site pain (92%), fatigue (69%), headache (63%), muscle pain (60%), joint pain (45%), chills (43%). Grade 3: Fatigue 9.7%, muscle ache 8.9%, joint pain 5.2%, headache 4.5%, pain 4.1%	Injection site (84%), fatigue (63%), headache (55%), myalgia (38%), chills (32%), arthralgia (24%), fever (14%). Grade 3: Fatigue 3.8%, headache 2.0%	Common: inj-site pain (49%), headache (39%), fatigue (38%), muscle ache (33%). Fatigue 1%, muscle ache 1%, any systemic 1.8%.	Inj-site reactions: tenderness (52-75%), pain (27-50%). Headache (25-40%), fatigue (20-40%), muscle pain (22-40%), malaise (10-30%) Grade 3: Any systemic AE (5%), any injection-site AE (4%)			No difference in SAEs between Ad5-nCoV and placebo, nor medically attended events. 63% reported a solicited systemic AE, headache 44%	Most AEs mild to moderate. Most common: inj-site pain, headache, fatigue. No imbalance in serious AEs	Common: Pain (60%), swelling (6%), pruritis (4%), erythema (4%), induration (4%). Grade 3: Local pain (0.1%), headache (0.6%), fatigue (0.2%).
PHASE 1/2: Publication lead author	Folegatti 2020, Ramasamy 2020, Voysey 2020	Jackson 2020 (18 to 55); Anderson 2020 (≥56)	Walsh 2020; Sahin 2020 Dec	Sadoff 2021	Keech 2020	*Press release*	Kremsner 2020	Zhu 2020a, Zhu 2020b, Halperin 2021	Xia 2020 Aug 13, Xia 2020 Oct 15	Zhang 2020
Vaccinee Cohort 1: age range (y), n	Folegatti: 18 to 55, n=533	Jackson: 18 to 55, n=15	18 to 55, n=12	18 to 55, n=402	18 to 59, n=29		18 to 59, n=28	≥18, n=253	Xia-Oct: 18 to 59, n=56	18 to 59, n=120
1. Vaccine Dosage, Regimen	$5x10^{10}$ vp, single dose	100 mcg, Days 0 + 28	30 mcg, Days 0 + 21	$5x10^{10}$ or $1x10^{11}$ vp, single dose or Day 0 + 56	5 mcg spike + 50 mcg adjuvant, Days 0 + 21		12 mcg, Days 0 + 28	$1x10^{11}$ vp, single dose	5 mcg, Days 0 + 21	3 mcg, Days 0 + 28
1. Neutralizing antibody responses: Onset (A). Assay (B), Peak	Onset by Day 28 (moderate at Day 14). MNA: 51 at Day 28, detected in 91% (n=35) rising further to Day 42. PRNT: 218 at Day 28, detected in 100% (n=35). Marburg/VN: 62% at Day 56 (n=37)	Onset by Day 35 (moderate at Days 14 and 28). PsVNA: 344 (peak at Day 42), detected in 100% at Day 35. PRNT: 654 at Day 42, detected in 100% at Day 42	Onset by Day 28 (modest at Day 21). VNT: 361 at Day 28, detected in 100%	Onset by Day 28. wtVNA: 224 (low dose x1), 224 (low x2), 215 (high x1), or 354 (high x2), detected in 88% to 96% at Day 28. By Day 56, further rise and 96% to 100% response. Dose 2 increased levels further	Most respond by Day 21 (earliest measurement), all by Day 35. MNA: Peak 3906 at Day 35, detected in 100%	Immunogenic, details TBA	Onset by Day 35, VNT >4-fold 64%, and 100% at Day 43	Onset by Day 28. NA-LV: 19.5 at Day 28, detected in 43%. NA-PV: 61 at Day 28, detected in 85%. Prior Ad5 immunity reduced nAb response ~2-fold	Onset by Day 35. PRNT: 247 at Day 35, detected in 98%	94% respond by Day 56 (only day tested). MCEA: 23.8 at Day 56
1. Relative to convalescent serum pool (C)	Pool n=142, pseudoneutralization, Figure 5, vaccinees similar to pool at Day 35 or 52. Pool n=5, Marburg VN, Figure 4, less than pool	Pool n=41. PsVNA: 109. PRNT: 158. Figure 2b: Dose 1--similar, Dose 2 (Day 56) vaccinees exceeded pool	Pool n=38. VNT: 94. Figure 4: Vaccinees 3.8-fold higher than pool	Pool n not described. wtVNA: 522	Pool n=29. MNA: 983. Figure 3B: Vaccinees 4-fold higher than pool	Comparable to convalescent plasma	Pool n=67. MNA: 113.	Not assessed	Not compared to convalescent serum	Pool not described. MCEA: 164. Vaccinees 2.5- to 6.8-fold lower than pool
1. T-cell response	100% responded, peak Day 14, n=43. No mention of CD8	100% responded, Th1 biased (TNFα > IL2 > IFNγ >> IL4, IL13). Low-level CD8 response post second 100-mcg dose	92% expanded CD8 cells. Th1 CD4 response, most producing IFNγ	CD4+ response in 80% at Day 14. Robust CD8 response, yet Th1 bias. Response to dose 2 pending	Most responded, Th1 biased (TNFα > IL2 > IFNγ >> IL5, IL13)		Not studied	IFNγ in 90% at Day 28. Not influenced by ad-5 status. No mention of CD8	No differences from controls for Th1, Th2 or Th17	Positive for IFNγ spot-forming cells
Vaccinee Cohort 2: age range (y), n	Ramasamy: 18 to 55 (n=100), 56-69 (n=120, ≥70 (n=200)	Anderson: 56 to 70, n=10, ≥71, n>10	65 to 85, n=12	≥65, n=394. Data on first 15 (65 to 88) reported here	18 to 59, n=28			≥18, n=129	18 to 59, n=42	18 to 59, n=120
2. Vaccine Dosage, Regimen	$5x10^{10}$ vp, Days 0 + 28	100 mcg, Days 0 + 28	30 mcg, Days 0 + 21	$5x10^{10}$ or $1x10^{11}$ vp, single dose or Dav 0 + 56	25 mcg spike + 50 mcg adjuvant, Days 0 + 21			$5x10^{10}$ vp, single dose	5 mcg, Days 0 + 14	3 mcg, Days 0 + 14
2. Neutralizing antibody responses: Onset (A). Assay (B), Peak	Onset by Day 28 (moderate at Day 14), higher with boost. MNA: peak at Day 42; 144 to 193; detected in >99%	Onset by Day 35 (moderate at Days 14 and 28). PsVNA: 402 or 317 (peak at Day 56), detected in 100%. Two other assay results similar	Onset by Day 28 (modest at Day 21). VNT: 149 at Day 28, detected in 100%	Onset by Day 14. wtVNA: 212 (low dose) or 172 (high), detected in 91% and 84%. At Day 28, increased to 277, 212, 96%, and 84%. Response to dose 2 pending	Most respond by day 21 (earliest measurement). MNA: 3305 at Day 35, detected in 100%			Onset by Day 28. NA-LV: 18.3 at Day 28, detected in 35%. NA-PV: 55 at Day 28, detected in 83%. Prior Ad5 immunity reduced nAb response ~2-fold	Onset by Day 28. PRNT: 121, detected in 98%	92% respond by Day 28. MCEA: 27.6 at Day 28
2. Relative to convalescent serum pool (C)	Not assessed in this study	Pool n=41. Figure 2b: above median titer at Day 56	Pool n=38. VNT: 94. Figure 4: Vaccinees 1.6-fold higher than pool	Pool n not described. wtVNA: 522 (NSS)	Pool n=29. MNA: 983. Figure 3B: Vaccinees 3.4-fold higher than pool			Not assessed	Not compared to convalescent serum	Pool not described. MCEA: 164. Vaccinees 2.5- to 6.8-fold lower than pool
2. T-cell response	100% responded, peak Day 14, little response to boost. Those 56-69 y/o had higher responses than younger and older volunteers. No mention of CD8	100% responded, Th1 biased response across all age groups	Results pending	CD4+ response in 60% to 67% at Day 14. Robust CD8 response, yet Th1 bias. Response to dose 2 pending	Most responded, Th1 biased (TNFα > IL2 > IFNγ >> IL5, IL13). No mention of CD8			IFNγ in 88% at Day 28. Not influenced by ad-5 status. No mention of CD8	No differences from controls for Th1, Th2 or Th17 (CD4, CD8, NK, B, TNFα, IFNγ, IL2, IL4, IL5, IL6)	Positive for IFNγ spot-forming cells
3. Other cohorts described in papers, but omitted here	None	Jackson: 25 mcg (n-15), 250 mcg (n=15). Anderson 25 mcg (n=20)	See Mulligan 2020 for BNT162b1	None	25 mcg spike alone twice (n=25); 25 mcg spike + 50 mcg adjuvant, Day 0 only (n=25)		2 mcg (n=47), 4 mcg (n=48), 6 mcg (n=48), 8 mcg (45)	None	Xia-Aug: 2.5, 5, 10 mcg, Days 0+28+56. Xia-Oct: 2,4 8 mcg. Days 0=14 or 21 or 28	6 mcg, either Days 0 + 14 or Days 0 + 28
Total n reported, all vaccinated study arms	543	55	72 with BNT162b2, others with BNT162b1	402+15=417	100		216	382	Xia-Aug 240. Xia-Oct 640	480
Most common injection-site symptoms	Tenderness, pain, warmth	Any ~100%; pain, swelling, redness	Pain, swelling, redness	Any: 27% to 58%; pain	Any ~90%; tenderness, pain		Pain, itching, swelling	Pain, itch, induration, swelling, redness	Pain, itching, swelling	Pain
Most common systemic adverse events	Fatigue, headache, muscle ache, chills, feverishness	Any: 65% w/dose 1, 100% w/dose 2; fatigue, headache, joint ache, chills, muscle ache	Fatigue, headache, chills, muscle pain, fever, joint pain	Any: 36% to 64%; fatigue, headache, myalgia, fever (5% grade-3) among 18 to 55 y/o	Any ~60%: headache, fatigue, muscle pain, malaise, joint pain, nausea		Headache, fatigue, myalgia, chills, fever, arthralgia, nausea, diarrhea	Fatigue, fever, headache, muscle pain, joint pain, appetite impaired	Fever, nausea, fatigue, headache	Fatigue, fever
SAEs in these trials related to vaccine	None	None	None	One - fever (hospitalized)	None		None	None	None	None

Abbreviations: Ad5 (adenovirus type 5); AlOH3 (aluminum hydroxide); MCEA (modified cytopathic effect assay); MNA (microneutralization assay); NA (neutralizing activity); nAb (neutralizing antibody); NA-LV (neutralizing antibody against live SARS-CoV-2 virus); NA-PV (neutralizing antibody against pseudovirus); PRNT (plaque-reduction neutralization test); PsVNT (pseudotyped single-round virus neutralization assay); SAE (serious adverse event); TBA (to be announced); VNT (virus neutralization titer); VN (virus neutralization); vp (viral particles); wt (wild-type)

Notes:

A - Onset defined as significant rise in neutralizing in all or most vaccine recipients. Comparison limited by few and inconsistent data points.

B - Major differences in assay methods between studies. Do not directly compare values between studies.

C - Each pool of convalescent plasma differs in size, donor age, disease severity, time since disease onset, and other factors.

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Applies to

Coronavirus Vaccine; COVID-19; COVID-19 Vaccine Tracker; COVID19; COVID19 Vaccine Tracker; SARS-CoV-2 Vaccine

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