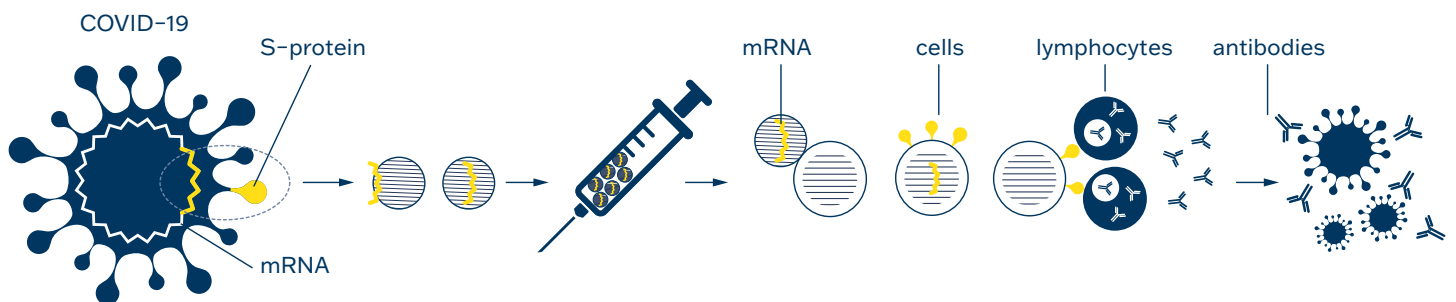


# COVID-19 vaccination

## Overview of post-vaccination reactivity of Microblot-Array kits

**In all EU Member States, vaccination against SARS-CoV-2 was launched in December 2020 using mRNA vaccines.**

The mRNA vaccines carry a specially designed mRNA sequence that is incorporated only into differentiated muscle, skin, and dendritic cells. When this mRNA encounters our ribosomes, they use it as an instruction to produce a part of the protein envelope called the spike S protein. The protein thus formed is presented on the cell surface in association with a histocompatible complex. Subsequently, the cells are recognized as foreign, which makes it possible to induce a complex immune response. It stimulates B-lymphocytes to produce antibodies, T-lymphocytes, which stimulate the differentiation and production of specialized B-lymphocytes and at the same time stimulate the cellular response.



**TestLine Microblot-Array COVID-19 diagnostic kits were used to verify post-vaccination immunity in vaccinated healthcare professionals.**

Post-vaccination reactivity was tested on antigens: RBD, NP, S2, ACE2, PLpro, and E, which are part of the MBA COVID-19 kit.

The most important antigen for monitoring post-vaccination reactivity is the Receptor-Binding Domain (RBD), a subunit of the Spike S1 protein that specifically binds to host cell angiotensin-converting

enzyme 2 (ACE2). This binding is highly correlated with the formation of neutralizing antibodies. The nucleocapsid protein (NP) encapsulates the viral genomic RNA and forms a major component of the viral structure. The presence of anti-NP antibodies indicates post-infectious immunity. The Spike S2 protein, which is part of the Spike protein, is involved in the fusion of the virus with the host cell membrane. Papain-like protease (PLpro) and Envelope (E) protein play a role in virus replication.

**Reactivity of vaccinated healthcare professionals after the 1<sup>st</sup> dose of Pfizer vaccine**

MICROBLOT-ARRAY					IgG						IgM						IgA					
No.	Date of application	Date of sample collection	PCR test	Ab test before vaccination	NP	RBD	Spike S2	E protein	ACE2	PLpro	NP	RBD	Spike S2	E protein	ACE2	PLpro	NP	RBD	Spike S2	E protein	ACE2	PLpro
A1	29.12.20	15.01.21	no	no	106.92	904.65	51.60	28.56	25.00	29.49	150.00	666.46	1.97	0.00	0.00	24.56	90.40	384.52	507.17	11.40	21.14	19.64
A2	07.01.21	16.01.21	no	no	50.96	33.86	21.40	23.08	30.71	23.59	23.18	0.00	0.00	0.00	0.00	0.00	30.08	630.01	24.01	20.19	32.81	31.69
A3	13.01.21	15.01.21	no	no	112.74	22.66	24.90	23.53	24.18	22.90	156.50	0.00	22.92	39.42	42.28	52.13	46.88	10.66	7.17	9.92	44.42	15.29
A4	29.12.20	16.01.21	NEG 10.2020	no	29.79	276.01	18.86	18.88	21.01	21.24	1.81	0.00	0.00	0.00	0.00	0.00	55.93	80.72	16.81	13.64	26.15	35.51
A5	07.01.21	16.01.21	no	no	137.93	24.12	24.18	23.84	23.12	22.14	43.40	0.00	0.00	0.00	0.00	0.00	17.50	34.86	185.37	9.34	32.69	31.32
A6	29.12.20	16.01.21	no	no	137.89	942.43	55.47	25.59	29.86	26.53	38.15	556.70	0.00	0.00	0.00	0.00	137.38	296.45	329.42	30.55	51.85	17.82
A7	30.12.20	18.01.21	POS 09.2020	POS	178.43	820.15	817.46	24.18	23.26	22.22	0.00	70.55	0.00	0.00	0.00	0.00	104.25	959.70	140.31	34.58	42.88	42.23
A8	29.12.20	18.01.21	NEG 12.2020	NEG	30.82	600.28	22.17	17.41	18.23	21.48	9.67	304.61	0.00	0.00	0.00	0.00	59.24	465.98	18.95	16.02	28.29	27.06
A9	29.12.20	18.01.21	NEG 12.2020	no	115.61	549.27	27.28	23.12	26.67	25.96	853.54	40.15	35.44	7.90	78.67	130.76	92.68	77.14	0.00	2.81	6.64	6.76
A10	30.12.20	18.01.21	NEG 10.2020	no	18.61	899.18	196.98	19.54	14.79	19.72	110.33	710.29	25.28	0.00	31.65	103.00	49.33	625.46	38.96	34.58	57.03	52.94
A11	30.12.20	18.01.21	no	no	87.54	755.70	27.59	30.02	29.54	41.44	181.10	321.57	82.46	19.79	143.26	208.27	31.89	633.19	106.99	21.86	38.44	46.72
A12	29.12.20	18.01.21	no	no	127.64	891.22	213.80	63.47	53.26	45.16	12.69	989.80	40.83	0.00	23.22	10.24	476.85	356.03	225.85	0.05	37.39	6.63
A16	30.12.20	19.01.21	NEG 12.2020	NEG	224.56	66.54	36.31	18.59	21.53	22.63	184.86	83.82	0.00	0.00	0.00	0.00	58.90	118.89	21.28	15.48	43.47	26.75
A18	30.12.20	19.01.21	NEG 12.2020	neg.	89.21	674.74	18.07	13.10	13.30	13.78	0.00	105.80	0.00	0.00	0.00	0.00	92.03	115.31	149.84	10.74	74.03	95.28
A19	31.12.20	19.01.21	POS 09.2020	POS	576.68	867.04	981.81	56.55	18.00	19.84	101.46	181.70	0.00	0.00	0.00	2.16	184.81	897.88	553.18	16.42	61.35	36.84
A23	14.01.21	22.01.21	POS 12.2020	POS	527.40	705.96	461.06	23.26	19.17	19.04	145.27	278.52	64.32	37.37	63.92	32.93	116.82	934.92	99.90	13.14	33.57	42.65
A26	12.01.21	22.01.21	no	no	42.64	103.95	33.30	22.26	40.95	22.80	91.41	200.00	23.99	1.60	35.63	71.37	254.30	551.10	7.09	15.08	59.75	86.56
A29	12.01.21	22.01.21	no	no	147.67	703.45	846.88	24.08	31.73	31.70	74.35	56.02	27.57	9.11	6.62	7.49	45.79	992.92	298.66	33.70	46.79	40.93
A30	13.01.21	22.01.21	POS 12.2020	POS	549.95	654.78	127.65	28.76	42.15	37.11	106.30	208.76	30.32	20.39	26.73	24.26	154.53	801.71	32.07	31.59	51.55	51.50
A31	12.01.21	22.01.21	NEG 12.2020	no	90.69	197.52	24.12	19.52	19.62	14.86	141.99	5.32	62.52	21.35	33.24	53.31	80.22	196.25	11.88	23.33	54.49	50.59
A32	12.01.21	22.01.21	1.12.2020	no	51.30	191.42	25.90	27.61	25.97	32.63	117.95	0.79	7.61	39.91	72.06	60.07	45.36	62.01	13.75	21.12	25.07	26.33
A33	12.01.21	21.01.21	POS 10.2020	POS	703.61	654.92	856.60	23.51	22.80	21.53	85.16	79.44	14.66	12.02	23.02	25.69	265.75	911.59	542.91	22.74	25.24	14.12
A34	12.01.21	26.01.21	no	no	66.89	421.46	39.97	29.43	25.00	29.60	97.09	85.19	21.29	30.77	22.93	19.59	91.88	144.41	29.80	22.91	50.39	43.53
A42	13.01.21	27.01.21	POS 12.2020	no	27.62	735.93	65.80	14.22	11.64	16.81	61.90	107.42	39.34	14.93	22.32	47.27	39.87	624.93	52.46	27.94	42.07	37.73
A44	07.01.21	28.01.21	no	no	43.44	54.52	22.90	28.47	39.52	45.47	33.55	53.63	10.75	0.69	15.98	18.75	78.29	34.22	19.42	27.46	56.36	23.74
A45	08.01.21	27.01.21	no	no	391.78	213.81	39.29	79.23	51.46	79.45	61.38	38.57	19.33	15.76	36.66	57.86	154.65	571.23	29.51	23.53	34.26	31.06
A49	12.01.21	28.01.21	POS 12.2020	POS	477.23	830.49	222.08	26.01	16.40	5.27	66.12	377.56	146.74	18.70	8.13	14.51	116.19	878.62	56.04	43.67	58.40	36.62

## Reactivity of vaccinated healthcare professionals after the 2<sup>nd</sup> dose of Pfizer vaccine

### MICROBLOT-ARRAY

No.	Date of application	Date of sample collection	PCR test	Ab test before vaccination	IgG						IgM						IgA					
					NP	RBD	Spike S2	E protein	ACE2	PLpro	NP	RBD	Spike S2	E protein	ACE2	PLpro	NP	RBD	Spike S2	E protein	ACE2	PLpro
A22	29.12.20/19.01.21	22.01.21	no	no	50.95	831.57	25.89	24.68	23.76	24.86	47.31	161.59	21.45	25.69	24.78	21.38	28.51	312.32	21.64	21.93	30.76	27.27
A24	29.12.20/19.01.21	22.01.21	POS 09.2020	POS	98.84	694.36	891.65	9.97	14.88	14.64	51.14	203.58	24.29	11.37	25.40	21.84	55.84	884.49	505.67	17.28	31.01	42.42
A25	28.12.20/20.01.21	22.01.21	NEG 12.2020	no	61.60	798.94	79.15	25.31	23.64	29.78	111.12	193.55	36.95	24.88	32.81	58.30	39.84	641.32	5.17	9.21	29.77	31.52
A27	29.12.20/19.01.21	22.01.21	POS 09.2020	POS	271.66	708.18	910.89	30.73	19.11	16.10	160.26	74.86	47.13	34.28	28.58	77.03	151.13	865.96	382.39	18.66	68.24	80.71
A28	29.12.20/19.01.21	22.01.21	NEG 12.2020	no	20.38	813.97	48.29	16.66	22.09	20.06	114.35	433.65	30.52	17.47	24.00	18.00	30.71	247.61	17.11	23.52	37.84	37.18
A35	29.12.20/19.01.21	26.01.21	NEG 12.2020	no	45.77	731.23	367.38	30.22	27.61	28.39	51.85	479.93	14.42	12.28	13.06	20.43	40.69	968.11	35.34	17.41	27.71	21.73
A36	30.12.20/20.01.21	27.01.21	NEG 12.2020	no	76.18	730.34	574.40	30.56	39.06	59.96	78.19	477.41	7.20	18.02	19.80	62.63	82.41	993.69	131.68	26.47	76.26	41.71
A37	29.12.20/19.01.21	27.01.21	NEG 01.2021	no	214.09	749.68	94.67	26.97	18.22	20.05	61.24	338.51	40.35	27.23	24.63	68.24	34.88	935.05	30.34	20.73	30.82	26.65
A38	30.12.20/20.01.21	27.01.21	NEG 12.2020	no	96.48	725.78	461.06	38.32	30.68	35.84	74.37	896.05	67.08	32.73	25.80	48.19	80.85	1015.17	134.56	17.93	25.24	20.81
A39	29.12.20/19.01.21	27.01.21	NEG 12.2020	no	133.54	715.77	249.82	67.24	45.91	69.98	104.05	717.30	65.95	31.31	38.46	32.02	107.51	968.07	109.96	29.69	80.04	43.22
A40	29.12.20/21.01.21	27.01.21	POS 11.2020	NEG	151.63	747.38	71.76	29.77	28.90	25.76	48.40	793.18	27.53	17.81	23.50	35.65	34.19	1002.87	134.11	23.93	26.05	23.35
A41	30.12.20/20.01.21	27.01.21	NEG 12.2020	no	101.13	782.90	426.04	36.46	32.89	40.08	68.20	571.80	36.56	33.22	26.40	20.14	28.63	1005.95	219.40	17.33	22.69	21.32
A43	30.12.20/20.01.21	27.01.21	NEG 12.2020	POS	223.95	770.24	914.93	32.93	43.11	48.68	29.89	33.98	71.74	60.84	70.95	81.12	64.05	976.73	201.91	16.85	22.10	16.71
A47	29.12.20/19.01.21	27.01.21	POS 10.2020	POS	422.96	798.26	875.82	42.63	25.14	37.94	121.87	47.28	53.30	20.47	32.49	56.12	320.07	1062.33	492.02	34.60	42.52	45.10
A48	29.12.20/19.01.21	28.01.21	NEG 12.2020	no	687.82	749.78	634.43	19.32	18.24	25.99	126.62	462.51	39.98	38.74	10.38	34.72	175.79	576.01	30.57	30.61	33.71	39.91

### Interpretation of MBA results – Units per millilitre (U/ml)

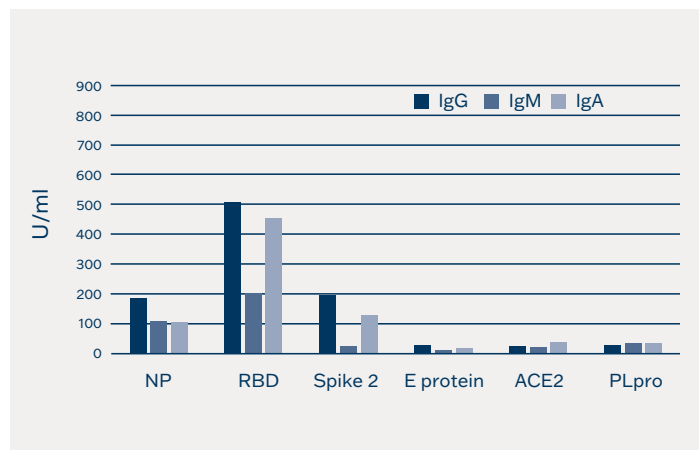
lower than 185 = negative
  185 to 210 = borderline
  higher than 210 = positive

The Ab test before the vaccine was performed in another laboratory.

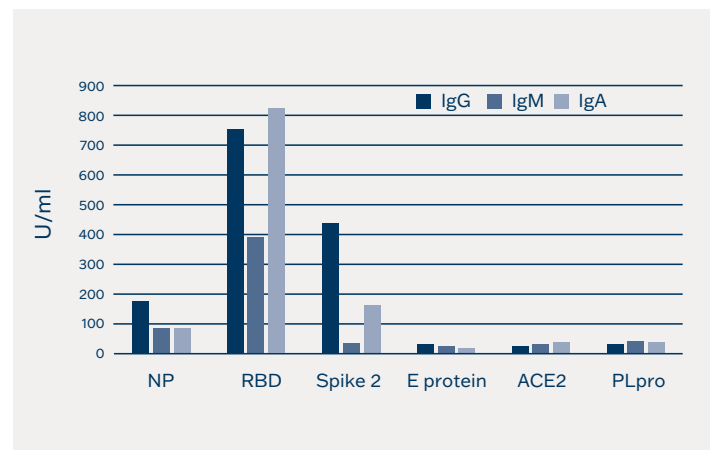
Note: The presence of anti-NP antibodies indicates post-infectious immunity.

The nucleocapsid protein (NP) encapsulates the viral genomic RNA and forms a major component of the viral structure.

### Mean values after the 1<sup>st</sup> dose of vaccination against SARS-CoV-2



### Mean values after the 2<sup>nd</sup> dose of vaccination against SARS-CoV-2



## Ordering information:

<b>Cat. No.</b>	<b>Product</b>	<b>No. of wells</b>
CoVAMA96	Microblot-Array COVID-19 IgA	96
CoVGMA96	Microblot-Array COVID-19 IgG	96
CoVMMMA96	Microblot-Array COVID-19 IgM	96

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