SUPPLEMENTAL APPENDIX

Supplement to:

Neutralization of SARS-CoV-2 Omicron and variants of concern following second and third vaccinations in patients with myelodysplastic syndromes and acute myeloid leukemia *by* Lorenza Bellusci, PhD; Gabrielle Grubbs, BS; Pragya Srivastava, PhD, Michael J. Nemeth, PhD; Elizabeth A. Griffiths, MD; Hana Golding, PhD; Surender Khurana, PhD.

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MATERIALS AND METHODS

Study background, patient characteristics, vaccines

Patients with myeloid malignancy, including MDS and AML, are routinely vaccinated on the presumption that the potential benefits outweigh any risk, although the response to such vaccinations are not well documented. Moreover, such patients were prioritized for vaccination against the emergent pandemic viral infection caused by SARS-CoV-2. Despite these efforts, there remains a fundamental gap in clinical knowledge about whether patients with myeloid malignancy respond to routine vaccination or if the therapies we use for these diseases impact these antibody responses.

To address this gap in knowledge, we designed a clinical study to assess the immunologic response following administration of the yearly influenza vaccination in patients with myeloid malignancies who are receiving different types of chemotherapy compared to healthy age-matched controls. The study was registered with clinicaltrials.gov (#NCT04484532) and is conducted in accordance with the Declaration of Helsinki, approved by the Roswell Park Cancer Institute Review Board. All patients provided written informed consent. Consent on this study included agreement for the use of remnant material for additional immunological assays at the time of study enrollment. Eligible patients carried a diagnosis of myeloid malignancy and were receiving standard of care treatment for their disease, including watchful waiting, growth factor support, or hypomethylating agents (including azacitidine or decitabine) either alone or in combination with venetoclax. Additional enrollment criteria included willingness to undergo seasonal influenza vaccination, and estimated survival of at least 8 weeks following study enrollment. Patients enrolled to this study received seasonal influenza vaccination for the year of enrollment and underwent

peripheral blood sampling prior to the vaccine and at serial time points following the influenza vaccination (baseline, 0-3m after vaccination, 3-6 months after vaccination).

Given the emergence of pandemic viral illness with SARS-CoV-2, the etiological agent of COVID-19, we assessed whether these patients with myeloid disorders demonstrated responses to COVID-19 vaccines received as standard of care. Medical records for these patients were reviewed and the types of vaccine, dates of vaccine administration and clinical characteristics of the patients were extracted. Table 1 lists the summary of patient characteristics for this cohort. Supplementary Table S1 lists the extended clinical characteristics, treatments summary, vaccine/booster types, and the time point of sampling relative to the most recent COVID-19 vaccination given.

Post-SARS-Cov-2 mRNA vaccination serum samples after the second vaccination and third vaccination were also obtained from SARS-CoV-2 naïve 16 healthy adult healthcare workers who work at research institution and are not exposed to COVID-19 patients as a comparative control group.

Neutralization assay

Sera were evaluated in a qualified SARS-CoV-2 pseudovirion neutralization assay (PsVNA) using SARS-CoV-2 WA-1 strain and the five variants of concern (VOCs): Alpha variant (B.1.1.7; with spike mutations H69-V70del, Y144del, N501Y, A570D, D614G, P681H, T716I, S982A, and D1118H), Beta variant (B.1.351; with spike mutations L18F, D80A, D215G, L242-244del, R246I, K417N, E484K, N501Y, D614G, and A701V), Gamma variant (P.1; with spike mutations L18F, T20N, P26S, D138Y, R190S, K417T, E484K, N501Y, H655Y, T1027I, D614G, V1176F), Delta variant (B.1.617.2; with spike mutations

T19R,G142D,E156del,F157del,R158G,L452R,T478K,D614G,P681R,D950N) and Omicron variant (B.1.1.529; with spike mutations A67V, H69-70del, T95I, G142D, V143-145del, Y145D, N211del, L212I, ins214EPE, G339D, S371L, S373P, S375F, K417N, N440K, G446S, S477N, T478K, E484A, Q493R, G496S, Q498R, N501Y, Y505H, T547K, D614G, H655Y, N679K, P681H, N764K, D796Y, N856K, Q954H, N969K, L981F). SARS-CoV-2 neutralizing activity measured by PsVNA correlates with PRNT (plaque reduction neutralization test with authentic SARS-CoV-2 virus) in previous studies [1-3]

Pseudovirions were produced as previously described[3]. Briefly, human codon-optimized cDNA encoding SARS-CoV-2 spike glycoprotein of the WA-1 and variant strains were synthesized by GenScript and cloned into eukaryotic cell expression vector pcDNA 3.1 between the *BamH*I and *Xho*I sites. The plasmid vector encoding spike for Omicron variant was a gift from Vaccine Research Center, NIAID, NIH. Pseudovirions were produced by co-transfection Lenti-X 293T cells with psPAX2(gag/pol), pTrip-luc lentiviral vector and pcDNA 3.1 SARS-CoV-2-spike-deltaC19, using Lipofectamine 3000. The supernatants were harvested at 48h post transfection and filtered through 0.45μm membranes and titrated using 293T-ACE2-TMPRSS2 cells (HEK 293T cells that express ACE2 and TMPRSS2 proteins)[3].

Neutralization assays were performed as previously described [1 4,5]. For the neutralization assay, 50 μL of SARS-CoV-2 S pseudovirions (counting ~200,000 relative light units) were pre-incubated with an equal volume of medium containing serial dilutions (20-, 60-, 180-, 540-, 1,620-, 4,860-, 14,580- and 43,740-fold dilution at the final concentration) of heat-inactivated serum at room temperature for 1h. Then 50 μL of virus-antibody mixtures were added to 293T-ACE2-TMPRSS2 cells (10^4 cells/50 μL) [3] in a 96-well plate. The input virus with all SARS-CoV-2 strains used in the current study were the same (2 x 10^5 relative light units/50 μL/well).

After a 3 h incubation, fresh medium was added to the wells. Cells were lysed 24 h later, and luciferase activity was measured using One-Glo luciferase assay system (Promega, Cat# E6130). The assay of each serum was performed in duplicate, and the 50% neutralization titer was calculated using Prism 9 (GraphPad Software). Controls included cells only, virus without any antibody and positive sera. The limit of detection for the neutralization assay is 1:20. Two independent biological replicate experiments were performed for each sample and variation in PsVNA50 titers was <9% between replicates.

Seroreactivity of post-vaccination samples to SARS-CoV-2 receptor binding domain by ELISA

96 well Immulon plates were coated with 50 ng/100 µL of recombinant spike-RBD either from vaccine-homologous WA1/2020 or the Omicron variant in PBS overnight at 4^{o}C. Starting at a 1:100 dilution, serum samples were serially diluted 5-fold and applied to the coated well for 1 hr at ambient temperature. Serum samples were assayed in duplicate. After three washes with PBS/0.05% Tween 20, bound human IgG antibodies were detected with 1:5000 dilution of HRP-conjugated anti-human IgG Fc-specific antibody (Jackson Immuno Research). After 1 hr, plates were washed PBST followed by PBS, and o-Phenylenediamine dihydrochloride (OPD) was added for 10 min. Absorbance was measured at 492 nm. End titer was determined as 2-fold above the average of the absorbance values of the binding of serum samples to blank control wells. The end-point titer is reported as the serum dilution that was above this cutoff and was calculated using Prism 9 (GraphPad Software).

Quantification and statistical analysis

Descriptive statistics were performed to determine the geometric mean titer values and were calculated using GraphPad. All experimental data to compare differences among groups were analyzed using lme4 and emmeans packages in R (RStudio version 1.1.463).

The demographic characteristics of these study participants are shown in Supplementary Table 1. Since age and sex can be biologically plausible confounders, data were analyzed for statistical significance between groups to control for age and sex as covariates (predictor variables) using a multivariate linear regression model. To ensure robustness of the results, absolute measurements were log2-transformed before performing the analysis. For comparisons between the vaccine groups (factor variable), pairwise comparisons were extracted using 'emmeans' and Tukey-adjusted p values were used for denoting significance to reduce Type 1 error due to multiple testing. The tests were two-sided tests. The differences were considered statistically significant with a 95% confidence interval when the p value was less than 0.05. (* ≤0.05, ** ≤0.01, *** ≤ 0.001, **** ≤0.0001).

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Supplementary References

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Supplementary Table S1: Participant's demographics, clinical characteristics, and vaccination type

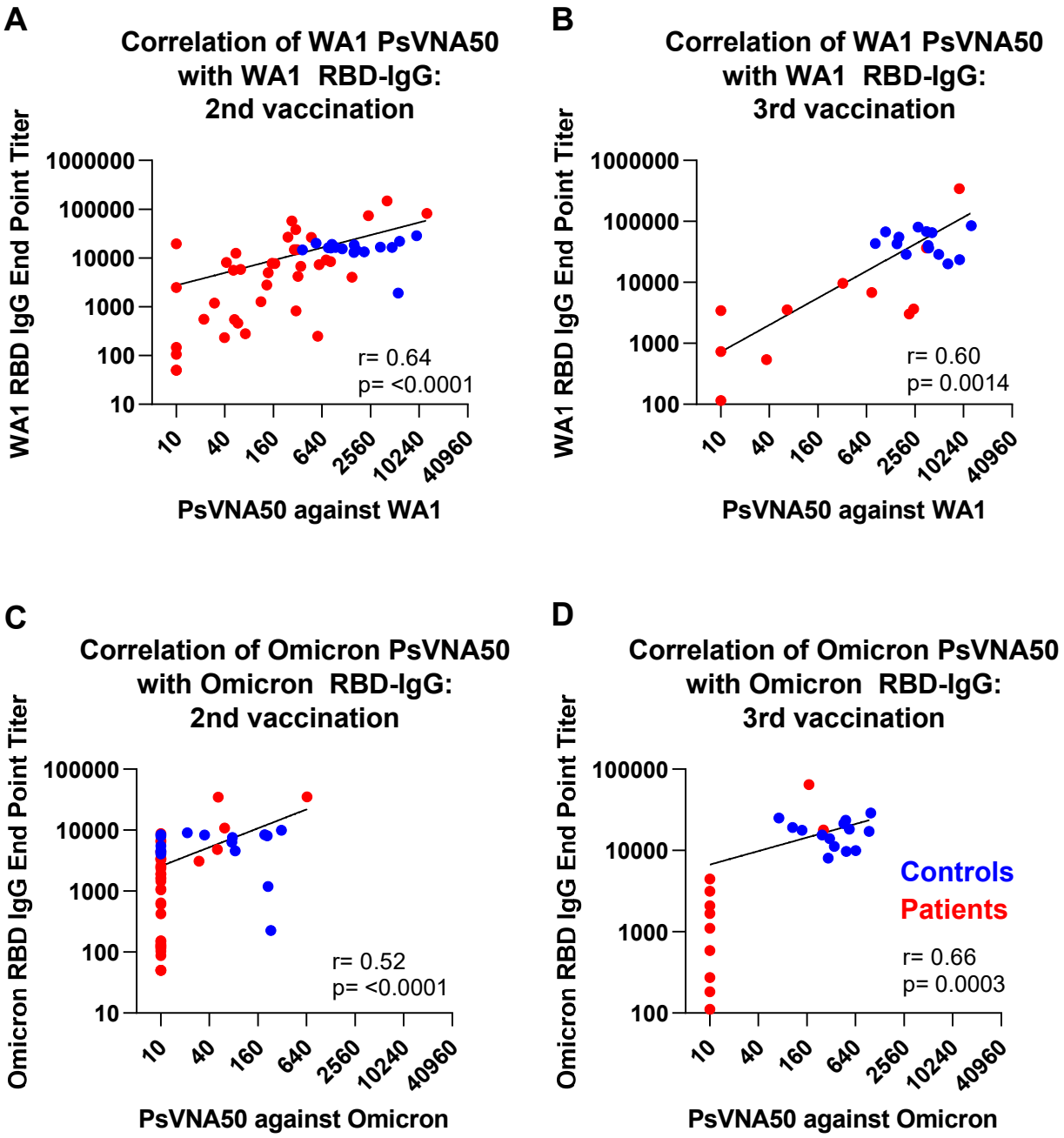
Patient ID	Age	Sex	Diagnosis	Karyotype	IPSS-R*/ELN/DIPSS	Treatment	Vaccine Type	Days from last Vaccination
Post-2nd vaccine dose in AML/MDS patients								
P-1	81	Male	MDS	Complex (del5q, del7p, +21)	8 (Very High)	Azacitidine 9 cycles	Moderna	250
P-2	45	Male	CMML	Normal	1.5 (Very Low)	Decitabine 10 cycles	Moderna	162
P-3	77	Female	AML	Normal	Intermediate	Azacitidine/ Venetoclax 7 cycles	Moderna	219
P-4	65	Male	MDS	Normal	5.5 (High)	Azacitidine 24 cycles	Pfizer	186
P-5	76	Female	AML-MRC	Normal	Adverse (ASXL1)	Decitabine/ Venetoclax <6 cycles	Moderna	228
P-6	74	Male	AML-MRC	Normal	Favorable (NPM1)	Azacitidine / Venetoclax <6 cycles	Moderna	153
P-7	82	Female	MDS	Normal	1.5 (Very Low)	Observation	Moderna	184
P-8	52	Male	MDS	Normal	2.5 (Low)	Observation	Pfizer	179
P-9	74	Male	MDS	Normal	2 (Low)	Darbopeoitin	Moderna	228
P-10	73	Male	MDS	46,XY,del(12)(q15q24.1)	3 (Low)	Decitabine 10 cycles	Pfizer	194
P-11	66	Male	AML-MRC	complex	Adverse	Decitabine/ Venetoclax 4 cycles	Pfizer	196
P-12	74	Male	MDS	46,XY,del(3)(q12q25),del(7)(q22q36	7.5 (Very High)	Azacitidine 5 cycles	Pfizer	186
P-13	70	Male	AML-MRC	Normal	Adverse (FLT3-ITD)	Decitabine/ Venetoclax 2 Cycles	Janssen	195
P-14	65	Male	MDS	46 XY [20]	3 (Low)	Decitabine/ Cedazuridine 20 cycles	Pfizer	56
P-15	79	Female	JAK2^{V617F+} Post ET-MF		DIPSS-3	Hydroxyurea	Pfizer	189
P-16	52	Male	JAK2^{V617F+} PV	46 XY [20]		Hydroxyurea	Pfizer	79
P-17	63	Male	AML-MRC	46 XY [20]	Adverse (AML-MRC/Secondary)	Post-Allo BMT	Pfizer	228
P-18[a]	73	Female	MDS	46,XX,der(7)add(7)(p12)add(7)(q11.2)[4] 46 XX der(7)add(7)(p12) add(7)(q11.2)[4]; 46,XX[4]	3 (Intermediate)	Observation	Pfizer	146
P-19	82	Female	MDS	46 XX [17]	3.5 (Intermediate)	Cyclosporine/ Eltrombopag	Pfizer	42
P-20	39	Female	JAK2^{V617F+} PV	46, XX [20]		Peginterferon	Pfizer	58
P-21	59	Male	JAK2^{V617F+} Post ET-MF			Ruxolitinib	Moderna	15
P-22	77	Male	AML	47 XY +8, del(7q)	Adverse	Azacitidine/ Venetoclax 9 cycles	Moderna	65
P-23	76	Male	MDS	Complex	7.5 (Very High)	Decitabine/ Venetoclax 8 cycles	Pfizer	31
P-24	56	Female	JAK2^{V617F+} ET	46 XX [20]		Anagrelide	Pfizer	31
P-25	28	Male	AML	46 XY [20]	Adverse	Post-Allo BMT	Pfizer	201
P-26	63	Female	JAK2^{V617F+} Primary MF		DIPSS-0	Observation	Pfizer	30
P-27	70	Male	MDS	46 XY [20]	3.5 (Intermediate)	Decitabine/ Cedazuridine 38 cycles	Moderna	68
P-28	76	Female	MDS	46,XX,del(13)(q12 q21)[6] 46,XX[14]	2 (Low)	Observation	Moderna	64
P-29	55	Female	JAK2^{V617F+} PV			Phlebotomy	Pfizer	141
P-30†[b]	70	Female	MDS	46, XX [20]	1.5 (Low)	Observation	Moderna	70
P-31	89	Female	MDS	46 XX, del(5q)	2 (Low)	Darbopoeitin	Moderna	155
P-32	69	Female	MDS	46,XX[20]	1 (Low)	Darbopoeitin/ G-CSF	Moderna	66
P-33	71	Female	JAK2^{V617F+} Primary MF	47 XX, +8 [20]	DIPSS-4	Ruxolitinib	Moderna	73
P-34	81	Male	JAK2^{V617F+} PV			Hydroxyurea	Moderna	101
P-35	64	Male	MDS	46 XY [25]	3 (Intermediate)	Observation	Pfizer	134
P-36	69	Female	JAK2^{V617F+} PV	46, XX [20]		Ruxolitinib/ Hydroxyurea	Moderna	148
P-37	83	Female	AML-MRC	46,XX,del(20)(q11 .2q13.3)[2]	Adverse (AML-MRC/Secondary)	Azacitidine 14 cycles	Moderna	286
P-38	66	Male	JAK2^{V617F+} PV			Ruxolitinib	Moderna	272
Post-3rd vaccine dose in AML/MDS patients								
P-48	78	Male	AML	Trisomy 8	Intermediate (FLT3 ITD/NPM1)	Azacitidine/ Gliteritinib 25 cycles	Moderna	24
P-49	82	Male	AML	Trisomy 8	Intermediate	Azacitidine/ Venetoclax >6 cycles	Pfizer	27
P-50	77	Male	AML MRC	Del (7q), +8,	Adverse (ASXL1/RUNX1)	Azacitidine/ Venetoclax 7 cycles	Moderna	27
P-51	79	Male	MDS	Normal	1.5 (Very Low)	Observation	Moderna	22
P-52	64	Male	MDS	Normal	1 (Very Low)	Observation	Pfizer	39
P-53[c]	65	Male	MDS	46,XY,del(7)(q22q36)	8 (Very High)	Azacitidine/ Glasdegib 31 cycles	Pfizer	53
P-54	70	Female	MDS	Normal	1.5 (Very Low)	Observation	Moderna	40
P-55	76	Female	AML-MRC	Normal	Intermediate	Azacitidine / Venetoclax 5 cycles	Unknown	Unknown
P-56	63	Female	MDS	complex >3	6.5 (Very High)	Azacitidine 6 cycles	Moderna	24
P-57	76	Female	MDS	46XY Del13q	2 (Low)	Observation	Moderna	34
P-30R†	70	Female	MDS	46, XX [20]	1.5 (Low)	Observation	Moderna	40
Post-2nd vaccine dose in Adult Controls								
C-1	24	Female	Healthy	N/A**	N/A	N/A	Pfizer	38
C-2	38	Female	Healthy	N/A	N/A	N/A	Moderna	38
C-3	31	Female	Healthy	N/A	N/A	N/A	Pfizer	38
C-4	34	Female	Healthy	N/A	N/A	N/A	Pfizer	38
C-5	35	Female	Healthy	N/A	N/A	N/A	Pfizer	57
C-6	47	Male	Healthy	N/A	N/A	N/A	Moderna	31
C-7	24	Female	Healthy	N/A	N/A	N/A	Pfizer	27
C-8	71	Female	Healthy	N/A	N/A	N/A	Moderna	58
C-9	75	Male	Healthy	N/A	N/A	N/A	Moderna	58
C-10	21	Female	Healthy	N/A	N/A	N/A	Pfizer	29
C-11	34	Male	Healthy	N/A	N/A	N/A	Pfizer	36
C-12	70	Female	Healthy	N/A	N/A	N/A	Moderna	29
C-13	43	Male	Healthy	N/A	N/A	N/A	Moderna	41
C-14	28	Female	Healthy	N/A	N/A	N/A	Moderna	38
C-15	35	Female	Healthy	N/A	N/A	N/A	Pfizer	43
C-16	26	Male	Healthy	N/A	N/A	N/A	Moderna	57
Post-3rd vaccine dose in Adult Controls								
C-1	24	Female	Healthy	N/A	N/A	N/A	Pfizer	51
C-2	38	Female	Healthy	N/A	N/A	N/A	Pfizer	64
C-3	31	Female	Healthy	N/A	N/A	N/A	Pfizer	37
C-4	34	Female	Healthy	N/A	N/A	N/A	Pfizer	42
C-6	47	Male	Healthy	N/A	N/A	N/A	Pfizer	59
C-8	71	Female	Healthy	N/A	N/A	N/A	Pfizer	79
C-9	75	Male	Healthy	N/A	N/A	N/A	Pfizer	83
C-10	21	Female	Healthy	N/A	N/A	N/A	Pfizer	56
C-11	34	Male	Healthy	N/A	N/A	N/A	Pfizer	62
C-12	70	Female	Healthy	N/A	N/A	N/A	Pfizer	33
C-13	43	Male	Healthy	N/A	N/A	N/A	Pfizer	45
C-14	28	Female	Healthy	N/A	N/A	N/A	Pfizer	29
C-15	35	Female	Healthy	N/A	N/A	N/A	Pfizer	51
C-16	26	Male	Healthy	N/A	N/A	N/A	Pfizer	39

* Revised international prognostic scoring system (IPSS-R) as per Greenberg PL, et al. Blood. 2012;120(12):2454-2465.
European LeukemiaNet (ELN) as per Dohner, H., et al., Blood. 2017;129(4):424-447.
Dynamic International Prognostic Scoring System (DIPSS) as per Passmonti, F., et al., Blood. 2010;115(9):1703-1708
**: N/A is 'not applicable'
†P-30 and P-30R are samples collected from the identical patient at different time points
a: Patient had documented breakthrough infection 278 days post 2nd vaccination: prolonged hospitalization and viral shedding; fully recovered
b: Patient had documented breakthrough infection 24 days post 2nd vaccination: managed as outpatient; fully recovered
c: Patient had documented breakthrough infection 126 days post 2nd vaccination: prolonged hospitalization and viral shedding; fully recovered
MDS: Myelodysplatic Syndromes
AML: Acute Myeloid Leukemia
AML-MRC: AML with Myelodysplasia-Related Changes
Post ET-MF: Post Essential Thrombocytopenia-Myelofibrosis
PV: Polycythemia Vera
ET: Essential Thrombocytopenia
MF: Myelofibrosis

Supplementary Table S2. Demographics and neutralization titers of post-vaccination serum used in this study

Donor ID	Diagnosis	Type of COVID-19 Vaccine	Sex	Age (in years)	50 % Neutralization titer					
					WA1/2020	Alpha	Beta	Gamma	Delta	Omicron
Post-2nd vaccine dose in AML/MDS patients										
P-1	MDS	Moderna	M	81	52.8	21.7	10.0	10.0	10.0	10.0
P-2	CMML	Moderna	M	45	42.0	18.5	10.0	10.0	10.0	10.0
P-3	MDS	Moderna	F	76	66.2	10.0	10.0	10.0	10.0	10.0
P-4	AML	Moderna	M	77	10.0	10.0	10.0	10.0	10.0	10.0
P-5	MDS	Pfizer	F	65	36.9	20.2	10.0	10.0	10.0	10.0
P-6	AML-MRC	Moderna	M	76	10.0	10.0	10.0	10.0	10.0	10.0
P-7	MDS	Moderna	F	82	10.0	10.0	10.0	10.0	10.0	10.0
P-8	MDS	Moderna	M	76	326.2	94.8	116.0	114.8	105.7	10.0
P-9	MDS	Pfizer	M	52	742.5	182.6	45.4	68.0	88.2	10.0
P-10	MDS	Pfizer	M	73	39.6	10.0	10.0	10.0	10.0	10.0
P-11	AML-MRC	Moderna	M	74	2172.2	326.5	10.0	10.0	10.0	10.0
P-12	MDS	Moderna	M	66	10.0	10.0	10.0	10.0	10.0	10.0
P-13	AML-MRC	Janssen	M	74	2477.5	736.8	22.3	64.3	105.1	10.0
P-14	MDS	Pfizer	M	65	72.0	33.0	33.0	25.0	64.0	10.0
P-15	Post ET MF	Pfizer	F	79	10.0	10.0	10.0	10.0	10.0	10.0
P-16	PV	Pfizer	M	52	22.0	10.0	10.0	10.0	10.0	10.0
P-17	AML	Pfizer	M	63	58.0	10.0	10.0	10.0	10.0	10.0
P-18	MDS	Pfizer	F	73	10.0	10.0	10.0	10.0	10.0	10.0
P-19	MDS	Pfizer	F	82	12762.0	4754.0	1508.0	1893.0	648.0	648.0
P-20	PV	Pfizer	F	39	820.0	383.0	354.0	405.0	10.0	10.0
P-21	Post ET MF	Moderna	M	59	2401.0	260.0	302.0	302.0	1558.0	62.0
P-22	AML	Moderna	M	77	472.0	10.0	32.0	32.0	213.0	10.0
P-23	AML	Pfizer	M	76	272.0	79.0	174.0	174.0	137.0	10.0
P-24	ET	Pfizer	F	56	154.0	10.0	59.0	59.0	42.0	10.0
P-25	AML	Pfizer	M	28	167.3	52.7	28.9	34.7	34.9	10.0
P-26	MF	Pfizer	F	63	592.0	344.0	10.0	76.0	219.0	10.0
P-27	MDS	Moderna	M	70	313.0	242.0	63.0	164.0	10.0	10.0
P-28	MDS	Moderna	F	76	322.0	280.0	117.0	202.0	10.0	10.0
P-29	PV	Pfizer	F	55	718.1	293.8	317.7	183.0	183.2	50.3
P-30	MDS	Moderna	F	70	133.0	119.0	10.0	23.0	56.0	10.0
P-31	MDS	Moderna	F	89	566.2	357.2	105.6	93.5	136.3	10.0
P-32	MDS	Moderna	F	69	304.0	127.0	10.0	73.0	10.0	10.0
P-33	MF	Moderna	F	71	63.0	36.0	10.0	10.0	45.0	10.0
P-34	PV	Moderna	M	81	55.0	28.0	10.0	10.0	48.0	10.0
P-35	MDS	Pfizer	M	64	51.0	10.0	10.0	10.0	10.0	10.0
P-36	PV	Moderna	F	69	138.0	59.0	10.0	40.0	10.0	10.0
P-37	AML-MRC	Moderna	F	83	242.0	165.0	52.0	93.0	140.0	10.0
P-38	PV	Moderna	M	66	10.0	10.0	10.0	10.0	10.0	10.0
			Geometric mean titer		**138.7**	**64.2**	**30.5**	**38.8**	**39.2**	**13.1**
Post-3rd vaccine dose in AML/MDS patients										
P-48	AML	Moderna	M	78	10.0	10.0	10.0	10.0	10.0	10.0
P-49	AML	Moderna	M	82	29.7	10.0	10.0	10.0	10.0	10.0
P-50	AML MRC	Moderna	M	77	350.2	312.9	10.0	10.0	61.1	10.0
P-51	MDS	Moderna	M	79	291.4	273.4	24.0	59.8	55.0	10.0
P-52	MDS	Pfizer	M	64	4109.4	3989.5	605.0	1142.2	1316.8	51.5
P-53	MDS	Pfizer	M	65	304.6	272.5	37.3	32.2	287.6	10.0
P-54	MDS	Moderna	F	70	1510.9	1466.0	694.0	618.5	1099.4	29.7
P-55	AML-MRC	Moderna	F	74	9075.0	7139.7	4685.3	5056.8	4056.1	169.4
P-56	MDS	Moderna	F	63	112.6	37.6	10.0	10.0	10.0	10.0
P-57	MDS	Moderna	F	76	10.0	10.0	10.0	10.0	10.0	10.0
P-30R	MDS	Moderna	F	70	3556.0	3135.0	1016.0	934.8	1683.0	256.9
			Geometric mean titer		**304.5**	**233.9**	**69.4**	**77.9**	**122.8**	**22.3**
Post-2nd vaccine dose in Healthy Adults										
C-1	Healthy Control	Pfizer	F	24	5848.8	4184.5	986.3	916.4	1277.5	230.6
C-2	Healthy Control	Moderna	F	38	542.9	411.8	347.0	273.1	527.0	10.0
C-3	Healthy Control	Pfizer	F	31	944.9	616.5	219.2	278.8	828.0	21.4
C-4	Healthy Control	Pfizer	F	34	766.8	851.1	561.0	465.8	734.9	10.0
C-5	Healthy Control	Pfizer	F	35	3393.3	2429.8	962.8	1110.0	2073.4	194.5
C-6	Healthy Control	Moderna	M	47	4746.7	4145.4	1120.1	998.0	1804.0	209.3
C-7	Healthy Control	Pfizer	F	24	853.7	796.6	318.9	376.5	840.6	34.9
C-8	Healthy Control	Moderna	F	71	5659.7	5199.9	3015.4	3578.1	3520.3	212.8
C-9	Healthy Control	Moderna	M	75	1696.1	987.6	184.2	286.9	1328.1	10.0
C-10	Healthy Control	Pfizer	F	21	1594.1	1431.8	231.8	100.3	1448.2	10.0
C-11	Healthy Control	Pfizer	M	34	822.6	791.0	256.187	295.9	353.1	10.0
C-12	Healthy Control	Moderna	F	70	367.8	261.2	152.2	246.5	42.8	10.0
C-13	Healthy Control	Moderna	M	43	9543.7	8439.4	1134.0	953.524	6636.1	311.5
C-14	Healthy Control	Moderna	F	28	1146.3	814.0	507.524	635.029	794.7	75.9
C-15	Healthy Control	Pfizer	F	35	1601.0	1136.9	576.815	585.7	762.5	77.2
C-16	Healthy Control	Moderna	M	26	2146.9	1671.2	395.3	484.4	925.4	83.5
			Geometric mean titer		**1713.0**	**1364.0**	**485.5**	**504.2**	**956.5**	**44.4**
Post-3rd vaccine dose in Healthy Adults										
C-1	Healthy Control	Pfizer	F	24	4176.1	2253.9	1223.8	937.1	2536.1	350.5
C-2	Healthy Control	Pfizer	F	38	1989.1	716.0	488.5	501.7	1533.3	491.0
C-3	Healthy Control	Pfizer	F	31	1533.6	1336.9	659.3	792.9	1142.1	536.6
C-4	Healthy Control	Pfizer	F	34	1616.1	1365.9	824.0	887.6	1261.4	138.9
C-6	Healthy Control	Pfizer	M	47	3782.5	2239.6	1119.5	1325.6	2261.4	305.6
C-8	Healthy Control	Pfizer	F	71	2802.1	1422.5	752.6	1014.2	1193.1	485.5
C-9	Healthy Control	Pfizer	M	75	1108.5	1189.8	570.0	705.5	804.7	71.7
C-10	Healthy Control	Pfizer	F	21	3745.0	3482.5	1747.1	2216.6	2971.9	246.2
C-11	Healthy Control	Pfizer	M	34	822.6	791.0	256.187	295.9	353.1	106.3
C-13	Healthy Control	Pfizer	M	43	12771.9	10199.5	4363.9	3978.0	7150.5	987.6
C-14	Healthy Control	Pfizer	F	28	5040.3	3537.2	985.2	1408.9	2221.0	293.4
C-15	Healthy Control	Pfizer	F	35	6579.0	3663.0	1170.0	1586.4	3468.9	646.5
C-16	Healthy Control	Pfizer	M	26	9171.3	7333.3	2877.2	3575.8	6705.8	942.5
			Geometric mean titer		**3141.0**	**2209.0**	**1001.0**	**1155.0**	**1917.0**	**334.0**

Supplementary Figure S1



Supplementary Figure S1: Relationship of post-vaccination SARS-CoV-2 serum neutralizing antibodies in AML/MDS patients and healthy controls with SARS-CoV-2 RBD binding antibodies. Correlation analysis between serum PsVNA50 neutralization antibody titers generated following second (panels A & C) and third (panels B & D) vaccination of 48 AML/MDS patients (in red) or 16 healthy controls (in blue) against vaccine-matched SARS-CoV-2 WA1 or the Omicron variant, and binding antibodies against either SARS-CoV-2 WA1 RBD (panels A-B) or Omicron RBD (panels C-D). Correlation analysis was performed using non-linear regression model and associated Spearman's correlation coefficients (r) and regression significance (p) are shown.