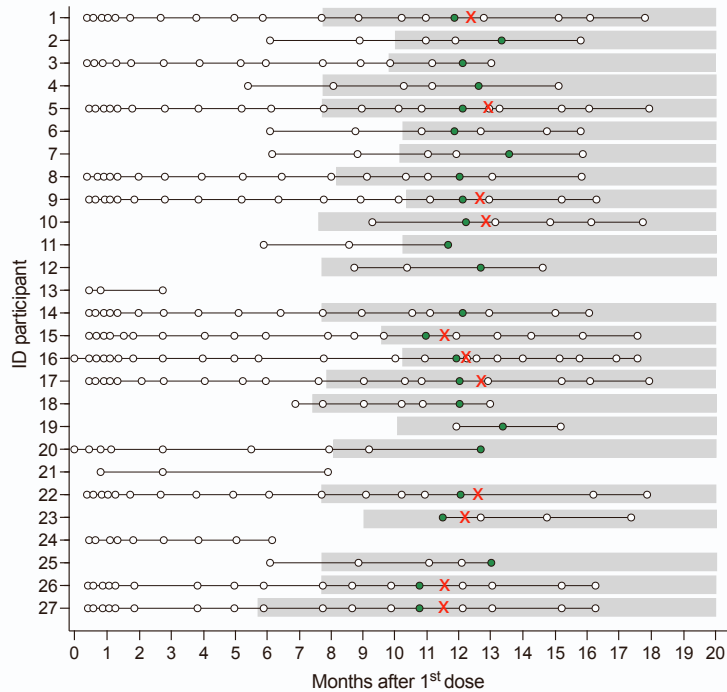


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Supplemental information

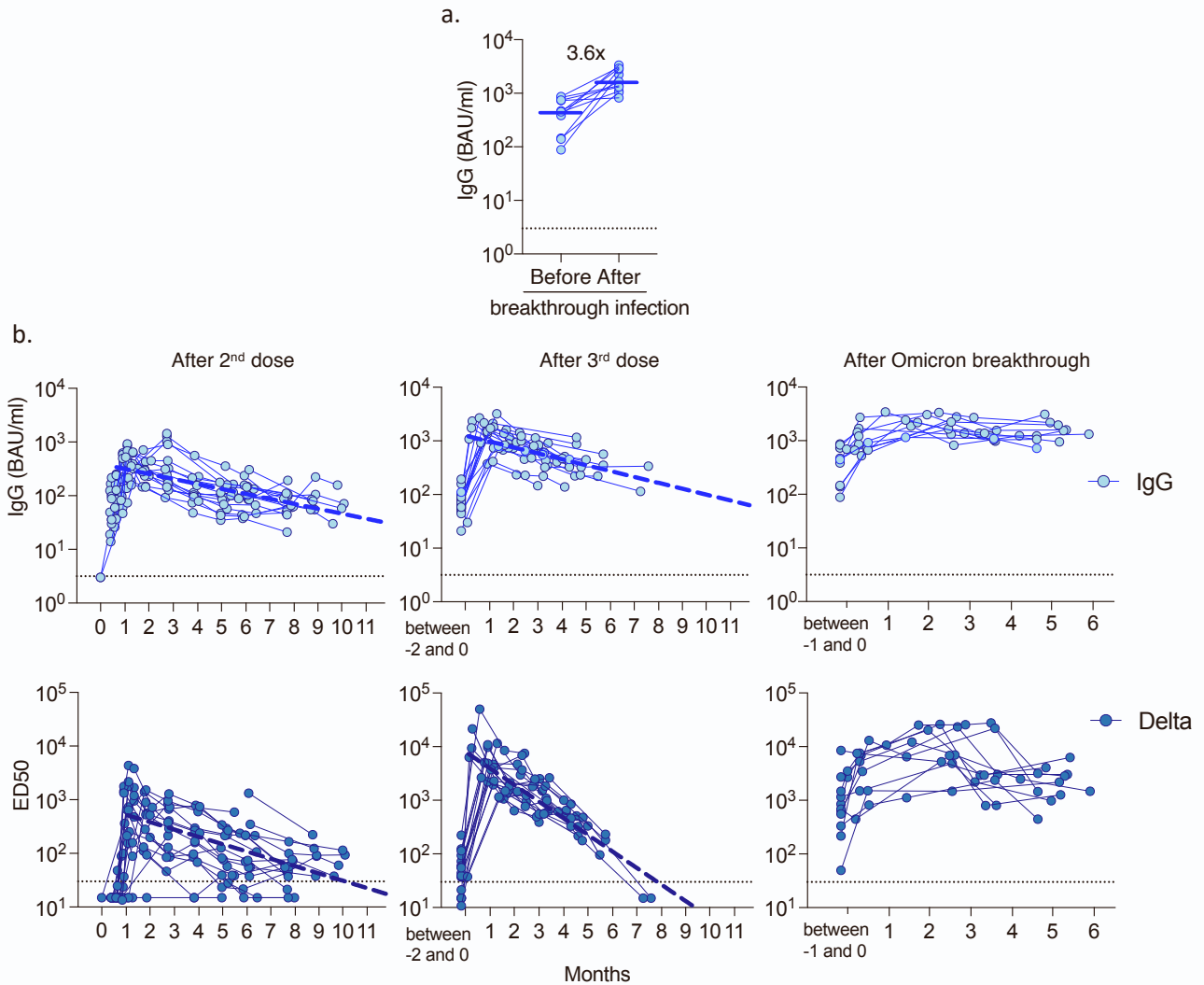
Duration of BA.5 neutralization in sera and nasal swabs from SARS-CoV-2 vaccinated individuals, with or without omicron breakthrough infection

Delphine Planas, Isabelle Staropoli, Françoise Porot, Florence Guivel-Benhassine, Lynda Handala, Matthieu Prot, William-Henry Bolland, Julien Puech, H  l  ne P  r  , David Veyer, Aymeric S  ve, Etienne Simon-Lori  re, Timoth  e Bruel, Thierry Prazuck, Karl Stefic, Laurent Hocqueloux, and Olivier Schwartz



Supplemental Figure 1: Chronology of vaccination and breakthrough infection. Related to Figure 1b

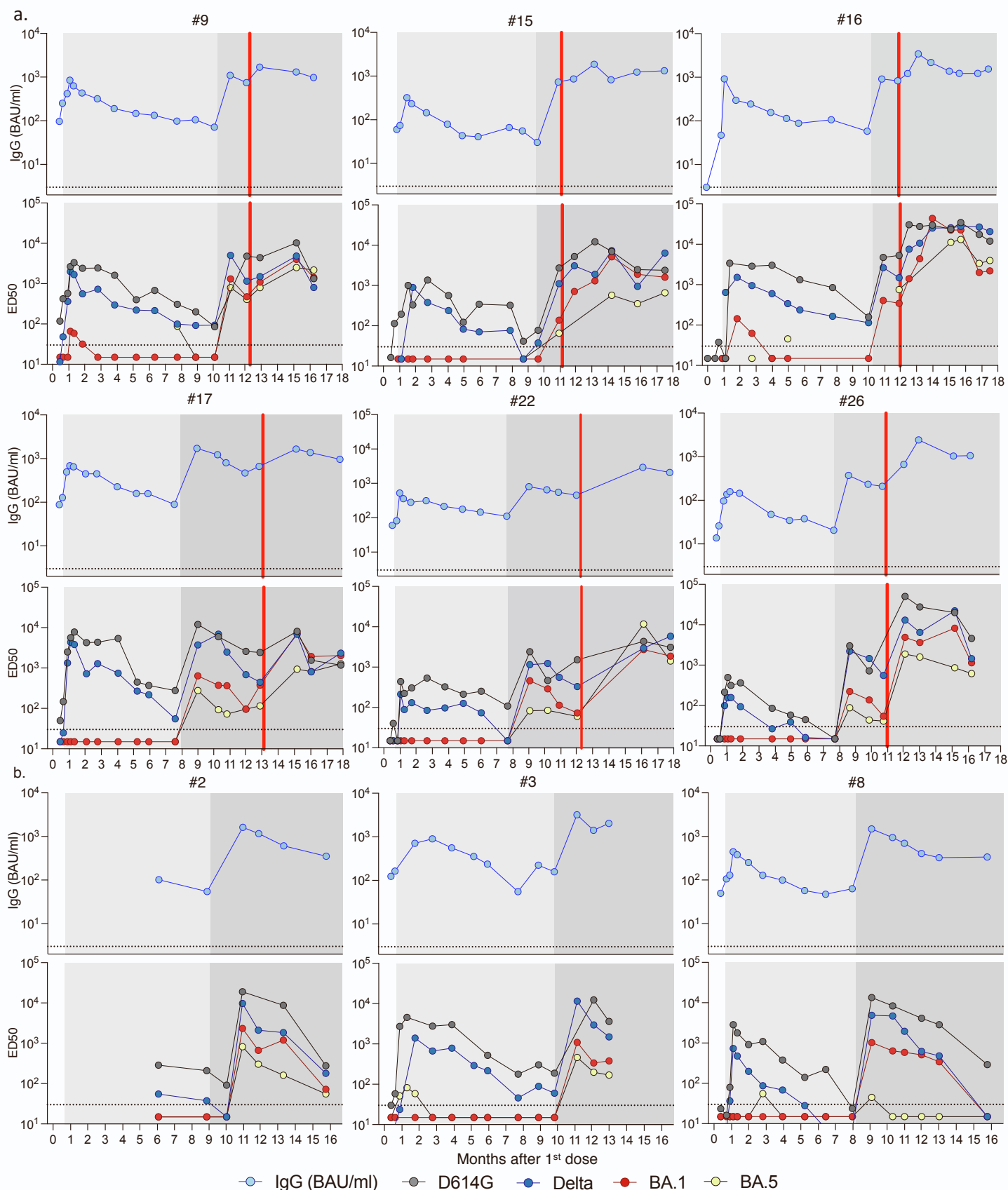
The 27 participants received 2 or 3 doses of Pfizer BNT162b2 vaccines. Sera were collected at the indicated time points after the first dose (white circles). The gray background indicates the period of time following the third dose. (x-axis is the timeline post first injection). The red crosses represent the occurrence of BA.1 or BA.2 breakthrough infection in 11 participants. Samples from the 24 participants used to generate Figure 1a (after third dose) are colored in green in the figure.



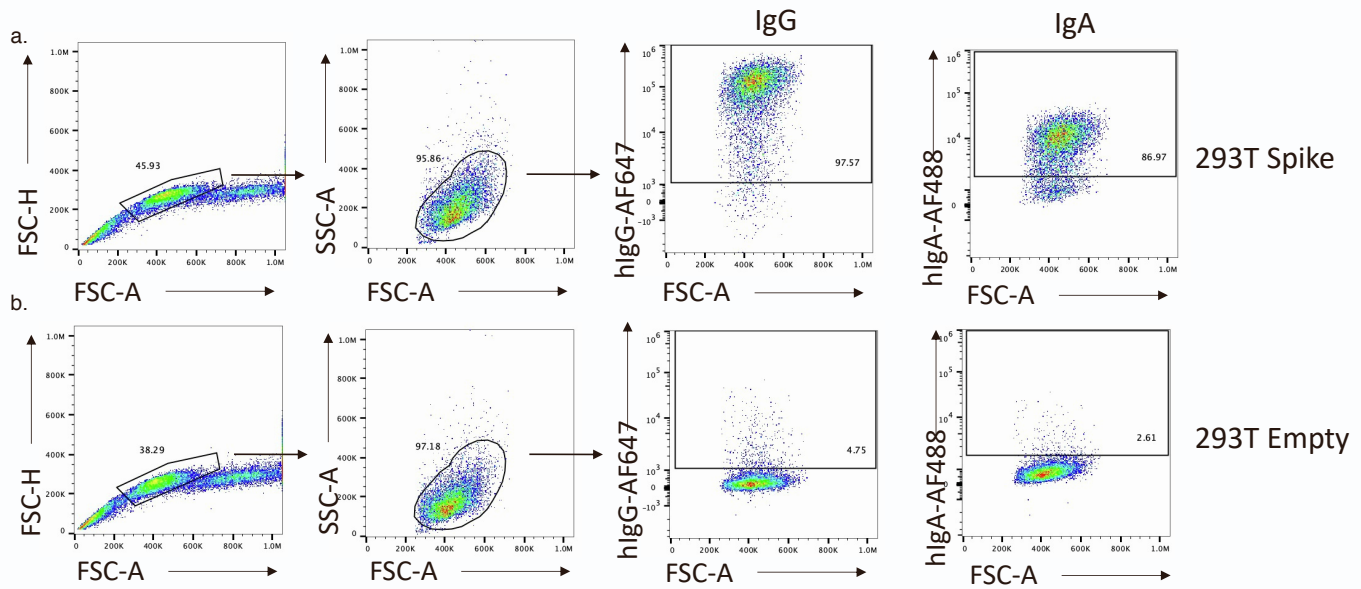
Supplemental Figure 2: Magnitude, cross-reactivity and durability of antibodies in sera from Pfizer vaccinees, with or without breakthrough BA.1/BA.2 infection. Related to figure 1b

a. Levels of anti-spike IgGs measured by flow cytometry with the S-Flow assay before (median = 20 days) and after (median = 80 days) in 11 individuals Omicron breakthrough. Results are presented in BAU/ml. The dotted lines indicate the limit of detection (3 BAU/ml). **b.** Temporal evolution of IgG levels (upper panels) and Nab titers (ED50) against Delta in 27 vaccine recipients and 11 participants who had Omicron BA.1 or BA.2 breakthrough infection. The IgG levels and Nab titers were calculated at the indicated months after the second dose (left panels), third dose (middle panels) or breakthrough infection (right panels). The bold dotted line included in some panels represents a simple linear regression of Nab waning. In the other panels, the shape of the curves did not allow this analysis.

Data are the mean from two independent experiments. The horizontal dotted line indicates the limit of detection (ED50 = 30).



Supplemental Figure 3: Temporal evolution of anti-Spike IgG and Nab titers after vaccination in nine individuals from the cohort. Related to figure 1b. We selected individuals with a large number of available longitudinal samples. Six individuals with Omicron breakthrough (**a**) infection and three individuals without Omicron breakthrough infection (**b**) are depicted. For each individual, the hashtag number corresponds to the ranking in supplemental Table 1. The upper panels represent the evolution of IgG levels, and the lower panels the neutralization profile against the indicated variants. The white, light grey and dark grey backgrounds indicate the period of time with one dose, two or three doses of vaccine. The red line corresponds to the last sample collected before breakthrough infection. Data are the mean from two independent experiments. The dotted lines indicate the limit of detection (BAU/ml = 3; ED50 = 30).



Supplemental Figure 4: Gating strategy of the S-Flow assay. Related to STAR Methods

293T cells stably expressing the Wuhan Spike were incubated with sera from vaccinated individuals (dilution 1:300) and stained with a mix of anti-human IgG (AlexaFluor 647) plus anti-human IgA (AlexaFluor 488) and analyzed by flow-cytometry. (a) One representative example of the gating strategy for anti-IgG and IgA is shown. (b) Gates are set on cells transfected with a control plasmid not encoding a spike (293T empty). An example of the signal obtained by a reactive serum on spike expressing cells is shown.

Supplemental Table 1. Characteristics of the participants of the Pfizer vaccine recipient cohort. Related to Figure 1 and Figure 2

ID	Vaccines	Sex	Age	Date first-dose	Date second-dose	Date third-dose	Breakthrough	Variants
#1	Pfizer	M	62	Jan-21	Jan-21	Aug-21	Jan-22	BA.1 or BA.2
#2	Pfizer	F	71	Jan-21	Feb-21	Nov-21	-	-
#3	Pfizer	M	52	Jan-21	Jan-21	Nov-21	-	-
#4	Pfizer	F	95	Feb-21	Mar-21	Sep-21	-	-
#5	Pfizer	M	59	Jan-21	Jan-21	Aug-21	Feb-22	BA.1 or BA.2
#6	Pfizer	F	57	Jan-21	Feb-21	Nov-21	-	-
#7	Pfizer	F	57	Jan-21	Feb-21	Nov-21	-	-
#8	Pfizer	M	74	Jan-21	Jan-21	Sep-21	-	-
#9	Pfizer	F	36	Jan-21	Jan-21	Nov-21	Jan-22	BA.1 or BA.2
#10	Pfizer	M	59	Jan-21	Feb-21	Sep-21	Feb-22	BA.1 or BA.2
#11	Pfizer	F	59	Jan-21	Feb-21	Nov-21	-	-
#12	Pfizer	F	37	Apr-21	May-21	Dec-21	-	-
#13	Pfizer	F	72	Jan-21	Jan-21	-	-	-
#14	Pfizer	M	53	Jan-21	Jan-21	Aug-21	-	-
#15	Pfizer	F	40	Jan-21	Feb-21	Oct-21	Dec-21	BA.1
#16	Pfizer	M	42	Jan-21	Feb-21	Nov-21	Jan-22	BA.1
#17	Pfizer	M	65	Jan-21	Jan-21	Sep-21	Jan-22	BA.1 or BA.2
#18	Pfizer	F	33	Apr-21	May-21	Nov-21	-	-
#19	Pfizer	F	54	Jan-21	Feb-21	Nov-21	-	-
#20	Pfizer	F	unknown	Jan-21	Jan-21	Sep-21	-	-
#21	Pfizer	M	75	Jan-21	Jan-21	-	-	-
#22	Pfizer	M	61	Jan-21	Jan-21	Aug-21	Jan-22	BA.1 or BA.2
#23	Pfizer	M	72	Jan-21	Mar-21	Oct-21	Jan-22	BA.1 or BA.2
#24	Pfizer	M	59	Jan-21	Jan-21	Jan-22	-	-
#25	Pfizer	M	67	Jan-21	Jan-21	Aug-21	-	-
#26	Pfizer	M	69	Jan-21	Jan-21	Aug-21	Dec-21	BA.1 or BA.2
#27	Pfizer	F	64	Jan-21	Jan-21	Jul-21	Dec-21	BA.1 or BA.2